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PREFACE:
An Introduction to Think Critically 2e

Welcome to THINK Critically 2e, an innovative textbook designed to transform your students as learners. This textbook provides the blueprint for developing the critical thinking skills and dispositions your students will use in their college years. Furthermore, it nurtures the skills and habits of mind that they will need to be successful in their civic, professional, and personal lives. Facione and Gittens make the concept of critical thinking come alive through topics such as clarifying ideas, evaluating claims and arguments, heuristic thinking, using maps to evaluate arguments and decisions, and deciding what to do and doing it. Each chapter includes numerous exercises through which students can practice what they learn. Whether you have taught a course in critical thinking for years or this is a new preparation, THINK: Critically 2e will be one of your most valued teaching resources.

Contents of the Instructor’s Manual Preface

Purpose and Philosophy of the THINK Critically 2e Textbook
Purpose and Philosophy of the Instructor’s Manual
Active Learning: Best Practice in the Classroom
Characteristics of an Active Learning Classroom
How Does Active Learning Relate to Critical Thinking?
Instructor Techniques for Promoting Critical Thinking
Student Techniques for Promoting Critical Thinking
Advanced Preparation: Designing Your Critical Thinking Course
Drafting Student Learning Objectives for Your Course
Develop an Assessment Plan: Providing Formative and Summative Feedback
Draft Grading Criteria to Evaluate Thinking and Learning
Preparing the Course Syllabus
Creating a “Zone of Inquiry” in the Classroom
What if I Have Never Taught This Way Before?
How to Approach Using THINK Critically 2e in Your Course

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Purpose and Philosophy of the THINK Critically 2e Textbook

The premise of the textbook is simple: To become stronger critical thinkers, students need to actively engage in thinking critically. In THINK Critically 2e, Facione and Gittens distinguish teaching for thinking from teaching about thinking. It is not sufficient to learn about critical thinking as if it were a set of steps or facts of principles to be memorized. Teaching for thinking means you structure your class so that students use their critical thinking constantly.

Teaching for thinking means that students:

- Exercise their critical thinking skills of interpretation, analysis, inference, evaluation, explanation, and reflective self-monitoring independently or in collaboration with others.
- Engage their critical thinking habits of mind, of truth-seeking, open mindedness, and inquisitiveness, as applied to issues where they may already hold strong beliefs.
- Expand the application of their thinking skills and dispositions to novel contexts, themes, problems, and ideas.
- Consider complex themes and problems that have multiple perspectives and imperfect solutions.
- Perform purposeful, reflective judgments about authentic scenarios and real-life situations.
- Receive formative feedback to augment and validate their self-monitoring, self-correction, and self-confidence.

Purpose and Philosophy of the Instructor’s Manual

This Instructor’s Manual was designed as a pedagogical support to the instructor as he or she uses the THINK Critically 2e text book. For each chapter in THINK Critically 2e, there is a companion chapter in the Instructor’s Manual that explains how to conduct the textbook activities and exercises. Following the guidelines in this Instructor’s Manual will facilitate maximal use of the numerous applied exercises that were created to support students’ critical thinking.

The Preface chapter of the Instructor’s Manual discusses the Active Learning paradigm and describes best practices in teaching for thinking in and out of the classroom. The Preface also contains a discussion of how to write student learning objectives, draft a course syllabus, plan for the assessment of student learning, and prepare for the first day of class. Each subsequent chapter in the Instructor’s Manual includes teaching techniques for nurturing students’ critical
thinking using the active learning principles. Every chapter includes student learning objectives, one or more activity suggestions that can be used as “Daily Discussion Starters” to begin each day’s lesson, and supplemental activities and exercises to augment the ones found in the textbook and on the companion Web site http://www.MyThinkingLab.com. Engaging students with the materials, lessons, ideas, principles and theorems, and applied examples from the textbook, companion Web site, and Instructor’s Manual will ensure the necessary opportunity for continual practice and improvement of students’ critical thinking skills and habits of mind. You are sure to find that the techniques embedded in Think Critically 2e and in this Instructor’s Manual have many suitable applications to any of your courses.

Active Learning: Best Practices in the Classroom

Active learning is a process by which students are engaged in an activity that requires them to Think Critically 2e (that is, purposefully and reflectively). Active learning is often contrasted with passive learning. Passive learning is teacher-centered. Passive learning can be characterized as a low level of student involvement, effort, or motivation in the learning experience. Transmission of course content is unidirectional from the knowledgeable instructor to the dependent student. The active learning model of teaching, on the other hand, assumes that the student is a partner in the learning process. An active learning classroom is a student-centered classroom. As such, students influence the pace of learning and the selection of activities and course materials. Active learning is collaborative and empowering. Students share the responsibility for their own learning and contribute to the learning experience of others.

Active learning casts the instructor as a resource, guide, and motivator during the learning process. The active learner invests considerable energy, enthusiasm, and effort into the learning experience. Because of this active involvement, the learning is self-reinforcing, which increases retention and transfer of what is learned to other courses and contexts. The underlying premise is the constructivist conceptualization of learning. Through active learning, students actively construct meaning from previous knowledge and skills and the new knowledge and skills they acquire. To facilitate this process, instructors provide students multiple opportunities to connect what
they learn to prior knowledge and to apply what they learn to authentic or real-life contexts. Furthermore, active learning strategies incorporate substantial opportunities for collaborative or cooperative learning.

It is important to note that active learning is more than giving students a choice of topics on a paper assignment, requiring student presentations, or asking a question and calling on a student to provide an answer. Active learning requires planning and commitment on the part of the instructor to put the student at the center of the learning experience and to conduct the course in a manner that maximizes the student’s multiple and frequent opportunities to apply and reflect on the knowledge, skills, and values that are central elements of the course.

To reap the benefits of active learning, the instructor should:

- **Model the behaviors students should practice.** (In this case, model the positive critical thinking habits of mind and the explicit application of the core critical thinking skills to make well-reasoned, fair-minded judgments.) One way to do this is to talk out loud as you think through a problem or consider an idea. Be a living example of a strong critical thinker. Show the students that you are a truth-seeker who has the courage to follow reasons and evidence wherever they may lead, even if the result is challenging to cherished, long-held beliefs.

- **Encourage students to view your classroom as a safe space for asking questions, sharing perspectives, and interacting meaningfully with others.** Students, regardless of their age or educational level, need to trust that they will be permitted to exercise their critical thinking, explore ideas fully, and be permitted to express well-reasoned opinions.

- **Insist upon nothing less than the full and thoughtful engagement of all students so that they may be active agents in their own learning.** Students should not be permitted to be “free riders” who do not participate but only sit in silent judgment of their peers. Controlling the classroom so that the naturally quiet are drawn into participation and the naturally vocal do not dominate or divert attention is part of the art of good teaching.
Active learning in the classroom can be identified by the following characteristics:

- Students who ask thoughtful and high-quality questions. The questions aid in understanding the course material. Questions that seek explanation, rationale, interpretation, clarification, definition, and application are common.

- The class is collaborative and non-confrontational. Interactions are constructive and meant to develop and enhance one another’s learning and understanding rather than to attack or show disrespect.

- Students challenge, assert, evaluate, and react to the ideas being shared by peers and the instructor. This reflective discourse is actively encouraged by all.

- Ideas from the course are applied to novel topics and contexts. The application of one’s learning reinforces the development of skills, deepens understanding, and encourages transfer.

- Class time is spent on discussion. Interactions with others aid in clarifying ideas, experiencing multiple and diverse perspectives, comparing findings, explaining one’s reasoning, and developing confidence in one’s self as a learner.

- Performance feedback is sought and internalized. If a student views his or her role as “partner” with a shared obligation for directing his or her own learning (as opposed to the passive perspective that learning depends exclusively on the talent, skills, and effort of the instructor), then the student is more likely to seek evidence that achieves the course objectives. They desire constructive feedback on what they can do to improve their learning because they view themselves as active agents, not passive recipients.

How Does Active Learning Relate to Critical Thinking?

Critical thinking pedagogy—teaching for thinking—fully embraces the principles of active learning. Teaching for thinking is “hands on” and is about practicing the use of one’s critical thinking skills and habits of mind. When teaching for thinking, an instructor provides numerous opportunities for students to actively apply their critical thinking skills and nurture their critical thinking dispositions / habits of mind. When teaching for thinking, students are asked to engage reflectively with
novel contexts, multiple perspectives, ideologically challenging themes, and authentic or real-life scenarios.

The active learning model of classroom teaching is highly compatible with the teaching for thinking perspective that is central to the *Think Critically* 2e textbook. The constant engagement with complex ideas encourages students to develop dispositions of truth-seeking, open-mindedness, and objectivity. When teaching for thinking, students are asked to reflect independently or think critically in groups, for this is how they employ their thinking skills and habits of mind in real life. When teaching for thinking, students interact with others to practice their critical thinking skills such as interpretation, analysis, evaluation, and explanation. These active learning features of a teaching-for-thinking approach reinforce students’ inquisitiveness, reflection, self-monitoring, and other critical thinking habits of mind. Repetitive practice, alone and in groups, accompanied by opportunities to receive supportive formative feedback will bolster students’ growth toward being strong critical thinkers.

**Techniques for Promoting Critical Thinking Through Active Learning**

Much like the common characteristics of an active learning classroom that were outlined previously, there are key strategies for the instructor and behaviors from the students that promote the development of strong critical thinking. To teach for critical thinking, instructors should employ the strategies outlined in this section and encourage the following behaviors from students.

Techniques an instructor can use to promote strong critical thinking include:

- Pose thoughtful or insightful questions and intentionally allow 10–15 seconds of silence to elapse before calling on students to respond. Cognitive science research has shown that a pause of this length is necessary for the human brain to sufficiently process a question and formulate a reasonable response.
- Work from example to theory. Discuss the examples in the text first, and then draw out the concepts they teach. This technique practices students’ inductive reasoning skills and promotes active engagement and inquisitiveness.
• Use critical thinking vocabulary when posing questions to students to reinforce conceptual understanding and promote recognition of reasoning. Use the names of the skills and the habits of mind that are found in the textbook. For example, use phrases such as: “What is your reason for that claim?” “Let’s interpret this statement,” “What inferences can we reasonably draw from these facts?” and “Let’s be systematic in our analysis.”

• Acknowledge when students use critical thinking to promote their self-awareness and recognition of reasoning (don’t forget to use the critical thinking vocabulary). For example, use phrases such as: “The claim you are making,” “The inquisitiveness of this group was evident when,” “I agree with your interpretation of,” and “In your analysis of.”

• Avoid sloppy, misleading, and imprecise expressions such as: “How do you feel about that?” and “What is your view of this?” and even “What did you think of this?”

• Engage students in dynamic learning activities that promote independent thinking or exposure to the thinking of others. Suggested activities include maintaining a reflective journal; conversing with a partner, small groups, or the whole class; investigations, inquiries, and informed conversations; debates; simulations; role playing; fishbowl activities; panel discussions; brainstorming exercises; case studies; course blogs or wikis; individual or group argument mapping; social networking features such as asynchronous bulletin boards that are often found in course management systems; maintaining a paper or electronic Portfolio, and so on.

• Provide numerous and frequent opportunities to practice critical thinking skills and receive formative feedback from the instructor and peers. Interactions that result in constructive feedback can be incorporated by the student and reinforce self-regulation.

• Require students to provide reasons or explanations for all of their claims, interpretations, analyses, evaluations, and decisions. Ask why and expect a good, well-reasoned answer. Don’t let students get by with shut-down clichés such as, “That’s just how I feel,” “I was brought up to think that...,” “My parents always said that...,” and “It’s common sense.”

• Model strong critical thinking for your students. Your students watch you to see if you believe in the value of critical thinking, so what you say and what you do might be more powerful in
motivating them to build their critical thinking skills than anything they read or hear in a lecture. If you show that you practice the positive critical thinking habits of mind and that you engage in problems and decisions by applying critical thinking skills, that message comes through to them. If you do not, you reflect a negative message.

**Techniques to encourage students to promote strong critical thinking include:**

- Practice asking “why” questions that seek reasons, analyses, clarifications, and explanations.
- Practice active listening and note taking. Use the “Divide the Page” technique where you split the notebook page in half with a vertical line. On the left side, take notes from the material that is discussed in class. On the right side, write down questions, analyses, inferences, and connections to other concepts that come to mind during class time.
- Attend each class session and complete each assignment with 100 percent effort.
- Use critical thinking vocabulary when talking with friends, classmates, faculty members, family members, and so on.
- Maintain a reflective journal to document and evaluate one’s thinking processes and decision making. Use the “Reflective Log” exercises in the book to help trigger thoughtful journal entries.
- Log examples of strong and poor critical thinking that come from daily conversations, television programs, films, print media, the Internet, and so on, and evaluate the reasoning displayed.
- Seek to identify the assumptions that are made by one's self or others in a decision-making situation.
- Ask others to give the reasons for their claims or decisions and evaluate what is said.
- Be meta-cognitive (think about your own thinking) and practice self-monitoring and self-correction often.
- Model and display strong critical thinking habits of mind and skills in and outside of the classroom.
Advanced Preparation: Designing Your Critical Thinking Course

As with all course preparations, essential considerations and planning steps should be undertaken to develop your critical thinking course. These planning steps are outlined in the following sections.

**STEP 1: Familiarize Yourself with the Think Critically 2e Textbook**

The organization of the chapters in *Think Critically 2e* is described in brief in the following list. Please review page ix in the textbook for a fuller explanation.

- Chapters 1 and 2 are introductory chapters. Together, these chapters provide an overview of critical thinking—what it is and why it is important in schooling and in everyday life. The interactive skills associated with critically thinking are explained and the dispositions or habits of mind that characterize a strong critical thinking are described.

- Chapter 3, an important new element in the second edition, connects critical thinking with problem solving. This chapter expands on the practical value of critical thinking by describing the IDEAS approach and applying this approach to the problems faced by college students of all ages and backgrounds in their daily lives.

- Chapters 4 and 5 focus on two of the six core critical thinking skills: interpretation and analysis. In these two chapters, Facione and Gittens describe how context and purpose affect the quality of an interpretation, how problematic vagueness and ambiguity can be resolved, the relationship between claims, reasons and arguments, and how to analyze and map these relationships.

- Chapters 6, 7, 8 and 9 focus on the core critical thinking skill evaluation. In these chapters, students explore how to evaluate claims and arguments. The Four Tests of the Worthiness of an argument are introduced and illustrated, and the evaluation of deductive and inductive reasoning is explained.

- Chapters 10 and 11 focus on meta-cognition and the skill of self-reflection. These chapters locate critical thinking within the larger domain of human decision making and problem solving. Several cognitive heuristics are described, and the role of heuristic thinking vis-à-vis critical thinking is explained. Dominance structuring as a strategy for bolstering confidence in
one’s decision making is described and illustrated through example.

- Chapters 12, 13, and 14 form a trilogy that addresses the three most powerful and fundamental modes of human reasoning: comparative reasoning, ideological reasoning, and empirical reasoning. These chapters focus on the skills of inference and explanation. Strategies for evaluating these three widely-used patterns of human reasoning are offered as are the benefits and risks of each pattern of reasoning.

- Chapter 15, another important new element of the second edition, connects critical thinking with the writing process by focusing on strategies for writing sound and effective arguments. This chapter develops students’ writing skills through examples, activities and exercises designed to help students “think like a writer”.

- Four Supplemental chapters are available with THINK Critically 2e. These chapters are designed to help students thinking like a social scientist, or a natural scientist, or an ethical decision-maker, or a logician. Each chapter was written with a focus on connecting critical thinking to the disciplines or professional fields that a student may be studying in a given college course or program of study.

**STEP 1A: Familiarize Yourself with MyThinkingLab.com and the Companion Web Site**

MyThinkingLab is an open-access Web site for Think Critically 2e. This Web site provides the resources students and instructors need to effectively use the text in the critical thinking course. The MyThinkingLab site reinforces course learning objectives by providing numerous exercises, videos, news, and Web sites to be used in or outside of class time. MyThinkingLab contains PowerPoint slides for lecture notes, chapter summaries, flash cards, audio summaries, and chapter quizzes. Instructors should access the MyThinkingLab site to become familiar with the interface and the available resources.

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STEP 2: Drafting Student Learning Objectives for Your Course

A Student Learning Objective (SLO) is a specific and detailed statement of the content or level of knowledge, skills, and/or values that an instructor expects students to possess upon completion of a specific course (known as “mastery objectives”). SLOs can also be the expected domain(s) in which students have demonstrated growth or change at the end of a course (known as “developmental objectives”).

Student Learning Objectives are typically written in the following format:

Students will [be able to] + action verb + expected learning outcome.

- The action verb should suggest a measurable cognitive activity such as “identify,” “analyze,” “design,” “evaluate,” or “explain.”
- The expected learning outcome should be an articulation of the knowledge, skills or values that are expected outcomes of your course.

This Instructor’s Manual provides SLOs for each individual chapter that can be used as a model for writing your course-level objectives. It is important to note that SLOs should not state what the student will do in terms of behaviors that would demonstrate their learning (such as...
receiving a passing grade, writing a paper, or giving an oral presentation). To clarify this distinction, consider the following course SLO statements:

**Example 1:** Students will evaluate arguments using the Four Tests of Worthiness.

**Example 2:** Students will work in small groups.

Example 1 is an appropriate learning objective for this course because it has a measurable action verb (evaluate) and expected learning outcome (Four Tests of Worthiness as applied to arguments). This can be practiced in several different types of activities, and the evidence of mastery could come from written responses and from oral reports.

Example 2 is an inappropriate learning objective because the action verb (work) is too vague to be measurable in its current form and the expected learning outcome (small groups) is not a statement of learning. Rather, example 2 is a statement of a teaching technique. To fix this second example, the instructor needs to clarify the intended learning that should occur through small group interaction (for example, evaluate different perspectives than their own, negotiate and reach consensus about a decision, develop oral communication skills, and so on), and then rewrite the learning objective with a measurable action verb and a clear statement of the desired learning.

**Here are some questions that might help you identify and prioritize what you want students to learn about in this course:**

- What do I want my students to learn in this class?
- What are the important ideas, skills, dispositions, principles, strategies, concepts, and experiences that I want my students to learn about and understand?
- What do the students need to be able to do (skills) to successfully complete this course?
- In what dispositional areas should students grow as a result of taking this class?
- How does this course relate to the overarching learning goals and objectives of my department and program?

**Things to remember when writing learning objectives include:**
• Keep the number of course-level SLOs to a manageable number. Between three and five is a recommended range. These course-level objectives should represent what you want your students to learn as a result of taking the course.

• Be sure to represent the range of critical thinking skills and dispositions (positive critical thinking habits of mind) that you expect students to learn or develop as a result of your class.

• If you find yourself struggling to identify measureable action verbs, consider those active verbs that appear as the six core critical thinking skills and the various subskills identified in Chapter 2 of THINK_Critically. If all else fails, you can always fall back on the verbs that appear on Bloom’s Cognitive Taxonomy¹.

• The chapter learning objectives in this Instructor’s Manual can be used as examples to emulate.

**STEP 3: Develop an Assessment Plan**

Assessment of student learning is the process by which we come to understand if students are accomplishing the learning objectives we set for them. Assessment occurs at the lesson, course, department and program, school or college, and university levels. Assessment might be *formative* (simultaneous with the learning process, enabling a feedback process that can guide future learning) or *summative* (occurring at the end of the learning process to document accomplishments). The assessment of student learning provides educators with information about students’ knowledge, skills, and values. Assessment endeavors provide instructors with opportunities to evaluate what students learn and determine what can be done to improve student learning. Assessment endeavors also provide students with feedback about their learning so that they can build confidence or make adjustments to improve their learning.

Educational assessment follows a cycle of articulating student learning objectives, crafting assignments, conducting learning activities that

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¹ In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. Bloom and colleagues identified six levels in the cognitive domain, from the simple recall or recognition of facts at the lowest level, through increasingly more complex and abstract mental levels, to the highest order that is classified as evaluation.
elicit evidence of student leaning, the collection and evaluation of these demonstrations of student learning, reflecting on the evidence, and providing feedback to students. Depending on the results of the assessment process, modifications may be made to the learning objectives and/or the learning activities for purposes of improvement. The Assessment Cycle is represented in the following illustration.

Crafting Assignments to Elicit Critical Thinking
After you have written SLOs for your course, you can begin to consider the specific assignments that you will ask students to complete to evaluate whether they have achieved the learning objectives. Review the learning objectives for the course and for the chapters. Brainstorm assignments that would elicit demonstration of students’ critical thinking skills and dispositions. Don’t reinvent the wheel if you don’t have to! There are literally hundreds of activities in the textbook, Instructor’s Manual, and companion Web site that can be used as graded assignments in this course. In Think Critically 2e and in this Instructor’s Manual, there are numerous activities that lend themselves to assignments such as five-minute quick writes, exit tickets, reflective logs, role plays, debates, meta-cognitive fishbowls, and the creation of iMovies, presentations, posters, and Web sites. You
should not feel discouraged about crafting your own assignments or using a favorite assignment from a previous term. Just be sure that the assignment requires students to perform the skills and habits of mind that you are seeking to reinforce based on the course objectives.

As you compile the final set of assignments, consider the following questions:

- Do the assignments enable students to demonstrate that they have met the learning objectives?
- Do the assignments map to the action verbs and key phrases in the course and/or chapter learning objectives?
- Do these assignments reflect optimal ways for students to meet the learning objectives?
- Are there a variety of assignments that engage students in one or more critical thinking skills?
- Are there assignments that elicit students’ critical thinking habits of mind?
- Do the assignments provide opportunities to evaluate students’ independent critical thinking and their thinking in groups?
- Are there a sufficient number of assignments that will be reviewed and returned to students so that they receive frequent feedback on their performances?
- How will these assignments be supported by in-class activities and other forms of informal feedback so students are able to practice their critical thinking skills and dispositions and make appropriate modifications?

Your graded assignments should demand the same engagement of students’ critical thinking as the classroom activities. Whether or not you assign an activity from the textbook, Instructor’s Manual, or companion Web site for a formal grade, incorporate as many of these activities as you can in each of your class sessions as an opportunity for students to practice their critical thinking.
Deciding how you will evaluate students’ performances is as important as crafting the assignments. If you adopt assignments from the *Think Critically 2e* textbook or instructor resources, you will have chosen an activity that will engage your students in critical thinking. If you require them to produce evidence of their learning, such as a short-answer essay, argument map, term paper, group report, field notes, reflective log entry, five-minute quick write, quiz or exam, PowerPoint presentation, poster, debate, iMovie, wiki or blog, or portfolio to name a few, then you will have ample sources from which to make your evaluations of their performances. There is also a strong chance that the evidence of student learning will come in a form where you will evaluate narratives or subjective responses. Because of this likelihood that the majority of evidence will be qualitative in nature, it would be wise to create scoring rubrics for these assignments.

Scoring rubrics are descriptive scoring tools that are developed by educators to organize the analysis and evaluation of student performances. Scoring rubrics are effective means of characterizing the quality of students’ work. Scoring rubrics articulate the criteria used for judging different levels of performance. Scoring rubrics facilitate the evaluation of narrative activities, live performances, or activities where there is likely to be a broad range of content or activity. Scoring rubrics might be used by instructors or peers to provide constructive feedback, given to students for purposes of self-evaluation, or distributed to the class before an assignment is due as a guide to how the student will be evaluated. For help in getting started with writing rubrics, consult one or more of the rubric generator sites geared toward educators on the Internet.

In addition to the rubrics you develop for your specific course assignments, use the Holistic Critical Thinking Scoring Rubric presented in Chapter 1 of *THINK Critically 2e* and the Rubric for Evaluating Written Arguments in Chapter 15 to help establish the overall expectations for what students should endeavor to demonstrate when completing course assignments. Because we often “get what we measure,” it is reasonable to let students know that you expect them to demonstrate consistently strong critical thinking skills if they hope to earn a good grade in your course.
As you write grading criteria for the class assignments, look over your course and chapter learning objectives and consider the following:

- Do the grading criteria for assignments permit you to evaluate whether students have achieved the learning objectives and expectations you have for them?

- Hint: Consider the action verbs and key phrases in the learning objectives to determine whether these same critical thinking skills and habits of mind are evaluated with the grading criteria you develop.
A Special Note about Feedback to Students

There are many ways to give feedback to students. One primary way, of course, is through graded assignments. Other opportunities to provide feedback include comments on reviewed but ungraded work products, responses and praise given during an in-class discussion, peer editing and peer evaluation, meetings with individuals or groups during office hours, comments on blog posts, notes on rough drafts, and so on.

The two most important things to remember when giving students feedback are 1) give feedback that is constructive and 2) make sure the feedback is timely.

- **Constructive** means that the feedback students receive can be directly applied to improve their learning. A letter grade might boost or smash a student’s spirits, but the letter grade by itself conveys nothing of value in terms of what they did well and where they need to improve. Communicating a student’s successes is vital to nurturing and reinforcing his or her critical thinking. Communicating specific recommendations regarding areas to improve is also vital to supporting students’ growth as thinkers.

- **Timely** means that students have an opportunity to receive formative feedback about their performances at the time that they work or shortly thereafter. To reinforce students’ learning, they need to receive informal feedback before they are evaluated formally through a graded assignment. Timely also means that there are multiple and frequent opportunities to receive informal and formal feedback.
PREPARING THE COURSE SYLLABUS

The syllabus is an outline of a particular course, containing the course description, instructor information, student learning objectives, assignments, due dates, classroom policies, and so on. Some instructors view the syllabus as a form of contract between instructor and student, and others see the syllabus as a direction for the course that is open to modification. A detailed and clear syllabus benefits both the instructor and the students by describing the criteria for success in the class. It can convey the instructor’s enthusiasm for a subject matter and for the students as learners. The syllabus is a teaching tool. It should describe the SLOs and expectations that the instructor holds for the students and for him or herself. The following questions are useful to consider when preparing your syllabus:

✓ Have I provided opportunities for students to build critical thinking skills and habits of mind?
   We were trained to teach students knowledge. But, in this course, the learning objectives should reflect the goal of strengthening critical thinking skills. They should also target the development of students’ positive critical thinking habits of mind. Are the course activities and graded assignments going to foster these critical thinking skills and habits of mind? If you use the exercises that appear in the textbook, the Instructors Manual, and at www.MyThinkingLab.com, the answer will likely be yes!

✓ Are there additional opportunities for active learning I could incorporate that would be even more effective than what I do now?
   Remember that in the active learning paradigm, the instructor is a resource, guide, and mentor to students. If we let go of the idea that it is best to use class time to “cover” the material, we can imagine what are often more effective pedagogies, such as encouraging students to analyze, evaluate, research, apply, dramatize, debate, deliberate, collaborate, judge, decide, reflect, and engage with real-life examples.

✓ Have I listed the course learning objectives on the syllabus?
   Listing the course student learning objectives on the syllabus will communicate your learning expectations to the students.
SPEND CLASS TIME TEACHING FOR THINKING:
Run the activities and exercises
in *Think Critically 2e*
and the companion resources.

- *Learning by doing*—Becoming more skillful and disposed critical thinkers means practice and more practice (with the instructor's support and feedback).

- *Chapter 2* describe the reciprocal relationship between doing (practice to improve skills) and the strengthening of dispositions.

✓ **If appropriate, have I listed the relevant departmental and programmatic learning objectives and General Education objectives on the syllabus?**
Listing these additional learning objectives will facilitate an understanding of how this course fits within the larger context of the students’ majors or general educations.
### Think Critically 2e in a Quarter Course Format

<table>
<thead>
<tr>
<th>WEEK</th>
<th>CHAPTERS</th>
<th>STUDENT LEARNING OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intro to Course / CH 1 &amp; 2</td>
<td><strong>CH 1</strong>&lt;br&gt;- Articulate a working definition of critical thinking.&lt;br&gt;- Explain why critical thinking is important in our daily lives.&lt;br&gt;- Identify the characteristics of strong or weak thinking.&lt;br&gt;- Defend the need for critical thinking in a free society.&lt;br&gt;<strong>CH 2</strong>&lt;br&gt;- Identify the core cognitive skills involved in critical thinking.&lt;br&gt;- Describe the relationship of cognitive skills during the critical thinking process.&lt;br&gt;- Describe, compare, and contrast inductive and deductive reasoning.&lt;br&gt;- Identify and evaluate instances of critical thinking found in human conversation.&lt;br&gt;- Describe the characteristics of a strong critical thinker.&lt;br&gt;- Explain ways to cultivate the seven critical thinking habits of mind.&lt;br&gt;- Contrast being a strong critical thinker and an ethical thinker.&lt;br&gt;- Explain why strong critical thinking requires one to be both “willing” and “able.”</td>
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<tr>
<td>2</td>
<td>CH 2 (cont.) &amp; 3</td>
<td><strong>CH 3</strong>&lt;br&gt;- Identify the five steps of the IDEAS Critical Thinking Problem Solving and Decision Making Process.&lt;br&gt;- Explain how to use the IDEAS process to think critically and solve problems that occur in the day-to-day lives of...</td>
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2 The instructor and students need access to the Internet during class time.
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<th>Page</th>
<th>Chapter(s)</th>
<th>CH 4</th>
<th>CH 5</th>
<th>CH 6 &amp; 7</th>
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<td>CH 4</td>
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<td>- Recognize the potential application of the IDEAS process to any decision making situation.</td>
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<td>4</td>
<td>CH 5</td>
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<td>- Explain why strong critical thinking, particularly judicious interpretation, is helpful when encountering a new language community.</td>
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<td>5</td>
<td>CH 6 &amp; 7</td>
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<td>- Define the terms reason, claim, premise, conclusion, and argument.</td>
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<td>- Identify and apply 12 criteria to evaluate the trustworthiness of a source.</td>
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<td>- Explain how to evaluate the plausibility of a claim independently.</td>
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<td>- Name and explain the four presumptions (or presuppositions) that are made when people offer reasons to support their claims.</td>
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<td>- Apply four tests to determine whether an argument is worthy of acceptance.</td>
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<td>- Use the argument mapping</td>
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<td>CH 8 &amp; 9</td>
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| 6 |         | • Evaluate the logical strength of *deductive* arguments.  
|   |         | • Identify common fallacies that are encountered when evaluating deductive arguments. |
|   |         | CH 9 |
|   |         | • Evaluate the logical strength of *inductive* arguments.  
|   |         | • Identify common fallacies that are encountered when evaluating inductive arguments. |

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<th>CH 10 &amp; 11</th>
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<td>7</td>
<td></td>
<td>• Describe the “two systems” approach to human decision making.</td>
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<td>• Explain the value of each system in the “two systems” approach.</td>
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<td>• Identify common cognitive heuristics when they are used in decision making.</td>
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<td>• Explain how heuristic thinking can help or hinder decision making.</td>
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<td>CH 11</td>
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<td>• Explain the benefits and risks associated with the natural tendency toward dominance structuring.</td>
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<td>• Identify specific critical thinking skills and dispositions that can improve decision making.</td>
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<td>• Explain how critical thinking can be used to make better decisions.</td>
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<th>CH 12 &amp; 13</th>
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| 8 |           | • Identify the three most fundamental
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| patterns of human reasoning.  
• Recognize comparative reasoning.  
• Evaluate comparative reasoning.  
• Explain the uses, benefits, and risks of comparative reasoning.  
CH 13  
• Recognize ideological reasoning.  
• Evaluate ideological reasoning using the four tests of worthiness of an argument.  
• Explain the uses, benefits, and risks of ideological reasoning.  |   |
| 9 | CH 14 & 15 |
|   | CH 14  
• Describe the three central characteristics of empirical reasoning.  
• Describe the steps in conducting an empirical investigation.  
• Explain the uses, benefits, and risks of empirical reasoning.  
CH 15  
• Identify the critical thinking questions that effective writers ask.  
• Explain how effective writers organize and develop their presentations.  
• Evaluate the credibility of sources.  
• Evaluate the effectiveness of one’s own and others’ writing.  |   |
| 10 | Supplemental Chapter(s) |
|   | • In this final week of classes you can cover one or more supplemental chapters (Think Like a Social Scientist, Think Like a Natural Scientist, Ethical Decision Making, The Logic of Declarative Statements).  |   |
|   | FINAL EXAM WEEK  |

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### Think Critically 2e in a Semester Course Format

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>CHAPTERS</th>
<th>STUDENT LEARNING OBJECTIVES</th>
</tr>
</thead>
</table>
| 1     | Intro to Course / CH 1 | • Articulate a working definition of critical thinking.  
      |           | • Explain why critical thinking is important in our daily lives.  
      |           | • Identify the characteristics of strong or weak thinking.  
      |           | • Defend the need for critical thinking in a free society. |
| 2     | CH 2     | • Identify the core cognitive skills involved in critical thinking.  
      |           | • Describe the relationship of cognitive skills during the critical thinking process.  
      |           | • Describe, compare, and contrast inductive and deductive reasoning.  
      |           | • Identify and evaluate instances of critical thinking found in human conversation.  
      |           | • Describe the characteristics of a strong critical thinker.  
      |           | • Explain ways to cultivate the seven critical thinking habits of mind.  
      |           | • Contrast being a strong critical thinker and an ethical thinker.  
      |           | • Explain why strong critical thinking requires one to be both “willing” and “able.” |
| 3     | CH 2 (cont.) & CH 3 | • Identify the five steps of the IDEAS Critical Thinking Problem Solving and Decision Making Process.  
      |           | • Explain how to use the IDEAS process to think critically and solve problems that occur in the day-to-day lives of college students.  
      |           | • Recognize the potential application |

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3 The instructor and students need access to the Internet during class time.

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| 4 | CH 4 | - Explain how context and purpose affect the quality of an interpretation.  
- Apply five strategies to effectively resolve problematic vagueness and ambiguity.  
- Describe the central characteristics of a language community.  
- Explain why strong critical thinking, particularly judicious interpretation, is helpful when encountering a new language community. |
|---|---|---|
| 5 | CH 5 | - Define the terms reason, claim, premise, conclusion, and argument.  
- Explain how reasons, conclusions, and arguments are related to one another.  
- Use visual maps to represent a person or group’s reasons, arguments, and decisions. |
| 6 | CH6 | - Define expertise as it relates to evaluating the credibility of the source of a claim.  
- Identify and apply 12 criteria to evaluate the trustworthiness of a source.  
- Explain how to evaluate the plausibility of a claim independently. |
| 7 | CH 7 | - Name and explain the four presumptions (or presuppositions) that are made when people offer reasons to support their claims.  
- Apply four tests to determine whether an argument is worthy of acceptance.  
- Use the argument mapping techniques developed in Chapter 5 to facilitate the analysis and |
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| 8       | CH 8    | - Describe and recognize common reasoning mistakes.  
|         |         | - Evaluate the logical strength of *deductive* arguments.  
|         |         | - Identify common fallacies that are encountered when evaluating deductive arguments. |
| 9       | CH 9    | - Evaluate the logical strength of *inductive* arguments.  
|         |         | - Identify common fallacies that are encountered when evaluating inductive arguments. |
| 10      | CH 10   | - Describe the “two systems” approach to human decision making.  
|         |         | - Explain the value of each system in the “two systems” approach.  
|         |         | - Identify common cognitive heuristics when they are used in decision making.  
|         |         | - Explain how heuristic thinking can help or hinder decision making. |
| 11      | CH 11   | - Apply the concept of dominance structuring to explain how people can maintain a steadfast commitment to their decisions.  
|         |         | - Explain the benefits and risks associated with the natural tendency toward dominance structuring.  
|         |         | - Identify specific critical thinking skills and dispositions that can improve decision making.  
|         |         | - Explain how critical thinking can be used to make better decisions. |
| 12      | CH 12   | - Identify the three most fundamental patterns of human reasoning.  
|         |         | - Recognize comparative reasoning.  
<p>|         |         | - Evaluate comparative reasoning. |</p>
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<tr>
<th>Chapter</th>
<th>Title</th>
<th>Topics</th>
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<tbody>
<tr>
<td>13</td>
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<td>- Explain the uses, benefits, and risks of comparative reasoning.</td>
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<tr>
<td>16</td>
<td>Supplemental Chapter(s)</td>
<td>- In this final week of classes you can cover one or more supplemental chapters (Think Like a Social Scientist, Think Like a Natural Scientist, Ethical Decision Making, The Logic of Declarative Statements).</td>
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</table>

**FINAL EXAM WEEK**
Creating a “Zone of Inquiry” in the Classroom

On the first day of class, most instructors take time to review the syllabus, assignments, and their expectations for student performance and participation. For you, this first day is essential for ensuring the success of this course.

When you meet your students for the first time, engage them in an activity meant to break the ice and get students comfortable with participating and interacting with one another. This is an ideal time to conduct one of the Daily Discussion Starters that you will find in this Instructor’s Manual. Students will try to guess your style and expectations, so set the bar high on the first day. Encourage everyone to contribute to the conversation. Call on students if they are not raising their hands. Ask vocal students to nominate a classmate to offer a response.

Your goal on this first day and every day thereafter is to make students feel comfortable, welcome, respected, and safe so they will share their ideas and their reasoning. How can you maintain an open classroom climate where students are free to question all views on controversial issues, including the professor’s views? Use some of the following techniques:

✓ Engage the students with multiple activities starting on the first day that require them to apply their critical thinking skills and dispositions. Set the expectation that active learning is going to be the *modus operandi* for this course. Share the Active Learning paradigm with your students so that they understand the teaching philosophy of the course.

✓ Encourage students to repeat back the comments made by others to show that they care about understanding their peers’ perspectives. Model this for the students.

✓ Praise students for their contributions to the conversation to build their self-confidence in their critical thinking skills.

✓ Be the facilitator of the conversation, but not the driver. Ask questions and pause to let students think before responding. If there is silence, wait for students. Someone other than you should fill the uncomfortable silence. If you break the silence the first time, they will always wait for you in the future.
Curb quickly any situation in which one or two students dominate the conversation or are always the first to speak. Ask students to reflect quietly before raising their hands. This will give everyone a chance to process the information that is presented.

Encourage students to interpret, analyze, and respond to each other’s comments and questions. You should not always be the one to answer students’ questions. Engage the students as learners to find answers.

Remind students that they are going to be challenged in this course by claims and arguments that might not be consistent with their personal viewpoints or beliefs. Encourage them to always treat one another with complete respect and tolerance for alternative points of view.

By creating an active zone of inquiry, your classroom will be a dynamic setting where students can discover a new awareness of their thought processes. They will actively engage their critical thinking skills and test their ideas, stretching the boundaries of their critical thinking habits of mind. It cannot be said enough times that your students need an abundance of time to work through the activities and exercises that Think Critically 2e offers. If you are committed to teaching for thinking using this textbook as the vehicle, then your efforts will be rewarded when your students grow as critical thinkers.

What if you never previously taught this way?

Conducting class sessions with a high level of activity and group conversation going on in the room might be new. You might wonder how you will conduct an effective class and maintain control while using the active learning approach.
Following are additional suggestions if active learning or teaching for thinking is new:

- To help ensure students stay on task, follow the detailed steps for each of the *Think Critically 2e* exercises that are contained in this Instructor’s Manual.

- Write SLO statements for each day’s lecture. Your daily learning objectives should reflect what you wish students to learn from that specific day’s lecture and activities. Write the day’s learning objectives on the board at the beginning of class. Talk to your students about them and discuss them as a class to be sure that students understand what learning you are targeting. At the end of the class, reflect as a class on whether or not the learning objectives were met. Use this conversation to gauge whether additional exercises from that chapter should be included in the next class session.

Build your critical thinking vocabulary by using the examples of language from *Think Critically 2e* text (skills, habits of mind, and the key terms in each chapter) and use these words with precision. You may also wish to supplement them with other cognitive action verbs, such as those found on Bloom’s Cognitive Taxonomy, if these words appear in your student learning objectives.

- Research suggests that active learning strategies are more successful than passive learning strategies in terms of students’ retaining what they have learned and being able to transfer knowledge and skills to new contexts. Read about the active learning and critical thinking literature to develop your teaching tool bag.

- Work the exercises from the book with your students. Put yourself in the role of learner.

- Raise your awareness of examples of critical thinking from the world around you. Look for examples everywhere you go (print and electronic media, movies, TV, Internet, advertisements, books, magazines, radio, and so on). Bring examples to class to use as Daily Discussion Starters of supplemental mapping or evaluation activities.
Most importantly, relax and enjoy this course! Your inquisitiveness and enthusiasm for critical thinking will come across and energize your students.

How to Use the *Think Critically 2e* Textbook

*Think Critically 2e* is unlike any textbook you have previously used. Each chapter of the text has sample assignments and evaluation criteria, such as, “Each week submit a written response to the Reflective Log questions in the text for the chapter covered that week.” The Instructor’s Manual provides descriptions of how to run the textbook examples and offers additional exercises to extend your options.

To maximize learning in this course, students will access to the Internet. Although you do not need to access the Internet during class time, the videos and URLs mentioned in the text and available at [www.MyThinkingLab.com](http://www.MyThinkingLab.com) can be powerful instructional assets. Thus, it is ideal to conduct this course in a room that has desktop computers such as a technology lab or in a room with a mobile technology cart so students can access the Internet via laptops. If the ideal isn’t available, access to the Internet through the instructor’s podium would be highly desirable because that permits you to show the videos or visit the URLs. But, if even that level of technology is not available, do not worry because there is more than enough in *Think Critically 2e* and in this Instructor’s Manual to more than fill your class time with interesting, engaging and powerfully instructive exercises and activities.

In the beginning of the term, you serve as the primary facilitator of course discussions and activities. Plan, however, to gradually increase students’ involvement in the delivery of the curriculum. For example, after a few days of modeling the Daily Discussion Starter, have the students take responsibility for initiating a Daily Discussion topic tied to the theme of the chapter they are studying. After you have modeled effective brainstorming, select a student to facilitate a brainstorming or group-sharing session. Task students with identifying additional examples of reasoning, claims, arguments, and fallacies to incorporate into class discussion, or assign them the activity of generating quiz questions modeled after the activities you have been working from in class.
Think Critically 2e nurtures and develops stronger critical thinking skills and positive dispositions of your students. It should come as no surprise that the techniques you find in this textbook have direct applications and uses in other courses. Your students will praise the usefulness of this course in their daily lives, and it will likely become one of the most enjoyable classes you will teach.
Chapter 1
The Power of Critical Thinking

CHAPTER OVERVIEW
This first chapter offers students a conceptualization of critical thinking that includes both thinking skills and thinking dispositions. A definition of critical thinking as the process of purposeful, reflective judgment is offered and explained. A case is made for why critical thinking is important to individuals and to society as a whole. Finally, students are introduced to the Critical Thinking Holistic Scoring Rubric that can be used to evaluate critical thinking. Numerous examples and exercises are provided to achieve the chapter learning objectives.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Articulate a working definition of critical thinking.
• Explain why critical thinking is important in our daily lives.
• Identify the characteristics of strong or weak thinking.
• Defend the need for critical thinking in a free society.

DAILY DISCUSSION STARTERS
1. What comes to mind when you hear the words critical thinking?
   • Record responses on the board. Capture all ideas—no censuring!
   • Leave the ideas on the board, and then return to them at the end of the first class to see how the class’s ideas correspond to the definition of critical thinking in Chapter 1.
2. Why is critical thinking an essential feature of a free society?
   • Guide the students toward identifying the social, political, and personal threats and risks that arise when critical thinking is discouraged, derailed, diverted, or distracted.
   • Connect this discussion to the concept of perception management.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in this Instructor's Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
MyThinkingLab: George Carlin on "Critical Thinking"
Text Box: Positive Examples of Critical Thinking
MyThinkingLab: George Carlin and Navy Admiral Mike Mullen
MyThinkingLab: Debt Crisis Example of Poor Critical Thinking
Text Box: Group Discussion: Critical Thinking and Risk Taking
Exercise: Applying the Holistic Critical Thinking Scoring Rubric to the Students’ Statements
Thinking Critically: Applying the Holistic Critical Thinking Scoring Rubric
End of Chapter Exercises: Reflective Log
End of Chapter Exercises: Explain What Is Wrong with Each
End of Chapter Exercises: Group Discussion — Imagine if Critical Thinking Were Illegal / Learning From Our Mistakes

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**MyThinkingLab: George Carlin on “Critical Thinking” (p. 4)**

George Carlin’s commentary provides an example of the point being made by the textbook authors: Individuals in positions of power might be disinclined to want the people around them or in their organizations to think critically because of the potential threat this might pose to their power, control, and position.

**Before showing this clip, tell students that comedian George Carlin might use language that some find offensive.**

2. Play the video clip in its entirety for your class.
3. Ask students to take 2–3 minutes to write their reactions to Carlin’s message.
4. Ask students to turn to a neighbor and share their reactions.
5. Bring the class back together for a discussion. Start by asking for a few students to share their reactions with the class.
6. Ask the group the following questions:
   a. Carlin uses humor to convey a message. What point(s) is Carlin trying to make?
   b. Why would people in power want to distract, derail, or divert other people’s thinking?
   c. What examples would support his argument?
   d. How would you evaluate Carlin’s thinking in this video clip? Is it strong or weak, and why?
7. Be sure to ask students to provide explanations for their statements and conclusions.

**Text Box: Positive Examples of Critical Thinking (p. 4)**

Engage students in an analysis of these examples: What makes for a positive instance of critical thinking?

1. Ask students to read each of the examples in the text box (or read them aloud to the class).
2. Ask students: What similarities can you identify across these examples?
   Seek responses, such as all have cognitive actions; people doing something, deciding what to do, or believing; all have action verbs; behaviors performed to determine a decision or engage in good practice; or choose what to do next, and so on.
3. Ask students: What differences can you identify across these examples?
   Seek responses, such as all different contexts (work, play, sport, home, parenting, family, arts, politics, and so on); some examples depict single individuals engaged in critical thinking and others are examples of groups engaging in critical thinking; lots of different kinds of mental activity, and so on.
4. Ask students to identify the action verbs and phrases in each example that indicates the critical thinking activity. As students identify these verbs and phrases, list them on the board in the front of the room.
   EXAMPLE #1: A person trying to interpret an angry friend’s needs, expressed through a rush of emotion and snide comments, to give that friend some help and support.

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5. After the “thinking verbs” are listed on the board, point out to students that they are building their critical thinking vocabulary. Encourage the class to use the language of critical thinking in this course when talking about, or evaluating, thinking examples. Let them know that using the language of critical thinking is part of the practice needed to become better critical thinkers because it will draw their attention to incidences of critical thinking in their own and other people’s speech. They will develop what is known as meta-cognitive awareness.

6. SUMMARY QUESTION: What makes these “positive” examples of critical thinking?

7. CHALLENGE QUESTION: What if the critical thinking process in any one of these examples doesn’t go well or the prediction doesn’t pan out? Does the situation no longer count as a positive example of critical thinking? Why or why not? (The point here is to get students to focus on critical thinking as a process that is not dependent upon a successful outcome or consequence. If the students do not readily appreciate that the outcome does not negate the instance of good thinking, ask them to reflect on experiences they have had personally where they know they have diligently thought critically but had to re-evaluate the situation after new evidence or a different outcome had come to light.)

**MyThinkingLab: George Carlin and Navy Admiral Mike Mullen (p.4)**

This exercise expands on the juxtaposition of the perspectives of Admiral Mullen and George Carlin by asking students to consider the words of Navy Admiral Mike Mullen, a high-ranking officer in the United States military, in light of the statement made by comedian George Carlin that high ranking or powerful people actively fear and shun critical thinking because of the threat a critical thinker can pose to one’s power, control, and position. The purpose of this exercise is for students to analyze and draw inferences about the contradictory evidence of Carlin’s commentary and Mullen’s words of advice to the graduates.

2. Play the Carlin video in its entirety for the class.
3. Have students read Mullen’s commencement speech.
4. Direct students’ attention to the sentence in Mullen’s speech that is quoted on page 4 of the textbook.
5. Ask students: Mullen is a powerful man, yet he encourages the graduates to think critically and to question without fear. Why is Mullen himself not fearful of what might happen if these graduates heed his advice?
6. Ask students: What are we to make of the Admiral’s words if we also believe Carlin’s point about powerful people fearing critical thinking to be valid?

**MyThinkingLab: Debt Crisis Example of Poor Critical Thinking (p.7)**

The purpose of this exercise is to engage students in an evaluation of the consequences of poor critical thinking. It is not enough to only expose students to positive examples of strong critical thinking. Positive examples provide possible strategies to emulate but they don’t help students analyze and avoid thinking missteps that are likely to be linked with negative outcomes. In order to develop one’s thinking it is necessary to analyze and come to appreciate the consequences that can result from failing to engage in strong critical thinking.

1. Permit students to view the links on ThinkSpot.com for the HBO film *Too Big to Fall*. Assign the activity of viewing the film clips as out of class preparation for the day’s lesson or arrange to view these film clips during class.

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2. Prepare to document the class discussion by writing “Strong Critical Thinking” and “Poor Critical Thinking” in two locations on the board. Ask students to draw a line down their notebooks on a clean sheet and put the same headings at the top left and right sides of the page.

3. Say to students: We are going to analyze the following film clips for examples of strong and poor critical thinking. First we will identify examples and then we will evaluate which column to put them in. I will document your conclusions on the board and I’d like you to put them in your notes.

4. After you have analyzed the film clips ask students to discuss with their neighbor their interpretations of the consequences of the poor critical thinking on the world’s economy.

5. Have each pair of students draft a ½ page summary, synthesizing the class analysis and their small group interpretation exercise.

**Text Box: Group Discussion: Critical Thinking and Risk Taking (p. 9)**

The purpose of these group discussion topics is to engage students in identifying and elaborating upon the best reasons for why particular groups of people are more likely to engage in, or be discouraged from, certain types of risk taking. The two topics, first a question about why annual rescues of hikers in the Grand Canyon are most likely to be young, healthy men, and the other about the consequences of parents actively discouraging the risk taking behavior of their children, are meant to encourage students to consider multiple reasons, anticipate the consequences of these reasons, evaluate the relative strength of these reasons, and ultimately identify the best reasons and explanations for each question.

- Have students work in small groups (no larger than 4-5 individuals) to discuss one or both of these critical thinking and risk taking questions.
- After 10 minutes of small group discussion ask each group to present their conclusions to the whole class.
- Engage the larger group in an examination of the reasons and explanations each group presented. What are the similarities across the groups? What are the differences? Guide the conversation so it does not become a debate.
- Close this exercise by reinforcing the point that this activity was not meant to serve as a debate of the pros and cons of particular perspectives on each question, but rather to promote students’ skill in identifying the best reasons on both sides of a question regardless of what their personal beliefs or experiences may be on the topic.

**Exercise: Applying the Holistic Critical Thinking Scoring Rubric to the Students’ Statements (p. 9)**

The purpose of this exercise is to become familiar with using a scoring rubric to evaluate examples of critical thinking. Engaging students in the evaluation of critical thinking is a valuable step in nurturing them as thinkers. *The Holistic Critical Thinking Scoring Rubric (HCTSR)* encourages the scorer to use critical thinking skills of analysis, interpretation, explanation, and evaluation in the application of the rubric standards of good reasoning.
1. Ask students: What is a scoring rubric and for what do you use it? Students today have typically had a good deal of experience with scoring rubrics in their K–12 education. General responses should include a tool for grading papers, a method for subjective evaluation, criteria for defining an assignment or for making judgments about student work, scoring technique for when there is no right or wrong answer, description of what features are required for strong performance on an assignment, and perhaps even a tool that enables two or more people to draw comparable conclusions about subjective information.

2. Summarize students’ responses and explain that rubrics help focus us on the features we are trying to evaluate. They help prevent against being persuaded or unduly influenced by our own feelings and reactions about the topic being reviewed.

3. Review each of the four levels of the HCTSR (p. 11).

4. Ask students: What is the difference of each level?

5. Ask students: How are levels 1 and 2 different from levels 3 and 4?

6. Practice using the HCTSR with the students’ statements in the textbook.
   a. The textbook authors mention that the response from Student #1 corresponds to a “1” on the rubric, Student #2 reflects a “2,” Student #3 is a “3,” and Student #4 is scored as a “4.”
   b. What evidence confirms the claims made by the authors?

7. Have students offer one or two examples for how each student statement fits to the level claimed by the authors. Students must refer directly to the criteria appearing at a given level of the HCTSR. Be sure to insist that the examples are justified with explanation in terms of the critical thinking language that appears on the rubric.

8. Actively discourage students from applying personal criteria to the evaluation process. Examples of personal criteria include using personal feelings of agreement or disagreement with the statement being evaluated as a justification for a rubric score, offering personally generated counterarguments to justify a rubric score, or augmenting a statement with inferentially derived arguments as a justification for a rubric score.

**Thinking Critically: Applying the Holistic Critical Thinking Scoring Rubric (p. 15)**

These exercises provide additional practice with the HCTSR. Access the *Kansas City Star* editorial on restricting teacher-student interactions on social networking sites and the StLtoday.com editorial on the U.S. Supreme Court order for California to reduce its state prison population from [www.MyThinkingLab.com](http://www.MyThinkingLab.com). Though these are separate exercises, they can be conducted in a similar fashion.

*Kansas City Star* editorial on restricting teacher-student interactions on social networking sites

1. Permit students to view the *Kansas City Star* editorial as part of a class session, or ask them to read the editorial as part of a homework assignment.

2. Use the HCTSR to evaluate the author’s thinking and argument in the written piece. Explain that they must assign the editorial a score that is a whole number (1–4). Decimals or fractions are not permitted when using the HCTSR. If this exercise is given as a homework assignment, explain to students that they must come to the next class session prepared to compare and explain their rubric score.

3. In class, have students share their rubric score with a partner, in a small group, or with the class as a whole. Chart how many individuals scored the interview at each level of the rubric. Ask for student volunteers to explain why they gave a particular score and ask them to provide evidence for why they drew that conclusion.
4. After several students give their explanations, ask whether any students would like to change their rubric score. Give the class 3–5 minutes to review the rubric criteria. Chart again the distribution of scores. Ask individuals who have changed their evaluation to explain why they feel differently about their rating of the editorial. What influenced their decision to re-evaluate the critical thinking exhibited?

5. If you are using a course management system that permits posts on a bulletin board, consider using the system to host an asynchronous discussion of students’ rubric scores and explanations. Encourage students to comment whether they have felt persuaded to reconsider their evaluation in light of the reasoning displayed by their classmates.

The StLtoday.com Editorial: Reducing the State Prison Population in California

1. Give students an opportunity to read the StLtoday.com editorial on how Missouri and Illinois should learn from the U.S. Supreme Court’s order to California to reduce its state prison population if it cannot properly incarcerate these individuals.

2. Use the HCTSR to evaluate the author’s thinking and argument in the written piece. Explain that they must assign the editorial a score that is a whole number (1–4). Decimals or fractions are not permitted when using the HCTSR. If this exercise is given as a homework assignment, explain to students that they must come to the next class session prepared to compare and explain their rubric score.

3. In class, have students share their rubric score with a partner, in a small group, or with the class as a whole. Chart how many individuals scored the interview at each level of the rubric. Ask for student volunteers to explain why they gave a particular score and ask them to provide evidence for why they drew that conclusion.

4. After several students give their explanations, ask whether any students would like to change their rubric score. Give the class 3–5 minutes to review the rubric criteria. Chart again the distribution of scores. Ask individuals who have changed their evaluation to explain why they feel differently about their rating of the editorial. What influenced their decision to re-evaluate the critical thinking exhibited?

5. If you are using a course management system that permits posts on a bulletin board, consider using the system to host an asynchronous discussion of students’ rubric scores and explanations. Encourage students to comment whether they have felt persuaded to reconsider their evaluation in light of the reasoning displayed by their classmates.

Calibrating Rubric Scores: Inter-Rater Reliability

Use this final exercise with the Critical Thinking Holistic Scoring Rubric to demonstrate to students how to achieve inter-rater reliability through the calibration of scores. In the previous two exercises, students have already engaged in the comparison of scores, the explanation of their evaluations, and the act of reconsidering their initial conclusions. Now they practice with a sequence of evaluation tasks that are based on performance to reach agreement of interpretation.

1. Identify two letters to the editor and two editorials from the campus newspaper.

2. In groups of four, score the two letters to the editor.

3. After each individual has completed his or her scoring, have the members of the group compare their ratings. If there is disagreement, each member of the group should provide evidence and explanation for his or her score. Come to a group consensus on the score (in whole numbers) for these two letters to the editor.
4. Now score one of the editorials. After each individual has completed the scoring, have the members of the group compare their ratings. If there is disagreement, each member of the group should provide evidence and explanation for his or her score. Come to a group consensus on the score (in whole numbers) for the first of the two editorials. Ask members of the group to take a moment to reflect on whether they were any closer to agreement after their independent ratings than they were during the first round. This is evidence that they are increasingly closer to one another in their understanding of the critical thinking criteria and the use of the rubric.

5. Now have each individual in the group score the final editorial. After each individual has completed his or her scoring, have the members of the group compare their ratings. If there is disagreement, each member of the group should provide evidence and explanation for their score. Come to a group consensus on the score (in whole numbers) for the second of the two editorials.

6. Call the class together and ask the groups to share their experiences in this calibration exercise.

7. CHALLENGE QUESTION: What is the purpose of trying to achieve inter-rater reliability? When would it matter that people share a common interpretation of the criteria that indicate strong or weak thinking?

End of Chapter Exercises: Reflective Log (p. 17)
The purpose of these reflective log exercises is for students to document their own thinking and to engage in meta-cognitive self-reflection about the quality of their thinking endeavors. There are reflective log exercises throughout the book. Every chapter has at least one.

To maximize the usefulness of these reflective log entries, the instructor is encouraged to develop a mechanism for students to maintain their entries. This mechanism should permit easy access over time. Suggestions include hard-copy lab books or composition notebooks, ePortfolios or paper portfolios, course management software systems that permit students to upload documents for storage and easy access, thumb drives that students are required to bring to class each session, an on-campus server or student accessible shared drive, and so on.

Explain to students that the reflective logs are to be maintained throughout the term. To increase students’ motivation to put effort into the reflective log activity, consider making the completion of the logs a component of your grading plan.

End of Chapter Exercises: Explain What Is Wrong with Each (P. 17)
Some of the most fruitful opportunities for increasing one’s appreciation of strong critical thinking come from being exposed to incidences of weak thinking. In this exercise, students are asked to explain why the examples are indicative of weak, poor, flawed, fallacious, uncritical, or erroneous thinking.

1. Use the statements in the end of chapter Exercise as a “problem of the day” either at the beginning or end of class.

2. Ask students to offer verbal explanations for what is wrong with each statement as part of a whole group discussion, or ask them to respond in a written 5-minute quick write that can be collected as a method for checking students’ understanding of the themes from Chapter 1.

3. EXTENDING THE LESSON: Have students make up their own examples using the format and style of these exercise statements. Use these student-generated examples (or create your own examples) as part of a quiz or section text.
End of Chapter Exercises: Group Discussion —Imagine if CT Were Illegal / Learning From Our Mistakes (p. 17)

The Group Discussion questions at the end of Chapter 1 can be used by you or your students as a Daily Discussion Starter. They can also be used as a 5-minute quick write prompt or a journal reflection prompt.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

1. Perception management and the manipulation of voters.
   Identify examples where political advertisements make outrageous claims of connection between an affirmative or negative voting decision and a socially feared outcome (for example, current examples include the passage of gay marriage legislation being linked to unmonitored and uncensored promotion of homosexuality in elementary schools; other examples include immigration or health-care reform legislation, or historical examples related to desegregation or suffrage).

   Discuss these examples by asking students to evaluate the veracity of the argument in light of evidence for and against the claim being made. If no evidence is available, ask students to predict what evidence could be gathered that might help the voter make an informed decision. Use this exercise to introduce the concept of perception management. Engage students in a discussion of why perception management is successful in influencing voter behavior.

2. Identify a video clip from the films mentioned in the text (Wag the Dog and Syriana) or from a movie or television show that you feel is a good example of critical thinking or perception management.
   a. Show the scene to the class.
   b. Ask students: What’s going on in this scene? What is motivating the speaker? Is there critical thinking (or manipulation) taking place? If so, what is the purpose or goal? Is the control of information being used in this situation to manage perception?
   c. If possible, consider places to pause the video to ask questions such as the previous ones or to ask students to predict the next event that will occur or the direction the dialogue will take as the scene unfolds.

3. On page 7, the textbook authors provide a series of analogies to help characterize critical thinking.
   a. Select one analogy and ask students to explain what is meant by the comparison. They should provide examples to support their explanation.
   b. Consider asking students to do this as a 5-minute quick write assignment in class. Put each analogy on a separate card or handout, and distribute them equally among the class.

4. Engage students in a discussion of comedian George Carlin’s hypothetical question: What if there were no hypothetical questions? The purpose of this exercise is to recognize the purpose of asking hypothetical questions as part of the critical thinking process.
   a. Put the quotation on the board.
b. Ask students: Why do people ask hypothetical questions?

c. Ask students: What would the world be like if there were no more hypothetical questions? What would be different?

d. Count to 10 silently to yourself, which enables students to think about the question you have asked. It takes the human brain approximately 10 seconds to process new information and to formulate a thoughtful verbal reaction or response.

e. Through class discussion, elicit responses that assist students in recognizing that hypothetical questions facilitate one’s ability to envision possible scenarios, anticipate consequences, or make predictions about the future if a particular set of events or actions were to occur. It is a critical part of the systematic analysis and evaluation of information.

CHALLENGE ACTIVITY: A friend of yours is particularly disinclined to ask hypothetical questions. In fact, every time you ask a question that starts with “what if” or “I wonder,” your friend rolls his or her eyes and pretends to gag. One day you decide to confront your friend about his or her bad attitude and he or she says, “Why would one bother asking questions like that? It’s not going to change anything, and you’ll just waste your mental energy for no good reason.” In groups of 3 to 5, come up with a scenario where asking the hypothetical “what if” or “I wonder” question seems like a waste of mental energy. It must be a novel scenario that is not already part of daily conversations of the modern media (for example, you cannot choose unemployment rates, public education, global warming, universal health care, and so on). Come up with an argument for why you should be encouraging the hypothetical questioning about your scenario.

5. CHECKING FOR UNDERSTANDING: Positive examples of critical thinking

Have each student come up with two positive examples of critical thinking that are different from the ones provided in the textbook. For each example, the student should explain what makes it positive. Check that students are describing a positive incidence of the thinking process rather than an example of a positive outcome that might have involved some thinking. They should be encouraged to use the language of critical thinking in their examples.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically

Students can access chapter summaries, exercises, and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Chapter 2
Skilled and Eager to Think

CHAPTER OVERVIEW
Chapter 1 offered students a conceptualization of critical thinking that includes both thinking skills and thinking dispositions. Chapter 2 focuses on the six cognitive skills central to critical thinking: interpretation, analysis, inference, evaluation, explanation, and self-regulation. A case is made for why critical thinking is a nonlinear and recursive mental activity; the metaphor of a sphere is presented to illustrate how critical thinking skills interact with one another. Seven habits of mind central to a disposition toward critical thinking are also introduced in this chapter: truth-seeking, open-mindedness, analyticity, systematicity, confidence in reasoning, inquisitiveness, and judiciousness. Distinctions between positive and negative habits of mind are used to illustrate the spirit of a strong critical thinker. A self-assessment survey is presented to stimulate reflection on one’s own critical thinking disposition. The relationship between critical thinking skills and dispositions is explored along with the connection between strong critical thinking and being an ethical person. Examples and exercises focused on the analysis of problem solving during crisis situations and daily conversation are provided to achieve the chapter learning objectives.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Identify the core cognitive skills involved in critical thinking.
• Describe the relationship of cognitive skills during the critical thinking process.
• Describe, compare, and contrast inductive and deductive reasoning.
• Identify and evaluate instances of critical thinking found in human conversation.
• Describe the characteristics of a strong critical thinker.
• Explain ways to cultivate the seven critical thinking habits of mind.
• Contrast being a strong critical thinker and an ethical thinker.
• Explain why strong critical thinking requires one to be both “willing” and “able.”

Encourage students to complete the Critical Thinking Disposition Self-Rating Form (p. 21) for the first time before you begin describing the positive dispositions.

DAILY DISCUSSION STARTERS
1. What does a strong critical thinking disposition sound like?
   • On page 22 of the textbook, the authors provide a set of statements with which a person with a strong disposition toward critical thinking would probably agree. Select one or more of the statements and write them on the board. Ask students to explain why each one of the statements is an example of a strong critical thinking disposition.
If you do this at the beginning of this chapter, students might offer explanations phrased in their own words. If this is used as a daily discussion started for a lesson taking place later in the week, then students should be encouraged to use the terminology of the seven critical thinking habits of mind (introduced in this chapter).

- Repeat this activity with the statements from the text that are indicative of a weak disposition toward critical thinking.

2. Conduct the “What Is Wrong with These False Statements?” exercise as described in the following.

3. When someone is “thinking critically,” what is it that he or she is doing?
   - Record responses on the board. Capture all ideas—no censuring!
   - Leave the ideas on the board, and then return to them at the end of class to see how the ideas of class members correspond to the list of critical thinking skills in Chapter 2.

4. How do these professionals use their critical thinking skills?
   - Generate a list of professions (15–20) to use for this exercise. Be sure to choose a variety (for example, lawyer, advertiser, teacher, veterinarian, landscaper, chef, software designer, athlete, musician, and so on).
   - Write each profession on an index card so that you can select them at random and so that students do not have the opportunity to see the full list at one time.
   - Ask students to give specific examples of how critical thinking is used in the daily lives of each professional.
   - Model using the terminology of critical thinking that is introduced in Chapter 2. Strongly encourage students to use this terminology. This gives the students an opportunity to build their familiarity with these terms and practice with identifying instances of critical thinking in daily life.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT

MyThinkingLab: Apollo 13, “Houston, We Have a Problem” Scene
Text Box: Critical Thinking Disposition Self-Rating Form
Thinking Critically: How TV Portrays Critical Thinking
MyThinkingLab: Philadelphia, Denzel Declines to Take Hank’s Case
MyThinkingLab: Leslie Stahl Interviews Victor Crawford Selling Cigarettes
Text Box: Experts Worried Critical Thinking Might Be Harmful
Text Box: Putting Positive Habits of Mind into Practice
Thinking Critically: Holistic Critical Thinking Scoring Rubric Exercise
Thinking Critically: What Is Wrong with These False Statements?
MyThinkingLab: 12 Angry Men El-Train Scene
Text Box: Questions to Fire Up Critical Thinking Skills
MyThinkingLab: Cosmos versus Chaos
Text Box: Early Life Factors and the Risk of Breast Cancer
Thinking Critically: What Are Your Professors and Textbooks Asking of You?
End of Chapter Exercise: Small Group Discussions—What Textbooks and Professors Ask
End of Chapter Exercises: Reflective Log
End of Chapter Exercise: Group Exercise–What Would It Be Like to Live or Work With...?
MyThinkingLab Bonus: The Colbert Report “Truthiness”
End of Chapter Exercise: Apollo 13 Question
End of Chapter Exercise: Web Video Project

**MyThinkingLab: Apollo 13, “Houston, We Have a Problem” Scene (p. 19)**

In this video clip, students watch the crew of the Apollo XIII space shuttle executing routine checks of the equipment when suddenly something goes very wrong. The adrenalin of the crew and staff at Mission Control rushes as they work together to understand the problem. This scene dramatically illustrates group critical thinking in a crisis situation. Facione and Gittens suggest viewing the Apollo XIII clip prior to reading the scene analysis provided in the textbook. This exercise is ideally run as a whole group activity.

1. The instructor should preview this video clip prior to running this in-class exercise to be familiar with the scene. If you have never seen this film, it is highly recommended that you watch (and enjoy) the movie so you can explain the context of the scene.
2. Tell students: While this video is playing, I want you to watch and listen to what is going on in the scene—to the dialogue of the actors, their body movements and nonverbal behavior, to the sounds and sights going on in the surrounding environment, and so on.
3. Play the video clip in its entirety.
4. After the scene has been shown uninterrupted, prepare to show the clip again from the beginning.
5. Begin the clip again, but this time be prepared to pause at two points to ask questions of the class.
6. A significant moment early on in this scene is when the character played by Tom Hanks silently appraises the situation. During the character’s sustained silence, count off in front of the class with your fingers (silently or speaking the count out loud) the seconds that elapse before the memorable line, “Houston, we have a problem,” is delivered.
7. Pause the clip and ask students: What is going on in this scene? (Encourage the students to describe what they see and hear.)
8. Ask students: What is going through the mind of Tom Hanks’ character?
9. Ask students follow-up questions: What is he thinking about? How do you know? Why do you say that? Use these follow-up questions to lead students to draw connections between his thoughts, actions, and other environmental cues that indicate critical thinking.
10. Continue the video clip so the class can hear again the dialogue between the Apollo XIII crew and Mission Control.
11. Pause the video during this part of the scene so that the class can discuss what is happening.
12. Tell students: They are trying to solve a serious problem, but right now they don’t know what the problem is exactly, so they are sharing information.
13. Ask students:
   a. What evidence do you see and hear that is shared? (Bells, lights, shaking, readouts, and so on)
   b. What explanations are offered? (Instrumentation, meteor, and so on)
   c. What reactions are you seeing and hearing? (Panic, stress, disbelief, urgency, confusion, and so on)
   d. What decisions are made along the way that shape the group’s thinking? (Characters need to consider what is relevant information needed to identify the problem.)
14. Another pivotal moment happens in this scene that helps determine the nature of the problem. Tom Hanks’ character looks outside the window. This is another opportunity to point out the time that it takes for the character to evaluate the new information he sees outside the window and to determine its relevance and significance.

15. Finish playing the clip so that the class again sees the group shifting from problem identification to problem solving. Close this activity by reviewing the critical thinking skills that were exhibited by the various characters. Use the terminology of critical thinking skills that was introduced in Chapter 2. Be sure to highlight the fact that the speakers demonstrated the interaction of their thinking skills (for example, analyzing their interpretations, evaluating their explanations, and continual self-regulation).

16. Tell students: There were many critical thinking skills displayed in this scene, but there were also critical thinking dispositions or habits of mind that could be identified. This is the focus of the current chapter.

**Text Box: Critical Thinking Disposition Self-Rating Form (p. 21)**

This short survey tool can be used to promote self-reflection on one’s internal motivation to engage problems and make decisions by using critical thinking. As it is explained by the textbook authors, critical thinking dispositions can be practiced and the activities in this chapter are intended to nurture students’ habits of mind. Because this self-rating form is focused on instances that have occurred in the past two days, it can be used frequently throughout the term for monitoring the development of one’s critical thinking dispositions over time.

1. Have the students independently complete the Critical Thinking Disposition Self-Rating Form on a separate piece of paper. Point out that the questions on the form pertain to situations occurring in the past two days.
2. Students should indicate a response of “yes” or “no” to each question.
3. Tell students: Now add up the number of times you wrote “yes” to the odd-numbered questions. Multiply this number by 5.
4. Tell students: Now add up the number of times you wrote “no” to the even-numbered questions. Multiply that number by 5.
5. Tell students: Add those two numbers together (don’t forget to have them multiply each by 5 before adding) to get your total score.
6. Interpretation guidelines are offered by the textbook authors:
   a. Scores of 70 or higher indicate a strong disposition toward critical thinking during the past two days.
   b. Scores between 50 and 70 indicate ambivalence or mixed overall disposition during the past two days.
   c. Scores of 50 or lower indicate adverseness or hostility toward critical thinking over the past two days.
7. Remind students that this is not a measure of critical thinking skill or ability, but rather it is intended to provide insight into one’s disposition or internal motivation toward critical thinking over the past two days.
8. Students should be encouraged to freely reflect on their score in a 2-minute quick write (reflective log entry).
9. Close this activity by asking the students to brainstorm the reasons why it is helpful to periodically conduct self-assessments of their critical thinking dispositions.
Thinking Critically: How TV Portrays Critical Thinking (p. 24)

In this exercise, students are asked to view two hours of commercial television to determine whether there are any trends in the critical thinking dispositions portrayed by the characters in the programming and in the commercials. This is an exploratory exercise that doesn’t require much setup other than checking that students understand the instructions. As the textbook authors suggest, this can be assigned as an independent activity or students can work in pairs.

1. Students should take detailed notes on the strong and weak critical thinkers that they observe on the television during the two hours of viewing.
2. Guide the students to divide their note pages down the middle with “+” (strong) on one side and “-” (weak) on the other.
3. Review with the class the instructions that appear in the textbook.
4. Point out to the students that they need to do more than mark the page for every strong or weak characterization. They should also note the salient details of the character and the context portrayed.
5. Consider deciding as a class what should be recorded about the character and context. For example, the authors have already asked students to consider whether there were any trends based on the characters’ ages. The students might want to track other demographic characteristics.
6. For the first hour, students should attend to the commercials. During the second hour, students should attend to the program. After the first hour, students should calculate the total number of instances on each side of the page. Another total should be calculated after the second hour of viewing.
7. At the next class session, ask students to report their total number of strong and weak disposition examples separately for commercials and programs.
8. Ask students: Can any trends be identified with this data?
9. Give the students time to tally their responses for the demographic variables that they tracked.
10. Ask students to report their total number of strong and weak disposition examples separately for commercials and programs for each of the demographic variables.
11. Ask students: Can any trends be identified with this data?
12. Close this activity by asking for analyses of the findings and explanations for any trends that were observed.

MyThinkingLab: Philadelphia, Denzel Declines to Take Hank’s Case (p. 23-24)

This video clip from the movie Philadelphia is a striking example of critical thinking in a novel and emotionally charged situation. In this scene, students watch a lawyer played by Denzel Washington who appears to be willing to take any case regardless of its merit. When Tom Hanks comes to ask him to take his wrongful termination case, Denzel’s disposition toward critical thinking is put to the test.

1. Prior to running this exercise in class, view the clip to become familiar with the scene.
2. Run this exercise after you have reviewed the seven critical thinking habits of mind with the class. When reviewing the positive habits of mind, be sure to contrast them with the negative habits of mind.
3. Play the scene up until the point where Tom Hanks walks in to the office so that students can see how Denzel Washington’s character interacts with the first client.
4. Ask students: What are your first impressions of Denzel Washington’s character? Ask: What evidence did the film provide which enabled you to draw that inference about Washington’s character? After students have offered initial descriptions, encourage them to use the language of the critical thinking habits of mind. Tell students: How about in terms of the seven critical thinking habits of mind. What can we say about this character?

5. Now play the rest of the scene. Engage the students in identifying the clues that reveal the critical thinking skills that Denzel Washington’s character uses.

6. Rerate Denzel Washington’s character in light of the interaction with Tom Hank’s character.

7. Close the exercise by discussing why, despite Denzel Washington’s character displaying evidence of strong critical thinking dispositions and skills, he would initially decline Tom Hank’s case. Remind students that this story takes place in the early days when little was known about AIDS compared to what we know today.

8. BONUS: Rent this film and review it for additional scenes that you can use to demonstrate Denzel Washington’s disposition toward critical thinking. Explain to the class that the lawyer in this film reconsiders and revises his judgment about taking this case. Use selected scenes to ask students to identify what events or additional information influenced Denzel Washington’s view on whether or not to take the case. The purpose of this bonus is to demonstrate this character’s critical thinking skills particularly self-regulation, and his dispositions that contributed to revising his initial decision not to represent Tom Hanks.

9. DOUBLE BONUS: Instead of the instructor reviewing the film and selecting scenes, have the students do this. The purpose of this assignment is to have students identify the pivotal moments in the film when the lawyer’s disposition toward critical thinking compelled him to pursue the details of Tom Hank’s claim. Arrange for a copy of this film to be available to students so they can complete this assignment. Students can be asked to describe these additional scenes in a written response.

MyThinkingLab: Leslie Stahl Interviews Victor Crawford on Selling Cigarettes (p. 26)

What is the relationship between critical thinking and ethics? Does being a strong critical thinker ensure or imply that one will be an ethical thinker? In this video clip, Leslie Stahl interviews tobacco lobbyist Victor Crawford. It becomes clear that the critical thinking Mr. Crawford dedicated to support the tobacco industry came at the expense of the man’s ethics and eventually his health.


2. If you can locate a copy of this powerful interview, play the video clip as students follow along with the transcript.

3. Have the students work in pairs to complete the following exercise.

4. REVIEW OF PRIOR LEARNING: Identify the critical thinking questions being asked by Leslie Stahl. Code these questions in terms of the critical thinking skills they are intended to elicit.

5. Identify places in the transcript where Mr. Crawford exhibits critical thinking. Code these examples in terms of both critical thinking skills and dispositions.

6. Now consider the question of Mr. Crawford’s ethics. Ask students: How can it be possible to be a strong thinker yet so despicable? Formulate your response in terms of the seven critical thinking habits of mind. Conduct this as a 5-minute, in-class quick write.
7. Bring the whole class together to close this exercise. Have students volunteer their reflections. Encourage students to share their ideas and comment on the perspectives shared by their classmates.

**Text Box: Experts Worried Critical Thinking Might Be Harmful (p. 27)**
In Chapter 1, Facione and Gittens describe a panel of experts who crafted the consensus definition of critical thinking that frames the context of the textbook. This panel of experts expressed concern that many common practices that are seen in today’s schools could be harmful to students’ development of strong critical thinking. In this exercise, students are asked to brainstorm examples that would support the panel’s assertion.

1. This exercise can be run as an in-class activity (whole class or small group), or it can be assigned as an out-of-class activity.
2. Ask students: What are ways that critical thinking skills and dispositions can be nurtured in school?
3. Ask students: What are some activities or practices that could limit the development of these skills and dispositions?
4. Ask students: What recommendations would you make to teachers in terms of what they should do and what they should avoid doing to promote the development of critical thinking among their students?
5. If this is done as an out-of-class activity, consider using this assignment as an opportunity to provide students with formative feedback and as a graded assignment in your course.

**Text Box: Putting Positive Habits of Mind into Practice (p. 27)**
This exercise is designed to provide students with opportunities to practice and nurture their positive critical thinking dispositions. Conduct this activity as a reflective log assignment.

1. Have each student choose one of the positive critical thinking dispositions. (Alternatively, have the whole class practice the same habit of mind for this exercise.)
2. Tell students: As a homework assignment tonight, I would like you to consider your selected critical thinking disposition. Review the suggested activities and reflective prompts that appear in the textbook for that disposition.
3. Tell students: In your reflective log entry, state the disposition you decided to practice. Then, list or describe the situation that you participated in to practice the disposition (for example, this might have been a conversation or a personal reflection). Describe the results of that activity and your overall experience. Rate the quality of your practice of this disposition on a scale of 1 to 5 with 1 being highly ineffective and 5 being highly effective. Explain the reason you gave yourself that particular rating.
4. Have students choose a new disposition to practice during each week remaining in the course.

**Thinking Critically: What Is Wrong with These False Statements? (p. 28)**
The purpose of this activity is to help students practice the articulation of strong critical thinking habits of mind. This activity can be performed as a whole class or you can divide the 10 statements among your students who can work in pairs.

1. Have students write the corrected statement on a sheet of paper.
2. Go through each statement and ask pairs (or volunteers from the class as a whole) to identify the error and read aloud their corrected statement.
3. Ask whether any other students have an alternative phrasing that they would like to offer. Provide informal feedback and praise for strong responses.

4. ALTERNATIVE USES:
   a. Use this activity as an “exit ticket”—each student must correct one of the statements and write the new statement on an index card that is turned in before the end of class.
   b. Assign as a homework activity or a reflective log prompt. Share the answers aloud at the next class session.
   c. Use one or more of these statements as a 5-minute quick-write assignment. Students should make the correction to the statement and explain why the original statement was incorrect and how the edits now make the statement correct.
   d. Use one of these prompts as a Daily Discussion Starter on the second day you work from Chapter 3.

5. BONUS CHALLENGE: Have students work in pairs, small groups, or independently to write one or more “incorrect” statements such as those that appear in the text box. These can then be discussed as a class and corrected as a group. Consider collecting this challenge assignment and use it as an opportunity to provide formative feedback. You can use it as a graded assignment in the course and/or use the created statements as future quiz questions.

MyThinkingLab: 12 Angry Men El-Train Scene (p. 29)
Cinematic portrayals of jury deliberations enable students to observe a group of individuals engaging in critical thinking. In this video clip from 12 Angry Men (1957), the jurors are considering the evidence that has been presented by the prosecution and the defense. These jurors must use their critical thinking skills to arrive at a just decision regarding the defendant’s innocence.

1. This video can be used as part of an in-class activity or it can be assigned as a homework exercise.

2. Tell students: In this movie, the jury has just learned that they are 10–2 in favor of a conviction in a murder trial. What ensues in the jury room is a group discussion about the quality of evidence available in order to form the jury’s decision. The scene I am going to show depicts some of the jurors engaging their thinking skills to analyze, interpret, and evaluate the evidence and testimony presented during the trial. Which inferences are warranted? Which witnesses are credible? There is a lot of interpersonal conflict on the jury, too. But the core skill of self-regulation and self-correction, applied by the jurors to their own opinions, along with their desire to be objective and to seek justice, powerfully balance the tendency of some jurors to leap to mistaken conclusions prematurely. Watch what happens when one courageous juror begins to ask some good critical thinking questions.

3. Play the video clip in its entirety.

4. Ask students: What is being said in the jury room that reveals the critical thinking going on among the individual jurors?

5. Ask students: What evidence of ____________ did you hear? (Insert the words: interpretation, analysis, inference, evaluation, explanation, and self-regulation.)

6. Students should repeat (quoting or paraphrasing) specific statements in support of their answers.

7. The jury vote keeps changing. Is this evidence of strong or weak thinking? Why? (Ask individuals to offer support for their perspective.)
8. **BONUS QUESTION:** Ask the students to apply the *Holistic Critical Thinking Scoring Rubric* to this jury conversation. What score would you give the group? What would you score specific individuals, for example, the character played by Lee J. Cobb or the character played by Henry Fonda? Why?

9. Close this activity by reflecting as a group on the fact that critical thinking can be observed not only within the individual, but also in group situations. Also, stress the importance of strong critical thinking in situations such as a jury deliberation where the context is “high-stakes.”

**Text Box: Questions to Fire Up Critical Thinking Skills (p. 31)**

The six core critical thinking skills table offers a number of questions that one could ask in order to invite a particular thinking skill. Facione and Gittens label them “questions to fire up critical thinking skills” because they do just that. Students could ask themselves these questions in order to stimulate (and practice!) their own thinking skills. Alternatively, students could pose one or another of these questions to others to activate and elicit their thinking skills. This exercise is designed to promote self-reflection and practice and to reinforce the idea that there are numerous ways to pose questions that invite critical thinking skills.

1. Count off the students in your class, assigning them a sequential number ranging from one to six.
2. Tell students they are going to work in pairs for this exercise.
3. Tell students: You each have been assigned a number from 1–6. Use the number you have each been assigned to identify which critical thinking skill you will be working with during this exercise. Refer to the table on page 31. Number 1 refers to interpretation; number 2 is analysis; and so on.
4. With your partner, review the questions that are given as examples for how to spark each critical thinking skill.
5. Working with your partner, generate two additional questions for each skill you have been assigned. Remind students that their questions must fit with the skill area. To ensure you understand each skill, refer to the Core Critical Thinking Skills table on page 33. Use these definitions and the other questions in the first table as a reference.
6. Give students time to work on this activity. Have them record their skill areas and associated questions on a piece of paper.
7. Call the class together and ask for examples of questions for each of the six cognitive skills. Pause after each of the examples to have the class consider whether the newly created question “works” with the set of questions provided by the authors. Work together to modify the question, if necessary.
8. Close this activity with a reminder that the authors didn’t intend to provide a comprehensive list of questions for each skill area but rather sought to illustrate what questions for each skill would sound like. Complement them on their ability to write good critical thinking questions.
9. Consider collecting the student-created questions to review as an opportunity to provide formative feedback to your students and to use for assigning participation points in your grade book.

**MyThinkingLab: Cosmos versus Chaos (p. 35)**

In this video clip from the show *Cosmos*, narrator Carl Sagan introduces viewers to the Greek astronomer and mathematician Aristarchus who was the first person whom we know of to have inferred—based on the evidence—that the Earth revolves around the sun. Use this video clip to demonstrate deductive reasoning.
1. Review definition of deductive reasoning provided in the textbook. Notice that it references how the argument is presented, and specifically that it is presented as if the conclusion could not possibly be false if all of the premises are taken to be true.
2. Pay particular attention to the key words in this definition: premise and conclusion, and the impossibility suggested by the argument’s presenter with regard to the truth of the conclusion given the assumption that all of the premises are true.
3. Note that the assumed truth of the premises is a hypothetical. Recall the discussion of hypotheticals in Chapter 1. The premises might not actually be true.
4. Note that the authors never refer to “general” and “specific” in defining either “deductive reasoning” or “inductive reasoning.” This is because the terms “general” and “specific” are not part of the conceptualization regarding deductive or inductive reasoning in contemporary logical theory. Do not try to simplify the definitions of “deduction” and “induction” using “general” and “specific” because this will be inconsistent with the presentations in other chapters of this text.
5. Discuss the examples provided in the text. For each example, have the class identify the premises and the conclusion.
6. Ask students: Why are these examples of “deductive” reasoning?
7. Ask students: What would need to be done in order to determine the actual, rather than the hypothetical, truth of the premises?
8. Tell students: Okay, now we are going to watch a video that shares a real-life example of deductive reasoning that occurred a long time ago.
9. Play the video clip in its entirety.
10. Ask students: What evidence does the narrator point to in order to demonstrate Aristarchus’s deduction?
11. What are the critical premises in this situation?
12. How did Aristarchus determine the truth of the premises?
13. Close this activity with a summary of the essential features of deductive reasoning and the basic criteria necessary to draw a conclusion via deductive reasoning.
14. Notice that in describing pieces of reasoning as “deductive” the authors are not presuming anything about its evaluation as strong (valid) or weak (invalid) reasoning. The skill of evaluating reasoning is the focus of Chapters 7 and 8. The focus here is to understand and describe these two kinds of reasoning.

Text Box: Early Life Factors and the Risk of Breast Cancer (p. 34)

In this text box, the authors present a finding from the Nurses’ Health Study. Specifically, students are offered the conclusion that breast tissue is particularly sensitive to factors occurring early in life and that this sensitivity increases the likelihood of developing cancer later in life. Use this text box to demonstrate inductive reasoning.

1. Review the definition of inductive reasoning provided in the textbook.
2. Pay particular attention to the key phrases in this definition: “probabilistic inferences” and “most likely to be true.”
3. Discuss the examples provided in the text. For each example, have the class identify the key pieces of evidence offered for consideration and the ultimate conclusion.
4. Ask students: Why are these examples of “inductive” reasoning?
5. If this doesn’t occur naturally, ask the class to think out loud about the likelihood of each conclusion given the evidence.
6. Tell students: Okay, now let’s consider the example of early life factors and the risk of breast cancer.
7. Ask students to follow along as someone from the class reads the text box aloud.
8. Ask students: What is the conclusion presented in this example?
9. Ask students: What evidence is provided in order to support this conclusion? (As students pull out the various epidemiological findings that are provided as supporting evidence, write them on the board and indicate the statistical relationship.)
10. How did the researchers come to their conclusions? (Draw out language regarding probabilities and likelihoods.)
11. It might be necessary to briefly describe the methods of scientific inquiry that permit probabilistic conclusions based on the principles of empiricism. These concepts are developed in Chapters 9 and 14.
12. What additional facts, consistent with the facts presented, might be discovered that would lead one to have greater or lesser confidence in the conclusions drawn by inductive reasoning in the Nurses Health Study?
13. Close this activity with a summary of the essential features of inductive reasoning and the basic criteria necessary to draw a conclusion via inductive reasoning.

**Thinking Critically: What Are Your Professors and Textbooks Asking of You? (p. 36)**

Part I: Professors’ Questions

In this chapter, students learned that a good question can invite people to use their critical thinking skills. This exercise gives students an opportunity to think critically about the questions they are asked in their classes.

1. Tell the students that they are going to conduct an informal investigation of the use of questions in their other courses.
2. Each student should conduct this experiment in all of their courses that meet before the next time that your class is meeting.
3. Students should record in their notebook all of the questions that are asked by their instructors during each lesson.
4. After each class, the student should review the questions that were asked and classify them in terms of the critical thinking skills that were introduced in this chapter. Advise the students that some of the questions might not evoke any critical thinking skills. They might be simply questions asking for observations to be reported or things to be recalled from what one remembers, for example. If the student feels that a question is trying to elicit more than one critical thinking skill, he or she should list all the skills that apply. Do this for all questions that were intended to elicit critical thinking.
5. Add up the total number of critical thinking skills questions that were asked in each class, and note the number and title of each course that was included.
6. At the next meeting of this course, review the results gathered by the class. Do this as a whole group discussion, or have the students share their results in small groups first and then report their conclusions to the whole class.
7. Ask students to give examples of the questions that were asked and the critical thinking skills that they elicited. Are there any patterns that can be identified in these results (for example, upper versus lower division courses, subject areas, major versus. non-major course, big versus small class sizes, and so on)?
8. Close the activity by discussing any trends that were uncovered in terms of which critical thinking skills were asked the most. Ask students to reflect on what they learned through this experiment.
Part II: Textbook Questions

1. For this exercise, students are asked to refer to course textbooks other than the one used for this class. To be sure that this exercise is successful, remind students at the session before this one that you would like them to bring a textbook from one of their other courses to your next class meeting.
2. Divide the class into pairs or small groups of three or four students.
3. Ask students to turn to the end of chapter Exercise for the unit or chapter they are working on in their textbooks.
4. Working in small groups, identify the questions that are used to elicit the critical thinking about the topic addressed in the unit.
5. In addition to identifying the actual questions in the text, each group should write five additional critical thinking questions for each chapter that pertain to the unit being studied. The content of these questions will be most familiar to the student in the specific course, but all group members should be able to participate in making these good critical thinking questions. (HINT: Suggest that students revise any questions that do not appear to elicit critical thinking but do relate the content being studied.)
6. Have each group turn in these questions along with the citation of the textbook that they were derived from. Use this assignment as an opportunity to provide students with formative feedback and as a graded assignment in the course.

End of Chapter Exercise: Small Group Discussions (p.40)
These two small group discussion topics could be run as in-class activities or they could be assigned as an out-of-class activity.

1. Start by putting the first prompt on the board.
2. Remind students that during this activity, they will not be evaluating, but they will be using their other critical thinking skills of interpretation, inference, analysis, explanation, and self-regulation.
3. The task is to come up with the best arguments for and against. (Write these words on the board so you can document the brainstorming session.)
4. Ask students to draw a line to divide a page in their notebooks in half. They should write “for” at the top of the left side and “against” at the top of the right side of the page.
5. Tell students: Consider the statement on the board. Take a few minutes to brainstorm arguments for and against this statement. Do not evaluate the arguments or take a particular side. You are building arguments on both sides right now.
6. Give students time to brainstorm their ideas.
7. Call the class together and solicit the arguments that have been brainstormed. List all arguments that are offered—no censuring!
8. Seek to make the sides balanced. Ask questions such as, “What are other good reasons for this perspective?”
9. Now add a column for ASSUMPTIONS/ADDITIONAL EVIDENCE on the board. Ask students to take out another piece of paper.
10. Tell students: We are now going to review these arguments to determine the underlying assumptions about learning and schooling that are made or additional evidence that might be sought. (Model this, if necessary, with the first argument on the board to get the conversation started.) Underlying assumptions are likely to reveal alternative perspectives on what constitutes “learning the material” and what would exemplify “better learning” and justifiable or valuable strategies to promote learning. Other assumptions related to the benefits of different strategies of teaching and learning are likely to be revealed. Additional evidence that might be sought include relevant theories, research findings, data such as test scores, examples from real life, expert opinion, student views, employer perspectives, and so on.

11. When performing this exercise, use the language of critical thinking skills to verbally acknowledge, identify, or prompt instances of inference, analysis, explanation, and so on, exhibited by the students.

12. Although the assumptions and additional information are discussed, listen for additional arguments to add to the lists on the board.

13. Close the activity by purposefully reviewing the “for” and “against” columns as a last step to refine, clarify, add, or delete the arguments to form a final list. (Point out that this is a process of self-regulation!)

14. After modeling this for the first statement, the second statement could be conducted as a small group exercise. Allow adequate time for the groups to generate their arguments for and against the second statement and to consider assumptions and additional information. Ask someone in each small group to serve as the note taker and to e-mail the group’s notes to you and to the other members of the small group (alternatively, have each small group post their notes to a class management software site so that all students can access them). Have the small groups share their ideas with the large group at the end of the exercise.

End of Chapter Exercises: Reflective Log (p. 40)

Mark Twain’s memorable quote, “I have never let my schooling interfere with my education,” can be puzzling at first, but upon reflection, it is quite provocative. The authors give suggestions about how to use this quote in relation to the exercise “The Experts Worried that School Might Be Harmful!”

1. Follow the instructions in the textbook by having students “free write” in their journals using the prompts given by Facione and Gittens: What is your reasoned opinion on this matter?

2. Ask students: Do you feel there should be something done to improve schooling? (Allow students to review their free-write reflections and talk to their neighbors before discussing this as a whole class.)

3. Have students complete the out-of-class activity that Facione and Gittens suggest. Students should identify a person who is 10 years younger and another person who is 20 years older. Read the Twain quote and ask students to suggest what they think Twain meant when he made this statement.

   a. Remind students to give their respondent silent time to think. Suggest to the students that they should count to 15 in their heads before speaking again.

   b. If the respondent says, “I don’t know,” suggest to your students that they should remind the respondent that there is no right or wrong answer, so they should take a guess at what they think Twain was trying to say.

   c. Students should record the responses they receive so they can share them in class.
4. Engage the class in comparing and contrasting the responses received. Are there similarities and differences? Does a person’s age seem to affect their response? Close this exercise by asking the class to reflect on the insights they have gained from analyzing Twain’s quote and evaluating the analyses of their respondents.

5. Consider asking students to write a response to these interpretation questions prior to coming to class. Collect written responses to this reflective log assignment, and use the activity as an opportunity to provide formative feedback.

End of Chapter Exercise: Group Exercise—What Would It Be Like to Live or Work With...? (p. 40)

One way to develop positive critical thinking habits of mind and an appreciation for positive critical thinking dispositions is to practice interacting with others who have negative critical thinking habits of mind. In this exercise, Facione and Gittens have provided two scenarios for consideration.

1. You can ask students to work in groups or individually to formulate written responses to Facione and Gittens’ scenarios. Debrief as a whole class by asking for volunteers to share their responses. Close this activity with a discussion of what was learned from responding to these scenarios. Encourage students to respond in a serious and constructive manner.

2. ALTERNATIVE: Engage students in a role-play exercise.
   a. Break the class into small mixed-gender groups of four to five students.
   b. Tell students: Work in groups to develop a skit based on Facione and Gittens’ scenarios to perform in front of the class. These skits must be realistic.
   c. Give the groups at least 20 minutes to prepare and rehearse their skit.
   d. After each performance, have the audience rate the players on their creativity, realism, and the critical thinking skills and dispositions exhibited by the characters. (Consider preparing a rating scale to facilitate this peer feedback.)
   e. Discuss these skits and the lessons learned as a class.

3. BONUS CHALLENGE: Have students work in groups to develop their own scenarios to perform in front of the class. After each performance, have the audience rate the players on their creativity, realism, and the critical thinking skills and dispositions exhibited by the characters.

4. EXTRA BONUS CHALLENGE: Solicit volunteers to perform Facione and Gittens’ scenarios as skits and improvisational performances in front of the class. Ask the audience to suggest realistic actions and dialogue for the players in character. The purpose of this improv is to engage the audience members’ critical thinking in terms of what would be a realistic and context appropriate element of the performance. After the performance, have the audience rate themselves on their creativity, realism, and the critical thinking skills and dispositions exhibited by the characters.

MyThinkingLab Bonus: The Colbert Report “Truthiness” (p. 41)

In this comedic routine, Stephen Colbert shares the word of the day, “truthiness.” This activity engages students in analyzing and interpreting truth-seeking, one of the most challenging critical thinking habits of mind.

1. Show the video clip through once in its entirety.
2. Show the video clip again, asking students to take notes on the word of the day.
3. Ask students: What does “truthiness” mean?
4. As a class, compare and contrast truthiness with truth-seeking.
5. Close this activity by reflecting on the meaning of truth-seeking and why this critical thinking disposition might be challenging at times.

6. CHALLENGE: Have students work in pairs to write three statements for which someone strong in “truthiness” would agree. Have the students then rewrite these statements so that someone strong in truth-seeking would agree with them.

**End of Chapter Exercise: Apollo 13 Question (p. 41)**

This chapter opens with an extensive exercise of a scene from the film *Apollo 13*. In this exercise, students are asked to consider another scene from this film in which a team of engineers is challenged to find a workable solution to the life or death problem faced by the Apollo 13 astronauts.

1. Ask students to review the Apollo 13 text box at the end of their chapter and to retrieve the clip from MyThinkingLab.com.

2. Working in small groups, follow the instructions given by Facione and Gittens. After viewing the clip a series of times, discuss the scene and write up a description that highlights the critical thinking skills and dispositions exhibited by the characters.

3. Students can submit their group description to the instructor for feedback or for a grade.

4. CHALLENGE: Ask each group to write a response to this question: “How would you use this clip to teach about critical thinking?” Encourage students to reflect on the numerous examples of critical thinking pedagogy that they have experienced throughout the course so far.

5. BONUS CHALLENGE: Ask for a group to volunteer to teach this clip to the whole class. Alternatively, ask groups to create a digital video project that shows them teaching critically thinking using this *Apollo 13* clip.

**End of Chapter Exercise: Web Video Project (p. 41)**

Run this activity as you would run the small group discussions described above. Remind students that during this activity, they will not be taking a position on the claim; rather, the task is to present the strongest possible arguments pro and con. Students are asked to conduct interviews with at least three teachers or professors, three successful professionals, and three others who graduated from college at least 20 years ago. Because students need to gather their views and reasons for their views on the claim for this exercise, encourage students to draft a set of interview questions to use when they are speaking to the interviewees. Particularly important will be for students to consider how to obtain both pro and con arguments from the interviewees. Consider dedicating class time to discuss as a whole class suitable interview questions and follow up probes that would elicit reasons, and not just opinions, from the interviewees. After students have completed the interviews additional class time may be dedicated to discussing the interview data and how to synthesize the quotes into pro and con summaries. Part of this class discussion should be focused on how to present these summaries in a video format. This activity can be an individual student or group project. Criteria for the Web videos can be discussed and agreed upon by the class prior to the completion of this assignment (e.g., optimal length, whether interview clips should be included, where the videos will be posted, etc.) If possible, have students post their videos to a location such that they are viewable by the rest of the class.
EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

1. Holistic Critical Thinking Scoring Rubric Exercise (HCTSR)
   This activity provides students with additional practice in identifying the language of strong critical thinking dispositions. Conduct these interpretive exercises as a whole class, small group, or independent activity.

   **Exercise 1:** For this activity, you need copies of the rubric and two highlighter pens in two different colors.
   - Copy the HCTSR onto an overhead transparency, a handout, or project an editable image of the HCTSR onto a screen in the front of the room. If you project the rubric from a computer file, be sure that you are able to edit the file.
   - Using one highlighter pen (or highlighting feature in a word processing program), identify the phrases that indicate positive critical thinking dispositions.
   - Use a different highlighter color to identify phrases that indicate negative critical thinking dispositions.

   **Exercise 2:** For this activity, you need editorials from *The New York Times* or the *Washington Post*. Note that you need at least one pro and one con editorial for the particular theme you discuss. If you have done Exercise 1 as a whole group in class, consider asking students to perform Exercise 2 in small groups or as a homework assignment.
   - Provide students with preselected editorials or instruct students to identify their own editorials. Remind them that they must find both a pro and con editorial for the topic.
   - Evaluate both editorials using the HCTSR rubric and explain your rating score in detail.
   - Discuss the results in class. This is easier if everyone has rated the same editorials but if there are varied editorials discussed, then students will need to provide a summary of the written pieces.
   - Discuss as a class the reasons for differences of perspective that might come up if there is a range of scores for the same editorial. Ask students: How might we resolve this difference of viewpoint to try and reach consensus in the rubric scores?
   - Close this discussion by discussing truth-seeking as a particularly difficult disposition to practice because of the powerful influence of attitudes, preconceived notions, opinions, and belief systems on decision making.

2. “Critical thinking is about how we approach problems, decisions, questions, and issues even if ultimate success eludes us.” (p. 22)
   a. Write this quote from the textbook on the board.
   b. Ask students to explain in their own words why this statement is true.
      Instruct them to provide two personal examples to illustrate the point they are trying to make. Finally, ask students to analyze their personal examples and offer an explanation for why they engaged in strong thinking but were ultimately unsuccessful.
3. Checking for understanding: On page 22, the textbook authors provide a set of statements with which a person with a strong disposition toward critical thinking would probably agree. This is followed by a set of statements with which persons with weak critical thinking dispositions would most likely agree.
   a. Organize the students in groups of three or four.
   b. In groups, write five additional statements with which persons with a strong critical thinking disposition would likely agree.
   c. Also in groups, write five additional statements with which persons with weak critical thinking dispositions would likely agree.
   d. Call the groups together and have each group offer one example from each of their created sets. The group should read their statement and then explain what someone strong (or weak) would likely be in agreement.
   e. Collect the written responses from the small group. Review the statements to be sure they are related to critical thinking dispositions rather than skills. This is an opportunity to provide formative feedback to your students and to use for assigning participation points in your grade book.

4. INCREASE THE CHALLENGE: To extend the activity presented previously or as an alternative, have students perform this reflective log assignment.
   a. This week, students should listen to what is said during their conversations with others (friends, family, co-workers, classmates, professors, and so on).
   b. When someone makes a statement that reveals either strong or weak critical thinking dispositions, this should be recorded in the student’s log. After each log entry, students should identify whether it is indicative of strong or weak CT dispositions and explain why it is so.
   c. These statements need to be related to critical thinking dispositions (not to skills)! Review the statements in the textbook and the ones that were generated by the small groups for examples of what to listen for.
   d. During class, have students volunteer some examples (remind students to protect the confidentiality of the individual being quoted).

5. Examples of inductive and deductive reasoning in our everyday lives.

   This could be used as a discussion prompt or used as an in-class activity or essay question, or an out-of-class reflective log assignment.

   Ask the students to consider situations in their personal lives where they feel they have used inductive or deductive reasoning to come to a conclusion. Review the definitions of inductive and deductive reasoning that are presented in the textbook. Ask students to describe one example of inductive reasoning and one example of deductive reasoning. For each example, the student should explain the context and the conclusion that he or she drew. (Be prepared to offer a personal example—factual or fictional—that would model what you would like the students to do.)

   Discuss these examples as a group.
   • For examples of inductive reasoning, ask students to identify the supporting evidence that was used to make their decision and describe how they determined the likelihood that they were drawing a correct conclusion.
• For examples of deductive reasoning, engage students in identifying the premises and describing how they understood the grammatical constructions and the meanings of key terms and ideas so that the inference, to them, could not possibly be false if all of the premises were taken to be true.

• Put the word “inference” on the board and draw two arrows going down at a 45-degree angle. Write “Inductive” under one arrow and “Deductive” under the other. Ask students to describe the essential features of each form of reasoning. Prompt them to identify where these inferential strategies differ from one another. Do not accept “goes from specific to general” or “goes from general to specific” as correct answers. Provide counter examples if necessary to reinforce that this is not an adequate characterization.

6. Identify a video clip from another popular film that has depictions of jury deliberations or witness interviews (for example, *A Time to Kill*, *Erin Brockovich*, *Philadelphia*, *Presumed Innocent*, *Reversal of Fortune*, and so on) or television show that you feel is a strong example of critical thinking being displayed in a group context.
   a. Show the scene to the class.
   b. Ask students: What’s going on in this scene? What critical thinking skills do you see being exhibited by the speakers? What is the purpose or goal being sought by the individual speakers? (AS A REVIEW OF CHAPTER 1: Is the control of information being used in this situation to manage perception?)
   c. If possible, consider places to pause the video to ask questions such as the previous ones or to ask students to predict the next event that will occur or the direction the dialogue will take as the scene unfolds.
   d. Use this activity as further practice of identifying critical thinking skills and using the language of critical thinking in the description of questions or conversation.

7. Checking for Understanding: Questions to Fire Up Critical Thinking Skills

In this chapter, we learned that a good question can invite people to use their critical thinking skills. The chapter began with thoughtful reflections of journalist Katie Couric as she described her preparations for interviewing the 2008 presidential candidates. Each day, there are numerous journalistic interviews shown on television channels such as FOX, MSNBC, and CNN, and on local network channels. Which of these interviewers use good critical thinking questions? How is the bombastic, sarcastic, and confrontational expression of one’s opinion different than demonstrating critical thinking?

Bring in video clips from two or more news channels that provide interviews on the same current event. Have students listen to each interview using the same method of recording questions that was performed in the exercises with Couric interviewing Palin. Have the students work in pairs or small groups to review the questions that were asked and classify them in terms of the critical thinking skills that were introduced in Chapter 2. If the student feels that a question is trying to elicit more than one critical thinking skill, he or she should list all the skills that apply. Perform this activity for all questions that were intended to elicit critical thinking.
QUESTIONS TO SPARK CONVERSATION: Are there any patterns that can be identified in these results? What are the similarities and differences across the three interviews from different news channels? Do you feel each interview was informational and objective? Why or why not?

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically
Students can access chapter summaries, exercises, and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Chapter 3
College Success through Critical Thinking

CHAPTER OVERVIEW
This chapter offers students an easy to remember, 5-Step critical thinking problem solving and decision making strategy that can be applied to the challenges and problems they will face in the college years and in their lives after college. Through a series of vignettes, the 5-Step IDEAS process is demonstrated and applied across six common domains of college student development: social, academic, vocational, physical, emotional, and spiritual. Numerous examples and exercises are provided to achieve the chapter learning objectives.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Identify the five steps of the IDEAS Critical Thinking Problem Solving and Decision Making Process.
• Explain how to use the IDEAS process to think critically and solve problems that occur in the day-to-day lives of college students.
• Recognize the potential application of the IDEAS process to any decision making situation.

DAILY DISCUSSION STARTERS
1. What factors are likely to influence your success as a college student?
   • Record responses on the board; capture all ideas—no censuring!
   • Leave these ideas on the board and then return to them at the end of the first class to see how the class’s ideas correspond to the authors’ conceptualizations of Student Success in the chapter.
2. What are some of the day-to-day challenges of being a college student?
   • Record responses on the board; guide the students toward identifying examples that represent the six domains that are addressed in this chapter: social, academic, vocational, physical, emotional, and spiritual.
   • Write the six domains on the board; label one of the student’s examples according to the domain it most represents. Repeat the labeling for another example and then ask students to label the remaining examples as you record the labels on the board. If there is a domain that is underrepresented, engage students in developing additional examples for that domain.

Additional Daily Discussion Starters can be drawn from the end-of-chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in this Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
MyThinkingLab: Institutional Programs and Measures of Student Success
Text Box: IDEAS: A 5-Step Critical Thinking Problem Solving and Decision Making Process
Text Box: Six Domains of Issues and Concern of College Students
MyThinkingLab: Malicious Intent or a Prank Gone Horribly Wrong?
MyThinkingLab: The "Gap Year"— Advantage or Liability?
MyThinkingLab: How Can We Use Our Study Time Most Effectively?
MyThinkingLab: What is the Relationship between Education and Income?
MyThinkingLab: How Can We Protect Ourselves from Ourselves?
MyThinkingLab: Religious Practices and Beliefs—What Do We Know?
MyThinkingLab: Institutional Programs and Measures of Student Success (p. 48)

“6-year graduation rate” and “first-year retention rate” are two indicators commonly used by colleges, accreditation agencies, and the media to measure college student success and to rank colleges and universities. The textbook authors introduce these two common metrics, pointing out some of the limitations of each as markers of the quality of a college or university. The authors also introduce other features of educational institutions that signal their commitment to student success. This exercise can be run in one or two parts.

PART 1:
2. Have students work in groups of 2–4 members.
3. Ask students to take 2–3 minutes to look up your own institution and record the statistics on freshmen retention and graduation rates.
4. Have the students spend the next 10–15 minutes obtaining these same statistics from 10–15 institutions like yours.
5. Have each group prepare a chart to represent the information for their selected 10–15 institutions PLUS your own institution. Tell students they should use the chart to compare the statistics and interpret the similarities and differences they observe. The group should also write a brief statement explaining why they included each of the comparison institutions—how was “an institution like ours” interpreted by the group for this exercise?
6. Bring the class back together for a discussion. Start by asking for a few students to share their observations with the class.
7. Ask the groups the following questions:
   a. What did you learn about our own institution in terms of freshmen retention and graduation rates?
   b. How did your group determine the “like institutions” for comparison?
   c. What observations did you make as you looked over the freshmen retention and graduation rates at these various institutions?

PART 2:
8. Have the students return to their working groups. Each group should spend 10–15 minutes identifying programs on your campus that are specifically designed to help assure undergraduate student success.

Note that several potential examples are provided by the textbook authors. Instructors should prepare a list of key programs from their campus to augment the lists generated by the student groups.

9. Bring the class back together for a discussion. Begin by asking each group to share the program list with the class. Write responses on the board. Augment with any key programs that may be missing from the student generated lists.
10. Ask students the following questions for each program:
    a. What is this program and what is its intended purpose?
    b. Where is it located?
    c. Who does it serve?
d. By a show of hands, how many of you have participated in this program? Which one(s) do you plan to participate in?
e. How does this program promote student success?

11. Be sure to ask students to provide explanations for their statements and conclusions.

12. LESSON EXTENSION: Reflective Log
   a. Ask a student who is not a member of the class who has participated in one of the programs listed on the board the following question: How does [did] participating in this program help you to be successful in college?
   b. Ask a staff member associated with the program the following question: How does participating in this program help promote student success?
   c. Evaluate the two interviewees’ responses. Did they have a similar understanding of the program’s value for promoting student success? How did they differ?
   d. Taking into consideration the interviewees’ responses, write in your own words a statement that expresses how this program promotes student success on your campus.

Text Box: IDEAS: A 5-Step Critical Thinking Problem Solving and Decision Making Process (p. 47)

Engage your students in a review of the IDEAS process. Ask students to “translate” the theme of each step into their own words.

1. Ask your students to read each of the steps in the text box (or read them aloud to the class).

2. FOR STEP 1 ASK:
   a. MEANING: When you think about solving a problem or making a decision, what does it mean to “Identify the Problem”? What does “Set Priorities” mean?
      Seek responses such as: problems are complex; there are oftentimes more than one problem to solve or more than one decision to make; we want to figure out the problem so we don’t waste time or make mistakes or misunderstandings; we need to choose which problem is most important; we need to solve problems one at a time, working on the important ones first; etc.
   b. EXAMPLES: Can anyone give me an example of a time when they “Identified the Problem” correctly? How about an example of a time when they “Identified the Problem” incorrectly? Can anyone give me an example where they had to “Set Priorities” in order to make a decision or solve a problem?
   c. QUESTIONS: What is a question we could ask ourselves to help us “Identify the Problem”? What is a question we could ask ourselves to help us “Set Priorities”?
   d. ANALYSIS: How does Step 1 help us to think critically when solving problems and making decisions?

3. REPEAT the translation process for all five steps. Focus on asking students to explain the meaning of each step, give examples of successful and unsuccessful resolution of each step, generate questions to guide one’s thinking in the step, and analyze why the step promotes critical thinking.

4. SUMMARY QUESTIONS: What might happen if a person skipped Step _____ (select Step 1–5)? How might that affect their thinking and decision making process?

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5. **CHALLENGE QUESTION:** What do the textbook authors mean when they say "The IDEAS process can fold back on itself whenever a thoughtful person realizes that he or she needs to make adjustments"? [The purpose of this challenge question is to help students understand that at any point in the problem-solving process we can readjust or modify our thinking. Scrutinization and self-correction shouldn’t be saved until the end of the decision-making process! If there is new information, a realization that we have made a mistake in our problem identification or priorities, or a lack of viable options, for example, we should return to a prior step in the IDEAS process before making a decision.]

**Text Box: Six Domains of Issues and Concern of College Students (p. 49)**

This text box offers a set of examples that represent the six domains of college student development that are discussed in the chapter. As the authors point out, it is not an exhaustive list, but it is intended to demonstrate how student’s concerns can be understood within the context of these six domains. This exercise is intended to familiarize the students with the six domains and help them to see that most issues or concerns do NOT fall discretely into one domain only.

Although it seems obvious, for some students it is not. So remind them that the authors are NOT associating a given domain with a given step in the IDEAS process. The IDEAS process applies to all problems in all domains.

1. Ask students to review the six domains and the issues that are presented for each.
2. SAY: Now, on your own, spend 5 minutes writing down a question that represents an issue or concern that YOU have in each of the six domains. They can be questions that are on the chart already or they can be ones that are personally meaningful to you but do not appear on the chart in the textbook.
3. SAY: Turn to your neighbor and share some of the questions you came up.
4. Bring the class together after about 5 minutes. ASK:
   a. Who would like to share a question that they came up with that is not already on the chart from the textbook? (Take at least one question from each of the six domains.)
   b. Did anyone else ask a question like this one?
   c. What domain does that question represent? (Ask this to the student who is sharing their question.)
   d. Can anyone see another domain that this same question also relates to?
5. Wrap up the conversation by asking: What is the value of thinking about the domain(s) that an issue or concern falls into? How does this impact the problem-solving or decision-making process, if at all?
   Seek responses such as: this can help a person identify the problem by focusing on the context; consider where or from whom to gather information based on cues from the domain; help the individual set priorities or evaluate options in light of other information and options pertinent to that domain; help the individual envision the consequences of an option on this domain or other domains in life; etc.
**MyThinkingLab.com: Malicious Intent or a Prank Gone Horribly Wrong? (p. 50)**

Engage your students in a discussion of the tragic events surrounding Rutgers student Tyler Clementi’s suicide in September 2010. This exercise is an application of Step 1 in the IDEAS Critical Thinking Problem Solving and Decision Making Process. As the authors point out, we will never know how Tyler Clementi viewed his problem such that he concluded suicide as his only option. Nevertheless, we can use this case as an exercise in thinking about how the individuals involved, the two young people facing charges related to the suicide, the Clementi family, and the Rutgers University community, might indentify the problem and set priorities in the aftermath of Tyler’s death.

**Before conducting this exercise tell your students that the topic of suicide can be very difficult and emotional. Let them know that you will be available after class and during office hours (and by phone or email, etc) if they would like to discuss anything that relates to today’s lesson. Also provide students with the information for your campus or local Counseling Services Center and Suicide Hotline. You may also wish to have someone from the counseling center present to co-lead this exercise and provide suicide prevention materials. **

1. Access [www.MyThinkingLab.com](http://www.MyThinkingLab.com) to obtain the news stories and other materials related to this event.
2. ASK: What do we know about this event from these news stories and other materials?
3. ASK: Who are the key individuals involved in this situation? [Tyler Clementi, the classmates allegedly involved in streaming the video on-line, the families of these individuals, the friends close to these individuals, the university community, etc.]
4. AS A WHOLE CLASS: Take one of the key individuals—ASK: What problem(s) does this individual face in relationship to this event? Use the six domains to guide students’ brainstorming.
   a. Seek responses such as: social ostracism; decreased academic performance due to stress or time away from studies while the legal process is playing out; vocational impacts that are necessitated by legal outcomes or chosen because of this significant life event; physical impact due to stress or lack of sleep; emotional reactions of guilt, depression, remorse, or denial; spiritual impact of personal involvement or closeness to another’s suicide; etc.
   b. Repeat with one or more additional key individuals.
5. ALTERNATIVE: Break students into groups and assign a key individual to each group. Have each group engage the question in Step 4. Have groups share their responses with the class as a whole.
6. Close this exercise with a discussion of counseling services and suicide prevention services on your campus.
7. Use this exercise as an introduction to the discussion of IDEAS Step 1.

**MyThinkingLab.com: The “Gap Year”—Advantage or Liability? (p. 52)**

This exercise is an application of Step 2 in the IDEAS Critical Thinking Problem Solving and Decision Making Process. In this exercise, students must deepen their understanding of a “gap year” by gathering relevant information regarding the pros and cons of this increasingly popular option. In addition to analyzing and evaluating the positive and negative ramifications of electing for a “gap year,” students must consider the impact of “gap year” practices on the policies and expectations of colleges and universities.
1. Access www.MyThinkingLab.com to obtain the article "The Lure of the Gap Year."
2. Have students read the “gap year” article, paying particular attention to statements regarding the pros and cons of “gap years” before, during, or after college.
3. ASK: What is the difference between the “gap year” or “gap year advantage” and “taking time off”? Do they mean the same thing or is there more to the concept of a “gap year”?
4. Engage the whole class in a brainstorming session on the pros and cons of participating in a “gap year.” List the responses on the board. [Consider having students work in pairs or small groups to generate a list of pros and cons before conducting the whole class brainstorming session.]
5. ASK: What are the expectations of our institution regarding the “gap year” before or during a student’s college experience?
6. ASK: What are the policies of our institution regarding the “gap year” before or during a student’s college experience?
7. ASK: Where on campus might we look for the answer to this question? (e.g., Admissions Office, Registrar, Advising Center, Career Center, International Programs Office, Student Life Office, etc).
8. As a homework assignment, assign one or more of the identified offices to students (individuals or working in pairs/groups) and have them gather information on expectations and policies regarding students taking a year off from their studies. Encourage them to look on the office’s website and also visit the office to speak to a staff member and/or collect the office’s published materials.
9. For the next class session, debrief this homework assignment by collecting the information that each student/group gathered.
10. ASK: Are there policies that would need modification (or need to be developed) to address the “gap year” if it become a common practice at this institution?
11. EXTENSION: Synthesize the collected information and develop an informational brochure on the pros and cons of a “gap year” with the institution’s policies included.

MyThinkingLab.com: How Can We Use Our Study Time Most Effectively? (p. 53)

For as important as studying is to being successful in school, effective studying skills are not typically discussed or explicitly taught. The authors describe several common studying behaviors such as outlining chapters, reviewing notes, writing test questions, making charts and diagrams of key ideas, etc. Furthermore, he argues that simply memorizing information is not enough to ensure success in college courses. Use this exercise to engage your students in a discussion of their typical studying habits and guide them in an evaluation of the relative effectiveness of various studying behaviors. The learning styles literature shows us that “one size does not fit all,” but there are general statements that can be made on the topic.

1. ASK: What do you do to prepare for a test? What are your preferred studying techniques? Record student responses to this question on the board.
   With this question you are trying to elicit study techniques such as reviewing highlighted text, rewriting class notes, making flash cards, meeting with a study groups, attending a test review session, etc.
2. ASK: What else are you typically doing while you are studying? Record student responses to this question on the board.
   Encourage students to be honest about what they do while they are studying—particularly regarding what distractions they may vulnerable to, such as having the television on in the background, simultaneously interacting with their Facebook, Yahoo, or other preferred IM system, having their iPod playing in their ears, etc.
3. ASK: Where did you learn how to study?
Students today may have had direct experiences where they were taught specific study skills but there are many practices that they were not taught. The purpose of this discussion is to demonstrate that this is not usually a purposeful skill set that is explicitly taught and that there are many different techniques that are used by students.

4. Engage students in evaluating the relative effectiveness of the techniques and concurrent activities that they have listed and that you have recorded on the board. Comment on practices that students may not realize or may not be able to evaluate as relatively ineffective such as spending fatiguing amounts of time going over and over the material they are trying to study.

5. **ASK:** Who can tell me something that we have discussed today that they find surprising? Who can identify a study technique mentioned today that they have never tried but that they will try next time you are studying for an upcoming exam?

6. **ASK:** Why, if we know it is not a good expenditure of our time or if we know it is a distraction, do we continue to engage in ineffective study habits? This question is intended to engage students in drawing inferences about their own behavior and why they persist in particular behaviors. It is not a simple question and it has no straightforward answer. The point here is to help students realize that it is difficult to change behavior, but important to make good decisions about how to approach their studies in order to maximize the likelihood of their success.

7. Close this exercise by asking students to do a 5-minute Quick Write in response to this prompt: It will be difficult for me to ______________ but I will ______________ as I study for my next test. Students should identify a common distraction that they are vulnerable to, such as texting on their phone, in the first blank, and identify an effective study skill in the second blank.

8. Have students copy their response in their notebooks before you collect this 5-minute Quick Write. Explain that you will collect these statements and return them to the class in a few weeks. At that time you will ask them to evaluate their success. (An evaluative statement of their success will be another Quick Write activity on the day these are passed back).

**MyThinkingLab.com: What is the Relationship between Education and Income? (p. 55)**

This exercise is an application of Step 3 in the IDEAS Critical Thinking Problem Solving and Decision Making Process. Students are asked to consider the decision of whether or not to go to college and graduate. To inform students’ thinking about this decision, the authors present a graphic titled “Richer by degrees” first published in The Economist. The graphic displays the relationship between academic attainment, sex, and income and uses data from the Brookings Institute. Use this exercise to practice students’ critical thinking as they anticipate the consequences of this potentially life altering decision.

1. Access www.MyThinkingLab.com to obtain the graphic “Richer by degrees”.
2. Divide the class into groups of 3–4 students. Give them 15–20 minutes to answer the questions posed by the authors in the chapter.
3. As part of the 15–20 minute group time, ask each group to formulate one critical thinking question that can be answered on this same topic of the relationship between academic attainment, sex, and income. [Refer students to the language of critical thinking skills on page 17 in Chapter 1 for a reminder of how to determine if the question is a “critical thinking” question.]
4. Bring the class back together for a discussion. Take turns asking each group to offer their thoughts on the questions asked by the text book authors.
5. If time permits, ask one or more of the groups to ask the class the critical thinking question that they wrote. Engage the class in a discussion of the group’s question. Allow the authoring group to conduct this discussion with their classmates.

6. Close by asking the class to explain how this exercise is an application of Step 3 in the IDEAS process. Seek responses that indicate the students’ realization that part of the decision of whether or not to attend college and graduate is to anticipate the consequences of the decision.

7. EXTENSION: Collect the written responses from each group. Use the student-generated questions as test questions, review questions, or as discussion starters for the next day’s lesson (reword as necessary).

MyThinkingLab.com: How Can We Protect Ourselves from Ourselves? (p. 56)

The authors pose the perplexing question “Why, when we know that a given behavior has harmful long-term effects, do we engage in that behavior anyway?” Perhaps some of your students have heard of the concept of a “sin tax,” but it is likely that others have not.

1. ASK: By a show of hands, and without naming the behavior, how many of you would say that you engage in a behavior that you know has harmful long-term effects?

2. ASK [or use as an ALTERNATIVE OPENING QUESTION]: Who can name a behavior that people engage in, even though they know it has harmful long-term effects? Record responses on the board.

3. ASK the question posed by the authors: Why, when we know that a given behavior has harmful long-term effects, do we engage in that behavior anyway? Typically responses will be that the behavior has short-term benefits such as pleasure or stress-release, or that the behavior is addictive, or potentially high pay-off, etc.

4. ASK: What are the long-term consequences of these behaviors to the individual? To their family and friends? To the community? To greater society?

5. ASK: What would it take to curb the unhealthy behavior?

6. SPECIFICALLY introduce the topic of reducing the incidence of childhood obesity. Introduce the concept of a “sin tax.” Access www.MyThinkingLab.com to obtain Professor Mankiw’s opinion piece in response to the question “Is a soda tax a good idea?”

7. Divide students into groups of 2–3. Ask them to review Professor Mankiw’s opinion piece. Based on their consideration of the professor’s perspective, have the groups enumerate the various options and their consequences for reducing childhood obesity through a tax on soda. Ask each group to formulate a statement that represents the group’s perspective. The group should include an explanation of their point of view using good reasons and solid evidence.

8. Bring the class together. Have each group present their perspective to their classmates. Be sure to require each group to share their reasoning and evidence—it is not enough to state the group opinion without support.

9. CLOSE the discussion by brainstorming options for the use of the monies collected from a soda tax. Engage the class in a discussion of the anticipated consequences of the various options enumerated.
Though there are other elements to the spiritual domain such as morals, beliefs, and personal ethical values, it is natural to also associate religiosity and knowledge of religion with the spiritual domain. The authors draw our attention to the results of a recent Religious Knowledge Survey that suggests that the majority of U.S. adults say that religion is “very important” to them. In this text box we also learn that, according to the survey results, large numbers of Americans could not answer informational questions about their own religion, let alone other major world religions. This exercise engages students in analyzing the predictors of religious knowledge, testing their own level of religious knowledge, and thinking critically about the meaning and significance of these survey results.

1. Before the class discussion of the Pew survey results, have students access [www.MyThinkingLab.com](http://www.MyThinkingLab.com) to take the Pew Research Center’s Religious Knowledge Quiz.

2. Access [www.MyThinkingLab.com](http://www.MyThinkingLab.com) to obtain the results from the Religious Knowledge Survey. Have students read the Executive Summary in class (or assign the full report as an out-of-class reading assignment).

3. Review the results to identify trends in the predictors of religious knowledge. Show students the bar charts that are in the main body of the report.

4. ASK: Why would a person’s years of schooling be a strong predictor of religious knowledge? Repeat this line of questioning with the other demographic characteristics from the “IV. Factors Linked with Religious Knowledge” section of the report (e.g., religious education, religious affiliation, reading religious materials, race/ethnicity, age, etc.).

5. SAY: Has anyone noticed that the report contains descriptions of group differences but no interpretation of the meaning of these differences? Why might which be?

6. ASK: What do the leading religious studies scholars say about the meaning of these results? Access [www.MyThinkingLab.com](http://www.MyThinkingLab.com) to obtain the Surveying Religious Knowledge blog post from The Immanent Frame. Give students 5–10 minutes to work with a partner to interpret the perspectives expressed in this blog post.

7. What interpretations and criticisms do these theologians offer in regard to the Pew survey? Write the students’ responses on the board.

8. Close this exercise by asking students to evaluate the claim made by Boston University professor Stephen Prothero in his 2007 book Religious Literacy: What every American Needs to Know—and Doesn’t. Professor Prothero argues that “Americans are both deeply religious and profoundly ignorant about religion.” Based on the title of his book, we can conclude that Professor Prothero considers this state of affairs to be problematic and in need of repair. Have students complete a 5-minute Quick Write in which they state their own perspective on whether the religious illiteracy of the American public is a problem. Students must support their perspective with evidence and reasons.

*End of Chapter Exercises: Reflective Log—What’s On My List? (p. 63)*

This reflective log exercise provides students with an opportunity to extend the activity that was conducted with the [Text Box: Six Domains of Issues and Concern of College Students](http://www.MyThinkingLab.com). In that activity, students recorded questions to represent issues or concerns they had in each of the six domains of development. For this reflective log, students should individually review their list and reflect on the relative challenge these concerns pose, the actions that have been taken toward resolving these issues, and the overall success thus far in these endeavors.
The purpose of these reflective log exercises is for students to document their own thinking and to engage in meta-cognitive self reflection about the quality of their thinking endeavors.

To maximize the usefulness of these reflective log entries, the instructor is encouraged to develop a mechanism for students to maintain their entries. This mechanism should permit easy access over time. Suggestions include: hard copy lab books or composition notebooks, ePortfolios or paper portfolios, course management software systems that permit students to upload documents for storage and easy access, thumb drives that students are required to bring to class each session, an on-campus server or student accessible shared drive, etc.

Explain to students that the reflective logs are to be maintained throughout the term. To increase students’ motivation to put effort into the reflective log activity, consider making the completion of the logs a component of your grading plan.

**End of Chapter Exercises: Believing Our Own Press Releases (p. 63)**

This set of questions is intended to engage students in reflecting on the degree of impression management they engage in through their social networks and other digital representations of themselves that they present to the outside world. Consider making a class assignment to view the films *The Social Network* or *Catfish*, or another film that features the theme of the presentation of self in the digital age. Alternatively, select a clip from one of these films and show it in your class. As a homework assignment, have students analyze the self-descriptions and visual images that appear on their social networking sites (or pages or posts). The log prompt is: Is the impression that you are trying to give others about yourself an honest one? Why or why not?

This assignment can be used in conjunction with an in-class discussion of the social domain of college student development. Engage students in thinking about the social implications of digital technologies such as instant messaging, texting, blogging, and social network websites. How is this changing how people relate to one another? What are the benefits and challenges of this shift in preferred communication styles? How do we evaluate the authenticity or honesty of our communications when are no longer face-to-face?

**End of Chapter Exercises: Group—Apply the Process (p. 63)**

The GROUP DISCUSSION questions at the end of this chapter can be used as an in-class activity. Review the group project vignette with Bree, Shawna, and Angelica from the chapter. Divide the class into groups of 4 and assign some groups the Shawna character and others the Angelica character. In groups, have students apply the IDEAS process from the perspective of their assigned character. After 10 minutes have elapsed, have students move into new groups that contain two individuals who were considering Shawna’s perspective and another two individuals who were considering Angelica’s perspective. Have the students share the results of the IDEAS process for their character with their new group. In these groups, ask students to respond to the questions posed by the textbook authors. Bring the class together. Debrief this activity by asking students to share their experience of trying to synthesis the perspectives of Shawna and Angelica. Use this activity to increase students’ familiarity with the IDEAS process.
End of Chapter Exercises: Group—Who Are “Today’s College Students”? (p. 63)
This activity can be used as an end-of-chapter review question or as a daily discussion starter. The purpose of the brainstorm is to identify characteristics that provide the diversity of students on today’s college campuses. It is also intended to engage students in thinking critically about commonalities among college students from various backgrounds. The goal of this chapter was to introduce the concept of college student success and provide students with critical thinking problem solving skills and a process for solving problems and making decisions in order to promote the likelihood of their success. In this final exercise, students are asked to consider how our differences and similarities promote or hinder the likelihood of success in college. Conduct this discussion as a whole-class brainstorm exercise. Use student responses to this exercise as an opportunity to introduce the resources and services available on your campus to promote student success.

End of Chapter Exercises: Group—Investigate, Classify, and Rank Order the Purposes of College (p. 63)
This exercise can be run in class with students divided into groups of 2–4. The authors list five different constituency groups that may have shared and unique perspectives on the purpose of college. Assign each group one of these constituencies and give groups 5–10 minutes to generate a list of reasons and purposes for college that would characterize this constituent perspective. Come together as a whole class and share the lists (have a group representative come and write the list on the board). Alternative: create a virtual page or shared document that can be used to record and collate each group’s responses. Circulate this collated list to the class. Engage students in a small group or whole class discussion of the authors’ questions. This exercise can be used in conjunction with the “Relationship between Education and Income” available from www.MyThinkingLab.com. Have students apply the IDEAS process from the perspective of each constituent group to the question of whether to attend college and graduate.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES AND ASSIGNMENTS

Questions to pose as discussion, in-class exercises, or out-of-class writing prompts:

1. The Secret of My Success.
   Interview a friend or family member who graduated from college at least five years ago. Ask them to describe a college program or experience that promoted their success as a college student. Ask them to explain why this was an effective means of promoting their success? In other words, why did it work in their case? Then ask them to describe a situation that was a potential hindrance to their success. How were they able to overcome this challenge?

2. Of course it’s true—I read it on the Internet!
   Invite a staff member from your campus library (or obtain lesson ideas from trusted sources on the Web) to conduct a lesson on information literacy. Focus this lesson on judging the credibility of sources, particularly those found on the Internet. This lesson on information literacy can be connected to class discussion on IDEAS Step 2, DEEPEN Understanding by Gathering Relevant Information.

3. Applying the IDEAS process.
   Develop brief scenarios such as those that appear in the chapter that represent typical student issues or concerns on your campus. Ask students to identify the domain(s) the scenario represents. Ask students to apply one or more of the 5-Step IDEAS process to the character(s) in the scenario.
4. Have students work in pairs to develop authentic scenarios for each of the six domains of college student development. Engage your class with these student generated scenarios throughout this chapter and the term as a way to continuously practice the 5-Step Process.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically

Students can access chapter summaries, exercises and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Chapter 4
Clarifying Ideas and Concepts

CHAPTER OVERVIEW
The first section of the textbook (Chapters 1–3) explores critical thinking as a process of purposeful reflective judgment. This process involves mutually interacting critical thinking skills and internally motivating critical thinking dispositions or habits of mind. The next section of the textbook examines two of the six critical thinking skill areas: interpretation and analysis. Interpreting ideas as they are expressed in language is discussed in Chapter 4. Successful interpretation relies upon contextual clues and an awareness of the intent of the speaker to the interpretation process. The reader is introduced to the concepts of vagueness and ambiguity as challenges that can hinder successful communication and require one to engage the critical thinking skill of interpretation. Examples in the text illustrate why vagueness and ambiguity can be problematic if context and purpose are unknown or poorly understood. Strategies for resolving problematic vagueness and ambiguity are practiced through a series of activities. Interpretation is also discussed in relation to language communities. The core critical thinking skill of interpretation is essential when trying to understand the words and symbols, sets of questions, kinds of evidence, methods, and standards of proof used by various language communities around us.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:

• Explain how context and purpose affect the quality of an interpretation.
• Apply five strategies to effectively resolve problematic vagueness and ambiguity.
• Describe the central characteristics of a language community.
• Explain why strong critical thinking, particularly judicious interpretation, is helpful when encountering a new language community.

DAILY DISCUSSION STARTERS
1. Multiple Meanings / Multiple Interpretations
   • On page 71, the textbook authors provide two images that illustrate the multiple meanings or interpretations of the word “offensive.” There are additional examples on that page of ambiguous words, expressions, and statements that have multiple meanings (for example, Heads up!). Brainstorm with the class additional words or phrases that are ambiguous unless the context of the conversation or purpose of the speaker is known.

2. Modify the Resolving Vagueness and Ambiguity exercise.
   • Write one of the 25 statements on the board as it appears in the textbook.
   • Engage the class in rewriting the statements to clarify the vague and ambiguous words or phrases.
   • Discuss the multiple possible interpretations of words and phrases in the statement.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
MyThinkingLab: Inherit the Wind “Then You Interpret!”
Thinking Critically: Interpreting “Dependent”
MyThinkingLab: Inherit the Wind “Then You Interpret!” (p. 65)
In this courtroom drama, Spencer Tracy’s keen questioning helps to illustrate the character’s interpretation skills. Run this exercise in the same way that the Apollo 13 “Houston We Have a Problem” exercise (Chapter 2) was conducted.

1. Play the video clip in its entirety.
2. Ask students: What evidence of critical thinking can be identified in this scene?
3. Encourage students to point out examples of how Spencer Tracy’s questions reveal the interpretation process and engage the interpretation skills of the witness. Interpretation is not the only critical thinking skill that Spencer Tracy’s character exhibits. Ask students to identify examples of inference in the film clip, for example.
4. Replay the scene. Pause the clip at points where you want to ask questions of the class.
5. Close this exercise by discussing the factors that influence interpretations—particularly the understanding of the context and purpose of the speakers and authors.

Thinking Critically: Interpreting “Dependent” (p. 69)
In this exercise, students are asked to interpret the tax rule language of IRS Publication 17 that offers clarification of the term “dependent” as it is used for purposes of filing a federal income tax return. Students practice interpretation and explanation in this activity.

1. Run this exercise the same way as the What Is Wrong with These False Statements exercise was conducted.
2. Tell students: The eight scenarios in this activity require that you interpret whether the situation qualifies as a dependent under the tax rule.
3. Have students work with a partner or in a small group.
4. Discuss answers and explanations as a whole group. Expect students to cite evidence as justification for their answers (obtain the full document from the www.irs.gov site if necessary). Work together as a class to rectify disagreements in interpretation.
5. Close this activity by asking the class what was learned. You should hear responses that would suggest an understanding that the context of a situation is relevant to making correct interpretations. Also, students should appreciate the challenge of interpreting vague situations but that elaborate rules and caveats do help.

MyThinkingLab: My Cousin Vinny—Confession Scene (p. 70)
This scene helps demonstrate how ambiguity of language and the misunderstandings that might ensue can be highly problematic and sometimes disastrous. It is likely that your students will have their own personal examples of misunderstandings that started with ambiguity of language.

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1. Watch the video clip in its entirety.
2. Ask students: How did ambiguity of language get Ralph Macchio’s character in trouble?
3. Ask students: How did it happen? What misinterpretations are the characters in this scene making? (Elicit comments that demonstrate the clues of context and purpose that the character was using, clues that were misinterpreted and essential clues that were missing.)
4. Ask students: Has this ever happened to you? At what point did you figure out that there was a misunderstanding? (Seek volunteered examples.)
5. Close this activity by reflecting on how context and purpose are used to make interpretations and that misinterpretation can occur in ambiguous situations.

**Text Box: About Successfully Negotiating (p. 76)**
1. Review the information in the text box with the class and the two types of negotiation.
2. Tell students: Think about the last time you were involved in a negotiation.
3. Ask students: What perspective was taken in that negotiation situation: positional negotiation or interest-based negotiation?
4. Tell students: If you felt satisfied with the compromise, please describe what made it work out well. If you feel that by reaching a compromise you had to give up something you wanted and therefore you were dissatisfied, then I want you to describe what you might have done differently to have achieved a better outcome. (Have students share their responses with a neighbor or write them as a journal entry.)
5. Discuss as a whole group. How many examples of each strategy were there? The authors assert that interest-based negotiation is more likely to result in both parties feeling satisfied. Can we draw this same conclusion from our examples? Why or why not?
6. Close this activity by discussing how to increase the likelihood that the students’ next negotiation will involve interest-based negotiation to reach a mutually satisfying compromise.

**Text Box: Watch Out for Donkey Cart Words (p. 78)**
In this text box, the authors point out how certain words can be manipulated away from their conventional meanings or usages in order to convey messages of power and control or other forms of social influence. Users of Donkey Cart Words want you to feel stupid because you didn’t understand the “true” meaning of a word. The concept of Donkey Cart Words is useful for understanding how language can be subversively manipulated to encourage particularly interpretations.

1. To help students understand the concept of Donkey Cart Words, seek examples to demonstrate in class. Look for examples in political speeches, editorials, lobbyist campaigns, persuasive essays, evangelistic statements, advertisements, and so on.
2. Discuss each example in class. Engage students in determining whether the speaker or author is using a Donkey Cart Word.
3. Ask students: How is this language used to influence the interpretations of the audience?
4. Close this exercise by discussing the context and purpose of speech these examples represent.

**CHALLENGE:** Have students bring in their own examples or write in their reflective log about an example they have found.
Thinking Critically: Resolving Vagueness and Ambiguity (p. 77)

In this exercise, students are asked to rewrite a set of statements that contain ambiguous terms and vague statements. The purpose of this exercise is to have students practice recognizing vagueness and ambiguity and use their interpretation skills to resolve these potentially problematic situations.

1. Run this exercise in the same as the What Is Wrong with These False Statements? exercise was conducted.
2. Have students work in pairs. Divide the 25 statements into five sets of 5, and give each pair of students a different set to work on. Give the students ample time to work in class.
3. ALTERNATIVE: Assign even or odd statements to different students or pairs of students and have them work on this portion of the activity outside of class time.
4. Have volunteers share the 25 revised statements in class.
5. Discuss where there were similarities and differences in interpretation and clarification.
6. Close this activity by discussing the implications of using vague or ambiguous statements in college-level writing assignments.
7. CHALLENGE: Have students bring in examples from out-of-class sources to share with the group.
8. BONUS CHALLENGE: Listen for examples of vague or ambiguous language use in everyday conversation (for example, conversations with friends, family, and co-workers, or on television).

MyThinkingLab: “Modern Man”—George Carlin (p. 78)

This video clip is an illustration of the dynamic nature of language. Carlin uses a series of socially constructed words and phrases to describe himself—and because of our mutually agreed upon comprehension of these words and phrases, everyone understands him completely.

** Before showing this clip, tell your students that the comedian George Carlin might use language that some find offensive. **

1. Watch the video clip in its entirety.
2. Have the students repeat as many of the words and phrases that they can remember.
3. Now have students brainstorm words that they didn’t hear Carlin use, but that are now socially constructed words or phrases (for example, Googled, global warming, netbook, death panel, sexting, tweeting, unfriend, subprime, and so on). The Oxford English Dictionary is a good Internet source for new words.
4. Ask students: How many words in Carlin’s monologue or our brainstormed words appear in the dictionary? (Have students look up the words in electronic dictionaries.)
5. EXTENSION: As an in-class or out-of-class activity, have students discover the process involved in adding words to the dictionary.
6. Close this exercise with a discussion of the dynamic nature of language and how the invention of new words can lead to changes in the dictionary.
MyThinkingLab: Do You Know Members of Any of These Language Communities? (p. 81)

This text box and companion MyThinkingLab entry provide some examples of the unique words and symbols that characterize particular language communities. It is likely that one or more of these examples will be familiar to students while others will be unfamiliar. Use this exercise to introduce and illustrate the concept of language communities.

1. Access the language community supporting information from www.MyThinkingLab.com. This can be done as a whole group or ask students to work in pairs or small groups.
2. Have students review the organizations that are described on the MyThinkingLab source.
3. Brainstorm the characteristics of a “language community” as described by the textbook authors (for example, special terminology and symbols, people with like interests, and so on).
4. Ask students: Are there any learning communities that could be added to the table?
5. EXTENSION: The authors describe academic disciplines as language communities with unique terminology and different conventions or methods of inquiry and communication of findings. This realization can be very helpful to first generation college students as a way of orienting themselves to the differences between the disciplines. A full exploration of different disciplines in terms of academic language communities can be of great benefit in a freshman seminar course. Have students identify the kinds of questions, kinds of evidence, methods, theories and standards of proof that allow us to differentiate the humanities, the social sciences, the natural sciences, and various professional fields.
6. Ask students: Is this just academic learning communities or can a case be made that these features apply to all of the language communities that appear in the text box? Why or why not?
7. Have students reflect on the various learning communities of which they are members. Have them describe (in writing or out loud) their memories of what it was like to be a new member or novice in a learning community.
8. Close this activity by discussing how strengthening one’s critical thinking skills, particularly interpretation, can be helpful as we become members of disciplinary language communities during the college years, and when encountering new language communities throughout life.

End of Chapter Exercises: Analyze and Interpret (p. 84)

This end of chapter Exercise provides additional practice in identifying and resolving instances of vague or ambiguous language.

1. Perform this exercise in the same way that the Resolving Vagueness and Ambiguity exercise was conducted.
2. This activity is more challenging for students because the vague or ambiguous words and phrases are not identified.
3. Remind students that the phrase might be “okay as is.”
4. Divide the ten statements among the students in the class. Have them work in pairs.
5. Have volunteers share the ten revised statements in class.
6. Discuss where there were similarities and differences in interpretation and clarification.
7. Close this activity by engaging students in meta-cognitive reflection on their interpretation processes. What strategies did they use to determine whether a word or phrase was ambiguous or vague? What process did they use to resolve the problems they identified? How would they rate their interpretation skills?

End of Chapter Small Group Exercises: Interpreting “Science” and “Pseudoscience” (p. 84)

1. Perform this exercise after the George Carlin “A Modern Man” exercise is conducted, or show the Carlin clip as an accompaniment to this exercise.
2. As Facione and Gittens suggest, have students work in small groups. Have students review the exercise description and instructions that appear in the text book.
3. Give students time in class to perform steps 1 and 2. Provide students with access to computers and the Internet to complete these tasks.
4. Brainstorm in small groups or as a whole class how to conduct the interviews so that step 4 will be possible.
5. Have students perform steps 3 and 4 outside of class.
6. Give students time to work in class in their small groups to complete step 5. They will need time to synthesize their respective pro and con reason lists.
7. Have the small groups write up a report that will represent their group’s work and conclusions. Collect these reports and use them as an opportunity to provide formative feedback and/or for a course grade.
8. Debrief this investigative activity as a class. What are the similarities and differences across the small group reports? How do the class findings compare to the NSF survey results that are available from www.MyThinkingLab.com? Close the activity with a group or individual reflection on what was learned in terms of people’s interpretation of science and scientific knowledge.

End of Chapter Small Group Exercises: Meaning Matters (p. 84)

In this exercise, students are asked to practice their use of contextualization, clarification of intent, negotiation, qualification, or stipulation to clarify the meaning of phrases in a set of passages. Furthermore, students are asked to suspend the inclination to evaluate the claims being made in the passages. Rewrite a set of statements that contain ambiguous terms and vague statements. The purpose of this exercise is to have students practice recognizing vagueness and ambiguity and use their interpretation skills to resolve these potentially problematic situations.

1. Run this exercise in the same as the What Is Wrong with These False Statements? exercise was conducted.
2. Have students work in small groups of 2-4 individuals. Divide the six passages among each group of students. Have the groups generate a statement that clarifies the meaning of the underlined phrase in the passage. Give the students ample time to work in class. Share the clarifications with the whole class.
3. Extend this exercise by giving each group more than one of the six passages so that their interpretations can be compared.
End of Chapter Video Exercise: Signs of the Times (p. 85)
Run this activity as you would run the small group discussions described above. Have students work in groups of 3-5 individuals. Brainstorm with the whole class about places to look for signs, headlines, want ads, slogans, etc. Criteria for the Web videos can be discussed and agreed upon by the class prior to the completion of this assignment (e.g., optimal length, how many signs should be included, where the videos will be posted, etc.) If possible, have students post their videos to a location such that they are viewable by the rest of the class.

End of Chapter Exercise: Reflective Log—Interpreting Lyrics and Poetry (p. 85)
This activity extends the students’ understanding of the relevance of context and purpose to alternative genres of linguistic expression.

1. Consider assigning either of the reflective log prompts from the textbook as in-class small group or paired activities or out-of-class reflections to be done independently.
2. Ask for volunteers to share their reflections in class on the following day.
3. Ask students: How does this activity help us to better understand the concept of language communities and how one’s learning community membership influences one’s interpretations?
4. EXTENSION: Have students select their own examples of multiple versions (covers, remixes, and so on) of their favorite songs to follow up to the second part of this reflective log activity.
5. BONUS: Complete a similar activity using written poetry. Use video clips from the HBO series Def Poetry Jam at http://www.hbo.com/defpoetry/ to kick off the class discussion.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

1. Vagueness and ambiguity are used by television and film writers to create comedic situations and develop plot lines. Select alternative scenes from the films mentioned in this chapter, from other films, or from sitcoms such as Seinfeld that provide examples of how vagueness and ambiguity are used in creative works. Ask students to reflect on how the writers use vagueness and ambiguity to create opportunities for mistaken interpretations. What clues to context and purpose are misinterpreted or missing, thereby encouraging a misinterpretation?
2. Can the concept of language communities be applied to mash up DJs and creators? Musical “mash ups” are a regular feature on the Fox television program Glee http://www.fox.com/glee/, and numerous Internet sites are dedicated to this emerging genre of musical expression.
   a. For this exercise, provide students with examples of mash ups or ask them for their favorite examples.
   b. Review the characteristics of a language community.
   c. Discuss whether a case can be made for the claim that the mash up was created for a language community.

Please refer to the THINK Critically Web site for additional exercises and assignments.
ACCESSING RESOURCES for THINK Critically

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For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Chapter 5
Analyze Arguments and Diagram Decisions

CHAPTER OVERVIEW
Chapters 4 and 5 of the textbook examine two of the six critical thinking skill areas: interpretation and analysis. Interpreting ideas as they are expressed in language is discussed in Chapter 4. Successful interpretation relies upon contextual clues and an awareness of the intent of the speaker to the interpretation process. In Chapter 5, the attention turns to the analysis of arguments and decisions. Emphasis is placed on identifying and considering the relationship among the reasons given for a particular conclusion rather than on one’s evaluation of the argument being made. The terms argument, claim, reason, premise, and conclusion are defined and the relationship among them is described. A visual mapping technique is introduced as a tool that is useful for clarifying and representing a person’s reasoning. The chapter has an abundance of exercises to build students’ familiarity with argument and decision maps.

Things to Remember: Distinguishing Reasons from Premises
Recall that an Argument = Claim + Reason. As Facione and Gittens point out, people often give several reasons to support a claim. Reasons function independently from one another. Disproving one reason when several have been offered does not negate the other reasons. It only takes one good reason to support a claim.

For example: There are three reasons the president is unpopular. The war has gone badly, the economy is terrible, and his administration is riddled with scandals. In giving three reasons for the same claim the speaker has, in effect, given three arguments:

1. The war has gone badly, and so the president is unpopular.
2. The economy is terrible, and so the president is unpopular.
3. His administration is riddled with scandals, and so the president is unpopular.

A reason is a set of premises. Premises are interconnected ideas—spoken or unspoken (and often times unspoken!)—that are inside of a reason. Multiple premises are often linked sequentially to form a reason.

The war has gone badly (as the nation’s commander in chief, the people hold the president accountable for the conduct of the war). Whenever the president is accountable for a failing effort, his popularity dips, and so the president is unpopular.

Because of this interconnectivity of premises, if one is able to disprove one premise in the string, then the whole reason falls apart.

Here is another example of one reason that includes multiple premises:

John is taller than Barbara. Barbara is taller than Alex. Alex is taller than William. And so John is taller than William.

Here only one reason is given, not four. This one reason includes four premises. If any one of the premises turns out to be false, then this reason will fail. Note for the students the contrast between this case and the three separate reasons for the claim about the president being unpopular.
CHAPTER LEARNING OBJECTIVES

After completing this chapter, students will be able to:

- Define the terms reason, claim, premise, conclusion, and argument.
- Explain how reasons, conclusions, and arguments are related to one another.
- Use visual maps to represent a person or group’s reasons, arguments, and decisions.

DAILY DISCUSSION STARTERS

1. Modify the Explain What Is Wrong with These False Statements exercise.
   - Write the first or third prompt from the Explain What Is Wrong exercise on the board.
   - Have the students brainstorm and explain what is wrong with the statement that makes it false.
   - This can be done to introduce again the critical thinking skill of analysis.

2. Modify the Analyze and Map the Arguments or Decisions in These Quotes exercise.
   - Write one of the 20 statements on the board as it appears on pages 100-101 in the textbook.
   - Engage the class in mapping the argument or decision using the mapping technique used in Chapter 5.
   - Use this as an opportunity to introduce or review the argument mapping conventions.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor's Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT

MyThinkingLab: Law and Order—SVU "Measles Vaccination" Clip
Text Box: Thinking Critically about Technical Vocabulary
MyThinkingLab: The El-Train Argument from 12 Angry Men
MyThinkingLab: Huckabee and Stewart Discuss “The Pro-Life Issue—Abortion”
Exercise and Think Spot: Interpret with Care and Precision
Thinking Critically: Analyze and Map the Arguments or Decisions in These Quotes
End of Chapter Exercises: Reflective Log
End of Chapter Exercises: Three-Person Group Exercise
End of Chapter Exercises: Explain What Is Wrong
End of Chapter Exercises: Analyze and Map the Friends’ Decision Making
End of Chapter Exercises: But What Does FOX and MSNBC Say?
End of Chapter Exercises: Video and Analyze
End of Chapter Exercises: Bonus Exercise #1 - “The Cramer Smack Down”
End of Chapter Exercises: Bonus Exercise #2 – The Dennis Miller Challenge

MyThinkingLab: Law and Order—SVU "Measles Vaccination” Clip (p. 88)

In this video clip, a mother explains why she chose not to have her child immunized again for measles. Use this exercise to help students identify claims and reasons.

1. Show the video clip in its entirety.
2. Replay the clip. Have the students record all of the statements given by the mother during the interview.
3. Write "Argument = (Reason + Claim)" on the board. Discuss the meaning of these terms. Emphasize that an argument is any reason and claim combination. If a speaker gives multiple reasons to support a statement, then there are multiple arguments being made.

4. Have students review their list of statements made by the mother and categorize the reasons and claims. Use the table on page 60 to discern the reasons from claims.

5. Ask students: How many arguments can we identify in this video clip?

6. Close this exercise by reviewing the key terms that are used in this chapter. Conclude by saying that this was meant to introduce the concepts of argument, claims and reasons. Tell students to keep their notes on this video clip because it will be used later in the week.

**Text Box: Thinking Critically about Technical Vocabulary (p. 91)**
This text box reviews the theme of language communities and the notion that language communities use specialized vocabulary to communicate with their members. Have students reflect on the statements being made in this text box.

1. Have students read the text box.
2. Tell students: Now look at the quote at the bottom of the second column: ‘‘…specialized vocabulary poses major problems for talking with people about their critical thinking.”
3. Ask students: In the context of the information written in the text box and in the chapter, how do you interpret the meaning of this statement?
4. Have students complete this as a whole class brainstorm, small group discussion, or an independent quick write.
5. If students have worked independently or in small groups, call them together to debrief as a whole group.

**MyThinkingLab: The El-Train Argument from 12 Angry Men (p. 93)**
This exercise is good for practicing mapping arguments. The transcript is provided in the text. Facione and Gittens begin the map, and the class can work to complete it.

1. Review the partially completed map that appears in the textbook.
2. Have the students work in small groups. They should start with the top ovals and “go backwards” to the starting point of the conversation in order to complete the map. Students should use the appropriate shapes to represent explicit reasons and implicit ideas.
3. Give the groups ample time to work and circulate around the room to check for understanding.
4. When the groups are finished, ask for volunteers to draw their map on the board. Let them know that the class is going to work together to complete the map on the board. Have one group complete one side of the map and another group to complete the other side of the map.
5. Editing and refining analyses is very important. Argument maps are seldom both complete and accurate in their first iterations. More often than not they omit key unspoken assumptions and transitional ideas that contextually connect a reason to a claim. Have each group come up to the board to share how their maps were similar and where they were different. Groups should feel comfortable suggesting edits to the map that is on the board. Discuss instances where there is disagreement as a class. Encourage the class as they complete this task; it is challenging at first but students will grow in their confidence as they practice mapping arguments.
MyThinkingLab: Huckabee and Stewart Discuss “The Pro-Life Issue—Abortion” (p. 94)

This is another opportunity for students to practice mapping arguments. As Facione and Gittens point out, this is another moderately difficult challenge. Students should work in groups as the practice their mapping skills.

1. Have the class listen to the video clip.
2. Play the video clip a second time, and have the students take notes on the statements that each speaker offers. (Check these notes against the descriptions and quotes that are in the textbook.)
3. Have students work in pairs or small groups to categorize the claims and reasons in the transcript.
4. Review the maps provided by the textbook author, and compare the map to the decisions the pair made in terms of claims and reasons.
5. Describe both maps that appear in the textbook, and point out how the maps match the transcripts they have created. Draw attention to the shapes that are used and the elements the shapes are intended to represent (for example, claim, reason, implicit idea, and so on). Use this demonstration to review the mapping conventions. Note that the large arrows are a new shape.
6. Close this discussion by pointing out that the speakers in the clip are engaging in interpretation and evaluation in order to further their conversation, but that when we are mapping we are suspending our evaluation and focusing on using our skills of analysis. Acknowledge that this not always easy to do!

Thinking Critically and MyThinkingLab: Interpret with Care and Precision (p. 100)

This exercise follows naturally from the previous activity. Analyzing an argument regarding a topic that students have strong views or feelings about can be extremely challenging. But to exercise strong thinking, they must strive to suspend judgment and remain open-minded as they analyze the claims and reasons offered. This activity helps students practice critical thinking dispositions and analysis skills.

1. Have students work in pairs or small groups.
2. Carry out this activity in a location where the students have access to the Internet or the library.
3. Have students create a map for each of the four statements that appear in the text box.
4. Have the groups share their maps in class.
5. Collect these maps and use them as an opportunity to provide formative feedback or use as a graded assignment.
6. Debrief this activity as a whole class. Take advantage of the opportunity to review the relevant critical thinking dispositions that students used to complete this assignment.

Thinking Critically: Analyze and Map the Arguments or Decisions in these Quotes (p. 100)

Perform this exercise like the What Is Wrong with These False Statements? exercise.

1. Divide the quotes among the students in the class. They can be organized into sets depending on the size of your class.
2. Have students work on the shorter quotes in class. Longer quotes can be completed outside of class as homework assignments.
3. Spend time in class discussing the maps that students have created. Ideally, there will be two or more maps for each quote that can be compared.

4. Close this activity by having students reflect on their experiences while working through these maps. Brainstorm the reasons why argument mapping can facilitate analysis of the reasoning process.

**End of Chapter Exercises: Reflective Log (p. 104)**

1. Conduct this exercise as it is described in the textbook.
2. Review the instructions with the students so that they understand the level of detail they should obtain during the interview with a friend. The goal is to get a full and accurate understanding of the friend’s reasoning.
3. Create a map of the friend's decision. Show the map to the friend for comments, reactions, and edits. Again, encourage deeper analysis, editing and refining of maps so that all the implicit unspoken assumptions are out in the open and included on the maps.
4. Students should retain a copy of the original map but note in their logs the modifications that the friend has suggested.
5. A revised map should be created and compared to the original map. The students should log their reflections regarding the experience of discussing the map with their friend. Facione and Gittens have asked whether the friend augmented or modified his or her story as a result of seeing the map. Students should comment on this discussion.
6. Finally students should apply the *Holistic Critical Thinking Scoring Rubric* to evaluate their friend’s reasoning.
7. Have students share their logs in class. Ask students: How did your friend react when you showed him your original map? Are there any trends in the edits that your friend offered?
8. Close this exercise by discussing the similarities and differences in mapping the arguments or decisions of friends versus scenes from a movie or quotes from the textbook.

**End of Chapter Exercises: Three-Person Group Exercise (p. 105)**

Students might ask why there is an instruction to “number each sentence or statement made so you can refer to that statement more easily in your analysis.” The authors suggest a method of identification that can assist when creating an argument map. Including the number of the appropriate transcript statement serves as:

- A reference point for locating specific statements in a large and detailed argument or decision map
- An indicator of the chronology of statements so that the reader can see which claims and reasons were spoken at what point in the argument or decision-making process
- A locator for the full statement in the original transcript. Refer students to the Appendix, “Quitting Smoking,” in the *THINK Critically* textbook for an example of the use of numbers in argument maps.

1. Conduct this exercise as it is described in the textbook.
2. Emphasize the need for full disclosure to the faculty member of administrative office regarding the purpose of the interview and the desire to audio tape the conversation.
3. Divide the topics from the campus newspaper among the students in the class so that not every group interviews the same individual. This is particularly important if you have a large class.
4. ALTERNATIVE: Interview other parties involved in the news story besides faculty or administrators.
5. Create a transcript of the interview. Notice that Facione and Gittens ask students to number the sentences in the transcript.
6. Create an argument or decision map to characterize the reasoning that is displayed in the interview. If the interview is long, students can choose to map a segment of the conversation.
7. Share the maps in class and discuss what was learned from this activity. If possible, compare maps that were based on interviews with the same individual or with various parties that were involved in the same news event. Edit, analyze more deeply, and refine the maps. The stronger and more detailed the analysis is in this chapter, the easier it will be to render a good evaluation of the arguments when we come to Chapters 7, 8 and 9.

End of Chapter Exercises: Explain What Is Wrong (p. 105)
Use this exercise as a daily discussion starter or as a quiz. Alternatively, you can use this exercise as an “Exit Ticket” from class. You can ask students to explain what is wrong with one or more of these statements. Their written responses can be collected and used as an opportunity to provide formative feedback or as a graded assignment.

End of Chapter Exercises: Analyze and Map the Friends’ Decision Making (p. 105)
In this exercise, there are five different challenging mapping activities presented. Perform this exercise like the Analyze and Map the Arguments of Decisions in These Quotes exercise.

1. Conduct this activity as an in-class activity or as a take-home assignment.
2. Have students work independently, and then compare maps with partners.
3. Run one or more of these scenarios as a demonstration to the full class (with student participation).
4. Consider using this activity for extra credit points or as a make-up assignment if you have decided not to use this as a regular graded activity for all students.

End of Chapter Exercises: But What Does FOX and MSNBC Say? (p. 106)

1. Students may be asked to work independently or in small groups for this exercise. A list of possible issues or potential political candidates can be developed by the whole class during a brainstorming session.
2. Students should identify print, audio- or video-based material that can be used to develop an argument map following the mapping conventions that are introduced in this textbook. These materials should be editorials, discussions, speeches, debates, etc.
3. If this is performed as a group assignment, consider assigning more than one argument map per group on the same issue or candidate so that students can draw comparisons between the examples.
4. Discuss the mapping activity as a class. Ask students: What made this mapping exercise challenging? (Solicit comments regarding the challenge to use one’s analytical skills and remain objective despite one’s views on the issue or candidate.)
5. Remind students that it is important not to evaluate or pass judgment on the position being taken on the issue or by the candidate in the argument being mapped.
6. Consider using this as a graded assignment or as test preparation/review.
End of Chapter Exercise: Video and Analyze (p. 107)

1. For this exercise students will work independent. Discuss as a class the importance of obtaining the consent of the interviewee to collaborate on this project and to be videotaped for this assignment.

2. Have students identify a topic and candidate to be interviewed. Students should be encouraged to generate a list of interview questions prior to conducting the taped interview sessions.

3. After the interview has been conducted students should prepare a written transcript of the interview before engaging in the argument mapping activity. This transcript can be submitted with the map and video if this is used as a graded assignment.

4. Discuss the mapping activity as a class. Ask students: What made this mapping exercise challenging? (Solicit comments regarding the challenge to remain in the role of interviewer and not let it become a debate, and so on.)

5. Remind students of the importance of applying their critical thinking skills and dispositions when engaging in the analysis and mapping process. Regardless of their personal perspectives on the issue, they must maintain a fair and open mind. Creating the argument maps can facilitate a more objective analysis of the reasoning.

End of Chapter Exercises: Bonus Exercise #1 – “The Cramer Smackdown” (p. 107)

Have the students go to the www.MyThinkingLab.com to watch “The Cramer Smack Down” video clip and map Jon Stewart’s argument. Discuss the mapping activity as a class. Ask students: What made this mapping exercise challenging? (Solicit comments regarding Stewart’s wit, humor, sarcasm, anger, and so on.) Remind students that it is important not to evaluate or pass judgment on the position of either party in this clip. Perform this exercise as a full-class activity or give as homework. Consider using this as a graded assignment or as test preparation/review.

End of Chapter Exercises: Bonus Exercise #2 – The Dennis Miller Challenge (p.107)

1. Have the students watch this video clip and map the Dennis Miller’s arguments regarding Sara Palin and Balloon Boy’s father.

2. Discuss the mapping activity as a class. Ask: What made this mapping exercise challenging? [solicit comments regarding Miller’s wit, humor, sarcasm, etc.]

3. Remind students of the importance of applying our critical thinking skills and dispositions when engaging in the analysis and mapping process. Regardless of our personal perspectives on either of the individuals Miller is talking about we must maintain a fair and open mind. Creating the argument maps can facilitate a more objective analysis of the reasoning.

4. Run this bonus exercise as a full class activity or give as homework. Consider using this as a graded assignment, or as test preparation / review.
EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

1. As an additional practice and to wrap up the chapter, have students revisit the transcripts they created for the Law and Order—SVU clip. Using the transcripts and the video clip available on www.MyThinkingLab.com, instruct students to create a decision map for the mother’s decision against having her son receive the measles vaccine. Tell them to expect that the arguments will be short—with the conclusion being her decision not to have her child vaccinated and her reasons given in brief sentences. TV and film dialogue is often artfully crafted to pack a lot of ideas into very few words. Have the students analyze the reasons deeply and make explicit all of the mother’s unspoken assumptions.

2. The mother in the Law and Order—SVU clip explains why she chose not to vaccinate her son for measles. Locate video clips or newspaper articles that depict parents expressing their views pro or con of giving his or her child the H1N1 vaccine. Have students map the arguments on both sides of this decision.

3. In early September 2009, President Obama was slated to deliver a speech on education to a group of school children in Arlington, Virginia. The President’s address was to be nationally televised, and schools across the country had the option of broadcasting the address in their classrooms. The weeks leading up to the speech were tense as conservatives voiced their opposition to the speech, declaring it a form of socialist indoctrination. The uproar in the media led some families to urge that schools let children choose to be excused from the broadcast. Obtain a transcript of President Obama’s speech from www.whitehouse.gov. Have students create an argument map for the speech. (Divide the speech among small groups or select a segment of the speech for this mapping exercise.) Discuss the map(s) as a class. How should we evaluate the critical thinking that is exhibited in President Obama’s speech? Use the HCTSR to formulate a response.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically

Students can access chapter summaries, exercises, and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor’s Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.

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Chapter 6
Evaluate the Credibility of Claims and Sources

CHAPTER OVERVIEW
In Chapter 5, students practice the skill of analyzing arguments and decisions. A visual mapping technique is offered as a means for clarifying and representing a person’s reasoning. Key terms such as argument, claim and reason, are introduced. The next three chapters focus on the critical thinking skill of evaluation. In Chapter 6, students turn their attention to the process of evaluating claims. Throughout this chapter, students consider the question of how to determine the truth of claims that they encounter that are not the conclusions of arguments, but are simply asserted. The two strategies for evaluating claims—as assertions without supporting reasons—are learning how to determine the trustworthiness of sources and exploring how to confirm or disconfirm the claim independently. Examples and exercises are provided as opportunities to practice this evaluative skill.

Chapter 6 focuses on the evaluation of assertions—also called “claims” in everyday language—that people might offer as true but without providing any more support than their own credibility. The aim here is to evaluate the credibility of the source or to find a way to independently confirm or disconfirm the claim. Contrast this for the students with the objective of Chapters 7, 8 and 9, which focus on evaluating arguments. In those chapters, we begin with a claim given as part of an argument that is with the speaker providing at least one supporting reason.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Define expertise as it relates to evaluating the credibility of the source of a claim.
• Identify and apply 12 criteria to evaluate the trustworthiness of a source.
• Explain how to evaluate the plausibility of a claim independently.

DAILY DISCUSSION STARTERS
1. Perform the Thinking Critically: Blogs and Web Pages exercise as described in the following.
2. Write one of the false statements from the end of chapter Exercises on the board. Ask the students to explain what is wrong with the statement. Select the false statement that would best launch discussion topics that you plan to cover that day.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
MyThinkingLab: Funeral for Selma Gonclaves
Text Box: Levels of Thinking and Knowing
Thinking Critically: Wikipedia! OMG!
MyThinkingLab: My Cousin Vinny, the “Expert Witness” Scene
MyThinkingLab: A Few Good Men, “You Can’t Handle the Truth!”
Thinking Critically: Who Checks What the Experts Claim?
Thinking Critically: Whom Do You Trust?
Thinking Critically: Blogs and Web Pages

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Thinking Critically: Cultivating a Healthy Sense of Skepticism

MyThinkingLab: Clio Award-Winning Commercials

Thinking Critically: Your Best and Worst Commercials

MyThinkingLab: The Q-Ray Bracelet Case

End of Chapter Exercises: What Is Wrong with These Inaccurate Statements?

End of Chapter Exercises: Reflective Log—Your Favorite Nutritional Supplement

End of Chapter Exercises: Selling Risk

End of Chapter Exercises: Group Exercise – The Most Popular Holiday on Campus

End of Chapter Exercises: Group Exercise – Claims that Cost Money and Cause Pain

MyThinkingLab: Funeral for Selma Gonclaves (p.109)

The first exercise in this chapter provides students with an emotional accounting of a racially motivated murder of a young African woman on the city streets in Massachusetts. Selma Goncalves and another West African man were murdered by a man who believed he was defending the white race—a belief that was apparently fueled by his frequent visits to white supremacist hate-based Web sites. When tragedies like this occur, people strive to find an explanation in the hopes of preventing them from happening ever again. This exercise sets the stage for learning how to evaluate claims that are made in the absence of supporting reasons or evidence—in this case, the killer’s defense attorney is claiming, in the absence of any supporting scientific evidence, that his client is not guilty of murder because he was brainwashed by the website.

1. Run the video clip in its entirety.
2. Ask students: What claims are made to explain the events surrounding this woman’s murder?
3. Who is asserting the claim? (This is asked to establish the source.)
4. BRAINSTORM: How might we go about evaluating the claim that the killer is not guilty of murder because the website made him do it? (The purpose of this brainstorming session is to gauge students’ awareness of the need to determine whether a claim is true or false and to establish ways of going about this evaluation. If students show awareness that one method of evaluating a claim is by evaluating the credibility of the source of the claim and that another way is to consider independently the possible evidence in support or against that claim.
5. Close this exercise by saying that this chapter is focused on evaluating claims—both claims that are supported with reasons (the work of Chapters 7, 8 and 9) and those that are not (the focus of Chapter 6). Let the students know that they will learn about how to evaluate the trustworthiness of the source and how to evaluate whether the claims themselves are truth or false.

Text Box: Levels of Thinking and Knowing (p. 111)

Review these Levels of Thinking and Knowing with students and seek their reactions to this development model of cognitive maturation. Do these levels resonate with their own sense of how one’s thinking develops over time as they grow and mature?

1. Have students read each Level of Thinking and Knowing as they appear in the table.
2. Ask students: How does each level compare to the one before it? What is changing and maturing?
3. Tell students: The textbook authors assert that most students entering college are at stage 3 or 4 and that many students become relativists (stage 5) during the college years. Ask students: What examples can you point to that might support this claim that thinking and knowing in the middle school and high school years is different than the kinds of thinking that is expected in college?
4. To augment this table, have students read one or two pieces published by Kitchener and King where they describe their Reflective Judgment Model. Alternatively, have students review the Reflective Judgment Web site maintained by Patricia King at the University of Michigan http://www.umich.edu/~refjudg/index.html.

5. Close this activity by sharing with students that courses such as the one are specifically designed to support their growth and maturation in Thinking and Knowing and that practicing their critical thinking skills and engaging their critical thinking habits of mind will help grow them as strong critical thinkers now and in the future.

Thinking Critically: Wikipedia! OMG! (p. 112)
The authors rightfully point out the irony of using a Wikipedia entry in a chapter focused on evaluating claims. But Wikipedia provides students an opportunity to practice the type of fact checking that strong critical thinkers do with all claims. They are asked to consider the accuracy of the definition of expertise that is quoted in the textbook. Students may follow the suggested methods in the text box, and they may employ methods beyond those that are suggested. The result of this exercise should be a validation of the Wikipedia entry. Or, alternatively, some minor modification that students have derived as a result of their investigation.

1. Have students work in small groups or independently. Because students might want to interview their professors, this could be assigned as an outside-of-class activity. Students need access to the Internet to complete this exercise.

2. The strategies and process of validation should be recorded and the results of these analyses should be reported (for example, what alternative sources did you check? How did you seek independent confirmation? What did you learn when you researched the entry?)

3. Each group should draw a conclusion regarding the accuracy of the Wikipedia definition. If the group has determined that there are inaccuracies in the definition, then they should propose a modified and more accurate version. Be sure that the groups do not simply “make up” a better definition. The goal here is accuracy, not creativity.

4. Collect these group reports and use as opportunities for formative feedback or a graded assignment.

5. Have student volunteers or each group share their processes of analysis, interpretations, and evaluative conclusions with the class.

6. CHALLENGE: Require students to use at least one validation strategy that was NOT suggested by the textbook authors.

MyThinkingLab: My Cousin Vinny, the “Expert Witness” Scene (p. 113)
In this scene, students watch Marisa Tomei playing a hairdresser who has been called to the witness stand as an expert witness for the defense on the topic of automotive mechanics. To establish the court’s trust in her testimony, she needs to be accepted as an expert on that topic. This video clip helps to illustrate the concept of expertise as it pertains to the evaluation of the trustworthiness of a source.

1. Have students watch the video clip to the point that the witness is accepted by the judge as an expert. Ask students to listen for how the defense attorney using questions to elicit evidence of Tomei’s expertise. Ask them to also pay attention to the line of questioning used by the prosecuting attorney to discredit this witness. They should be encouraged to take notes for later discussion.

2. Ask students: What themes came out of the questions that Joe Pesci’s character asked to show that this witness was an expert on the topic of automotive mechanics?
3. Ask students: The prosecutor was trying to discredit this witness but he failed. What characteristics were revealed as a result of the questions she was asked by the prosecutor?

4. Summarize this portion of the exercise by summarizing the criteria by which Tomei’s character is deemed to be an expert. The goal of this discussion is to identify generalizable characteristics that can qualify someone as an expert on a given topic. (Seek to reinforce the criteria of being learned, experienced on-topic, up to date, and capable of explaining that are discussed in the textbook.)

5. Now show the remainder of the video clip where Tomei’s character is testifying. Ask students to listen for evidence that she was a trustworthy expert. (Seek to reinforce the criteria of being learned, experienced on-topic, up to date, and capable of explaining that are discussed in the textbook.)

6. Have students evaluate the trustworthiness of this expert testimony. Did she meet the criteria of being well-informed, experienced, up to date, and capable of explaining the basis for her opinions, and so on?

MyThinkingLab: A Few Good Men, “You Can’t Handle the Truth!” (p. 116)

In this video clip, students are challenged to evaluate the trustworthiness of a senior military officer. The fact that Jack Nicholson’s character is an expert is not in question. But should he be trusted to be speaking the truth? This exercise invites students to consider how two other criteria, bias and truthfulness, can interact and interfere with an expert’s trustworthiness.

1. Have students view the clip and discuss the context of this courtroom scene.
2. Ask students: What does Tom Cruise’s character do to establish the trustworthiness of this witness? How does Cruise ultimately provoke Nicholson’s character to lose his temper?
3. Ask students: What general conclusions can you draw regarding the trustworthiness of this expert source? (Seek to reinforce the criteria of being unbiased and truthful, which are discussed in the textbook.)
4. Review the concept of the Noble Lie as proposed by Plato and described in the textbook. Have students brainstorm about why the senior military leader in this scene was inclined to withhold the truth. Explore how deceitfulness might be used by those who seek to obtain or maintain power and control over others. Close by reinforcing the theme that deceitfulness—whether it is outright lying or misdirection—makes an expert anything but trustworthy.

Thinking Critically: Who Checks What the Experts Claim? (p.116)

In this chapter students are offered criteria for determining whether a source is credible by evaluating the degree of relevant expertise the person (or organization) has in a given topical domain. But even if we are able to determine someone is an expert, we still are wise to evaluate the claims that the expert makes. In this exercise, students are asked to review the evidence as presented by the website www.Politifact.com for a set of claims made by political experts.

1. Form students into small groups of 2-3 individuals. Divide the six claims among the student groups. Ask each group to review the evidence on the Politifact.com website. Have each group make a brief (5 minute) presentation to the whole class summarizing the evidence that they reviewed that either supports truth or falsity of the claim as well as their conclusion regarding the veracity of the claim.
2. As a whole class, discuss the quote from the political observer presented in the second portion of this text box. Have students offer their opinion as to whether they feel the statements to be true or false. As a class, define a strategy for investigating the claims made by the political observer. Have students identify “hard evidence” that could be obtained to support or refute the claims.

3. BONUS: Assign each student group to obtain one or more of the sources of evidence identified by the class. With the collected evidence for review, have the large group come to a reasoned conclusion as to whether or not they feel the political observer's claims are true or false.

**Thinking Critically: Whom Do You Trust? (p. 119)**

Although students might have an internal sense of whom they trust and whom they mistrust, it is unlikely that they have actively considered the 12 characteristics of a trustworthy source in relation to these individuals. Have the students conduct this exercise as a reflective log.

1. Students should create a table that lists the 12 characteristics of a trustworthy source and then four additional columns—two for the trusted individuals and two for the mistrusted individuals.
2. For the trusted individuals, have students check off the characteristics that fit for each of the individuals. Students should make notes in specific cells of this table to indicate where students feel particularly highly about individuals in terms of things they have done to garner their trust.
3. For the mistrusted individuals, students should consider which of the 12 criteria contributed to the loss of their trust. The student should make notes in the cells that represent areas where something was said or done that made them lose trust in the person. Encourage students to consider each of the 12 characteristics separately.
4. Students should then write a reflective log entry about the results. Does it take more to build trust than to lose it? Why or why not?
5. If you plan to collect this assignment, be sure to ask students to maintain the confidentiality of the individuals they name as trustworthy and those they name as untrustworthy.

**Thinking Critically: Blogs and Web Pages (p. 120)**

Use this activity to gauge students’ information literacy. How do they determine whether to trust something that they have read on the Web? Pose the question in this text box as an open-ended discussion prompt for the whole class to consider. Document the content of the brainstorming session on the board. Follow up this conversation with a handout on establishing the credibility of sources and verifying the trustworthiness of information found on the Internet. Consult your campus librarian for appropriate materials on this topic, or consider inviting the campus librarian as a guest speaker on the topic of evaluating Internet sources.

**Thinking Critically: Cultivating a Healthy Sense of Skepticism (p. 122)**

This exercise provides students with opportunities to craft questions that will assist in the evaluation of claims that are presented without associated reasons.

1. Have students work in pairs or small groups to write questions for each claim statement.
2. If this is done as an in-class activity, consider dividing the claim statements among your students so that at least one group works on each statement.
3. Give students an opportunity to present (or compare) their questions and evaluate whether these questions are likely to yield sufficient information to permit an evaluation regarding the plausibility of the claim.

4. Have the class reflect on whether some claims were more challenging than others. Why might this have been the case?

**MyThinkingLab: Clio Award-Winning Commercials (p. 123)**

Your students are not likely to guess what the Fortum Company means by their advertising claim that is quoted in the textbook. Engage your students to determine how they might go about evaluating this claim, and then let them watch the commercial to see how they did.

1. Ask students: What is your first reaction to the quote from the Fortum ad?
2. Perform this exercise like the Cultivating a Healthy Sense of Skepticism activity described previously.
3. Have students work in pairs or groups to develop four questions that they can ask to determine the plausibility of the Fortum claim.
4. Have students view the Clio Award-winning commercial.
5. To debrief this activity, ask students for their reactions to the commercial. Did the commercial answer the questions that they had posed? Now that they understand the purpose of the advertisement claim, how would they evaluate its plausibility?

**Thinking Critically: Your Best and Worst Commercials (p. 124)**

What makes a commercial work and what makes it fail? Use this activity to discuss the powerful influence commercials can have on the decision to make a purchase. Conduct this activity as it is described in the text box.

1. Students should maintain a running list of commercials that they view over a 24-hour period of time.
2. List the resulting “top three best” and “top three worst” commercials. Have students respond to the reflection questions posed by the textbook authors. Share these commercials and reflections in class.
3. Debrief as a whole class. Have students share what made them decide on their best and worst commercials. What features made some commercials the best and what features made other commercials the worst? Ask students one or more of these additional questions: Did any one pick the same commercials? What channel(s) were you watching? Who is the intended audience of your commercials (men, women, adults, children, elderly, and so on?) Did the men and women in our class agree on what makes a good or bad commercial or is there a gender difference?
4. Close this activity by asking the class to consider what techniques advertisers use to make people suspend their critical thinking skills and dispositions.
5. Discuss the claim: “It takes good critical thinking to make a commercial that is effective in selling a product without letting the buyer realize that he or she is not using good critical thinking in purchasing the product.”
**MyThinkingLab: The Q-Ray Bracelet Case (p.126)**

**End of Chapter Exercises: What Is Wrong with These Inaccurate Statements? (p. 128)**

The practice of analyzing a statement to determine what is wrong should be familiar by now. Consider asking students why they are given so much practice with false statements. One of the best ways to strengthen one’s critical thinking is by learning to recognize and explain the errors in others’ reasoning. Have students work independently or in pairs to identify the error in each statement. Share the results of these analyses with the class. Use this activity at the end of a class session by having students write their response to one or more of the statements on a card or piece of paper. Review students’ responses before the next class session to gauge their understanding. Determine which of these statements to review as a whole class during the next class time.

**End of Chapter Exercises: Reflective Log—Your Favorite Nutritional Supplement (p. 128)**

This exercise is a “must do” for college students and can serve as an ideal end of chapter assignment for a letter grade.

1. Have students conduct this Reflective Log Project outside of class time. Allow for sufficient time (a weekend or a full week) to complete this assignment.
2. Students should courageously perform this reflective log assignment with a nutritional supplement that they personally consume! It is not acceptable for them to research a product that a friend or family member is consuming no matter how they feel about that person’s decision.
3. Collect the reflective logs and use them as an opportunity for providing feedback on the student’s growth as a critical thinker.
4. After you have collected the log reports, ask for a show of hand from anyone who plans to continue consuming the product they researched. Follow that question by asking for a show of hand for students who have decided against consuming their chosen product from now on. Finally, ask to see hands for those who have suspended their judgment about the product. Ask for volunteers from each of these three groups to explain their decision. Did anyone else in the class research the same product but come to a different conclusion? Why might that have happened?

**End of Chapter Exercises: Selling Risk (p. 128)**

Though television viewers are exposed to thousands of commercials on a weekly basis, it is unlikely that the average individual has spent much time reflecting on the risks of the products advertised. In this activity, students are asked to attend to the risks associated with products and services advertised during the evening national news hour on network television. Have students follow the instructions that appear in the chapter of the textbook. Debrief this exercise as a whole class. Have students turn in their notes from the commercials and their written reflections as a graded assignment.

**End of Chapter Exercises: Group Exercise – The Most Popular Holiday on Campus (p. 129)**

This exercise asks students to consider what information is needed to confirm or disconfirm the claim that Valentine’s Day is the most popular holiday on this campus.

1. Ask students to work independently at first to devise a plan or strategy to confirm this claim. Give students 10 minutes to work up their proposed plan.
2. Then ask students to gather in groups of three or four to synthesize the best features of their individual plans to come up with the best overall approach.

3. Have each group prepare a written reflection of their consensus agreement on how to interpret the phrases “most popular” and “holiday on this campus.”

4. Have the groups share their strategies with the class. What is similar across the groups? Where do the groups differ? Are the differences due to differing interpretations of the phrases “most popular” and “holiday on this campus”?

5. Close this exercise by asking students to share what they learned about the process of interpreting and evaluating claims in the absence of reasons.

End of Chapter Exercises: Group Exercise – Claims that Cost Money and Cause Pain (p. 129)

This exercise provides students’ with an opportunity to build their critical thinking skills of analysis and interpretation by asking them to consider situations where divergent claims are being made by reputable sources. Facione and Gittens present two cases, one gingko biloba and the other the First Amendment of the U.S. Constitution, and students are asked to assess claims regarding in light of the supporting reasons and evidence. Have students work in groups of 3-5 to complete these group exercises. Assign one or the other case to each group. Groups should conduct their Internet research outside class but should be offered time in class to discuss the supporting evidence and reasons they have identified for their case. Remind students that these cases were selected because of the divergent claims being made by reputable sources. As such, they should focus their research on both sides of the argument being made. Each group should be asked to write a one-page summary of the evidence and their group’s well-reasoned and thoughtful evaluation of the claim. Each group can be asked to make a presentation to the whole class to summarize their research findings and conclusions. During these presentations the audience should listen for strong critical thinking skills and dispositions. After each group presentation, ask members of the audience to comment on the critical thinking that was displayed during the presentation.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

1. Challenging Claims with Tough Questions
   Use this exercise as a daily discussion starter or as an “exit ticket” from class. If using this as an exit ticket, have students write two to three questions for one of the claims on p. 110. If using it as a daily discussion starter, then ask for students to volunteer questions out loud. Encourage the participation of students who haven’t been as involved in previous brainstorming sessions. This is not the class for students to sit silently every day!

2. A central theme in this chapter is that strong critical thinkers should have a healthy sense of skepticism. A great way to cultivate this sense of skepticism is to analyze the techniques marketers use to get consumers to buy their products.
   • Have your students identify two or three commercials on the Internet to be used as a class discussion or out-of-class assignment. (www.YouTube.com is a great source to search.)
   • Have students review these commercials to determine the strategies being used by the marketers. What claims are made explicitly about the product or service? What implicit messages are sent through the images, music, behaviors or mannerisms, and context? Does the commercial make an emotional appeal (humor, entertainment, surprise, love, fear, sadness, and so on)?
• Have students reflect on what it takes not to be drawn in by the emotional appeals or the extravagant claims that we see in most commercials. Encourage students to use the language of critical thinking skills and dispositions in their responses. (Emotional appeals will be discussed briefly in the fallacies sections of Chapters 8 and 9, but it is fine to bring them up here too. It is never too soon to reflect on the ways in which our judgments about what to believe or what to do might be influenced.)

3. Are print advertisements just as alluring as TV commercials?
• Numerous strategies are outlined in the chapter as methods of encouraging consumers to suspend their critical thinking and make purchasing decisions based on emotional appeals or unsubstantiated claims.
• Bring in a selection of print advertisements (for example, products, services, organizations, political ad campaigns, and so on), and engage the class in identifying examples of marketing, spin, disinformation, propaganda, slanted language, loaded expressions, and appeals to emotion. Have students brainstorm strategies for confirming or disconfirming any unsubstantiated claims used in these print ads.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically
Students can access chapter summaries, exercises, and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Chapter 7
Evaluate Arguments
The Four Basic Tests

CHAPTER OVERVIEW
In Chapter 6, the attention was on the process of evaluating claims asserted in the absence of reasons. Students learned 12 characteristics that can be reviewed when evaluating the trustworthiness of a source. Students also practiced strategies for independently evaluating the veracity of claims, especially ones that are asserted without supporting reasons. In Chapter 7, students broaden their evaluation skills to include arguments. Students learn four tests that an argument must pass in order to be deemed worthy of acceptance. A number of examples are provided that help students practice evaluating arguments and recognizing common reasoning mistakes.

Review “Reasons” and “Premises”
To refresh students’ memories, refer to the discussion in Chapter 4 of how these terms are related yet distinct.

 Argument = A Reason and the Claim/Conclusion it is intended to support.
Reason = Set of premises explicitly asserted or implicitly assumed.

Things to Remember when Evaluating Arguments:
• The Four Tests of Worthiness must be applied in sequence! If an argument fails any of the tests, then that argument has been shown to be unworthy of acceptance.
• When applying the Four Tests of Worthiness, to reject a claim that is supported by multiple independent reasons, you need to prove that all of the supporting reasons fail.
• Being able to explain why an argument is unacceptable is more important to students’ development as critical thinkers than their abilities to memorize and regurgitate definitions of common fallacies. Craft assignments that help students demonstrate their critical thinking skills, not their memory skills.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Name and explain the four presumptions (or presuppositions) that are made when people offer reasons to support their claims.
• Apply four tests to determine whether an argument is worthy of acceptance.
• Use the argument mapping techniques developed in Chapter 5 to facilitate the analysis and evaluation of arguments.
• Describe and recognize common reasoning mistakes.

DAILY DISCUSSION STARTERS
1. The HBO Original Series Real Time with Bill Maher offers numerous examples of political figures and celebrities discussing current events. Though humor is woven throughout each episode, the host’s and guests’ intellectual and emotional convictions about the topic at hand are also evident. Bring in a video clip or transcript of an argument that is made by a guest or the host of this program. Have students evaluate the argument. If you do this at the beginning of this chapter unit, guide students to ask the questions that one would ask for each of the Four Tests of Worthiness. The “bottom up” strategy sets the stage for the ensuing lecture.
2. Write the following George Bernard Shaw quote on the board: “The fact that a believer is happier than a skeptic is no more to the point than the fact that a drunken man is happier than a sober one.” Have the students discuss the meaning of the quote. Use this as a transition from evaluating claims to evaluating arguments.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT

Thinking Critically: It’s All Thanks to the Ionians!
Thinking Critically: The Name of the Rose
Thinking Critically: Evaluate Argument Worthiness and Explain
Thinking Critically: Worthy of Acceptance
Thinking Critically: The Practice—Wrongful Termination
Thinking Critically: Should DUI Homicide Be Prosecuted as Murder?
Thinking Critically: Bluster, Badger, Interrupt, Whine and Scoff
Thinking Critically: Is Competitive Cheerleading a Sport?
Reprise www.MyThinkingLab.com (pp. XX)
End of Chapter Exercises: Reflective Log—The Ethics of Fallacious Argumentation
End of Chapter Exercises: Gays in the Military
End of Chapter Exercises: Five-Person Group Project—What Do Others Think?

Thinking Critically: It’s All Thanks to the Ionians (p. 133)
This exercise serves as an introduction to the use of argumentation as a historically-grounded convention for resolving problems. Students are asked to consider the relative merits of other methods for deciding what to believe and what to do if we did not have argumentation.

1. Play the video clip for the whole class. Pause the film periodically to ask students to describe and analyze the evidence and reasons for the rise and impact of argumentation that are being presented by the narrator Burke.
2. What if reason giving and argument making as a method for solving problems never came into existence? Break the students into small groups of 3-4 students and have them discuss the questions that are presented by Facione and Gittens. Each group should brainstorm likely alternative methods of deciding what to believe or do in the absence of reason giving and argument making. The groups should evaluate the potential ramifications of this alternative method. What would our individual lives be like if this was how we solved problems? What would society be like?
3. Have each group give a brief report to the whole class on their proposed method and reasons for why this would be the method we would likely use as individuals and community. Are there similarities among the conclusions that the small groups came to? As a whole class, debrief the conclusions that the small groups came to and the reasons they have for reaching these conclusions.

Thinking Critically: The Name of the Rose (p. 135)
Because this is the first time the class will apply one of the four tests to evaluate an argument, perform this exercise together as a whole class. Follow the instructions that appear in the text box.
1. Play the video clip and have the students write the dialogue to create a transcript of the abbot’s argument. Pause the film so the class can first analyze and then evaluate the abbot’s argument.

2. Guide the students through the questions that will test the logical strength of the argument. This is done by trying to envision a scenario where the premises are true but the conclusion is false.

3. Ask students to brainstorm alternative explanations for how the monk died that would fit with the information provided thus far in the movie. Can the students come up with one or more plausible scenarios where all of the abbot’s premises are true but the claim is false? Based on the class discussion, what is an evaluation of the abbot’s argument at this point in the movie?

4. Continue playing the scene and listen as Sean Connery’s character provides an alternative explanation for the monk’s death. Create a transcript of this alternative explanation.

5. As the authors suggest, create an argument map of Sean Connery’s explanation. The mapping portion of this activity can be done in small groups or partners. Compare the maps as a whole group as a review of the mapping process. Have the students retain their maps because they will be used later in the week to evaluate this alternative argument.

**Thinking Critically: Evaluate Argument Worthiness and Explain (p. 140)**

This exercise encourages students to apply the sequence of tests to evaluate arguments. Students can assume that all of the premises are true; therefore, the arguments have all passed the first test. Students will apply Tests #2 through #4 in order. If an argument is shown to have failed a test, then the exercise is complete for that argument.

1. Twenty arguments are presented for evaluation. Start out by evaluating one or more arguments together as a class so that students become comfortable with the activity. The tests must be conducted in sequential order.

2. For each argument, determine whether the argument is worthy of acceptance or whether it should be rejected. Have students explain their conclusions.

3. The table on page 141, “Evaluative Adjectives for Arguments and Their Elements,” offers some useful vocabulary for describing the soundness or worthiness of arguments. Using the suggested positive and negative adjectives will build students’ familiarity and facility with explaining their decisions in this evaluative exercise.

4. Because there are many arguments to use in this exercise, you can vary the procedure. After the whole group examples, the remaining arguments can be evaluated in small groups, pairs, or independently. Students can be required to conduct one or more evaluations as an out-of-class assignment or as an “exit ticket” to check for understanding. Collect students’ written responses to provide formative feedback or as a graded assignment.

5. EXTENSION: Have students create an argument map to represent the reasoning for the argument(s) they are evaluating.
Thinking Critically: Worthy of Acceptance (p. 142)
This exercise naturally follows from the previous activity. In this situation, students must apply all Four Tests of Worthiness in the correct sequence. Note that in the third and fourth argument, the authors ask that students consider the premises to all be true (thus the First Test has been passed in these scenarios). Divide the five arguments among the students in your class. As a first step, have the students create an argument map. On that same piece of paper, have students list the Four Tests of Worthiness. For each test, students should take notes regarding their analysis of the argument and its elements and draw an evaluative conclusion. If the argument does not pass a particular test, then have the student(s) explain what makes the argument unacceptable. If the argument passes all tests, then they can conclude that it is true or highly likely to be true.

Thinking Critically: The Practice—Wrongful Termination (p. 142)
Students often hear persuasive arguments that, upon reflection, cannot stand up to the test of relevance. This exercise enables students to practice identifying some common fallacies of relevance. Are all of the reasons being offered by the defense attorney relevant to the claim being made? You be the judge!

1. View the video clip as a class. Create a transcript of the defense attorney’s arguments making note of all of the reasons put forth in support of the claim(s).
2. Review the list of Fallacies of Relevance that are described in the textbook. Consider each of the reasons—do any of the reasons make appeals to ignorance, to the mob, or to emotions? Are there any ad hominem attacks or straw man fallacies? Does the attorney play with words or misuse authority?
3. After all fallacies of relevance have been identified, have the students reflect on this episode. Why do you think the jury came to the decision they did? How do you explain the judge’s final response? Students should connect their response to their own independent evaluation of the defense attorney’s argument (apply the Four Tests to each argument that is offered—do any pass the test of soundness or worthiness?).
4. This exercise can be assigned as homework and then collected for a grade. Debrief during the next class session by having students share the fallacies they found and their reflections on the turn of events in the episode. Close the activity with a discussion of how the students evaluated the attorney’s arguments.
5. BONUS: Have students watch this episode with a roommate who is not in the class. Have the student ask his or her roommate what he or she thinks about the attorney’s argument. Seek the roommate’s evaluation of the arguments being made. How did the roommate do in his or her evaluation of the argument (without the benefit of knowing the Four Tests method)? Did the roommate correctly identify places where the reasons were irrelevant? If he or she was on the jury, what would he or she have found in this case? Was the roommate persuaded by any of the fallacies? After questioning the roommate, the student can share some of the techniques he or she has learned in this class and common reasoning errors to avoid.
Thinking Critically: Should DUI Homicide Be Prosecuted as Murder? (p. 144)

It is extremely important to employ strong critical thinking when evaluating arguments about emotionally charged topics. In this chapter, students are introduced to the Four Tests of Worthiness and practice applying those tests to a range of scenarios. In this activity, students are now asked to evaluate two sides of a legal debate regarding whether homicides committed while driving under the influence (DUI) should be prosecuted as murder. The evaluation of both perspectives on this debate is followed by the student articulating his or her own reasoned view on this issue.

1. Have students follow the instructions presented in the text box. Begin by watching the 60 Minutes segment and creating a transcript. Use the transcript to create an argument map for both sides of debate.
2. Apply the Four Tests of Worthiness for each argument that is presented. If any of the arguments fail a particular test, they can be evaluated as unworthy or unsound. Explain the evaluation decision for each argument on both sides of the debate.
3. As a final step, have students draft a written statement presenting his or her reasoned perspectives on the issue. This assignment can be done inside or outside of class. Collect the written responses in order to provide formative feedback or a grade.
4. EXTENSION: Using the arguments presented in the 60 Minutes segment and in the students’ personal statements, have the students engage in a class debate on this issue. Run this debate as a “fishbowl.” Start with debate teams of 3–4 students on each side and after a student has made an argument or offered a response, he must return to his or her seat and select a member of the class audience to take his or her place on the team. Choose to have students defend a side whether or not they hold that perspective or have students identify their inclinations ahead of time. Select 3–4 students to be “argument judges” and give them the task of listening to the arguments presented during this debate. If they hear any reasons that fail one of the Tests of Worthiness (for example, they include a reason that is untrue or include a fallacy of relevance), then the debate is frozen and the judges explain what was unsound. During the debate, have students rotate so that they have a turn as an argument judge.

Thinking Critically: Bluster, Badger, Interrupt, Whine, and Scoff (p. 145)

This exercise gives students practice with mapping arguments as well as identifying the use of verbal ridicule and *ad hominem* attacks in political speakers’ statements on the Bill Maher’s HBO show *Real Time*. Such attacks can compromise a person’s ability to effectively analyze and evaluate the strength of an opposing perspective or argument. Have students access the Episode 203 of *Real Time* from www.MyThinkingLab.com. Follow the instructions in the exercise. Remind students to map Maher’s arguments toward the end of the episode as well as document instances of *ad hominem* attacked by Maher or his guests. Conduct this exercise as a whole class or assign as homework. Review students’ responses and discuss the reasons and evidence students have given for their argument.
Thinking Critically: Is Competitive Cheerleading a Sport? (p. 146)
This exercise gives students an opportunity to practice researching arguments for and against the claim that cheerleading should be recognized as a high school or college sport. As the authors suggest, students should be evaluating the reasons pro and con and vigilantly seeking to identify any fallacies that may be offered as part of the argument making. This exercise will also support students’ argument mapping skills. The research for this activity can be assigned as homework, either to individuals or small groups. The reasons, pro and con, from the students’ research can be discussed as a whole class. Have the students apply the Four Tests to both the pro and con arguments. Consider assigning the mapping exercise as homework or as exam review.

Reprise www.MyThinkingLab.com (p. 147)
At the end of the chapter, follow up on previous MyThinkingLab.com activities with these additional exercises:

1. At the end of the chapter, students should once again review their argument map from the Name of the Rose video clip. As the textbook authors suggest, students should watch the entire film and map the reasoning used by Sean Connery’s character to identify the real killer. Apply the Four Tests of Worthiness to this alternative explanation for the monk’s death. This can be assigned as an out-of-class activity or as an extra credit or make-up activity.

2. As the authors suggest, retrieve the episode of The Practice and evaluate the arguments made by the plaintiff’s lawyer. Map the arguments offered in support of the plaintiff’s case, and evaluate these arguments using the Four Tests of Worthiness. Do these arguments seem strong? Have students provide an explanation for why they think the jury voted the way they did in this case.

3. As a follow-up to the 60 Minutes segment on prosecuting DUI homicide as murder, the authors ask students to consider whether the bartender should also be prosecuted. Have students prepare a written response to the question of whether the bartender should be prosecuted as an accomplice to murder. Conduct this exercise as a 5-minute in-class quick write. After students have drafted their arguments, have them work in pairs to review each other’s response and test each other’s arguments using the criteria explained in the chapter. A revision of the student’s argument can be assigned as homework. Collect both quick write and the revision during the next class session. Use the quick write as an opportunity to provide formative feedback.

End of Chapter Exercises: Reflective Log—The Ethics of Fallacious Argumentation (p. 148)
This Reflective Log assignment encourages students to reflect on the realization that a person’s strong critical thinking skills can be used for personal and group gains that might not be considered ethical. Assuming that this course and their college education is going to strengthen their critical thinking skills and dispositions, to what purposes does the student plan to apply his or her strong critical thinking? Have students respond privately in their logs to the questions posed by the textbook authors. They should include a statement of purpose(s) and an explanation. Though you might decide to collect this log entry, it should not be used as a graded assignment. Ask students to maintain a copy of this log entry and reflect on it again at the end of the term to see whether their commitments and explanations have changed or strengthened. A similar reflection process at points in the future (after each term or academic year, upon graduation, as they start a new job, and during their professional careers, after major life milestones, and so on) should also be encouraged.
**End of Chapter Exercises: Gays in the Military (p. 148)**

This End of Chapter Exercise provides students with an additional opportunity to research arguments and practice argument mapping. Furthermore, students will be applying the Four Tests of Worthiness presented in this chapter. Remind students that they should research both the “for” and “against” arguments. The authors have suggested a published source for students to start with, but students should be encouraged to expand their research beyond this recommendation. Run this exercise using the same approaches described in the “Is Cheerleading a Sport?” activity.

**End of Chapter Exercises: Assisted Suicide (p. 148)**

This activity engages students in an evaluation of the arguments supporting and opposing assisted suicide. In addition to researching and mapping the arguments, this exercise involves interviewing four individuals in two different age brackets to determine if a person’s age is related to their inclination to support a law that permits assisted suicide.

1. Run this activity in small groups (4 individuals if possible). Have each small group research the arguments for and against assisted suicide as an out of class activity.
2. In class, have each group create an argument map for the arguments they researchers. After each group has created their maps, come together as a whole group to draw the argument maps on the board. Start by having one group draw their argument map in favor of assisted suicide on the board. Call up subsequent groups to add to this map to make it a complete representation of the class’s work. Repeat with the argument map against assisted suicide. Each group should record the elements of the class-generated map that were not included in their original map so that each group has a comprehensive argument map.
3. Small groups should be giving a sufficient amount of time to conduct their interviews. Prior to interviewing, discuss as a class the process for assuring that the interviewee has consented to be videotaped. Give small groups time during class to develop a set of interview questions that each member of the group will use during their interviews.
4. A map and narrative evaluation of each interviewee’s argument using the Four Tests of Worthiness should be created by the small group members.
5. Have each small group create a summary presentation of their maps, evaluations, and conclusions regarding age differences. These presentations can be multimedia projects that may be shared with the class on an electronic discussion board or delivered in class.

**End of Chapter Exercises: Five-Person Group Project—What Do Others Think? (p. 149)**

The instructions for this activity are provided in the textbook. Have students work in groups. Facilitate the identification of persons to interview by brainstorming sources with your students or making preliminary contacts with selected organizations on their behalf.

1. Before students conduct interviews, discuss with them issues of confidentiality and mutual respect. The instructions for this activity are that the students must set aside their personal viewpoints on the topic. This is not an easy request, so consider brainstorming techniques for maintaining objectivity during the interview.
2. Have each group prepare a collective opinion with accompanying explanatory reasons and have each student prepare a statement of his or her own opinion with reasons.
3. This is a complex activity that requires time to complete. If you are going to use this activity as a graded assignment in your course, then be sure to introduce it at the time that you are conducting the initial 60 Minutes exercise. Give the students advanced warning of the due date of this project so they can make arrangements for the interviews and subsequent group work.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

1. As an alternative or as an extension of the 60 Minutes end of chapter exercise, conduct a criminal trial simulation where the class tries the bartender as an accomplice to a DUI homicide.
   • Have students work together in small groups with one or more groups as the prosecution and one or more groups as the defense. A student from the class or the instructor should "play" the bartender (defendant).
   • The instructor (or class) should determine which of the steps in a criminal case he or she wants to simulate and which will be summarized or determined by the instructor before the simulation (initial appearance, preliminary hearing, jury selection, depositions, and so on). For example, the instructor might assign some students as the jury as opposed to simulating jury selection, whereas a deposition of the defendant might be simulated.
   • Have one group start as the prosecution and another group start as the defense team. If there are more than two groups preparing for one side or the other of this case, they should be ready to step in and take over at any time so the trial moves smoothly but everyone participates (the instructor can determine appropriate transition points).
   • Select 2–3 students to be “argument judges” and give them the task of listening to the arguments being presented during this trial. If they hear any argument that fails one of the Tests of Worthiness (for example, they include a reason that is untrue or include a fallacy of relevance), then the trial is frozen and the judges explain what they have found to be unsound. Have students rotate so that they have a turn at being an argument judge.
   • The American Bar Association provides a useful resource for describing the “Steps in a Trial.” For a review of this resource that might be helpful for running this exercise, visit [http://www.abanet.org/publiced/courts/trialsteps.html](http://www.abanet.org/publiced/courts/trialsteps.html).

2. Why I Buy Organic Foods
   Most major grocery stores offer organically grown produce and other products containing organically grown fruits, vegetables, grains, dairy, or meat. In this exercise, students solicit and evaluate arguments regarding their decision to “go organic.”
   • Students must interview two people who routinely purchase organic foods. These people need to be able to honestly say that they regularly or exclusively buy the organic version of a product if that option is available. Ask these individuals to explain why they opt to buy organically grown food products and record the reasons they give.
   • Evaluate the arguments each interviewee gives. Are there any good arguments for organic food? Are there any fallacious arguments offered? Are the reasons true and relevant? Are the arguments sound and noncircular?
   • Have students share the results of their evaluations. Summarize as a group the strength or weakness of reasoning that the class observed on this topic.
Please refer to the *THINK Critically* Web site for additional exercises and assignments.

**ACCESSING RESOURCES for *THINK Critically***

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For technical support for any of your Pearson products, you and your students can contact [http://247.pearsoned.com](http://247.pearsoned.com).
Chapter 8
Evaluate Reasoning and Spot Deductive Fallacies

CHAPTER OVERVIEW
Deductive arguments are introduced in Chapter 2. Chapter 8 extends the discussion of evaluating reasoning to include deductive argumentation. Facione and Gittens demonstrate how to evaluate the logical strength of deductive arguments and introduce a number of fallacies that are common in this form of argumentation. Illustrative examples and exercises are included throughout the chapter to assist students with developing their skills at evaluating deductive arguments and recognizing the common fallacies that can plague this reasoning strategy.

Things to Remember:
• An argument can be evaluated as a deductively valid argument only if it is impossible for the premises all to be true and the conclusion false. Deductive validity tends to depend upon syntactical and semantic factors such as the meanings of terms and the rules of grammar.
• Being able to construct and evaluate valid arguments (or construct examples of invalid arguments to illustrate fallacies) is more important to students’ development as critical thinkers than their ability to memorize the definitions and features of the deductive templates or common fallacies. Therefore, utilize assignments such as the ones in this chapter to enable students to demonstrate their logical understanding and budding critical thinking skills, not their memory skills.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Evaluate the logical strength of deductive arguments.
• Identify common fallacies that are encountered when evaluating deductive arguments.

DAILY DISCUSSION STARTERS
1. Write an example of valid deductive reasoning on the board. Also write the corresponding structural template on the board (for example, denying the consequent, affirming the antecedent, disjunctive syllogism, and so on). Have students create their own examples. Use this technique to build students’ skills at analysis and application before you introduce the formal terminology that is used in the day’s lesson.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
Thinking Critically: “Neither,” “Unless,” and “Only”
Thinking Critically: Classes and Objects
Thinking Critically: Therefore...
MyThinkingLab: Holy Grail, “She’s a Witch!” Scene
MyThinkingLab: The Day the Universe Changed—An Act of Mercy
Thinking Critically: Create Your Own Deductive Reasoning Examples
End of Chapter Exercise: Evaluate Arguments
**End of Chapter Exercise: Reflective Log – Getting the Problem Wrong**

**End of Chapter Exercise: Bonus Exercise – Devil and Angel**

**Thinking Critically: “Neither,” “Unless,” and “Only” (p. 155)**

This exercise gives students practice in writing deductive arguments using common words that carry logical force. The structural templates are provided for ten different arguments. Using the declarative statements provided, have students articulate arguments that follow the desired structure.

1. This activity can be done in class. Have students follow along in the textbook as you ask for volunteers to say out loud the reworded argument. Pause after each argument to evaluate it for logical strength.
2. The second part of the exercise can be done independently by each student in their notebook or on a separate page of paper that you collect. Give students 5–7 minutes to write three declarative statements. Ask students to write the ten arguments using their declarative statements and the structure templates in the text box or have ten volunteers speak aloud an argument using their own declarative statements. Pause after each argument to evaluate it for logical strength. If the student’s argument does not pass the test of logical strength, then ask the class for suggestions regarding what could be changed to make it strong.

**Thinking Critically: Classes and Objects (p. 157)**

Perform this exercise similarly to the exercise “Neither,” “Unless,” and “Only” previously. Have students follow along in the textbook as you ask for volunteers to say aloud the ten reworded arguments. Pause after each argument to evaluate it for logical strength. Can students come up with a viable counterargument for any of the ten? If yes, have students explain their reasoning for why the argument is not deductively valid.

**Thinking Critically: Therefore... (p. 159)**

In this exercise, students have the opportunity to practice their deductive reasoning skills. Perform this activity as an in-class exercise.

1. Have students work with a partner to draw a logically correct conclusion for each of the ten arguments. Assign two arguments to each pair. Be sure to overlap the assignments so that at least two pairs work on each argument prompt (for example, assign the first pair of students numbers 1 and 2, the second pair numbers 2 and 3, the third pair numbers 3 and 4, and so on).
2. Give the students adequate time to work on this exercise with their partners. Have the students write their arguments for each prompt.
3. Ask for volunteers to read their responses to each argument prompt. Pause after each argument to have the class evaluate it for logical strength.
4. CHALLENGE: Have the partners identify what structural template matches the two deductive arguments that they completed.

**MyThinkingLab: Holy Grail, “She’s a Witch!” Scene (p. 160)**

This video clip shows how the fallacy of false classification is used for comedic entertainment in the Monty Python film *Holy Grail*. Show this video clip and ask students to evaluate the knights’ deductive reasoning. If you use this clip before talking about false classification as a means of illustrating the fallacy and engaging students in identifying the error, ask the students to describe the logical error in their own words.
The juxtaposition of this video clip with the previous clip from the Holy Grail is powerful in that it shows that the evaluation of arguments is not only governed by the rules of logic, but it is also influenced by the implicit unspoken assumptions and worldviews of the individuals at that particular moment in time. The arguments used to confirm the hypothesis that the woman is a witch are not deductively valid. But the evidence brought forward by the investigator was seen as persuasive at the time. The people of that time and place were highly confident in their inductive inference that the woman was a witch. This activity provides a context for discussing the relevance of socio-historical context. It further underscores the dispositional dimension of critical thinking as an essential feature of strong reasoning. And it cautions students to attend to the unspoken assumptions within which and through which they see the world. We can only escape relativism if we use our critical thinking to reveal it to ourselves.

1. Prior to showing this clip, forewarn students that some of the images might be disturbing to watch.
2. View the witch burning segment of the Day the Universe Changed series.
3. Ask students: What reasons did the interrogator use to confirm that the woman was a witch?
4. What implicit unspoken assumptions influence the argument that claims this woman is a witch? What plausible alternative explanations would we offer today to show that the inference is not warranted, even if all the same observations are granted to be true?
5. Tell students: This scene depicts a witch hunt that occurred in Scotland during the seventeenth century. Ask students: What do we know about the worldviews of Europeans who lived back in those times?
6. Ask students: If you were around in those times, how would you have evaluated the argument being made? What about now (in the twenty-first century); how should we evaluate the argument? (Encourage discussion that raises students’ awareness of the significance of worldviews relating to science, technology, religion, education, political orientations, and other belief systems.) Brainstorm the question that the authors pose—what modern-day practice do students think might shock, dismay, or horrify the people of the twenty-fourth century?
7. Debrief by reviewing the critical thinking dispositions or habits of mind. Discuss how it is important to exercise truth-seeking and judiciousness in terms of questioning our implicit assumptions when drawing conclusions.

Thinking Critically: Create Your Own Deductive Reasoning Examples (p. 161)

The exercise is a good way to summarize and bring closure to the concepts that were introduced in Chapter 8. Students’ responses reveal their level of understanding and can suggest what concepts need to be reviewed before the class moves on to the next part of the chapter.

1. Require students to construct valid arguments for one or more deductive templates and construct examples of one or more fallacious arguments. Assign this activity as an out-of-class task or as an “exit ticket” that students must do before the end of class. Collect students’ written responses to provide formative feedback or use this activity for a graded assignment.
2. EXTENSION: Review the students’ responses and identify a subset of arguments that contains correct and incorrect examples. These examples can be used in a variety of ways to give students additional practice in the evaluation of deductive arguments. Have students evaluate one or more of these selected arguments as a Daily Discussion Starter. Alternatively use the set as an end of chapter review: Ask students to map the arguments, identify the errors, evaluate the arguments, and identify the structural templates, fallacies, and so on.

**End of Chapter Exercise: Evaluate Arguments (p. 163)**

This exercise allows students to practice their skills of evaluating arguments. Students are asked to evaluate whether a given statement is a valid deductive argument or whether it is fallacious. Have students work independently or in pairs to complete this exercise. Remind students that they are to assume that all premises are true. Consider running this activity as a Daily Discussion Starter, as homework or exam review.

1. Assign each student or pair of students one of the ten statements.
2. Give students time in class to evaluate their statement, decide if it is valid or fallacious and identify the valid deductive argument template or fallacy most closely matches their statement.
3. Have students report out to the whole class their decision and provide the evidence and reason for their conclusion. Confirm that the class agrees with this evaluation.
4. EXTENSION: Have students work independently or in pairs to write their own examples of valid deductive arguments and fallacious arguments. Have students exchange with one another and repeat the activity with the student generated examples.

**End of Chapter Exercise: Reflective Log – Getting the Problem Wrong (p. 163)**

Students are asked to review the Thinking Critically box “The House M.D. Fallacy” and reflect on the fallacy of affirming the consequent. Students are asked to consider a time in their life where they have either committed this fallacy or been a victim of this form of fallacious reasoning. Assign this reflective log activity as either in class writing assignment or as out of class assignment. Remind students that they are to describe the circumstances where this fallacious reasoning occurred and the results. After recounting the situation, students should describe what they might have done differently to avoid their fallacious reasoning or falling victim to this fallacy. After students have written their log entries, ask if anyone would be willing to share their example with the class (this should be voluntary).

**End of Chapter Exercise: Bonus Exercise – Devil and Angel (p. 163)**

The solution for many clever word puzzles is a successful deductive argument. In this Devil and Angel exercise students are confronted with a hypothetical situation with some potentially dire consequences! The authors are challenging students to develop a single well-crafted question so that they are able to determine with absolute certainty which of the two doors is being guarded by an angel. Have students work in small groups (3-4 people) to come up with the question they would pose and the guard they would ask. Have small groups share their question with the class as a whole. Remind students to word their question careful and precisely. The class should evaluate the likelihood that each group’s question would successfully identify the angel. Students should project the response they would get if each group’s question was asked to the guard who is the angel and the guard who is the angel (remember that we don’t know which one is which, but we can assume what each might answer).
Use this exercise to reinforce the idea that precision in questioning is critical to successfully solving this puzzle – will the questions that the groups are asking allow them to achieve absolute certainty that they have selected the correct door to heaven? If possible, show the episode of the *Ricky Gervaise Show* to see how this puzzle is solved. Wrap up this exercise by considering alternative scenarios where one speaker will always tell the truth and the other will always lie.

**EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS**

**Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts**

2. As an extension to the *Real Time with Bill Maher* end of chapter exercise, have students map, analyze, and evaluate Senator Joe Lieberman’s arguments related to the “public option” in health-care reform. Senator Lieberman’s press release on November 2, 2009, is available from [http://lieberman.senate.gov/](http://lieberman.senate.gov/).

3. Bring additional examples of deductive or inductive arguments from the films that are mentioned in the textbook or from feature films, television programs, or other Internet or print sources so that students can practice their evaluation skills. Bring in examples of both valid and fallacious thinking. ALTERNATIVE: Assign students the task of identifying (and bringing to class, if possible) one example of deductive or inductive arguments that they encountered in a television program or film.

Please refer to the *THINK Critically* Web site for additional exercises and assignments.

**ACCESSING RESOURCES for *THINK Critically***

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For access to the instructor supplements, simply go to [http://www.pearsonhighered.com/educator](http://www.pearsonhighered.com/educator) and search for *THINK Critically*. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for *THINK Critically*. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact [http://247.pearsoned.com](http://247.pearsoned.com).
Chapter 9
Evaluate Inductive Reasoning and Spot Inductive Fallacies

CHAPTER OVERVIEW
Inductive arguments are introduced in Chapter 2. Chapter 9 extends the discussion of evaluating reasoning to include inductive argumentation. Facione and Gittens demonstrate how to evaluate whether an inductive argument is justified (or warranted) and introduce a number of fallacies that are common in this form of argumentation. Illustrative examples and exercises are included throughout the chapter to assist students with developing their skills at evaluating inductive arguments and recognizing the common fallacies that can plague this reasoning strategy.

Things to Remember:
• An *inductively justified argument* is an argument such that if all of its premises are true, then it is most likely or highly probable that the conclusion is also true. Inductive strength tends to depend on probabilities, correlations, observed similarities or differences, and causal connections.
• Being able to construct and evaluate valid arguments (or construct examples of invalid arguments to illustrate fallacies) is more important to students’ development as critical thinkers than their ability to memorize definitions or common fallacies. Therefore, utilize assignments such as the ones in this chapter to enable students to demonstrate their logical understanding and budding critical thinking skills, not their memory skills.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Evaluate the logical strength of *inductive* arguments.
• Identify common fallacies that are encountered when evaluating inductive arguments.

DAILY DISCUSSION STARTERS

1. Bring in examples of valid inductive reasoning from the ABC police drama *Body of Proof* starring Dana Delany as Medical Examiner Megan Hunt. Select a scene where M.E. Hunt is conducting an exam to determine cause of death or is working in the field to determine the events that preceded the victim’s death that may point to cause. Show the video clip to the class. Draw their attention to how Delany’s character evaluates the degree of truth of the various premises being considered and how the characters in the program use their critical thinking skills to evaluate the likely cause of death based on these premises. Use these clips to introduce inductive reasoning as distinct from deductive reasoning that was explored in Chapter 8. Show additional video examples and have students identify the premises in the inductive argument that is being built in the episode. Use this technique to build students’ skills at analysis and application before you introduce the formal terminology that is used in the day’s lesson.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.
EXERCISES AND VIDEO CLIPS FROM THE TEXT

Thinking Critically: Which Report Should We Believe and Why?
Thinking Critically: Hotel Bedbugs and August Cold
Thinking Critically: Group Project Challenge—The U.S. Census
Thinking Critically: Create Your Own Inductive Reasoning Examples
End of Chapter Exercise and MyThinkingLab: Reflective Log—To Kill a Mockingbird
End of Chapter Exercise: Evaluate Argument Worthiness and Explain
End of Chapter Exercise: What’s the Truth about Colon Cleansing?
End of Chapter Exercise: Challenge—What’s the Truth about Climate Change?
End of Chapter Exercise: Group Exercise—Real Time with Bill Maher

Thinking Critically: Which Report Should We Believe and Why? (p. 169)

This exercise gives students practice in applying the four questions that the authors have introduced for evaluating the logical strength of inductive generalizations. Have students review the two websites that are presented in the Thinking Critically box. Display the websites on a projection screen and have students view them on computers at their desks if possible. Write the four questions on the board. As a whole class, work through each question, citing specifically the evidence available on the website. Determine as a class which report is likely to be closer to the truth based on the level of satisfaction the groups is able to achieve for the four questions asked. Close this exercise by reviewing how sampling practices can result in drastically different probabilistic inferences. BONUS: Have students generate their own examples of sources that have conflicting results that stem from sampling differences.

Thinking Critically: Hotel Bedbugs and August Cold (p. 170)

This activity gives students an opportunity to evaluate the logical strength of the “bedbug” and “San Francisco in August” inductive arguments. Students should apply the four sampling questions and determine whether satisfactory answers can be obtained from the information that is provided in the textbook. If the evaluative conclusion is that the argument lacks logical strength, then students should explain what additional information would be needed to conclude that the argument was inductively justified. Evaluate one of these arguments as a whole class to demonstrate the thinking that is involved in answering the four questions. Have students work in small groups to evaluate the second argument. Compare the conclusions and explanations from the small groups to check that the students came to similar conclusions.

Thinking Critically: Group Project Challenge—The U.S. Census (p. 172)

Follow the instructions as they appear in the text box. Have students work in groups of 3–4 for this project. As the word “challenge” in the title of this exercise suggests, students need to apply strong critical thinking as they work to formulate methodological recommendations to the national Census Bureau. Have the class evaluate the proposals from each group and determine who has come up with the more reasonable methodological recommendations.

1. Give students time during class to work on this group project. Groups might also be required to meet as a group outside of class to finalize their recommendations (or the entire group project can be given as an out-of-class assignment).
2. Have students research the methodology information on the U.S. Census Web site in class. Remind students to consider the four sampling questions and the thought question posed by the textbook authors when developing their recommendations. Students should take into consideration the socio-economic and political factors that might impact the strategies used to conduct the census.
3. Have each group write up and turn in their recommendations. Have groups make a presentation of their methodological recommendations to the whole class. Determine the group that made the strongest recommendations based on the four sampling questions.

4. Close this activity by guiding the class through a meta-cognitive reflection on the process they followed to analyze the methodology used in the U.S. Census, the logical strength of 100 percent count versus estimates based on sampling, and the additional considerations they made when coming up with their recommendations. What challenges did they face and how did they resolve these challenges? How did socio-economic and political considerations figure in to their recommendations? How would they evaluate their group’s critical thinking?

Thinking Critically: Create Your Own Inductive Reasoning Examples (p. 174)
This activity provides students with the opportunity to demonstrate their understanding of common fallacies. Encourage your students to have fun with this exercise and also apply their strong critical thinking. Have the students work in pairs. Assign each pair one or more of the fallacies named in the text box. Tell the class that their task is to create three arguments that contain fallacious thinking BUT seems plausible at first glance. Have pairs present their “best” argument aloud to the class. Ask the class to identify the appropriate fallacy demonstrated. End the exercise by having the class pick the top three arguments that best represent the appropriate fallacy but also challenged the audience to think critically to determine whether it was a valid argument.

End of Chapter Exercise and MyThinkingLab: Reflective Log—To Kill a Mockingbird (p. 177)
This exercise asks students to perform arguments analysis, mapping, and evaluation. It can be used to test students’ learning from Chapters 5, 7, 8 & 9. This activity can be given as either an in-class or out-of-class assignment. Depending on how you choose to use this exercise, you might want to have students submit their map and an explanation of their analysis and evaluation for a course grade, or you could conduct this activity as a pre-exam review. Students can compare their work to their neighbor’s or as a whole class in order to determine what they need to study more closely before an exam or other graded assignment.

End of Chapter Exercise: Evaluate Argument Worthiness and Explain (p. 177)
In this activity, students are given an opportunity to practice applying the Four Tests of Worthiness by evaluating a set of inductive arguments. Remind students that they are to assume that all premises in the arguments are true, and therefore they should start with the second test, Logical Strength.

1. Have the students work alone or with new (different) partners for this exercise. Divide the arguments among the students. Assign three arguments to each student/pair. Be sure to overlap the assignments so that each argument prompt is evaluated by multiple individuals (for example, assign the first pair of students numbers 1–3, the second pair numbers 2–4, the third pair numbers 4–5…the sixteenth pair numbers 16, 17, and 1, and the seventeenth pair numbers 17, 1, and 2).

2. If this activity is done during class, allow students enough time to conduct their evaluations. If this is an out-of-class assignment, it should be collected during the next class session.
3. Ask the students to record their detailed explanations in their notebooks so that they can refer back to them in the future. As the authors point out, students should note implicit but unspoken premises and assumptions as they explain their evaluations.

4. Debrief this assignment in class by having students share their evaluations and explanations. Have students who worked on the same arguments comment on whether they came to the same conclusion and whether their explanations match or differ with the one being shared.

**End of Chapter Exercise: What’s the Truth about Colon Cleansing? (p. 178)**

The exercise is a good way to summarize and bring closure to the concepts that were introduced in Chapters 7-9. Students’ responses reveal their level of understanding and can suggest what concepts need to be reviewed before the class moves on to the next part of the textbook. As the authors suggest, students should be evaluating the reasons in support and opposed to colon cleansing and vigilantly seeking to identify any fallacies that may be offered as part of the argument making. The research for this activity can be assigned as homework, either to individuals or small groups. The reasons, pro and con, from the students’ research can be discussed as a whole class. Have the students apply the Four Tests to both the pro and con arguments. Consider assigning an argument mapping exercise as homework or as exam review.

**End of Chapter Exercise: Challenge -What’s the Truth about Climate Change? (p. 178)**

The exercise is another good way to summarize and bring closure to the concepts that were introduced in Chapters 7-9. Students’ responses reveal their level of understanding and can suggest what concepts need to be reviewed before the class moves on to the next part of the textbook. As the authors suggest, students should be evaluating the arguments given by the IPCC in support of the claim that climate change is occurring and the steps that should be taken to manage risks of extreme events that are occurring as a result of this change. The review of the IPPC report can be assigned as homework, either to individuals or small groups. The premises and evidence gleaned from the students’ review of the report can be discussed as a whole class. Have the students apply the Four Tests or Worthiness to the IPCC’s arguments. Consider assigning one or more argument mapping exercises as homework or as exam review.

**End of Chapter Exercise: Group Exercise —Real Time with Bill Maher (p. 179)**

This exercise challenges students to perform a fair-minded evaluation of an argument in favor of the “public option” provision in the health-care reform legislation. Access to affordable, quality health care is a topic that many people feel strongly about, so this exercise helps students practice in maintaining objectivity no matter how they feel about the provision. Students are asked specifically to map Bill Maher’s reasoning and apply the Four Tests of Worthiness. This activity can be given as either an in-class or out-of-class assignment. Depending on how you choose to use this exercise, you might want to have students submit their maps and explanations of their analyses and evaluations for a course grade, or you could conduct this activity as a pre-exam review. Students can compare their work to their neighbor’s or as a whole class to determine what they need to study more closely before an exam or other graded assignment.
EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

2. As an extension to the Real Time with Bill Maher end of chapter exercise, have students map, analyze, and evaluate Senator Joe Lieberman’s arguments related to the “public option” in health-care reform. Senator Lieberman’s press release on November 2, 2009, is available from http://lieberman.senate.gov/.

3. Bring additional examples of inductive arguments from the films that are mentioned in the textbook or from feature films, television programs, or other Internet or print sources so that students can practice their evaluation skills. Bring in examples of both valid and fallacious thinking. ALTERNATIVE: Assign students the task of identifying (and bringing to class, if possible) one example of deductive or inductive arguments that they encountered in a television program or film.

Please refer to the THINK Critically Web site for additional exercises and assignments.

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Chapter 10
Think Heuristically
Risks and Benefits of Snap Judgments

CHAPTER OVERVIEW

Chapters 10 and 11 focus on the critical thinking skill of self-regulation. In Chapter 10, Facione and Gittens situate critical thinking within the larger context of human decision making and problem solving. A two-system model of human decision making is discussed. Students are also introduced to 17 cognitive heuristics, highly reliable, natural human decision-making shortcuts, which we rely on to make expeditious decisions. The advantages and disadvantages of heuristic thinking are illustrated with examples and activities for practice and reflection.

CHAPTER LEARNING OBJECTIVES

After completing this chapter, students will be able to:
• Describe the “two systems” approach to human decision making.
• Explain the value of each system in the “two systems” approach.
• Identify common cognitive heuristics when they are used in decision making.
• Explain how heuristic thinking can help or hinder decision making.

Things to Remember:
• Heuristics are not fallacies. They are generally very useful, effective and efficient cognitive shortcuts. But we need to monitor our use of them, for they are not logically strong arguments either. This is why we need to use the System-2 skill of self-regulation to monitor and to correct our own thinking from time to time. To always rely on heuristics is to put one’s self at risk of making mistakes unnecessarily.
• Both System-1 and System-2 operate in all of us all the time; neither is “bad.” People are not divided into those who are system-1 and those who are system-2. We need both systems to get through our day successfully.
• We can train ourselves to recognize certain patterns and to use certain skills so that behaviors which require a lot of time and reflection initially become more automatic, reactive – that is, more system-1, with practice. If we had to start each activity as if we had never done it before, we would not get very far as individuals or as a species.
• Education and higher education especially, focuses on System-2 because expanding our skills at reflective judgment enables us to apply those skills to almost any other topic. With strong System-2 skills, that is with strong critical thinking, we are able to learn better whatever content areas we might wish to focus our minds on.

DAILY DISCUSSION STARTERS

1. Will it happen to me? Bring in a selection of examples from the nightly news, the newspaper, or the Internet of people who have recently experienced a positive outcome (for example, overcoming adversity, winning, success, honor, and so on). Be sure that the images vary in terms of the person’s age, gender, ethnicity, and so on. Have students estimate, on a scale of 1–1,000 (with 1,000 being highly likely), the odds of something similar happening to them.
   • Ask students: Are your ratings higher for some outcomes over others? Why?
   (Encourage students to think about the similarities they share with the examples and the additional personal stories they might have thought of when doing this activity.)
• Use this activity for introducing cognitive heuristics in general or the availability heuristic in particular. Talk about how the availability heuristic can make us feel like we must take extraordinary actions or avoid remote risks because of a heightened sense (that is a mistaken estimation) that a similar outcome might happen to us.

2. When you think of the word “stereotype,” what comes to mind?
• Start a brainstorming session to elicit common negative associations with the term and related terms (for example, racial profiling, bias, discrimination, and prejudice). Ask follow-up questions to elicit examples where stereotyping can lead to positive attributions, recommendations, or opportunities. Encourage examples that go beyond demographic characteristics (for example, race, class, and gender). Use this discussion as an introduction to the stereotyping heuristic. It is important to have students understand “stereotype” as a social scientific term that refers to an oftentimes useful mental shortcut.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
Thinking Critically: How Good Is Good Enough?
Thinking Critically: Emotional Jolts
Thinking Critically: Simulate
Thinking Critically: Estimate Your Chances
Thinking Critically: Last Word to First Word
Thinking Critically: Have You Ever Been Stereotyped?
Thinking Critically: Closer to Home
Thinking Critically: Fostering a Group Culture of Critical Thinking
Thinking Critically: First Impressions
Thinking Critically: ATVs
Thinking Critically: Two Decimal Places
Thinking Critically: Why Do We Privilege the Status Quo
Reprise www.MyThinkingLab.com
End of Chapter Exercise: Two- or Three-Person Small Group Exercise—Thinking Through the Day
End of Chapter Exercise: Reflective Log—Two Hours
End of Chapter Exercise: Challenge—Explain It to Grandma
End of Chapter Exercise: Would You or Would you Not?
End of Chapter Exercise: All American Families

Thinking Critically: How Good Is Good Enough? (p. 186)
This exercise asks students to reflect on two recent occasions where they were disappointed with an outcome because they underestimated how much effort it was going to take on their part. As part of the reflection, students are to consider how to make an adjustment to their concept of “good enough” so that they are more likely to achieve success on a similar endeavor in the future. Have the students share their responses with the class or have them record their answers privately in a reflective journal entry. Use this exercise to discuss the cognitive heuristics of “satisficing” and “temporizing.”
Thinking Critically: Emotional Jolts (p. 187)
Use this exercise to discuss the “Affect: Go with Your Gut” cognitive heuristic, and system-2 reflective critical thinking, particularly the critical thinking habits of mind of truth-seeking and open-mindedness. This exercise asks students to reflect on two recent occasions when they had a strong initial affective reaction. This might have been a first encounter with a person, an idea, a proposal, opportunity, or event, and so on. Students should select one situation in which their initial affective response was positive and another in which their first response was negative.

1. As the instructions in the text box suggest, students should reflect on whether they followed up on their initial affective response with a strong critical thinking response that involved analyzing, evaluating, and reflecting on that first response.
2. Have students share with a partner or in a small group the first situation, their initial response, and whether they applied their System-2 reflective critical thinking to confirm the response. If students report that they did not apply critical thinking, then they should think and talk aloud about what information they should gather in order to evaluate their affective response. The group members should provide feedback to the speaker. Repeat with the second situation.
3. Come back together as a whole group. Ask for a show of hands of those who reported that they did not apply critical thinking to their initial affective response. Was this more likely to happen with positive or negative affective responses or was the likelihood equal in both conditions?
4. As a take-home assignment, tell all of the students that they must identify a situation where they did not fully apply their System-2 critical thinking to confirm an initial affective response. Students should gather the necessary information to evaluate that first response. Have them write a reflection on their analysis based on this new information. Collect these written responses and use as an opportunity to provide formative feedback. At the next class session, ask for volunteers to share their reflections. What conclusions did they draw about those first impressions after applying their System-2 reflective critical thinking?

Thinking Critically: Simulate (p. 188)
Students will have fun working with the Simulation exercise. Perform the exercise as it is described in the text box. The instructor should read the vivid descriptions in each simulation as students close their eyes and imagine themselves in the scene. The important part of this exercise is not the emotional reaction to the simulations but the realization that the vivid images fail to convey concrete information regarding hang gliding such as how it is done, where to go gliding, and safety issues involved in the activity. The discussion following the visual simulation should include these themes, and students should be encouraged to reflect on what additional information they would need in order to draw reasonable conclusions about how easy or hard it is to hang glide.

• EXTENSION: Have students share personal experiences where they have engaged in simulation and it has affected their decision making. Did they follow up on the simulation with System-2 reflective critical thinking about the choice?

Thinking Critically: Estimate Your Chances (p. 190)
This exercise provides a first-hand experience of the availability heuristic in action. Vivid memories of past events are used to gauge the likelihood of future events, providing warnings or advisories about what to do or not do as the case might be.
1. Assign this activity as a reflective log assignment. Have the students record the detailed circumstances of the victim they saw on the nightly news. Then have them estimate the likelihood of a similar fate befalling them. Finally, have them investigate the actual likelihood of that event occurring.

2. Debrief this exercise by having the students reflect on the degree to which they feel they share common characteristics with the victim or how much empathy they feel for the victim (has a similar circumstance occurred to someone they know or have heard of before?). Talk about how the availability heuristic, unchecked by system-2 thinking, can lead one to misestimate risk.

**Thinking Critically: Last Word to First Word (p. 181)**

This is an ideal activity to be used as a reflective log assignment. Students can listen to conversations in the cafeteria or student union during meal times or between classes. Have students record the gender of the two speakers and the location that the conversation took place. Inconspicuously record how many times a speaker begins his or her sentence with a word or a phrase that just was spoken by the other individual. Note also whether the topic has shifted with this new utterance. If possible, record the length of time the speakers stay on a single topic. In their journals, students should reflect on the conversation they heard and the associational thinking that was exhibited. How might one characterize the critical thinking that was exhibited during the conversation? Did either speaker draw any conclusions or express judgments that could be classified as unreflective system-1 reactions to the word associations he or she made?

**Thinking Critically: Have You Ever Been Stereotyped? (p. 183)**

This is another ideal activity to be used as a reflective log assignment. It is highly encouraged that the instructor brainstorm with students about the meaning of the term “stereotype” (see the Daily Discussion Starter). It is important for students to understand “stereotype” as a social scientific term. Ask students to share their reflections in class. Use the discussion as an opportunity to emphasize that stereotyping can lead to both positive and negative associations and that stereotypical thinking can be about more than just demographic characteristics.

**Thinking Critically: Closer to Home (p. 196)**

This is another ideal activity to be used as a reflective log assignment. Have students write about the most recent meeting they attended where the group was involved in a decision-making task. Was there any “us versus them” heuristic thinking going on? If so, how did it influence the group’s thinking? What if the sense of “us versus them” wasn’t there—would the group’s decision be different? How so? If you have students share these reflections in class, be sure to remind them of the importance of respecting and preserving the confidentiality of the group members.

**Thinking Critically: Fostering a Group Culture of Critical Thinking (p. 197)**

In this activity, students have the opportunity to apply what they learn about strong critical thinking to the context of leadership style. Conduct a brainstorming session where students generate a list of things a group leader should do to promote a culture of reflective, fair-minded, strong critical thinking, and a list of group leader behaviors that undermine such a culture. Generate this list as a whole class. How many of the negative leader behaviors can be linked to the misapplication of one or more cognitive heuristics or to negative critical thinking habits of mind? Use this activity to reinforce the concept of cognitive heuristics and how, when they are misapplied, can negatively impact group dynamics.
Thinking Critically: First Impressions (p. 198)

This is an ideal reflective log activity. Have each student create a list of recent acquaintances who made a positive first impression and those who made a poor first impression. For each person on the list, the student should indicate whether or not his or her general impression has since changed. If the answer is yes, then the student should describe the circumstances that led him or her to change the perceptions of the individual. For those whose answers are no, they should consider what it would take to change that enduring positive or enduring negative perception. As a final element of the reflection, have students reflect on the anchoring with adjustment heuristic and times in their life where they feel it has affected another person’s perceptions of them.

Thinking Critically: ATVs (p. 199)

This activity provides students with a first-hand experience of the illusion of control heuristic. Perform this activity with the whole class. Before showing the video clip, ask students to record in their notebooks the likelihood that they would accept the Yamaha Rhino offer (with the terms outlined in the text box).

1. Now show the clip to the class. Ask students: What examples can be pointed to in the clip to illustrate the “illusion of control” heuristic? How so?
2. Ask students: Having viewed the video clip, what is the likelihood that you would accept the free use of the Yamaha Rhino? For those of you who have changed your rating, why did you change it?
3. Write the following heuristics on the board: availability, simulation, representation, anchoring with adjustment, loss and risk aversion. Go through each one and ask students to comment on whether these heuristics played a role in their decision making at either point.
4. Close this exercise by using the students’ analysis, examples, and reflections on this experience to reinforce the role of heuristic thinking and reflective critical thinking on their own and others’ decision to engage in activities that present the possibility of risk and possible loss.

Thinking Critically: Two Decimal Places (p. 200)

This exercise can be assigned as a reflective log activity. To facilitate this exercise, suggest that students focus on a specific decision such as how they picked what college to attend, how they would decide on what car to buy, or how they decide who to date (or another personally meaningful decision). Ask students to reflect on what their personal make-or-break criteria are for that decision. Follow this with asking how good the evidence is for supporting the use of this particular make-or-break feature or decision point. Finally, ask students to reflect on what this activity has taught them in terms of employing the elimination by aspect heuristic when making key decisions in the future. Collect students’ log entries. Check their responses to see whether they understand that heuristic thinking is helpful but that they should be mindful to also employ reflective, self-regulated critical thinking when making decisions.

Thinking Critically: Why Do We Privilege the Status Quo? (p. 202)

Humans have a natural tendency to avoid loss and risk—it is a basic survival mechanism. So how can students prevent giving the status quo undeserved priority over other options when making a decision? Perform this exercise as a whole class, small group, or independent reflective log. A primary benefit of this activity is the resulting list of steps to use to self-monitor during decision making for loss aversion.
1. Give students 2–3 minutes to independently reflect on a recent decision they have made that involved some element of risk or possible loss. How did they value maintaining the status quo as compared to other options?

2. Have students come together in small groups (2–4 students) to talk about their decision and how they viewed their options. In these small groups, have students brainstorm how a stronger application of their critical thinking might have impacted their decision.

3. After 5–8 minutes, interrupt the groups and give them the additional instruction to write two questions that individuals might ask themselves that would promote a good decision in contexts of risk, uncertainty, and potential loss.

4. Call the class together again and have each group share their questions. Enlist a couple of student volunteers to write the questions on the board as the groups share them. Did groups come up with similar questions? To close this activity, have each student write a final reflection explaining why it is important to monitor one’s decision making for loss aversion.

Reprise www.MyThinkingLab.com (p. 205)
In this exercise, ask students to view the film Glory Road and analyze the critical thinking of the coach and his wife as they solve important problems and make critical decisions regarding how to deal with the stresses of racial discrimination and prejudice. This activity can be given as an out-of-class assignment. Ask students to identify two scenes in which the character engages in critical thinking to make an important decision. Evaluate the critical thinking of that character. Have the students also identify two places in the film where the screen writers have created situations that would appeal to one or more of the viewer’s heuristic responses. Students should explain in their own words how the scene has been a power of appeal. Have students submit their explanations of their analyses and evaluations for a course grade, or you could conduct this activity as a pre-exam review. Students can compare their work to their neighbor’s or as a whole class to determine what they need to study more closely before an exam or other graded assignment. Alternatively, this activity could be used as a make-up assignment for students who have missed class.

End of Chapter Exercise: Two- or Three-Person Small Group Exercise—Thinking Through the Day (p. 206)
Follow the instructions that appear in the text box. Students should work in small groups. Have each student identify a choice he or she made earlier that same day. As the authors model in the book, have the students describe how they made their decisions. What other options did they consider? How did they eliminate the options to get to their choices? Did they make the decision quickly or after a reflective critical thinking process? Which cognitive heuristics can the student use as an example to better understand how he or she expedited the decision of what option to choose? The other students in the group should assist with the identification of relevant heuristics. This exercise will assist students in becoming more familiar with the cognitive heuristics that are described in the chapter.

End of Chapter Exercise: Reflective Log—Two Hours (p. 206)
In this exercise, students must keep a log of all of the actions, decisions, and judgments they make in a 2-hour period. It is important that students choose to start their log 1 hour before a main meal. As the authors suggest, students should make brief log entries every 15 minutes during that 2-hour period, recording the details of the previous 15 minutes. Later in the day, students should return to their logs and code their actions, decisions, and judgments as System-1 or System-2. Refer to the definition and description of these two systems that are found in the book.

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The next step in this activity is to have the student review the elements that they coded as System-1 to decide whether they should have approached that action, judgment, or decision with more reflection or critical thinking. Students should report on their conclusions to this question. What could have been different had they engaged in more reflection? As a conclusion to this activity, have students evaluate the degree to which they were reflective and self-monitoring during this 2-hour experiment, and write their reactions and ideas regarding how to increase the critical thinking, self-monitoring, and self-correction into their daily life. Collect these written reports and use them to determine whether students understand the two-system, decision-making model.

**End of Chapter Exercise: Challenge—Explain It to Grandma (p. 206)**

One of the best tests of whether you understand something is whether you can explain it to another person. This activity puts that adage to the test. Students are asked to discuss critical thinking and what they are learning in this class with a grandparent (or an individual who is at least 40 years older than them). The authors point out that it might not be as easy as just asking their grandparents whether they “use critical thinking to make decisions” because the term “critical thinking” might not be familiar. So students will have to talk to their grandparents about critical thinking skills and dispositions without using the formal terminology. The purpose of this exercise is to talk with the older adult about what the student is learning in the class. Another purpose is to figure out what the older person might have learned about these same topics and whether he or she knows things that the student has not yet learned. Have students take this opportunity to have a meaningful conversation with someone at least 40 years older, preferably one of their grandparents, about thinking and decision making and habits of mind such as open-mindedness and truth-seeking. After the conversation, students should write a reflection of the experience, providing ideas, themes, and examples that their grandparents shared with them. Students should also reflect on how easy or challenging it was to discuss the course topics with their grandparents. Does the student have confidence in their level of understanding of these course themes so far? Have students share the insights that they gathered from their grandparents with the class.

**End of Chapter Exercise: Would You or Would you Not? (p. 207)**

In this exercise students are given a vivid example of the role of System 1 and System 2 thinking in decision making. To increase the likelihood that students will make a snap judgment, pose the genetic testing question to the whole class before you announce that they will be engaging in this end of chapter activity. Have those students who would opt for the free genetic testing raise their hand (or use iClicker or similar technology to record student responses more anonymously). Everyone who does not raise their hand should automatically assume their answer is “no”. Have students complete a reflective log entry based on the questions the authors ask in the exercise instructions. Have students complete the research about genetic testing outside of class as homework before the next class session. Encourage students to gather research from valid and credible sources including the Internet, print, as well as interviews with medical professionals. During the next class meeting have students share their decision based on reflection. Probe students regarding the research they found on genetic testing and how the opportunity to reflect this information either reinforced or changed their initial snap judgment. Ask students to prepare a follow up reflective log entry on how this exercise helped them to better understand their System 1 and System 2 thinking.
End of Chapter Exercise: All American Families (p. 207)

This final end of chapter exercise challenges students to engage their critical thinking habits of mind of truthseeking and openmindedness when examining the protests against the TLC reality television program “All-American Muslim” and the decision by major retailer Lowe’s to pull its advertising from the program in response to the protest campaign by the Florida Family Association. Facione and Gittens ask students to review newspaper stories containing statements by the American Family Association, the responses by Lowe’s, and finally the backlash against Lowe’s following their marketing decision for examples of heuristic thinking. Divide students in small groups for this exercise. Ask students to prepare an analysis of each news article and at least one additional print source on this topic. In their written analysis students should identify all examples of heuristic thinking (provide the name of the heuristic and quoted phrase from the article). Remind students that for the second part of this exercise they should seek to propose a more reflective and reasoned course of action that either the American Family Association, Lowe’s, or boycotters could have taken that would have been more effective for that group / company. To complete this exercise, have each group draft a letter to the organization(s) in which they outline their analysis and offer their proposed reasoned and reflective response, explaining why they feel that it would be have been a more effective course of action.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

1. How about a boost?
   - Have the students view the television commercial for “5-Hour Energy.” Ask students: What heuristic thinking modalities are the advertisers trying to elicit to influence your decision to try their product? After viewing the commercial, have students go to the product Web site and see what additional cognitive heuristics might be triggered by their advertising http://www.5hourenergy.com/. Discuss the students’ analyses and findings as a class.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically

Students can access chapter summaries, exercises, and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor’s Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Chapter 11
Think Reflectively
Strategies for Decision Making

CHAPTER OVERVIEW
Chapters 10 and 11 focus on the critical thinking skill of self-regulation. In Chapter 10, critical thinking is situated within the larger context of human decision making and problem solving. A two-system model of human decision making and cognitive heuristics are introduced. In Chapter 11, students explore the natural human tendency toward what is known as dominance structuring. Dominance structuring gives students the capacity to embrace their decisions with confidence and stand firm in the decision to maintain that choice or perform an action. Although this strength and conviction can be an asset in difficult situations, it can also be a detriment when the decision made is unwise or unwarranted. In Chapter 11, students explore these issues and learn how applying critical thinking skills and habits of mind can reduce the chances of maintaining a commitment to poor decisions.

Before You Begin
Review the Suggestion for Instructors document titled “Preparing to Discuss an Issue” that is available at www.MyThinkingLab.com.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Apply the concept of dominance structuring to explain how people can maintain a steadfast commitment to their decisions.
• Explain the benefits and risks associated with the natural tendency toward dominance structuring.
• Identify specific critical thinking skills and dispositions that can improve decision making.
• Explain how critical thinking can be used to make better decisions.

DAILY DISCUSSION STARTERS
1. Have students reflect on a decision they are trying to make about what to do during the upcoming weekend or the upcoming holiday or academic break. Have them list the pros and cons of the choice they feel they are mostly likely going to make. Ask for a show of hands to indicate how many of them can come up with more arguments in favor of their choice than against it. Use this as an introduction to the concept of dominance structuring.
2. Pose one or both of the questions that appear in the end of chapter exercise “Wishy-Washy Flip Floppers.”

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor's Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
Thinking Critically: Pro or Con
Thinking Critically: Pro or Con Revisited
Thinking Critically: Poor Reflective Decisions
Thinking Critically: Recalling One of Your Own Decisions

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Thinking Critically: Pro or Con (p. 213)
This exercise asks students to first identify their position on seven different issues. Secondly, they are asked to list all of the arguments they can think of to support their position. Finally, they should list the arguments on the side of the issue that is not their viewpoint. These lists should be set aside until the following have been performed.

1. Have students perform this activity before you talk about human tendencies when they explain or defend themselves.
2. Review the “Poorly Crafted Assignment” section of the text. Does it surprise anyone that the students would respond to Facione and Gittens’ assignment the way they did? Review the revised assignment description. How would students approach the gun control assignment if they were given this second set of instructions?
3. Have students return to their Pro or Con lists (proceed to the Pro or Con Revisited exercise).

Thinking Critically: Pro or Con Revisited (p. 214)
Have the students count the number of good reasons they wrote down for the position they took on the seven issues. Secondly, have them count the good reasons for the other side. What are the results? Did students provide more reasons for the side they endorsed or the opposite view? Pose the remaining questions in the text box and review the caution issued by the authors. The Pro or Con activities reinforce the human tendency to build dominance structures around viewpoints and risk undervaluing and underestimating alternative or opposing perspectives.

Thinking Critically: Poor Reflective Decisions (p. 215)
The tragic events described in this Think Critically box are vivid and real examples of people whose lives were lost after a series of poor reflective decisions. Instructors should be familiar with the events as they are presented in this text box and on the web. Discuss these cases in turn with the whole case. Ask students to identify what poor reflective decisions were made by the individuals involved. Ask: What might have changed the actor(s) decisions and the ultimate consequences? What questions could have been asked to promote stronger reflective judgments? Use this discussion to demonstrate how poor
reflective judgments and incomplete anticipation of consequences can be observed in groups as well as individuals.
After a discussion of these cases in class, divide students into pairs or small groups and assign further Internet research to locate and present to the whole class one or two examples of poor reflective decisions and the consequences that have resulted. EXTEND: Challenge the students to find examples of poor reflective judgment that have led to positive societal consequences (Hint: the capture of a fugitive, etc.).

**Thinking Critically: Recalling One of Your Own Decisions (p. 217)**
This exercise asks students to reflect on an important decision they had to make under conditions of uncertainty. As part of this reflection, students are to consider how well the four stages proposed by Montgomery fit the process they followed. Have students work with a partner on this exercise. Give the students ample time to work together to answer the questions in the text box. Call the class together. Ask students: How many of you answered “yes” to all of the questions (suggesting that they created dominance structure around their selected option)? Ask whether anyone said “no” to one or more of the questions (suggesting that they did not create dominance structure around their selected option). Ask these students to share with the class why they think this happened and what might have made them decide differently. The results of this exercise should document the consistency in which most people make decisions and dominance structure around the choice being made. If there are students who shared that they did not form a dominance structure, have students analyze the characteristics of those situations that contributed to this less common outcome.

**Thinking Critically: Map Your Own Arguments (p. 218)**
Students are once again asked to consider their original Pro or Con lists. Give students sufficient time to reflect on the question that is asked of them: “What information or new considerations would lead you to change your mind?” Tell them to sit quietly and think for 2–3 minutes before writing a response. Call the class together and ask for volunteers to share their reflections (alternatively, have students share in small groups). Close this exercise by discussing how critical thinking can be used to help individuals make better decisions.

EXTENSION: As the title of the text box suggests, have students create an argument map for the position they are taking on one of the issues.

The suggested lesson extension on organic foods from Chapter 7 asks students to evaluate another person’s argument regarding organic foods. In this activity, students have the opportunity to explore their own dominance structuring around going organic.

1. Follow the instructions as they appear in the text box. Five common reasons supporting organic foods are provided in the exercise. The author discredits the first reason as a fallacy but leaves the other four for consideration. The author also removes the major counterargument by stating that “money is not a problem.”
2. Perform this exercise as a whole class. Read each question aloud and have students write their answers in their notebook.
3. Now show the video clip from *Penn and Teller’s Bullshit!* Remind students to listen to how the speakers react when their arguments in favor of organic foods are shown to be weak or invalid. Close this argument by asking students to reflect on what they have seen and what they understand in terms of the power of dominance structures.
Perform this exercise during class time or assign it as homework. If this is an in-class activity, be sure to give students sufficient time to create a decision map representing the reasons they supported a particular 2012 presidential candidate. They are also asked to create an argument map representing the reasons for supporting the other candidate. In a reflective log entry, have students evaluate their arguments for both candidates using the methods they have learned in previous chapters. Like they did in the Map Your Own Arguments exercise, students should reflect on the question of what it would have taken for them to change their mind and support the other candidate. Call the class together and ask for volunteers to share their reflections with the class. If this is a homework assignment, give students a chance at the next class meeting to share their experiences while doing this exercise.

This activity incorporates several of the elements that have been covered in the course thus far. Therefore this could be used as a summative assessment (in-class or out-of-class exam question). The activity could also be used as a review in preparation of an upcoming exam. Because there are several steps in this exercise, one or more of these steps can be performed as a whole class or in small groups during class time. Alternatively, the mapping portion of this exercise could be assigned as homework and the analysis and evaluation steps can be performed in class. After students have completed this exercise, engage the class in identifying and discussing the critical thinking skills and disposition they used, how they applied what they have been learning in the course so far, and how they successfully monitored their objectivity and impartiality.

Note: The author provides a map of the Schwarzenegger decision in Appendix A.

Perform this activity exactly as it is described in the textbook. Collect students’ responses and use as an opportunity to provide formative feedback.

Allow students ample time to work in small groups to interpret, analyze, and evaluate the scenario as it is presented in this text box. In small groups, discuss what response their senior advisory committee might give the Governor. After the small group discussion, have students prepare an independent recommendation statement that includes their supporting reasons. They should also write their reasons for not recommending the opposite action. Finally, students should respond to the question of what it would take to change their mind or explain why that is not a possibility. Have the students come together in their small groups and share their recommendation. Have the small groups discuss what they learned from this exercise. Share these conclusions as a whole group.

This is an ideal activity to foster independent self-reflection. Students are asked to consider an important upcoming decision. The question prompts in the text box engage students in self-regulated critical thinking as they complete the initial stages of decision making. Have students respond to the questions that the author is posing. If performed as an in-class activity, have students share their answers with a neighbor. Ask students to explain whether this exercise has influenced their decision making on this issue in any way.
End of Chapter Exercise: Small Group Discussion—“Wishy-Washy Flip Floppers” (p. 226)

Use these prompts as discussion starters at the beginning, middle, or end of a Chapter 11 lesson. Use this discussion as an opportunity for students to explore stereotypes and assumptions that are held about leaders and their desperate need for dominance structuring in themselves and others.

End of Chapter Exercise: Optional Bonus Exercise: Death in the West (p. 227)

This bonus exercise features a 1979 BBC documentary on smoking that affords the viewer several vivid examples of dominance structuring. This film includes interviews with executives from Phillip Morris, the manufacturer of Marlboro cigarettes, as well as interviews with American cowboys from the Western United States who were dying of lung cancer, emphysema and heart disease after years of smoking. In these interviews company executives give reasons for why the viewer should not believe cigarettes are causally linked to these deadly diseases commonly found among chronic smokers. As Facione and Gittens mention, this film was suppressed by court order after the BBC was sued by Phillip Morris, so obtaining a copy may be difficult. If one is located, students can be asked to create a transcript of one or more interviews and practice mapping the arguments made by the cigarette company executives and other featured speakers in the film.

Optional Challenge Exercise: Questioning the Beliefs We Are Born Into (p. 227)

This challenge exercise asks students to reflect on the dominance structure that is likely to be built around of religious affiliation. An assumption is made by the authors that most people identify with a religious tradition that they were raised in since their youth and furthermore, most people have not objectively and open-mindedly compared our religious beliefs with the tenets and practices of other major world religions. Therefore, the purpose of this exercise is to build students’ critical thinking skills and habits of mind by asking them to reflect on how much they have dominance structured around the religion of their youth and what it would take for them to thoughtfully and intentionally walk away from their current religious affiliation. This is called a challenge exercise for a reason. These reflections are purposefully difficult to highlight the strength of dominance structuring. Have students conduct their mediations on the questions posed by the authors and prepare a reflective journal response (or alternatively have them prepare a poem, short story, or song) that expresses their thoughts on these challenging questions about questioning some of our deepest held beliefs. [As an alternative, have students conduct this same thought exercise on another deeply held belief that is likely to be grounded in our upbringing, such as political party affiliation.]

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

In the textbook, the lead author describes one of his assignments that is labeled as a “poorly written assignment.” It was poorly written because it encouraged students to first choose their personal position then only after that to defend it rather than eliciting fair-minded, reflective, and rigorous analysis and evaluation of all possible perspectives. In this exercise, students should bring in an assignment from one of the other classes they are taking this term. Have students work in small groups to evaluate how well each assignment will elicit critical thinking.
Ask students to consider whether the instructor who gave the assignment thinks that it will elicit students’ critical thinking. Have students reflect on how they are approaching the assignment: Are they currently approaching the assignment in the same way that the author described the way students approached his poorly written assignment or are they indeed engaging their fair-minded, reflective, and rigorous critical thinking? Have the students in each group record their conclusions about the assignments and their answers regarding their strategies for the assignment. Before the next class period, have students interview their respective instructor about the assignment. Ask the instructor to explain in his or her own words how he or she sees the assignment engaging students’ critical thinking. See what the instructor says. The next day in class, have the students get together in their small groups to discuss the instructor interviews. What is the degree of agreement between students’ ratings of the assignments, what they predicted the instructor’s intentions to be, and what the instructor said? Given what they have learned, do students feel that they are approaching the assignment in the correct way? What if any improvements might they suggest to their instructor to help him or her increase the level of critical thinking the students will invest in the assignment? Discuss the groups’ analyses and recommendations as a whole class. REMINDER: Protect the confidentiality of the instructors when sharing as a group and as a whole class.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically
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For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

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Chapter 12
Comparative Reasoning
*Think “This Is Like That”*

CHAPTER OVERVIEW

Chapters 12–14 are perhaps the most important chapters in this book and must be included in any course on critical thinking. These final three chapters focus on the most powerful and fundamental modes of human reasoning. They address the critical thinking skills of inference and explanation. Chapter 12 answers the question of what are the three most fundamental patterns of human reasoning. In this chapter, students learn how to recognize and evaluate comparative reasoning. Examples and exercises are presented to engage students in identifying the uses, benefits, and risks of comparative reasoning.

CHAPTER LEARNING OBJECTIVES

After completing this chapter, students will be able to:

- Identify the three most fundamental patterns of human reasoning.
- Recognize comparative reasoning.
- Evaluate comparative reasoning.
- Explain the uses, benefits, and risks of comparative reasoning.

DAILY DISCUSSION STARTERS

1. Have students come up with an analogy. Using the five criteria for evaluating comparative reasoning, have the class determine what the top five analogies are that day. Repeat this activity each day that this chapter is studied. Give the students time in class on the first day to prepare their analogy. On alternative days, the students should bring their analogies with them to class.

2. Search the Internet or a printed source for quotes from the late civil rights activist, clergyman, and leader Martin Luther King, Jr. Identify one or more quotes that employ comparative reasoning. Have students interpret the meaning of the analogy. Use this activity to introduce one or more of the five criteria for evaluating comparative reasoning.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT

MyThinkingLab: *Ethics in America—Journalists Embedded with the Enemy*
Thinking Critically: Preliminary Evaluation of Mike Wallace’s Analogy
Text Box: Clichés
Thinking Critically: Keeping It Simple and Familiar
Thinking Critically: Side-by-Side Comparison
Thinking Critically: Practice Using the Five Criteria on Two Analogies
MyThinkingLab: *The West Wing—Fr. Tom Advises President Bartlett*
MyThinkingLab: *Day the Universe Changed—Cosmic Clockwork*
Thinking Critically: Simplicity and Hypothetical Entities
Thinking Critically: Group Discussion—The “Free Enterprise System” Model
End of Chapter Exercises: Reflective Log—Time Travel—Evaluate the Evaluations
End of Chapter Exercises: Jon Stewart: “I Was Wrong — Charlton Heston Was Right”
End of Chapter Exercises: Group—Are Viruses Living Things?
This video clip is a vivid example of Mike Wallace and Peter Jennings, two highly accomplished and respected American journalists, thinking through a high-stakes, novel ethical problem. Show the video clip for the class and ask them to identify why this is such a challenging hypothetical dilemma for the journalists. Ask the students to explain why Marine Colonel Connell is so angered by the journalists’ responses. Use this activity in conjunction with the Thinking Critically exercise that is described in the following paragraph.

**Thinking Critically: Preliminary Evaluation of Mike Wallace’s Analogy (p. 230)**
As the authors suggest, students should attempt to evaluate the analogy that is offered by Mike Wallace. As a place to begin, students are encouraged to apply the four tests of acceptability of an argument presented in Chapter 7. Students are cautioned to keep this evaluation tentative until later in the chapter when they learn the criteria for evaluating comparisons. Have students work in pairs to evaluate Wallace’s analogy. Students should independently record their tentative conclusions in their notebooks so that they are retrievable in the future.

**Text Box: Clichés (p. 235)**
This exercise helps illustrate the fact that clichés are analogies and often form the basis of comparative reasoning. Students should be familiar with the clichés that appear in the text box. The challenge is to identify five more to add to the list. Have students work independently or in groups of 2–3 students. Generate a list of five clichés that are not currently listed. Give students about 5 minutes to create their lists. Share the proposed clichés as a whole class and record them on the board. How many unique clichés did the class come up with?

**Thinking Critically: Keeping It Simple and Familiar (p. 236)**
This exercise enables students to practice creating analogies that pass the tests of familiarity and simplicity. Have students work in groups of 3–4. Students should work together to analyze the similarities and differences of podcast and newspaper subscriptions. Based on this comparative analysis and other things that students know about podcasts, have the group brainstorm how it would explain subscribing to podcasts to someone without technological experience or awareness. Have the groups document their recommended strategies for explanation including any and all analogies that they might use. Call the class together to share its strategies. How many of the groups used the same or similar analogies? Were there any novel explanatory approaches? Use this exercise to demonstrate the power of comparative reasoning to explain an unfamiliar concept or object to a novice learner.

**Thinking Critically: Side-by-Side Comparison (p. 238)**
This exercise enables students to practice applying the test of comprehensiveness to the analogy that booking a hotel reservation in another country is like buying a book online. Have students work in groups of 3–4. Students should work together to indentify and write the steps for purchasing a book from eBay assuming that the individual is a new customer who has never used eBay before. Then have the group identify and write the steps for making an online, international hotel reservation. Again, it should be assumed that the individual is a new customer who has never used the booking service before. As soon as the groups are sure that they have made two comprehensive and complete lists of all the necessary steps, they should compare the lists to one another. The group should record their analysis and evaluations regarding the comprehensiveness of this comparison.
Give students ample time to work together (approximately 10–15 minutes). Have each group report its conclusions with supporting explanations. If there are differing evaluations, determine the source of the disagreement (does each group have the same number of steps in both purchasing processes?). Attempt to come to a resolution or an explanation for why conclusions might vary.

**Thinking Critically: Practice Using the Five Criteria on Two Analogies (p. 238)**

At this point in the lesson, it is time to reconsider and evaluate the comparative reasoning of Mike Wallace. Play the video clip again to refresh students’ memories of the situation and the dialogue. Have students retrieve their preliminary analyses that they recorded in their notebooks. Have students work in pairs to apply the five criteria for evaluating comparative reasoning (it does not have to be the same partner as the first time when they created their preliminary analyses). Have students record their evaluations in their notebooks and explain their conclusions. Call the students back together and review the students’ findings. Go through each of the five criteria, calling on different students to provide their conclusions and explanations. Discuss as a class whether there are incongruities that undercut the comparison that Wallace makes.

**MyThinkingLab: The West Wing—Fr. Tom Advises President Bartlett (p. 238)**

This activity provides students with additional practice in applying the five criteria for evaluating comparative reasoning. Watch the video clip as a whole class and engage the students in the application of each of the five criteria to the analogy offered by the priest. Ask for a volunteer to explain the analogy and then call on different students to analyze and evaluate the five criteria. Invite the quieter students to offer a response in an effort to include everyone’s participation. This activity can be conducted as a whole class either before or after revisiting the Mike Wallace analogy.

**MyThinkingLab: Day the Universe Changed—Cosmic Clockwork (p. 240)**

In this video clip, students hear the analogies and comparative reasoning that served as the foundation of the Aristotelian conceptualization of the universe—a worldview that was highly influential and endured for two millennia. As you show this clip, ask students to listen to what happened as the people of the time grappled with the anomalies that they observed (for example, the human tendency to hold on to a strong belief system and to assimilate or simply accept evidence to the contrary without displacing or amending the original belief). Eventually, however, an alternative proposal of causality emerged and everything that was influenced by Aristotle’s propositions was called into question. Lead a class discussion by asking students to interpret how the people of the time reacted to the increasing evidence that the Aristotelian view of the universe was perhaps incorrect. Follow this with an analysis of the impact on the European people and culture when this worldview was dismantled and replaced with a completely new guiding metaphor. Close this exercise with a group reflection on what enabled the thinkers of the time to boldly propose that the sun, not the Earth, was the center.

EXTENTION: Ask how “atom smashing” and “string theory” might be a powerfully guiding analogy for physicists in the 20th and 21st Centuries.

**Thinking Critically: Simplicity and Hypothetical Entities (p. 240)**

As an extension of the previous exercise, consider the simplicity criterion in relation to the argument presented by Copernicus for the orbits of the Earth and the sun. Listen again to the video clip from the *Day the Universe Changed* and have students attend to the notion of simplicity as commented on by the narrator James Burke. Have the students work in small groups to answer the questions that are posed in the text box.

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Give the groups adequate time to discuss each question before the group comes together. As a whole class, discuss these questions and the students’ responses. Incorporate into this discussion the use of hypothetical entities as explanations for observation. Pay particular attention to the criterion of testability when using hypothetical entities that are themselves not observable. Be sure to ask how one might test the existence of orbits, atoms, germs, and angels. Have students explain their proposed strategies in each case.

**Thinking Critically: Group Discussion—The “Free Enterprise System” Model (p. 242)**

This exercise tests the generalizability of the free enterprise system principle of “the law of supply and demand.” Three contexts in the American economy that seem to be at odds with the law of supply and demand are presented. Divide the students into groups of four to five and assign each group one of the three contexts to discuss. Have each group analyze and evaluate the degree to which the free enterprise model fits within the context of each group using the criteria each has learned in the chapter. Each group should prepare to respond to the questions that are posed in the text box: How well does the comparison aid in understanding higher education (or health-care services or organized religion)? In what ways is the comparison problematic because it doesn’t fit? Have the groups report to the whole class the results of their evaluations and their conclusions regarding the degree to which the free enterprise system model assists in understanding the context the group is considering. If you have more than three groups running in the classroom, be sure to have each group participate in the reporting by having different groups attend to each question or make additional comments and contributions to the discussion. Each group should be able to report on the process it undertook to think critically during this activity.

**End of Chapter Exercises: Reflective Log—Time Travel—Evaluate the Evaluations (p. 244)**

As the authors suggest, students should pause after reading the analogies for time and write a reflective journal entry in which they document their evaluation of these comparisons. After students have made their entries, they are asked to read two critiques and evaluate those responses. Students should follow their evaluations of the critics with a proposed response that the advocates of each perspective would give to their critics. Students should close this reflective entry with their own conceptualization of time. (Encourage students to respond to the bonus question, which asks if time travel is possible.) Collect students’ entries and use them as an opportunity to provide formative feedback. Students might appreciate the opportunity to share their views on time and time travel with the class. As students share, have the class consider how well these alternative analogies or model of time stand up to the five criteria for evaluating comparisons.

**End of Chapter Exercises: Jon Stewart: “I Was Wrong – Charlton Heston Was Right” (p. 245)**

In this exercise students are given an opportunity to practice identifying comparative reasoning and evaluating this form of reasoning in a clip from the Daily Show starring Jon Stewart. Facione and Gittens provide some information to assist students in identifying the two places in Stewart’s opening monologue where he draws an analogy between the controversy over protests against the NRA in 1999 and protests against the planned building of a Muslim Community Center near Ground Zero in New York. Have students work in pairs or small groups to apply the strategies described in this chapter to evaluate the comparative reasoning in this episode. Have each group create an electronic presentation that summarizes their evaluation and overall conclusions. These presentations can be posted to the course’s learning system for comment by classmates if there is a discussion board function available.
End of Chapter Exercises: "Ticking Time Bombs" (p. 245)

This exercise engages students in the evaluation of comparisons such as “ticking time bomb” that are used in arguments made in a 20/20 news feature. Conduct this exercise either as a whole class as a chapter review (or it can be assigned as homework). Show students the 20/20 video. Ask students to reflect on the argument made by an attorney in the video that selling a product that is known to be dangerous is ethically wrong. Ask the questions posed by the authors in this exercise and record students’ responses on the board. Do students agree or are there differences of view? Discuss any differences, reminding students that they should provide reasons for the perspective they are advocating. Conclude this exercise by challenging students to develop comparisons that would represent their ethical position in this case. After the class discussion, give students 5-10 minutes to write a journal entry about what they have learned about the power of comparisons and analogies in ethical decision making.

End of Chapter Exercises: Group—Are Viruses Living Things? (p. 245)

In this final chapter example, students are asked to determine whether viruses are living organisms. Have students work independently or in pairs to complete this activity. It can be given as an in-class assignment or as homework. Students are asked to locate a scientific definition of “living organism.” Students must interpret this scientific definition and evaluate whether viruses qualify. Have students or partners write their conclusions and provide the reasons that explain their decisions. This activity also involves the identification of useful comparisons to explain “viruses” to the general public. Have each student or partnership create two comparisons that they would recommend to be used by the Department of Health or the Center for Disease Control in their brochures or Web sites to explain viruses to the average adult. CHALLENGE: Facione and Gittens extend this exercise by asking students to consider whether nanobots are living things according to the definition of living organism that was used in reference to viruses. Run this second portion of this exercise as described above, or conduct a whole class discussion after debriefing students’ conclusions regarding viruses.

End of Chapter Exercises: The Politics of Health Care (p. 245)

In this exercise students are asked to review news stories covering the 2010 Affordable Health Care Act and the decision by the White House in 2011 to invite the U.S. Supreme Court to rule on the constitutionality of the legislation. Have students work independently or in small groups. Have students locate at least four separate news sources and analyze these reports for examples of comparative reasoning by the spokesperson. These can be either print or electronic media. If working in small groups, ask each group to select the source example with the most incidences of comparative reasoning and share that with another group (or with the whole class). Were some news sources more likely to have comparative reasoning examples than others?

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

Don’t forget to vote!

- Many Americans don’t go to the polls because they feel that their vote doesn’t make a difference. Have students work in small groups to develop compelling analogies that send a persuasive message of the importance of voting to those who might feel like their vote doesn’t matter. The group’s reasoning must stand up to the five criteria of evaluation for comparative reasoning.

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Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically

Students can access chapter summaries, exercises, and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

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Chapter 13
Ideological Reasoning
Think “Top Down”

CHAPTER OVERVIEW
Chapter 12 introduced the three fundamental patterns of human reasoning: comparative, ideological, and empirical. Students learned how to recognize and evaluate comparative reasoning. In Chapter 13, the attention turns to ideological or “Top Down” reasoning. Examples and exercises are presented to engage students in recognizing and evaluating ideological reasoning. Through this chapter, students learn the uses, benefits, and risks of ideological reasoning.

Things to Remember:
Ideological arguments are deductive in nature. They are a form of deductive reasoning but do not encompass all forms of deductive arguments. There are other forms of deductive reasoning that are not ideological in nature. It is important to remember that the benefits and risks of ideological arguments discussed in this chapter do not apply to all deductive arguments.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Recognize ideological reasoning.
• Evaluate ideological reasoning using the four tests of worthiness of an argument.
• Explain the uses, benefits, and risks of ideological reasoning.

DAILY DISCUSSION STARTERS
1. Write the word “ideology” on the board.
   • Start a brainstorming session to elicit common associations with the term and related terms (for example, ideological, ideologies, ideologic, ideologue, and so on). Ask follow-up questions to elicit examples of common social or human ideological domains. Use this discussion as an introduction of how “ideology” is used in Chapter 13. It is important to have students understand how “ideology” is used as a value-neutral term that refers to ideas that express concepts, opinions, beliefs, principles, or doctrine.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
MyThinkingLab: Friedman Legal Analysis CNN
Thinking Critically: The Media and Politically Engendered Cynicism
Thinking Critically: Assessing Our Convictions
Thinking Critically: Faith in Adversity—The Book of Job
Text Box: Nineteenth-Century Ideologies and Twentieth-Century Wars
Thinking Critically: Group Project—Conflicting Principles and Conflicting Positions
Thinking Critically: Group Exercise—Why Do We Believe What We Believe?
MyThinkingLab: The Courage to Challenge the Ideologue
End of Chapter Exercise: Reflective Log—The Military Draft
End of Chapter Exercise: Group Discussion—What Ideals Would You Go to War to Defend?

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End of Chapter Exercise: When Ideologies Clash

**MyThinkingLab: Friedman Legal Analysis CNN (p. 248)**
In this video clip, CNN commentator and civil rights attorney Avery Freeman provides viewers with a legal analysis of the same-sex marriages issue. Have students access this video clip and listen to the ideological argument that Freeman presents. As a whole class, identify the claims and reasons embedded in the statements given by Freeman. What implicit assumptions are made in this ideological argument? Close this activity by having students review the argument map in the text that represents Freeman’s analysis. Did the class identify the same central claims and reasons? Did the class recognize this ideological issue as a conflict of rights [those of the individual versus those of the people of the state of California]? Use this exercise to introduce the chapter theme of ideological reasoning.

*** Note that there are ideological arguments being made on both sides of the gay-marriage issue. ***

**Thinking Critically: The Media and Politically Engendered Cynicism (p. 250)**
Has there been a time when you have heard a network news report that you felt was biased or slanted toward a particular perspective? Do you prefer one news channel over the others because you feel that they share your perspective on most issues? Does the vast array of readily available social and mainstream media promote reasoned public discourse and democracy or hinder it? In this activity, students should work in small groups to answer the questions posed by the textbook authors. Each group should formulate a response to the question of policies to promote objectivity in the media without suppressing free speech. After groups have had some time to work, call the class together and ask for a show of hands to determine what perspectives have resulted in the small group discussions. Ask a representative from each group to present the group’s conclusions and recommended policies. Close this activity by asking students whether they are persuaded by the arguments provided by their classmates. How can we use the results of this in-class activity to better understand the accusations of bias that are bandied around in the media?

**Thinking Critically: Assessing Our Convictions (p. 255)**
This exercise requires students to practice their critical thinking habits of mind of truth-seeking and open-mindedness to objectively evaluate beliefs about a variety of topics. This activity challenges students to courageously consider the evidence or experiences that they would accept as proof against ideas that they hold with great conviction.

1. Have students follow the instructions that appear in the text box. They should independently decide whether they believe the 25 statements to be True, False, or if they feel Uncertain about the topic.
2. Perform the first aspect of Step 2 as a class. Ask students to share their recollections regarding the risk of dominance structuring that were discussed in Chapter 11. After the risks have been described, remind students of the instructions to approach this activity with truth-seeking, open-mindedness, and objectivity.
3. Proceed in one of the following manners:
• Have students work independently on Steps 3–5 during class time. Be sure to give students ample time to work through each step. Students should write their responses to be turned in during the class meeting.
• Have students work independently on Steps 3–5 as a homework assignment. Students should write their responses to be turned in during the following class meeting.
• Have students work in small groups. Starting with statement 1, ask students who said “true” to sit together, those who said “false” to sit together, and those who wrote “uncertain” to sit together. Have the groups work together to perform the appropriate reflective step. Proceed with the next statement (or select statements at random) and have the students shift to the group that represents their perspective. After a few rotations, have students return to their desks. Students should write their responses for Steps 3–5 for three statements that either were or were not discussed in the small groups. These written responses can be collected that same day or at the following class meeting.

4. During the following class session, ask students to reflect on this exercise. Ask students to share what this activity taught them in terms of their convictions and their critical thinking.

**Thinking Critically: Faith in Adversity—The Book of Job (p. 257)**

It is an interesting proposition to consider mapping the arguments found in the Judeo-Christian Bible, which is exactly what the textbook authors are asking students to do in this activity. *Faith in Adversity: The Book of Job* can be assigned as an out-of-class activity, an extra credit project, or as an in-class demonstration of how to identify an ideological argument. If performed in class, consider bringing in passages from the Book of Job for your students to work from. Begin an in-class discussion by asking students whether they are familiar with this Biblical story of Job and the test of his faith. Have students respond aloud or in writing to the questions that appear in the text box.

**Text Box: Nineteenth-Century Ideologies and Twentieth-Century Wars (p. 258)**

“Science made subservient to ideology will always pose a grave danger for us all.” Students have the opportunity to see the truth of Facione and Gittens’s statement illustrated in the “Fit to Rule” segment of the *Day the University Changed* series. Write the quote from the textbook on the board and show the video clip to the class. After the video clip and before any discussion, have students complete a 5-minute quick-write paper explaining their interpretation of the meaning of the authors’ quote. After you collect the papers, have small groups or a whole class discussion in which students compare their interpretations. Use the Quick Write as an opportunity for formative feedback and perhaps also a graded assignment.

This exercise provides another opportunity to weaken the grip that cultural relativism has on the minds of some. Ask the students to discuss implications of the realization that Capitalism is simply an economic misunderstanding of Darwin, just as Communism was. Are their politicians today who advocate economic policies based on this confusion?

**Thinking Critically: Group Project—Conflicting Principles and Conflicting Positions (p. 261)**

This activity is ideal for a small group, out-of-class assignment. Have students form groups of 3–4 students who share an interest in one of the three topics presented in the text box. (Consider allowing students to propose alternative topic ideas. Be sure that these proposed conflicts fit the requirement of being fueled by two ideological perspectives.)
Give students at least two days and perhaps a full week to conduct their research. Groups should prepare talking points, handouts, a PowerPoint or other multimedia presentation of their findings. Have students present their research to the whole class (if your course has a small to medium enrollment) or to another group (if your course has a medium to large enrollment). If small groups make presentations to one another, be sure to provide time for both groups to give their presentations.

**Thinking Critically: Group Exercise—Why Do We Believe What We Believe? (p. 262)**
This exercise is intended to be used as a group activity. Students are given the opportunity to generate and analyze the reasons to believe certain commonly asserted ideological claims are true or false.

1. Perform this activity as a whole class discussion.
2. Consider each statement in turn. Give students ample time to interpret each statement and think of a response (give the class at least 10–15 seconds of silence before letting anyone speak!).
3. Brainstorm the reasons why the statement might be true and the reasons the statement might be false. Record these reasons on the board or on an overhead projection system.
4. The challenge of this activity is to maintain objectivity—students must suspend their dominance structuring around one side of the position or the other.
5. BONUS: Evaluate the logical soundness, and acceptability of each argument that is generated. Can the class have confidence that these reasons represent their collective strong critical thinking?
6. Close with a reminder that this exercise provided practice of the habits of mind of truth-seeking and open-mindedness, and critical thinking skills. Praise students if they achieved a level of objectivity that is characteristic of strong critical thinkers.

**MyThinkingLab: The Courage to Challenge the Ideologue (p. 263)**
In this video clip, students view a dramatic recreation of a conversation that might have taken place at CBS when journalists Edward R. Morrow and Fred Friendly decided to engage Senator Joseph McCarthy. This clip is a striking example of the speech and behavior of an ideologue who held a position of political power. Play the video clip for the class. Have students discuss the dispositional characteristics, skills, and ethical values of the journalists that likely gave them the courage to take on Senator McCarthy.

**End of Chapter Exercise: Reflective Log—The Military Draft (p. 265)**
This is a wonderful opportunity to have students reflect on a hypothetical situation that was reality for previous generations—a military draft.

1. Have students prepare a reflective log entry where they consider and respond to the questions that the authors are posing.
2. Certain assumptions should be made including the fact that the student is the right age and otherwise fully qualified and eligible to enter the military as a soldier should the call to serve come.
3. Assign this log as an out-of-class activity. Collect the written entries for a letter grade or for purposes of providing formative feedback.
4. Before you collect the entries, have students share their recommendations to their state representatives and senators with a partner, small group, or the whole class. Then ask students to rate their thinking using the Holistic Critical Thinking Scoring Rubric.
5. Close this activity by asking whether there is evidence in their recommendations and reasoning that they approached this task with fair-minded, objective critical thinking. Have them record their HCTSR self-ratings in their journal entry and add their reflections for why they did or did not engage in strong critical thinking on the topic of the military draft.

End of Chapter Exercise: Group Discussion—What Ideals Would You Go to War to Defend? (p. 265)
This exercise is designed to be run as a small group discussion. Form groups of 3–5 students. Have the students follow the instructions as they appear in the text box. In their groups, students should share with their peers the list of things that they personally feel are worth going to war over. It is acceptable to assert that there is nothing worth war. Students should provide reasons to support their assertions—for every worthy ideal, there should be a list of reasons. If there is not a worthy idea, that claim must be supported with reasons. Ask each group to generate a list of ideas that they all agree are worth warfare in order to protect. Are there any ideas that one or more group members would fight to defend that others in the group would fight to defeat? Give the students 10–15 minutes to discuss these ideas. Then ask students to write an independent response, with supporting reasons, to the question of what in their view is worth going to war over. Collect these responses and use them as a participation grade or to provide formative feedback.

End of Chapter Exercise: When Ideologies Clash (p. 265)
This exercise asks students to view the film Capitalism: A Love Story (2009) and develop an independent, reasoned, and evidence-based analysis of filmmaker Michael Moore’s claim that contemporary American Capitalism is at odds with the ideals of Democracy, Christianity, and Socialism. As Facione and Gittens point out, given that these ideologies are themselves at odds with one another, it would not be reasonable to conclude that there is no incongruence (for example, that the claim is false). Students should explain their analyses and provide recommendations to reconcile the ideological conflicts. This activity is well suited as an out-of-class assignment. It could be assigned as an independent project or as a partner or small group activity. Depending on how you choose to use this exercise, you might want to have students submit their analysis, recommendations, and explanation for a course grade or alternatively as an extra-credit assignment or a make-up assignment.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

“Ideological convictions enable us to escape the suffocating malaise of relativism.” —Facione & Gittens (p. 261)
- Lest students think that ideological reasoning will lead inevitably to unrelenting commitment to misleading or misguided principles, Facione and Gittens offer students this insight into a major benefit of this approach to reasoning. Have students complete a 5-minute Quick Write paper explaining their interpretation of the meaning of the authors’ quote. After you collect the papers, have small groups or a whole class discussion in which students compare their interpretations. Use the quick write as an opportunity for formative feedback and perhaps also a graded assignment. Use this activity to initiate a discussion of the benefits and risks of ideological reasoning.

Please refer to the THINK Critically Web site for additional exercises and assignments.
**ACCESSING RESOURCES for THINK Critically**

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For access to the instructor supplements, simply go to [http://www.pearsonhighered.com/educator](http://www.pearsonhighered.com/educator) and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

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Chapter 14
Empirical Reasoning
Think “Bottom Up”

CHAPTER OVERVIEW
In the previous two chapters, students learn how to recognize and evaluate comparative and ideological reasoning. In Chapter 14, the attention turns to the third fundamental reasoning pattern: empirical or “Bottom Up” reasoning. As with earlier chapters, examples and exercises are presented to engage students in recognizing empirical reasoning and learn the uses, benefits, and risks of empirical reasoning. The steps for conducting an empirical investigation are explained and illustrated through real-life examples that engage the students’ thinking and interest.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Describe the three central characteristics of empirical reasoning.
• Describe the steps in conducting an empirical investigation.
• Explain the uses, benefits, and risks of empirical reasoning.

Things to Remember:
Empirical reasoning is one form of inductive reasoning, but not the only form. Comparative reasoning (Chapter 12) is another form of inductive reasoning. The uses, benefits, and risks attributed in Chapter 14 to empirical reasoning do not attach to all forms of inductive reasoning.

DAILY DISCUSSION STARTERS
1. Do attractive men smell better to women? What about attractive women, do they smell better to men?
   • Perform the small group activity “Physical Symmetry, Sexual Attractiveness, and Smell.” Do this activity as the kick-off to this chapter to introduce the idea of empirical reasoning by demonstrating that the students have the skills to think like an empiricist. This will build their critical thinking self-confidence and lessen apprehensions they might have about scientific research methods. Start the activity by writing the following prompt on the board: “Do attractive men smell better to women?” Have some fun making the expression “attractive people” operational. Have some fun too by imagining ways to separately evaluate male subjects for attractiveness, both for how they smell and how they look, without having the women see and smell the men at the same time. Perhaps an article of clothing could be used or pictures. Ask students what they would do to prevent the person who is conducting the experiment from accidentally tipping off the women with regards to which article of clothing belongs to which male subject. In this way, create a “blind,” and if needed a “double blind” to protect the validity of the experiment. Would any foods have to be ruled out? What about cologne or laundry soap? How would symmetry be established? Recalling the discussion about correlations from Chapter 9, is this empirical investigation looking into a causal hypothesis or merely a correlation?
   • See additional notes on this exercise later in this IM chapter.
2. Choose a current event taken from the campus newspaper or the local news. Identify a problem currently being reported that the class determines is significant and could be turned into a testable hypothesis. Have students design a study to test the hypothesis they have formed to better understand the current event.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor's Manual.

**EXERCISES AND VIDEO CLIPS FROM THE TEXT**

- **MyThinkingLab: Walter Reed’s Yellow Fever Experiment**
- **Thinking Critically: Measurable Manifestations**
- **Text Box and MyThinkingLab: Small Group - Physical Symmetry, Sexual Attractiveness, and Smell**
- **MyThinkingLab: Cosmos—Aristophanes and the Well with No Shadows**
- **End of Chapter Exercises: Group Exercise — Design the Initial Steps in a Scientific Investigation**
- **End of Chapter Exercises: Evaluate Reports of Empirical Research**
- **End of Chapter Exercises: Reflective Log—Comparative, Ideological, and Empirical Reasoning**

**MyThinkingLab: Walter Reed’s Yellow Fever Experiment (p. 269)**

Without an understanding of how Yellow Fever was spread from person to person, the people of the eighteenth and nineteenth centuries tried to no avail to stop the spread of the lethal disease. Even when the hypothesis that mosquitoes were the vector was advanced by Carlos Juan Finley, this was ignored because the medical community did not believe that mosquitoes could transmit human diseases. It took nearly two decades before Major Walter Reed conducted his experiment that tested the two competing explanations for the transmission of Yellow Fever. Use this exercise to introduce the language of empirical reasoning.

1. Have students access [www.MyThinkingLab.com](http://www.MyThinkingLab.com) to review the details of Reed’s experiment.
2. Perform this activity as a whole class. Ask students to identify the following elements as they pertain to the Yellow Fever example: study objective(s), hypotheses, theories, experimental design, protocol, subjects, condition(s), data, results, findings, and conclusions.
3. As students identify elements of Reed’s experimental investigation, write the appropriate term on the board. Ask students: Why are ___________ (for example, subjects, conditions, data, and so on) crucial to the empirical reasoning process?
4. Ask students: Why did Reed put up a screen around the outside of the huts? Why did he put a screen on the inside of Hut 2?
5. **CHALLENGE**: What if Reed had decided to have only one hut with filthy clothing and bedding on one side and infected mosquitoes on the other. Would that have been sufficient?
6. Close this activity by having students summarize in their own words the steps in an empirical investigation.
Thinking Critically: Measurable Manifestations (p. 271)

This exercise engages students in the generation (or, in this case, completion) of a testable hypothesis. Students must generate a relevant prediction that qualifies as a measurable manifestation. For this reason, this activity requires more than a simple “fill-in-the-blank” response. In each of the five example hypotheses, students must support their prediction with clarifications or expanded descriptions of the exact conditions under which their prediction will be observed. Use this activity to demonstrate the principles of testability, generalizability, and the trade off that often must be made for sufficient control of extraneous factors.

1. Have students work in pairs for this exercise. Divide the five examples among the class so that each example is discussed by at least two partner groups.
2. Give students ample time to complete their examples. Pairs should write the complete statement of the hypothesis. They should also write any necessary clarifications and expanded descriptions of the experimental conditions. For each clarification and expanded description, students should provide an explanation for why it is helpful for understanding their hypothesis statements.
3. Call on volunteers to share their hypotheses and additional statements. Call on a different volunteer to interpret and explain why that partnership made the additional statements. If the explanation is different from what the original pair of students wrote, have the original pair give their reasons for the statements. Discuss why this discrepancy occurred. (Perhaps there are additional reasons that the statements are helpful besides the ones that the original pair wrote down. That would be fine. However, discrepancies might be signals that the conditions are not testable or that they lack sufficient description).
4. Have partnerships who worked with a particular example share their hypotheses in the methods described previously before moving on to the next example.
5. Close this exercise by asking students to analyze the variations that were heard even when groups had started with the same example. Ask students: How does this observation of variation related to the three characteristics of empirical research (inductive, self-corrective, open to independent verification, and so on).

Text Box and MyThinkingLab: Small Group - Physical Symmetry, Sexual Attractiveness, and Smell (p. 272)

This is wonderful illustration of the critical thinking that is involved in the design of an experiment. Students must engage their skills of interpretation, analysis, evaluation, and explanation to create well-designed studies. With every suggestion from a classmate regarding a potential protocol to follow or an extraneous factor that needs to be controlled, students will monitor and self-regulate their thinking to adjust the experimental design. Use this activity to build your students’ critical thinking self-confidence.

1. Perform this activity as a whole-class discussion.
2. Read the hypothesis aloud and ask students to consider how they might design an experiment to test it.
3. Document the key design ideas that students generate regarding study protocol, subject characteristics and participation, experimental conditions, measurement strategies, data collection, experimental control, potential confounds, and so on.
4. Lead the discussion by asking questions consistent with the ones that would be considered by empiricists when planning this experiment. For example, how do you measure and evaluate symmetry? How do female subjects rate “sexual attraction” without being influenced by the looks of the man they are rating? What does it mean to “smell better” and how do you measure females’ ratings on that variable? What might affect the way a man smells?

5. Ask students: Let’s assume that you find a correlation between women’s ratings of sexual attraction and odor and men’s symmetry. What is a possible explanation for this finding? (Symmetrical faces are more likely to be evaluated as attractive. Symmetry is an indicator of physical health and strong genetics, therefore, increasing the likelihood of survival and health of off-spring, the role of pheromones in the attraction between males and females for human reproduction.) Close this exercise by reviewing the articles available from www.MyThinkingLab.com to compare the students’ study plans to the ones that have been conducted by other researchers.

MyThinkingLab: Cosmos—Aristophanes and the Well with No Shadows (p. 273)
Examples of empirical reasoning can come from modern-day science, like the symmetry study illustrates, and they can come from Ancient History, too. In this video clip, students hear the details of Aristophanes’ empirical reasoning that led to his conclusion that the curious shadows could be explained only if the Earth was, in fact, curved.

1. Perform this activity in the same manner as the Walter Reed’s Yellow Fever Experiment video clip.
2. Have students describe and analyze the experimental methods used by Aristophanes. Ask students: What evidence did Aristophanes use to develop his empirical argument?
3. BONUS: What did we learn in Chapter 13 about ideological reasoning that might explain why the belief that the Earth was flat prevailed despite Aristophanes’ argument to the contrary?

End of Chapter Exercises: Group Exercise—Design the Initial Steps in a Scientific Investigation (p. 279)
In this exercise, students are asked to design the first steps of a scientific investigation into the claim that global warming will result in a rise in sea level of as much as 10 feet. Refer students to the “Steps in a Scientific Investigation” table that appears on pages 275-276. This table illustrates with two examples the steps that are relevant to this activity. Have students work in small groups of 3–5 students. This activity can be conducted in class or assigned for outside-of-class time. Students should carefully consider each question as it is posed in the text box and craft a group response. Each group should prepare a presentation to give to the class. The presentation should include a visual representation (poster, handout, PowerPoint, and so on) of the research design that they have initiated. Prepare a Self-Assessment/Peer-Evaluation form that the group members can use to evaluate themselves and the audience can use to provide narrative feedback to each group after they have given their presentation. Students might evaluate one or more of the following:

• The logical strength of the arguments given for determining the significance of the problem
• Whether the articulated hypotheses are testable
• The quality of critical thinking exhibited by the group to determine what factors to measure to support or disconfirm the hypothesis, and what factors might confound the evidence being gathered. (Characterize the thinking as strong or weak, and explain why.)

Collect written group responses, the group’s visual presentation, each member’s self-evaluation, and the peer evaluations to be used for formative feedback or a course grade.

**End of Chapter Exercises: Evaluate Reports of Empirical Research (p. 279)**

After students have learned the steps of a scientific investigation, they will notice how few of the steps are reported in the media other than the findings of a scientific study.

1. As the authors suggest, have students work independently or with a partner to identify a recent news report of a scientific study. It is important that students do not review an online publication of original research, so check that they understand the task of locating a story about a scientific study.

2. Have students review the “Steps in a Scientific Investigation” table on pp. 203–204 and determine which of the steps are reported in the news story. Students should then evaluate the quality of scientific research in the study based on what they have learned in the news report. (Evaluations should be influenced by the degree to which the study seems to fulfill the steps in the table.) Have students or partners submit their written analyses.

3. **CHALLENGE:** To extend this activity, have students locate the original published study of the newspaper report. The student or the pair should repeat the steps of evaluation, this time using the scientific article. Compare the evaluation decisions. Close this activity by having students share their findings from one or both of these evaluations.

4. **ALTERNATIVE:** Supply students with the newspaper article so that they work from the same example. After they have completed this exercise with a common example, you can have them repeat the process with a news story of their choosing. Use the written reports as an opportunity for formative feedback or a course grade.

**End of Chapter Exercises: Reflective Log—Comparative, Ideological, and Empirical Reasoning (p. 279)**

This reflective log assignment asks students to consider what they have learned in Chapters 12–14, as well as in the course to this point, to describe the relative strengths and weaknesses of comparative, ideological, and empirical reasoning. Furthermore, students are to evaluate and come to a decision as to which of the three fundamental patterns of human reasoning is most valuable. This wouldn’t suffice as a critical thinking exercise if students were not also asked to provide an explanation for this decision and support the explanation with examples.

This reflective log could be given as an end-of-term final exam question. The student should be evaluated on the degree to which he or she demonstrates an accurate explanation and a fair-minded evaluation of the three patterns, provides a thoughtful and thorough analysis of the relative strengths and weaknesses of these three patterns of reasoning, and the logical strength and clarity of his or her explanation of their choice of which one is most valuable.
As was the case throughout the book, whether one agrees with the perspective advocated or not, a strong critical thinker will approach the thinking task with true-seeking, open-mindedness, maturity of judgment and objectivity. Use this activity as an opportunity to provide summative feedback on the student’s growth as a thinker and as a result of his or her diligent work in your course.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

Can your shoes make you fit?

- Wearing the EasyTone walking shoe by Reebok will tone the legs and buttocks muscles better than regular walking shoes. This advertiser claim has been very effective as evidenced by sales figures, but has it been investigated scientifically? A recent story in The New York Times (December, 2009) describes the research to support this claim. Have students access the on-line newspaper article and evaluate the empirical reasoning that supports this conclusion. Ask students: Can we evaluate the empirical reasoning using the four tests of the worthiness of an argument? Why or why not? Referring to the “Steps of a Scientific Investigation” table on pp. 275-276, what steps are reported in the news article? Is there a way to confirm this news report by reading the original research? Why or why not? So what should the consumer believe about the fitness advantage of this brand of shoe? What cognitive heuristics might be contributing to a consumer’s decision to buy this shoe?

- Perform this activity as a whole class, small group, or individual student assignment.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically

Students can access chapter summaries, exercises, and video files of the complete chapter at www.MyThinkingLab.com.

For access to the instructor supplements, simply go to http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Chapter 15
Write Sound and Effective Arguments

CHAPTER OVERVIEW
Chapter 15 focuses on the connection between critical thinking and the writing process. In this chapter, Facione and Gittens introduce students to the critical thinking questions that writers ask, and give numerous examples of what it means to “thinking like an author”. The four key elements of the rhetorical situation are introduced: author, audience, purpose and presentation. As the authors demonstrate, critical thinking about how to organize and develop a sound and effective presentation involves mapping out the arguments, evaluating the credibility of sources, prewriting, writing and rewriting, and ultimately evaluating the effectiveness of one’s writing. A rubric for evaluating the effectiveness of writing is provided in this chapter as well as numerous practical examples, activities and exercises for students to use as their strengthen their critical thinking and writing skills.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
- Identify the critical thinking questions that effective writers ask.
- Explain how effective writers organize and develop their presentations.
- Evaluate the credibility of sources.
- Evaluate the effectiveness of one’s own and others’ writing.

DAILY DISCUSSION STARTERS
1. Have students bring in a writing assignment that they have from another class that they are taking. Select one of the examples from the class and use it as the example for this whole group discussion. Ask the class to respond to each of the four critical thinking questions from page 283 in the chapter about the rhetorical situation. When multiple interpretations are possible, engage the students in evaluating the relative merits of each option.
2. Bring in one or two examples of introductions from students’ papers that you have graded in the past (do not select papers from the currently enrolled students). Make sure that these papers have “ho hum nap time” opening paragraphs. Ask the students to propose alternative language for the opening paragraph that would convert the example to an “Okay, I’d like to read some more” introduction.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or suggested Lecture Extensions in the Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
MyThinkingLab.com: 2010 State of the Union Address
Thinking Critically: A Dozen Office E-Mail No No’s
Thinking Critically: Gullible, Uncritical Searchers Make the Internet a Liar’s Paradise
End of Chapter Exercise: Letters to the Editor about College Application Essays
End of Chapter Exercise: Letters to the Editor of the City or Campus Newspaper
End of Chapter Exercise: Penn Jillette on Connecting with the Audience
End of Chapter Exercise: Research for the Campus President
End of Chapter Exercise: Reflective Log – Analyze your Own Prior Writing
End of Chapter Exercise: Group Project – Artificial Sweeteners
End of Chapter Exercise: Employer Exploitation Fashion Models
MyThinkingLab.com: 2010 State of the Union Address (p. 281)

In this opening story Facione and Gittens highlight the critical thinking of political speech writers such as the ones that were involved in the preparation of President Obama’s 2010 State of the Union Address as well as Governor Bob McDonnell’s response. Video clips for these speeches are available from www.MyThinkingLab.com. Use this opening exercise as an introduction to this chapter by asking the class to respond as whole group to the questions asked by the authors. Have students work in pairs to describe the author, audience, purpose and presentation in these two rhetorical situations. Pairs should report out their conclusions to the class. Document the responses on the board. Use this exercise to introduce the concept of critical thinking about the rhetorical situation.

Thinking Critically: A Dozen Office E-Mail No No’s (p. 291)

This Thinking Critically box lists twelve strategies for maximizing the effectiveness of office email communications. Arguably, these email communication strategies can extend to other email communication contexts. For this exercise, have students develop analogous lists of successful communication tactics for one or more of the following:

- Campus emails to faculty and staff
- Emails between students working on a group project
- Course Electronic Discussion threads (posts and comments)
- Tweets or Social Networking posts

Have students work in pairs or small groups, Have each group share their lists with another small group. Create a master list synthesizing the tactics from each group. Compare lists across groups who worked on different types of audiences to see what similarities and differences are noted. Complete this exercise before you begin your discussion of crafting a presentation.

Thinking Critically: Gullible, Uncritical Searchers Make the Internet a Liar’s Paradise (p. 297)

This exercise is one of the authors’ favorites for demonstrating the need for vigilance in evaluating the credibility of Internet sources and the potential for snap judgments regarding credibility from Web addresses and “home pages” that appear credible on face value. Run this exercise in a computer lab where students can search the sites independently as well as view them projected in the front of the room.

1. Before looking at any sites, have students rank order the sites in term of likely credibility based on their Web addresses alone. By a show of hands, determine the sites that the class as a whole feels are likely to be the most and least credible.
2. Ask each student to review the websites one by one. Remind them to thoroughly investigate each site moving further than simply the home page.
3. Have students to prepare for each Website a 2-3 sentence summary of the author(s)’ credentials, organizational affiliations, accuracy of information and any biases that are detected. Collect these responses to gauge how well students are able to analyze the credibility of these sites. Use this information to determine what further instruction is needed to support students’ ability to evaluate source material.
4. ASK: Which one is the hate site? How quickly did you come to this realization? What evidence did you use to draw this conclusion?
5. Ask students to reconsider their rankings of the four Websites. Have their conclusions changed as a result of analyzing each site in detail? By a show of hands, see how many students have changed the order of their rankings. Also by a show of hands, see if the overall class rankings have changed.
6. Close this exercise by asking students to work in pairs to respond to this hypothetical situation: Your little sister [or brother] who is a middle-school student, has come to you with these websites and has used them in a paper for school. You see that the paper contains claims that you know are not valid. What could you say to help your sibling think critically about the credibility of these sources? Give the students 5-10 minutes to come up with some tactics to explain how to evaluate the credibility of Internet sources. Call the class together and ask the pairs to share some of their tactics. Be sure to have students explain why the tactic that they are proposing is likely to be effective.

_End of Chapter Exercise: Letters to the Editor About College Application Essays (p. 303)_

This exercise provides students with an opportunity to use the Rubric for Evaluating Written Argumentation (REWA) to evaluate a newspaper story as well as the letters to the editor received about that front page story. The purpose of this exercise is to give students practice in using an evaluative rubric, to help them become familiar with the language and structure of the REWA and to apply their critical thinking skills of analysis and evaluation to a written argument that is not their own. Ultimately, once students are familiar with the REWA they should be encouraged to use it to evaluate their own writing, but beginning with another person’s written argument can reduce the degree of dominance structuring around any preconceived (positive or negative) evaluation. Use the REWA as an “analytic” rubric, meaning that an evaluative judgment should be made for each of the criteria (rows) of the rubric. If this is the first time that the students are using the REWA then have students evaluate the newspaper story along only the first two or three criteria and then discuss the results as a class before having them use the full REWA. Explain that this process of evaluating independently then discussing scores is called **calibration** and it increases **inter-rater reliability** or the degree of agreement and common interpretation and use of a rubric across two or more evaluators.

1. Provide students with a copy of the REWA on a separate sheet of paper. Alternatively, instruct students to write the labels that run down the left column of the REWA – Purpose and Focus, Depth of Thought, etc. – in a column on a sheet of notebook paper.
2. Point out to students that there are four levels – Highly Developed, Developed, Underdeveloped and Substandard. Read through each level for the first criterion, Purpose and Focus and ask students to identify what makes one level different from the others. SAY: You will indicate your evaluation by choosing one of these levels for each of these criteria.
3. Have students work independently or in pairs to evaluate the newspaper story.
4. Once students are done evaluating the front page story, have them turn to a neighbor to compare their ratings. For any criterion where the students disagree, they should discuss the reasons for their evaluation and see if they can come to consensus.
5. As Homework, have students evaluate the letters to the editor using the REWA.
6. EXTENSION: Ask students to write their own letter to the editor on this topic. Their letter should qualify as at least “Developed” if not “Highly Developed” on the REWA.
End of Chapter Exercise: Letters to the Editor of the City or Campus Newspaper (p. 303)

Run the REWA evaluation portion of this exercise as you did with Letters to the Editor about College exercise. Either select a common city or campus editorial for all students to use or ask students to select their own example. As the authors suggest, students should work individually or with a partner to write an opinion piece about the editorial topic. Collect students’ opinion piece as well as a self-evaluation of this writing assignment using the REWA. Students should submit their finished piece for publication in the news source.

End of Chapter Exercise: Penn Jillette on Connecting with the Audience (p. 303)

In this exercise students are asked to take the perspective of a performing magician and analyze the factors that may influence a magician’s ability to connect with her or his audience.

1. Run this exercise in class. Ask the students if they have ever been a member of the audience during a magic show.
2. Discuss the four elements of the rhetorical context (author, audience, purpose and presentation). Guide the conversation so that students develop an understanding of how a magician’s act can be interpreted as a form of argument.
3. In a whole class brainstorm, or with students working in small groups, identify how each of these four elements constrain the soundness and effectiveness of the argument being made by the magician. If this step is conducted in small groups bring the groups together to debrief their analyses as a whole group. Call on students who don’t typically participate in whole group conversations to present the ideas from their small group. By doing this you are better able to gauge these quieter students’ understanding.
4. After the class discussion, play the NPR interview with Penn Jillette which is available from www.MyThinkingLab.com.
5. End this activity by asking students to identify where the class interpretation and explanation is similar to or differs from Jillette’s.
6. EXTEND: Ask students to identify other rhetorical contexts that may share this challenge of developing a connection with audience.

End of Chapter Exercise: Research for the Campus President (p. 303)

Use this exercise as a tool for connecting students’ learning across several concepts and chapters in your course. Have students work in teams of 4.

Each group should prepare the following:

- A list of at least four (4) credible sources that represent both the pro and con sides of the argument;
- A written analysis of how and where each source was obtained along with an evaluation of the credibility of the source.
- A written recommendation to the President that includes an explanation for WHY the group is making this recommendation.

EXTEND:

- Assign one or more of the following additional tasks:
- Argument maps for the pro and con arguments that were obtained through the source material
- REWA evaluation of the group’s recommendation statement to the President
• Have groups make a presentation to the class offering their recommendation. Submit with their presentation an analysis of the four elements of the rhetorical situation that this presentation represents.

OPTIONAL: This exercise could be assigned as a question on take home midterm or final exam. Students would write independent responses if this exercise is used in this manner.

End of Chapter Exercise: Reflective Log – Analyze your Own Prior Writing (p. 303)
For this exercise students are asked to reflect on a research paper or persuasive essay writing assignment from a past course. Have students prepare a reflective log entry responding to the first set of questions posed by Facione and Gittens. After completing this initial log entry, students are asked to evaluate their written work using the HCTSR and REWA rubrics. When finished, students should revisit their reflective log and add a final paragraph that focuses their attention on the relationship between their writing process and critical thinking evaluation. This exercise is designed to promote metacognitive awareness of one’s writing and thinking processes in order to encourage more intentional and organized thinking about future writing assignments. Use this exercise as a summary of this chapter to promote discussion about how to think critically about writing assignments and planning for presenting an effective argument.

End of Chapter Exercise: Group Project – Artificial Sweeteners (p. 304)
This activity is designed to offer students a real-life example of how sound and effective written argumentation is a skill required in the workplace.

1. Assign this activity as an in-class short essay. It is recommended that this be used as a formative assessment opportunity to provide students with feedback on their thinking and writing rather than a graded activity.
2. Give students 10-15 minutes to reflect on the request from the legal department and draft a response statement that will appear on the company Web site. Remind students that they should keep in mind the recommendations throughout the chapter for preparing sound and effective arguments.
3. Bring students together in groups of 3-5 to represent the Standard Sodas Inc. legal team. Have the group work together using their individual draft statements to write up the final text for their written argument.
4. Have the groups exchange their written responses and evaluate them with the REWA rubric.
5. Collect the group’s statement, the peer REWA feedback and each team member’s draft statement.
6. EXTEND: Have each group create a webpage or other electronic version of this in-class writing activity and post it to the class electronic discussion board for additional peer feedback.

End of Chapter Exercise: Employer Exploitation Fashion Models (p. 304)
As Facione and Gittens suggest, this exercise is intended to be a group project that is used as a culminating final paper for this chapter or in a course dedicated to critical thinking and writing. Use this exercise as a vehicle for connecting students’ learning across several chapters in the textbook and for assessing the extent to which students have mastered the concepts of your course. Given the magnitude of this assignment, give students ample time to conduct the background research and prepare a sound and effective argument in response to the authors’ hypothetical question.
An effective pedagogical technique to maximize students’ success with this and other complex assignment is to establish a sequence of due dates where portions of the assignment (e.g., list of source material, outline, rough draft, final project, etc.) are turned in to the instructor for feedback. Partitioning the assignment into segments and establishing a timeline for completing the assignment can be accomplished through a brainstorm with the class on the day this assignment is given. On the day that the completed assignment is submitted have students write a reflective essay on what they have learned about critical thinking and writing that can be applied to increase the effectiveness of learning through group assignments.

**EXTEND:**
- Assign one or more of the following additional tasks:
  - Create an argument map to accompany the group’s recommendation. REWA evaluation of the group’s recommendation statement
  - Group presentations to the class offering their recommendation. Submit with their presentation an analysis of the four elements of the rhetorical situation that this presentation represents.

**EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS**

**Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts**

For this exercise students should locate a writing assignment from a past course in which they struggled or which they found to be challenging. This can be the same or a different assignment than the one the student used in the End of Chapter Exercise: Reflective Log – Analyze your own Prior Writing. They should have both the assignment (instructions) that they received from the instructor, and a copy of their completed and graded work. Have students prepare a reflective essay where they respond to the following questions:

- What strategy did I use to organize my response to this assignment?
- How much time did I spending thinking about myself as the author, the intended audience or the intended purpose of this assignment?
- If I were to be able to redo this assignment, what conclusions would I draw by thinking reflectively and intentionally about the rhetorical situation?

Collect these reflective essays and summarize the results for the class. Use this exercise to begin a discussion about how to think critically about writing assignments and planning for presenting an effective argument.

Please refer to the THINK Critically Web site for additional exercises and assignments.

**ACCESSING RESOURCES for THINK Critically**

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For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Supplemental Chapter A
Think Like a Social Scientist

CHAPTER OVERVIEW
This Supplemental Chapter focuses on how strong critical thinkers engage in social science inquiry and apply social science understandings and strategies to support their professional work. In other words, this chapter explores what it means to think like a social scientist. Social scientists ask critical thinking questions about the participants, situation, actions and motivations of human behavior in a social context. Social scientists use investigative methods and empirical reasoning to analyze and explain human behavior, and they apply standards to evaluate their thinking about human behavior. In this Supplemental chapter, students explore these ideas as well as the ways in which social science research is applied by professionals in the real world.

Remember:
This chapter is not meant to cover the content of an introductory course in a social science discipline or to substitute for a research methods course in one of these fields.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Identify the critical thinking questions that social scientists ask.
• Describe the methods social scientists use to analyze and explain human behavior.
• Explain how social scientists evaluate their thinking about human behavior.
• Analyze how social science research is applied in the real world.

DAILY DISCUSSION STARTERS
1. Social Science Disciplines and Fields
Write the disciplines and fields of study that appear in the text box on page 5 on the board. SAY: These are all examples of disciplines and fields of study that focus on social science questions and use social science methods. ASK: Who can give me an example of a question that might be asked by an [anthropologist]? Substitute disciplines in to cover the subjects on the board. Encourage students to ask questions that focus on social science. Use this activity to broaden students’ familiarity with these subject areas and developed their sense of critical thinking questions that illustrate thinking like a social scientist. Revisit this exercise when beginning the section of the chapter on methods.
EXTEND: Write the disciplines and fields of study that are NOT social sciences on the board. ASK: Why are the following NOT considered social sciences? Asking students to think about why these examples are not part of the family of social sciences will strengthen the skills of analysis and interpretation.
2. Perform the End of Chapter Exercises: Think Questions activity described below.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or the suggested Lecture Extensions in this Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
Thinking Critically: Surrogate or Source?
Thinking Critically: What Would I Do in That Situation?
Thinking Critically: How Are Our Motivations Connected to Our Needs?
Thinking Critically: What Makes People Live Longer?

Thinking Critically: The Human Mind Craves Order and Consistency

End of Chapter Exercise: Think Questions

End of Chapter Exercise: Progression Question – Think Methods of Investigation

End of Chapter Exercise: Group Exercise – Interview Professionals

End of Chapter Exercise: Challenge Exercise – Think Next Steps

End of Chapter Exercise: Reflective Log – Think Like a Social Scientist

End of Chapter Exercise: Group Social Science Project

Thinking Critically: Surrogate or Source? (p. 4)

Use this exercise as a Daily Discussion Starter or an opening discussion for this chapter.

1. **ASK:** What are some of your favorite television talk shows? Solicit responses such as Dr. Phil, Oprah Winfrey, The Doctors, Jerry Springer, Maury, Rachel Ray, The View, etc.

2. **ASK:** What are the hosts trying to accomplish in these shows? (Seek responses such as give viewers information, teach the audience something, help the guests with their problems, get ratings, etc.)

3. **NOTE:** Steer this brainstorming so that you elicit comments that will allow you to ask whether we should consider these hosts or their shows as credible sources of information.

4. [Write on the board the question posed by the authors in the text box.]

5. Ask students to recall what they learned in Chapter 6 about evaluating claims and sources. Document their brainstorming on the board.

6. Have students apply these ideas from Chapter 6 to the authors’ question by asking for examples of themes from talk shows that could be converted into questions about human behavior.

7. Close this exercise by calling students attention to the fact that this chapter addresses the critical thinking questions they are asking – which are the ones that social scientists ask! – and the methods used by social scientists to answer these questions.

Thinking Critically: What Would I Do in That Situation? (p. 9)

The Zimbardo Prison Study is a vivid example of the power of situational cues to affect human behaviors. Have students research the Zimbardo study on the Internet. Assign the viewing of “The Experiment” (2010) as an out of class activity. Have students complete one of the following activities:

3. Compare and contrast the events and conclusion of “The Experiment” with what you have learned about Zimbardo’s study through your Internet research. Discuss as a class or do an in-class quick write explaining why the film director would have made the creative deviations from the classic study? Does the overall message of the power of situational cues still come through in the film? Why or why not?

4. Write a reflective log on a personal experience where you were a participant in a social situation, or witness to a social situation, where the participants engaged in aggression or violence in response to situational cues.

5. Working in pairs or small groups, conduct Internet or print media research to find an example of a group engaging in aggression or violence in response to social role perceptions or situational cues. Write an analysis of the situation and an explanation for the effect on participants’ behavior. Share this example with the class.
Thinking Critically: How Are Our Motivations Connected to Our Needs? (p. 10)
As part of his theory of human motivation, Maslow presents a hierarchy of needs to visually represent the idea that lower-order needs must be satisfied in order for a person to be motivated to resolve higher-order needs. Maslow places problem solving at the highest level in the hierarchy within the category of self-actualization. After it is clear that students understand the basic premises of Maslow’s theory, engage the class in a discussion of whether they agree with this placement of problem solving. Consider the questions posed by the authors in the text box. Do we in fact need problem solving in order to resolve the lower level needs? Close this discussion by pointing out how social scientists might ask questions about the relationship between human motivation and needs.
EXTEND: Select one or more of the questions or assumptions that were expressed during the class discussion. Have students break into small groups and think like social scientists to develop a method by which they could investigate this question. Remind students about the strategies presented in Chapter 14 Empirical Reasoning as they design their methodological approach.

Thinking Critically: What Makes People Live Longer? (p. 12)
In this activity students are asked to consider findings from an 80+ year longitudinal study that was initiated in the 1920s with 1500 children. Social science researchers Friedman and Martin have recently published their findings from this study that help answer the question “What makes people live longer?”

1. Begin this activity by brainstorming with the class about what claims they have heard that describe behaviors that supposedly promote a long healthy life.
2. Then have students go to www.MyThinkingLab.com to view the interviews with Friedman and Martin.
3. After giving students a sufficient time to view the interviews and learn more about The Longevity Project, ASK: Did these researchers address any of the class’s list of claims in their study? What did the researchers find?
4. ASK: Where there any claims that we did not think of that were addressed by these researchers? What of their findings surprised you?
5. SAY: The researchers have asked the class to join their research team. To become researchers on the team the class needs to rephrase the yet unanswered health claims as social science research questions so that they can be addressed in the longitudinal data. Have the class work in pairs or small groups to rephrase the claims on the board. Have the groups share their research questions. When there are differences in questions for the same health claim use this to demonstrate how varied the questions of social scientists can be even when they are interested in the same human behavior.

Thinking Critically: The Human Mind Craves Order and Consistency (p. 21)
For this exercise have students write a reflective log entry about a time where they – or someone they know well - were confronted with information that called into question one of their deeply held beliefs (a lie told or secret exposed by a trusted friend or colleague, infidelity in a love relationship, a crime committed by a dear family member, etc.) Have students respond to the following questions: Briefly describe the situation. How did you (the person) resolve the cognitive dissonance? Did you (the person) alter a belief or find a way to rationalize the information so that the belief could be protected and maintained? How might we use our critical thinking skills to resolve situations where we are feeling cognitive dissonance?
**End of Chapter Exercise: Think Questions (p. 26)**
This activity will give students practice with thinking like a social scientist and thinking critically about the questions that social scientists ask about human behavior. Perform this activity as it is described in the text book. Break students into pairs or small groups and assign each group one of the statements from this exercise. Give the groups 10-15 minutes to generate a critical thinking question about participants, situation, actions and motivation for their social science topic. Bring the groups together and ask each group to share just one of their questions with the class. Have the rest of the class identify the question in terms of whether it is about participants, situation, actions or motivation. Use this peer feedback to hone students’ ability to discern these four domains of human behavior.

**CHALLENGE:** Ask each group to use the library databases and Internet to find out whether any of their questions have been studied by social scientists. Have the groups bring in at least one credible scholarly article to represent a question that they had asked during this exercise.

**End of Chapter Exercise: Progression Question – Think Methods of Investigation (p. 26)**
This activity is an extension of the previous exercise. In this activity students think critically about the social science method of evidence gathering that they could use to answer the questions they have posed about a selected domain of human behavior. Have the students continue to work in the same groups for this activity. Groups should prepare a written description of their methodological strategy for each of the four questions. To assist with this activity, remind students to review the examples given in the text book and use the discussion of these examples as a guide for their thinking. Give students ample time to work on this activity in class or assign it as homework. After students have written their methods for each question, have them select the one that they feel is the strongest to present to the class. After each group’s presentation, ask the class to provide feedback – will the proposed strategy produce the necessary evidence to answer the question? Provide feedback to groups when needed to help students understand the connections between their selected methodological approaches and the most appropriate data needed to answer their questions.

**End of Chapter Exercise: Group Exercise – Interview Professionals (p. 26)**
In this group exercise students are asked to interview professionals from four different fields to identify the similarities and differences with which these professionals interpret human behavior. This exercise extends the idea that even within the language community of social scientists, there are a vast array of theoretical perspectives and ways of understanding and explaining behavior. Have students work in groups of four to complete this project. Remind students that they must identify professionals from the fields listed in the exercise and that these professionals must have at least seven years of work experience. The three interview questions to be asked are provided in the exercise. Groups should summarize their findings from the interviews, noting similarities and differences across the four professional fields. Students may find the identification task challenging. Remind them that their campus reference librarian may be a helpful resource. Groups should prepare a visual presentation (poster, PowerPoint, short video, idea map, etc.) of their findings and conclusions. Conduct a poster session or other open forum for groups to make their presentations as class members rotate around the room.

**End of Chapter Exercise: Challenge Exercise – Think Next Steps (p. 27)**
This application exercise is intended to help students understand scientific investigation as a process of inquiry with specific steps or phases. Students are asked to articulate the steps in a scientific investigation that apply to the research project that they conducted in the **Group Exercise - Interview Professionals**.

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1. Run this exercise in the same small groups as the Interview Professionals exercise.
2. Have groups review the Steps in a Scientific Investigation table from this chapter or Chapter 14. *Note: Chapter 14 includes a running example in the table that may helpful as a model for this exercise.*
3. Each group should develop a brief statement of the steps they have in the research plan for their Professional Interviews investigation. Suggest that the group prepare their responses as a column that corresponds to the table rows like the example that appears in Chapter 14.
4. Call the class together to compare the tables. The groups should have a high level of similarity among them. If any groups completed more steps than others, determine whether these steps in the plan were in fact carried out by all groups.
5. EXTEND: As a whole class, brainstorm about how the groups might carry out any steps that remain incomplete (e.g., new hypotheses, publish the research, etc.).

*End of Chapter Exercise: Reflective Log – Think Like a Social Scientist (p. 27)*
This reflective log exercise provides students an opportunity to apply their learning from Chapters 1, 2 and 3 to describe how critical thinking skills and habits of mind, as well as the IDEAS process, could assist social scientists in maintaining objective analyses and interpretations in the face of any personal relationships they may have built with the participants that are in their research studies. The authors reference the fact that the researcher Zimbardo’s behavior in the example of the prison experiment was influenced by his emotional investment in the research project and participants to demonstrate the possible challenges with the participant-observation data collection technique. Suggest to students that they review the Internet reference for the Zimbardo study to better understand the behavioral responses of the participants and the researcher in that experiment. Collect students’ reflections to gauge their understanding of the iterative and interacting role of skills and habits of mind in sound and effective critical thinking. Also check that students’ understand the value of following the IDEAS process to maintain systematicity and self-correction in problem solving and decision making. Log entries should reference the importance of these concepts for maximizing objectivity when thinking critically about what to believe or what to do.

*End of Chapter Exercise: Group Social Science Project (p. 27)*
This end of chapter exercise could be used as a unit exam question or a culminating project for a course focused on social science methods.

1. Have students work in teams of 2-4 individuals.
2. Provide ample in-class time to review the SPLC website and work as a team, or assign this exercise as an out of class project. Groups should review the SPLC site and select a case to use in this project.
3. Groups should prepare a written report that includes answers to the questions posed by the authors. Encourage the groups to pose at least two potential research questions focused on participants, situation, action and motivation.
4. Groups should briefly outline possible methods for all of the potential research questions as well as an evaluation of the practicality of each possible study.
5. After this preliminary planning and discussion is complete, have each group identify one research question from their proposed set and prepare a research plan for evidence collection. Remind groups that they can refer to the Steps in a Scientific Investigation table for help with this research plan.
6. The final step in this exercise is an opportunity for students to apply what they have learned from the section of the chapter that describes social scientists’ standards for evaluation in the context of this proposed study.
7. **EXTEND:** In addition to the written report, groups should present their case, as well as their research study proposal to the whole class. If groups have selected the same case there will be an opportunity to explore the similarities and differences among the research teams in their questions and methods.

**EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS**

**Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts**

**Obedience to Authority**

- The obedience research conducted by Stanley Milgram in the mid-1960s is one of the most recognized set of empirical studies in the field of Social Psychology. The thought that a person might obediently follow an instruction to cause immense harm to another person is appalling to those who first consider Milgram’s work, but as Milgram’s studies show, the vast majority of subjects followed along willingly. But that was then and this is now, right? Dr. Jerry Burger, a psychologist at Santa Clara University, sought to answer this question by replicating Milgram’s classic investigations. Have students read the published findings from this replication available online at [http://www.apa.org/journals/releases/amp641-1.pdf](http://www.apa.org/journals/releases/amp641-1.pdf).
- Use this exercise to analyze the elements of a published scientific research paper. Use the table of “Steps in a Scientific Investigation” to identify the section headings that are typically used in published research to demonstrate the process and results of empirical reasoning.
- What does this research tell us about the power of authority figures to influence their subordinates to do things that cause harm or pain to others? How could our System-2 reflective critical thinking skills and habits of mind help us not to be unduly influenced by authority figures?

Please refer to the **THINK Critically** Web site for additional exercises and assignments.

**ACCESSING RESOURCES for **THINK Critically**

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For access to the instructor supplements, simply go to [http://www.pearsonhighered.com/educator](http://www.pearsonhighered.com/educator) and search for **THINK Critically**. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for **THINK Critically**. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

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Supplemental Chapter B
Think Like a Natural Scientist

CHAPTER OVERVIEW
This Supplemental Chapter focuses on how strong critical thinkers engage in scientific inquiry and apply scientific understandings and strategies to support their professional work. In other words, this chapter explores what it means to think like a natural scientist. Natural science refers to the systematic empirical inquiry into the causal explanations for the observed patterns, structures, and functions of natural phenomena from the subatomic to the galactic in scope. Natural scientists use investigative methods and empirical reasoning to analyze and explain patterns, structures, and functions of natural phenomena. In this Supplemental chapter, students explore the ways in which natural science research is applied by professionals in the real world.

Remember:
As Facione and Gittens explain, this chapter is for people taking courses in, or considering majoring in, subjects like astronomy, biology, chemistry, geology, physics, or in subjects like engineering and medicine, which rely heavily on the application of natural science knowledge. This chapter is not meant to cover the content of an introductory course in these disciplines and it is not meant to substitute for a research methods course in these fields.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
- Identify the critical thinking questions that natural scientists ask.
- Describe the methods natural scientists use to falsify a hypothesis.
- Explain how natural scientists evaluate their thinking.
- Analyze how natural science research is applied in the real world.

DAILY DISCUSSION STARTERS
1. Natural Science Disciplines and Fields
   Write the disciplines and fields of study that appear in the text box on page XX on the board. SAY: These are all examples of disciplines and fields of study that focus on natural science questions and use empirical science methods. ASK: Who can give me an example of a question that might be asked by an [biochemistry]?
   Substitute disciplines in to cover the subjects on the board. Encourage students to ask questions that focus on natural science. Use this activity to broaden students’ familiarity with these subject areas and developed their sense of critical thinking questions that illustrate thinking like a natural scientist.
   Revisit this exercise when beginning the section of the chapter on methods.
   EXTEND: Write the disciplines and fields of study that are NOT natural sciences on the board. ASK: Why are the following NOT considered natural sciences? Asking students to think about why these examples are not part of the family of natural sciences will strengthen the skills of analysis and interpretation.

2. Run the Thinking Critically: Which Statements Cannot be Falsified? activity described below.
Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or the suggested Lecture Extensions in this Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT

Thinking Critically: How Do Genetics, Environment, and Personal Determination Combine to Make You Who You Are?
Thinking Critically: Biology, Chemistry and Physics – Are They Different?
Which Statements Cannot Be Falsified?
End of Chapter Exercise: Kinds of Hypotheses
End of Chapter Exercise: Not Natural Science Because...
End of Chapter Exercise: Progression Exercise – Think Methods of Investigation
End of Chapter Exercise: Reflective Log
End of Chapter Exercise: Group Science Project – Heat Exhaustion

Thinking Critically: How Do Genetics, Environment, and Personal Determination Combine to Make You Who You Are? (p. 8)

Students should be familiar with the “Nature versus Nurture” debate. The authors unveil the web of intrigue that is the role of genetics, environment and personal determination in the case of genetically identical twins. Engage students’ critical thinking with a discussion of the role of twin studies in natural science investigations. Divide the class into small groups and assign each of the groups one of the following topics for out-of-class Internet research:

3. Why twin studies are used to study “Nature versus Nurture” questions
4. The history of twin studies in the United States and around the world
5. Methods used in twin studies – What questions can we ask and answer?
6. Twin studies in the health sciences
7. Twin studies and mental health research
8. Twin studies and brain development

Groups should research their topics prepare a presentation (PowerPoint, Website, poster, etc.) to give to the whole class. EXTEND: Working together as a whole class, combine the research of each group into a single presentation that describes the role of twin studies in natural science research and provides an historical perspective as well as applied examples.

Thinking Critically: Biology, Chemistry and Physics – Are They Different? (p. 12)

Facione and Gittens pose the question of how to distinguish between the traditional natural science disciplines of biology, chemistry and physics when they overlap in investigative questions and methodologies, and apply the same reasoning and evaluation standards. Furthermore they muse that the most new and exciting research is at the intersection of these traditional disciplines. This activity is designed to engage students in thinking critically about the perspective that the traditional distinctions are no longer relevant.

1. For this activity, have students work in groups of 4-5. The task for each group is to propose the organization of departments and program in a School of Natural Sciences for a hypothetical new university that is being built in the local community. Remind students that they want the departments to represent the most appropriate configuration to attract students to marketable science careers and to attract faculty who will conduct cutting edge research. The programs can have traditional or creative names, as long as the programs are sufficiently understandable and identifiable.
2. To gather information about the optimal configuration, groups should interview at least five natural science faculty members and five professionals working in a natural science field. Ask each interviewee the questions that are posed by the text book authors. Specifically, ask whether the traditional science disciplines should be combined or remain independent departments. Explain the assignment and ask the interviewee what they would recommend as a configuration. Be sure to ask them to explain their recommendations and document their reasons.

3. Each group will identify by name the departments / programs to be included in this new School. The final project will be an organizational chart listing the proposed departments / programs. The chart should be accompanied by a written rationale for the proposed department names and why these (and not others) were included. Internet research should be conducted to augment the interviews and support the rationale.

4. EXTEND: Conduct an in-class debate. The debate topic is: Traditional natural science departments should be combined and renamed to represent cutting edge trends in research and job opportunities. Research and interviews described above should be conducted in teams. These teams will form the debate teams in the class activity. Assign teams to sides as the debate begins thus ensuring that all teams will prepare both sides of the argument. Rotate teams in and out of the debate so that all teams get experience arguing both sides.

5. OPTION: Periodically stop the debate and ask students to apply the four tests of worthiness to the argument as it is being made in the moment.

Which Statements Cannot Be Falsified? (p. 13)
Facione and Gittens offer twelve statements about the universe. In order for these statements to be considered viable questions for investigation they must be testable hypotheses that can be shown to be false by reference to empirical evidence. Students are asked to analyze these statements and draw inferences about the data that would be necessary to show these ideas as false.

1. Conduct this exercise as a whole class discussion. Consider each statement. Ask students whether the statement represents a testable hypothesis.
2. For those statements considered to be not falsifiable, ask students whether the statements could be rephrased as testable hypotheses.
3. OPTIONAL: For those statements that represent testable hypotheses, ask students to brainstorm possible sources of data or procedures that could be employed to falsify the statement.
4. EXTEND: As an “exit ticket” for the day have students generate one testable hypothesis and state the explanation for why it is falsifiable.

End of Chapter Exercise: Kinds of Hypotheses (p. 21)
This exercise asks students to interpret hypotheses and identify them as testable, null, or both. This is a great exercise for monitoring students’ understanding. This exercise can be used as an end of chapter exam question or an in-class review activity. Ask students to write down their answers on a sheet of paper. Remind them that in addition to labeling the statements as testable, null or both, they should also identify each hypothesis as being social science or natural science. Once students have recorded their individual answers, open up a class discussion and ask students to identify the correct responses. Ask for a show of hands (testable, null, both) for each statement. Note which hypotheses gave students the most trouble and review the definitions of testable and null hypotheses to explain why a particular label is correct.
EXTEND: Ask students to write 5 additional hypotheses. These statements should be testable, null, both, or not falsifiable. Have students exchange with their neighbor and label the set of hypotheses they received. Have the original author then correct their neighbor’s answers. The pair should then discuss their mutual sets to validate the attached labels. Collect these student-generated sets and use them as labeling exercises on an exam or a daily discussion starter.

End of Chapter Exercise: Not Natural Science Because... (p. 21)
For this exercise students are asked to analyze and interpret a statement and explain why it does NOT fall within the scope of a natural science. Use this activity as an opportunity to reinforce the concept of a testable hypothesis and to introduce the distinction between a natural and social science. This exercise can be used as an end of chapter exam question or an in-class review activity. Ask students to write down their answers on a sheet of paper. Once students have recorded their individual responses, open up a class discussion and ask students to share their explanations for why each statement is not a natural science. Be sure to engage multiple students – no student should answer more than once. Note which statements gave students the most trouble to determine if any chapter material should be retaught. Review the definitions of a natural science and testable hypothesis.

End of Chapter Exercise: Progression Question – Think Methods of Investigation (p. 21)
This activity is an extension of the Kinds of Hypotheses exercise. In this activity students think critically about an experimental strategy that they could use to falsify the natural science hypotheses in the previous exercise.

1. Have students work in groups for this activity. Groups should prepare a brief description of an experiment for each of the natural science hypotheses.
2. To assist with this activity, remind students to review the examples given in the textbook and use the discussion of these examples as a guide for their thinking. Facione and Gittens have also provided hints in the exercise instructions.
3. Give students ample time to work on this activity in class or assign it as homework.
4. After students have written their methods for each natural science hypothesis, have them select the one that they feel is the strongest to present to the class. After each group’s presentation, ask the class to provide feedback – will the proposed strategy produce the necessary evidence to answer the question?
5. Provide feedback to groups when needed to help students understand the connections between their selected methodological approaches and the most appropriate data needed to answer their questions.

End of Chapter Exercise: Reflective Log (p. 21)
In this reflective log students are asked to recall a time in their childhood when they made an observation about the natural world around them and wondered about its causes. At first students are asked to recount whether there were any supernatural or anthropomorphic attributions made at the time to “explain” the observed pattern (when they were still kids). Students are then asked to consider whether there is a scientific explanation that can be applied now to this remembered natural event and if this scientific explanation adds to or detracts from their curiosity or interest. Give students approximately 10 minutes in class to complete this reflective log entry (or assign as homework). Ask students if they would be willing to share their reflections in class or on the electronic discussion board in a course management system. This exercise is an opportunity to draw connections between critical thinking habits of mind and questions and methods used by natural scientists. This is a wonderful extension to a discussion of natural science and critical thinking skills.
End of Chapter Exercise: Group Science Project – Heat Exhaustion (p. 21)
This end of chapter exercise could be used as a culminating final project for the unit or course. Connect lesson themes from the chapter to this activity by asking students to give examples from their heat exhaustion project during lecture when appropriate.

1. Have students work in teams of 3-4 individuals.
2. Provide ample out of class time to conduct Internet and library research on heat exhaustion.
3. Allot in-class time for teams to plan their investigation of heat exhaustion among their peer group. Remind the teams that they can refer to the Steps in a Scientific Investigation table for help with this research plan.
4. Meet with the teams in class, after class, or during office hours to serve as a consultant for data collection, data analysis or to provide assistance with interpreting published research.
5. Groups should prepare a written report that includes answers to the questions posed by the authors. Remind students that they should include their own empirical data and not rely only on citations from the published literature.
6. EXTEND: In addition to the written report, groups should present their findings and conclusions to the whole class. Use these presentations as an opportunity to explore the similarities and differences among the research teams in their methods, findings and conclusions.

EXTENSIONS: SUGGESTED LECTURE, EXERCISES, AND ASSIGNMENTS

Questions to Pose as Discussion, In-Class Exercises, or Out-of-Class Writing Prompts

Natural Science Departments / Programs at This Institution
This activity extends the theme introduced in the Thinking Critically: Biology, Chemistry and Physics – Are They Different? activity.

1. Have students work in pairs or small groups to identify all of the departments and program on the campus that fall under the umbrella of natural sciences.
2. Groups should then go through their list and identify which departments would be considered “traditional” and which would be considered at the borderline or combinations of multiple science fields.
3. Also for each department, determine the year in which the program was established at that institution. This may require some archival research so remind students that they may want to consult with the library staff.
4. ASK: Is there a relationship between the year a program was established and whether it is a traditional discipline?
5. OPTIONAL: Divide the list of natural science programs among the groups and assign each group to research the undergraduate and graduate degrees held by all full time faculty members in their assigned department [and year awarded if possible]. Have each group provide a summary to the class.
6. ASK THE CLASS: Are notable trends in the degrees held by faculty in the traditional versus borderline departments/programs? Does this research help us answer the questions posed by the authors in the Thinking Critically box? Why or why not?
7. Close this exercise by brainstorming what additional questions could be asked to help us answer the questions posed by Facione and Gittens.

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The Effects of Heading the Ball in Soccer on Children's Brain Development

Research has shown that heading a soccer ball more than 1100 times a year can lead to significant loss of white brain matter and other traumatic brain injury symptoms such as loss in memory, attention and visual processing. Apparently, 1100 times in the past 12 months is a critical threshold for adults. In this activity, students are asked to plan an investigation to test the hypothesis: Because kids’ brains are developing fast they may experience more problems than adults from heading of the soccer ball.

1. Have students work in teams of 3-4 individuals.
2. Provide students the following New York Times article that discusses research that has been done on adults. [http://well.blogs.nytimes.com/2011/12/07/a-new-worry-for-soccer-parents-heading-the-ball/?ref=health](http://well.blogs.nytimes.com/2011/12/07/a-new-worry-for-soccer-parents-heading-the-ball/?ref=health). Teams should use this as the beginning of their internet research for this topic.
3. Allot in-class time for teams to plan an investigation of soccer heading among children. Remind the teams that they can refer to Chapter 14 where empirical reasoning was discussed as well as the Steps in a Scientific Investigation table in this chapter for help with this research plan.
4. Groups should prepare a written research plan mapped to the Steps in a Scientific Investigation. These plans should be presented plan to the whole class. Use these presentations as an opportunity to explore the similarities and differences among the research teams in their proposed methods and interpretation of the hypothesis.
5. With all students working together, determine the strongest features from each team’s plan and craft a master research plan that represents the contributions of the class as a whole.

Please refer to the *THINK Critically* Web site for additional exercises and assignments.

**ACCESSING RESOURCES for *THINK Critically***

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For access to the instructor supplements, simply go to [http://www.pearsonhighered.com/educator](http://www.pearsonhighered.com/educator) and search for *THINK Critically*. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for *THINK Critically*. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

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Supplemental Chapter C
Ethical Decision Making

CHAPTER OVERVIEW
This Supplemental Chapter focuses on the application of critical thinking skills and habits of mind to reflect on one’s core values, moral opinions and ethical ideologies. Ethics and ethical imperatives are defined as expressions of behavioral ideals and moral principles. The three general groupings ethical imperatives, considerations based on consequences, duties, and virtues, are described. Distinctions are made between ethical decision making and decision making in general. In this chapter the authors make a case for why strong critical thinkers and truth-seekers engage questions that challenge fundamental assumptions about what is right and wrong. Examples and activities are used throughout the chapter to illustrate ways in which one might think critically through diverging ethical imperatives.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Identify and describe ethical imperatives.
• Explain the differences between ethical decision making and decision making in general.
• Explain how critical thinking helps when faced divergent ethical imperatives.

DAILY DISCUSSION STARTERS
Does critical thinking make you a good person?
1. This question was originally raised in Chapter 2 when critical thinking skills and habits of mind are introduced.
2. Write the following quote on the board: "Is a critical thinker automatically a good person?"
3. SAY: Reflect on this question for a few moments. Then I will ask if you agree or disagree with this statement. (allow students to formulate a response).
4. ASK: What do you think? Yes or No?
5. Solicit students’ views and be sure to ask them to explain their reasons for drawing a particular conclusion.
6. Use this activity as an introduction to this chapter on ethical decision making.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or the suggested Lecture Extensions in this Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
Thinking Critically: How Broad Is My Circle of Ethical Concern?
Thinking Critically: Is It Ethically Acceptable to Con a Con?
Thinking Critically: Duty vs. Consequences
Thinking Critically: Conflicting Duties to Church and State
Thinking Critically: By Nature Saints or Savages?
Thinking Critically: Is World Peace Possible?
End of Chapter Exercises: Anything Goes These Days – Not!
End of Chapter Exercises: Video Exercise – Take Three
End of Chapter Exercises: Reflective Log – Extraordinary Rendition
End of Chapter Exercises: Challenge Group Project – How Much?

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**Thinking Critically: How Broad Is My Circle of Ethical Concern? (p. 8)**

In this text box the authors are asking students to consider whom should be included as part of our consideration when contemplating the consequences of an ethical decision. While it is common to take those closest to us into consideration, we may not so readily consider the larger circles of potential affected people. The authors reference the film *Restrepo* as a discussion starter given the high stress of a combat situation and the potential ethical dilemmas that can arise for those out on the battlefield. Use these questions, “How broad is my circle of ethical concern?” and “How broad should it be?” to conduct a class discussion. When students offer comments or conclusions ask them to support these ideas with reasons and examples. Close the activity by having students consider a time when they had to make an ethical decision. Assign a 5 minute quick write. The prompt is: Who was in my circle of ethical concern for that decision? How might my decision have been affected if I had broadened my circle?

**EXTEND:** Consider showing clips from *Restrepo* to supplement the conversation, or assign the viewing of this film and have students write a reflective log entry on the day’s conversation and how it is linked to the themes of the film.

**Thinking Critically: Is It Ethically Acceptable to Con a Con? (p. 9)**

In this exercise students are introduced to three examples of scams that college students often fall prey to, and are encouraged to visit a web site that lists several more. Use this activity to have students think critically about the ethical question – is it ever ethically acceptable to con a con?

1. Divide students into small groups. Assign this activity as an out of class project.
2. Ask each group to review the examples in the text box as well as the ones that are found on the website reference. Then have each group view either *The Sting* or *Ocean’s Thirteen* (or both films).
3. Each group should then prepare an argument for either affirming or denying the claim that it is ethically acceptable to con a con.
4. Arguments should be submitted either in narrative form, an argument map, or as an oral presentation to the class.
5. **OPTIONAL:** Ask each group to select one of the scams and offer an explanation for how a strong critical thinker could avoid being victimized.
6. **EXTEND:** Students can be asked to identify an additional film that serves as an example of coning a con.

**Thinking Critically: Duties vs. Consequences (p. 10)**

This activity provides students an opportunity to think critically about situations where duty-based ethical decision making and consequence-based ethical decision making pit individuals against each other. First, students are asked to consider the dramatic tensions of these two ethical decision making approaches as they are portrayed in high stakes military situations. Conduct this activity as an in-class activity or as an out-of-class team exercise.

1. Have students view *Mutiny on the Bounty* and / or *Crimson Tide*. Using dialogue and other cinematic effects as evidence, ask students to identify how the main characters prioritize duty or consequences in their ethical decision making.
2. **ASK THE FOLLOWING QUESTIONS:**
a. What evidence do you see for duty-based ethical decision making? (Repeat for consequence-based).
b. What reasons are given for each approach? Seek concrete examples and explanations.
c. How was the ethical decision resolved in the film?
d. Which ethical imperative was ultimately applied? What were the consequences?
e. What might have happened if the other approach would have been applied?
f. What would you have done if you were the main character?
g. Can you name a movie that uses a non-military context to illustrate the conflict between duty-based and consequence-based ethical decision making? (Encourage students to consider films where there are clear social roles such as police, family, or medical dramas).

Close this exercise by asking students to identify examples of critical thinking skills and habits of mind that are exhibited by the central characters in each film. Use this in your discussion of ethical decision making as a form of general decision making.

**Thinking Critically: Conflicting Duties to Church and State (p. 10)**
The questions posed by Facione and Gittens in this text box will challenge students to exercise the habits of mind of truth-seeking and openmindedness as they consider circumstances where duties to Church and duties to State come into conflict. As the films *Becket* and *A Man for All Seasons* illustrate, tensions can arise during duty-based ethical decision making when the individual is emotionally torn between diverging dutiful obligations. The questions in this exercise are not directly related to these two films. You may recommend that students view these films and you may wish to use clips from these films in a discussion of conflicting duties but this exercise does not require this.

1. Run this activity as a “fish bowl”. Select four (4) students from the class and have them come to the front of the room to sit in four chairs that have been placed in a semi-circle facing the class. These students will begin the class discussion in the fish bowl.
2. TELL THE FOUR STUDENTS: After two thoughtful contributions to the fish bowl conversation you may return to your seat after you have tapped a classmate on the shoulder. Whomever you tap will take your place in the fish bowl and join the on-going small group conversation. You must select someone who has not yet participated.
3. SAY TO THE WHOLE CLASS: We are going to think critically about the questions posed by the textbook authors. Your classmates will get the conversation started but if you are tapped please join the small group. Because you don’t know when you might be picked, pay attention to the ongoing conversation and be ready to contribute meaningfully.
4. Start the fishbowl with the question: What are some examples of a person’s duty to Church (duties to one’s God) or duty to State (duties to one’s sovereign)?
5. Allow the fishbowl conversation to proceed so that students get into a flow of contributing and selecting replacement participants.
6. MEANWHILE: Select three or more students from the audience and quietly ask them to observe the critical thinking that takes place in the fish bowl. Let them know that you will be asking them to offer their observations and evaluations at the end of the activity.
7. Ask probing / clarifying questions if the fishbowl participants are not exhibiting strong critical thinking.
8. Introduce the authors’ questions sequentially.
9. Close this activity by reflecting on the critical thinking that was exhibited in the fish bowl conversation. Ask those students who you selected to be observers to share their reflections.

Thinking Critically: By Nature Saints or Savages? (p. 15)
Run this exercise using the fish bowl technique described in the Conflicting Duties of Church and State activity. Begin with the opening question posed in the text box. Interject into the fishbowl conversation if participants are not offering reasons or evidence to support their statements. If students struggle with any of the authors’ questions encourage them to think critically about what the authors are asking to clarify the question before attempting to answer it. Use this activity to promote students’ inferences about the role of social, historical, and economic factors in ethical decision making.

Thinking Critically: Is World Peace Possible? (p. 17)

1. Have students work in groups for this activity. Give students ample time to work on this activity in class or assign it as homework.
2. Groups should begin by researching Kohlberg’s theory of moral development using the citations provided by the authors and supplemented by Internet research. Groups should prepare a brief description or create a chart to represent Kohlberg’s 6-stage theory.
3. After students have conducted their background research, they should prepare a response to the authors’ questions about the possibility of world peace. Remind them that it may be necessary to conduct additional research to answer the questions regarding world cultures, traditions, political systems, etc.
4. Groups should prepare to answer all of the authors’ questions during an in-class discussion. Begin the class discussion by asking one of the groups to answer the first question. Ask another group to respond and extend the first group’s response. Move through the groups asking them to answer the authors’ questions and respond to each other. Select groups at random. Have groups make multiple contributions so that they are all paying attention and are ready to participate.
5. Close the activity by engaging the class in an evaluation of the critical thinking that has been exhibited. Are the proposed strategies for preparing our own society and the general population for peace practical and achievable?
6. Provide feedback to groups when needed. Acknowledge examples of strong critical thinking about the interaction of individual differences in moral development and group differences in culture, politics, religion, economics, etc. that may influence the pursuit and achievement of world peace.
End of Chapter Exercises: Anything Goes These Days – Not! (p. 20)
Use this culminating exercise to cultivate students’ critical thinking skills in analyzing, interpreting and explaining the application of the three major categories of ethical imperatives as they related to each of four ethical situations. This activity will deepen students’ understanding of the unique considerations of these basic ethical approaches. This exercise also allows for the connection of learning in this chapter with the ideas from previous chapters covered thus far in the course.

1. Begin with the ethical imperative of considering the consequences of our actions and policies for ourselves and for others.
2. Apply this first approach to cases 1-4 in turn. Ask students to respond to each of the authors’ questions considering only this approach for ethical decision making.
3. Be sure that the conversation includes all aspects of the critical thinking process that are alluded to in the question set.
4. If students provide a response that introduces elements of the other two approaches (duties or virtues) offer the reminder that those approaches will be applied in turn, but at this time they must assume that the only approach available is the consequences.
5. Rotate through the four cases using the second basic category of imperatives, duties regardless of consequences, and then the third, the cultivation of virtues and the elimination of vices approaches.
6. Close the exercise by asking students to reflect (out loud or in a reflective log entry) on their personal reaction to each of these three approaches. ANSWER THE FOLLOWING QUESTIONS: Are some outcomes more palatable to you than others? Do any outcomes conflict dramatically with your personal sense of ethics? (Explain) In which case(s) did you sense a tension between your System 1 and System 2 thinking?

End of Chapter Exercises: Video Exercise – Take Three (p. 21)
This activity is an extension of the previous exercise and a wonderful opportunity to connect the lessons of this chapter with previous learning in the course.

1. For this exercise students will work independent. Discuss as a class the importance of obtaining the consent of the interviewee to collaborate on this project and to be videotaped for this assignment.
2. Have students identify a case and candidate to be interviewed. The interview questions for this activity are the questions posed by the authors.
3. Remind students of the importance of applying their critical thinking skills and dispositions when engaging in the analysis and mapping process. Regardless of their personal perspectives on the issue, they must maintain a fair and open mind. Creating the argument maps can facilitate a more objective analysis of the reasoning.
4. After the interview has been conducted students should prepare a written transcript of the interview before engaging in the argument mapping activity. This transcript can be submitted with the map and video if this is used as a graded assignment.
5. In addition to creating the map, students should prepare a table in which they identify examples of the numerous critical thinking concepts that are listed by the textbook authors. Students should select which one of the three interviews they feel is the strongest example of critical thinking and ethical decision making and write a brief statement explaining their selection.
6. Discuss the interview activity as a class. Ask students to provide a summary of the strong critical thinking and ethical decision making interview.

7. **ASK**: Do any patterns in critical thinking or ethical decision making emerge when looking collectively across the strong interviews?

8. Close this exercise by discussing the role of critical thinking in ethical decision making.

**End of Chapter Exercises: Reflective Log—Extraordinary Rendition (p. 21)**

This exercise would work well as a final exam essay question or a chapter exam short answer question. Engage students with these issues by running a class discussion of the ethical dilemmas introduced by the practice of extraordinary rendition. Extend the conversation by introducing examples of ethically ambiguous practices from American history (and international examples if appropriate for your course). These examples can be ones you bring in to class or ones that you assign students to identify. Examples that you may consider including are: U.S. laws on torture, the debate during the first decade post 9-11 about doing whatever it takes to win the War on Terror, the assassination of Osama Bin Laden, or other examples in American history (e.g., treaties with Native Americans, use of Chinese laborers to build railroads, etc.).

**End of Chapter Exercises: Challenge Group Project - How Much? (p. 21)**

In this exercise students are asked to apply their critical thinking and ethical decision making in teams to make a recommendation regarding how much the national government should appropriate in the coming budget year for diagnosing, treating and preventing childhood diabetes.

1. **Have students work in teams of 3-4 individuals.**

2. **Allot in-class time for teams to plan an investigation of diseases, including diabetes, among children.** It is recommended that whole class discussion be used to assist the groups in brainstorming what they should research in order to gather appropriate and relevant evidence for this assignment. Some guidance is provided in the exercise to begin this brainstorm session.

3. **Groups should prepare a written recommendation (either an essay, PowerPoint, or Web site) including the explanation and supporting evidence.** These recommendations should be presented plan to the whole class. Use these presentations as an opportunity to explore the similarities and differences among the teams in their proposed spending allocations.

4. **After each group’s presentation the other groups should pose a strong critical thinking question of the presenters.**

**EXTENSIONS: SUGGESTED LECTURE, EXERCISES AND ASSIGNMENTS**

**Questions to pose as discussion, in-class exercises, or out-of-class writing prompts:**
• This activity is an extension of the Extraordinary Rendition activity. This can be used as a reflective log entry or a short essay question on an exam. The challenge of this activity comes from students to think critically about the limits and boundaries of their ethical imperatives. Tell the students that they are to think of something in their lives that they would want so badly, or fear so much, that they would do anything, literally, to get it or to avoid it (things like lie, cheat, steal, theft, etc.). The example should be ethically challenging – rat out a friend for money, cheat to get into a top rate graduate school, steal from my parents or siblings to buy a treasured item, etc. Write the question of generalizability on the board “What if everyone made this same decision?” Tell students that you will not accept “easy” responses like murdering an intruder to protect the lives of loved ones. Students should explain the hypothetical situation and explain what might happen if we lived in a world where everyone was willing to make this decision or take this action.

Please refer to the THINK Critically Web site for additional exercises and assignments.

ACCESSING RESOURCES for THINK Critically

Students can access chapter summaries, exercises and video files of the complete chapter at www.MyThinkingLab.com.

http://www.pearsonhighered.com/educator and search for THINK Critically. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for THINK Critically. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
Supplemental Chapter D
The Logic of Declarative Statements

CHAPTER OVERVIEW
This Supplemental Chapter focuses on the Logic of Declarative Statements. Students are shown how to express simple statements, negations, conjunctions, disjunctions, and conditional statements in symbolic notation. As a next step, students learn how to translate between symbolic logic and a natural language, English. A central goal of this chapter is to develop students’ skills in building Truth Tables and using Truth Tables to determine the logical characteristics of individual statements and pairs of statements. By the end of the chapter, students are able to put all of these skills together and apply what they have learned to evaluating arguments for deductive validity. Numerous examples and exercises are provided to achieve the chapter learning objectives.

CHAPTER LEARNING OBJECTIVES
After completing this chapter, students will be able to:
• Express relationships among statements in symbolic logic notation.
• Translate between symbolic logic and a natural language.
• Test two statements for implication and equivalence using Truth Tables.
• Test and evaluate arguments for deductive validity using Truth Tables.

DAILY DISCUSSION STARTERS
1. The Logic of Statements Made by Advertisers
   • Bring a variety of product advertisements to class. Be sure that there are product claims in these ads.
   • Select one example and read the product claim aloud.
   • Ask students to identify the declarative statements being made explicitly and implicitly.
   • Develop a conditional expression in natural language to represent the advertisement.
   • As a class, translate this natural language expression to symbolic logic.
   • Repeat with additional examples.
   • This daily discussion starter can be done in phases to match the sections of the chapter being discussed in that day’s lesson.

2. Where Might We Be without Logic?
   • Engage students in the “Where Might We Be without Logic?” exercise as described below or as a whole-class discussion.

Additional Daily Discussion Starters can be drawn from the end of chapter Exercises for Group Discussion in the textbook or the suggested Lecture Extensions in this Instructor’s Manual.

EXERCISES AND VIDEO CLIPS FROM THE TEXT
Text Box: Can You Claim the Credit?
MyThinkingLab: Animated Example—How to Make a Truth Table
Thinking Critically: Where Might We Be without Logic?
Thinking Critically: Quick Check Exercise – Identify the Negations, Conjunctions, and Disjunctions
Thinking Critically: Logic Circuits
Thinking Critically: Quick Check Exercise—Grammatically Correct Expression
Thinking Critically: Quick Check Exercise—From Symbols to English
Thinking Critically: Quick Check Exercise—From English to Symbols
MyThinkingLab: Who Ate the Pizza?
Thinking Critically: Quick Check Exercise—Tautology, Inconsistent Statement, or Contingent Statement
Thinking Critically: Logical Circuits Again
Thinking Critically: Quick Check Exercise—Implication and Equivalence
Thinking Critically: Quick Check Exercise—Are these Symbolic Logic Arguments Valid?
End of Chapter Exercises: Check for Equivalence
End of Chapter Exercises: Translate and Evaluate
End of Chapter Exercises: Reflective Log—Find a Reliable Short Cut
End of Chapter Exercises: Challenge Exercise—“The Teeter-Totter Coach”

Text Box: Can You Claim the Credit? (p. 5)

This exercise may be your students’ first exposure to the decision-making flow charts that are offered by the Internal Revenue Service to aid in the preparation of a tax return. Charts such as this one are created in order to simplify the interpretation of tax laws, but the visual maps can oftentimes be just as complex and overwhelming as the sentences they are meant to represent! In this exercise, students are asked to consider ways to redraw the Dependent Care Credit flow chart that preserves the “rules” of the tax regulations but makes the chart clearer to the user. This exercise serves as a “bottom-up” method of introducing the Logic of Statements.

1. Review the opening scenario of Joan and her problem-solving task related to her dependent care expenses.

2. As a whole class, work through the IRS Child and Dependent Care Credit flow chart to draw your own conclusion regarding Joan’s eligibility for the deduction.

3. Divide the students into groups of 2–3. Refer the groups to the textbook author’s instructions at the bottom of the text box.

4. Allow groups to spend the next 10–15 minutes reasoning through alternative visual representations of the tax regulation flow chart. Remind them that their only limitation is that they must preserve the accuracy of the tax regulations.

5. Have each group draw their revised flow charts on a large piece of butcher paper. Post the group-generated flow charts on the walls so that it is possible to have students view them as an exhibit.

6. Have students spend the next 15 minutes touring the exhibited flow charts. Students should evaluate each chart for its accuracy in representing the tax regulations and for clarity and ease of use.

7. Bring the class back together for a discussion. Start by asking for a few students to share their observations with the class.

8. Ask the groups the following questions:
   a. How well did each group retain the accuracy of the regulations? Were there any mistakes in logic that occurred?
   b. Which charts were the most clear and easy to use?
   c. Could any of these charts be considered easier to use than the IRS chart in the textbook?

9. Close this exercise by explaining how the students have just engaged in thinking critically about the Logic of Declarative Statements.

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MyThinkingLab: Animated Example—How to Make a Truth Table (p. 11)

There are several points in the chapter where you might introduce this animated example of how to make a Truth Table. While there are several progressive examples of Truth Table development offered in the text, the animated file provides a step-by-step explanation that makes the process clear and easier to understand. Ideally you will integrate this animated example before, during, and after the lesson(s) on building Truth Tables.

Access the animated PowerPoint through a link on www.MyThinkingLab.com to www.measuredreasons.com/truthtablePP.html

Suggested uses of this example include:

• Click through the pages in the file using a laptop computer/projection system as a method for teaching about building Truth Tables or as a review.
• Encourage students to access the file as a review or to obtain additional explanation and demonstration beyond the textbook.
• Ask students to develop their own PowerPoint shows illustrating the development of a Truth Table for a symbolic logic example from the chapter. Use the animated example as a reference for this out-of-class example.

Thinking Critically: Where Might We Be Without Logic? (p. 9)

In this text box the authors vividly describe the extent to which the invention of logic has transformed our society. Indeed, it is difficult to fathom what life might be without logic. The authors suggest that one way to visualize life without logic is to “eliminate” all items that contain a computer chip. Integrate this text box as an exercise in your course in one of the following ways:

• Have students identify the items in their immediate possession (on their person or in their backpacks, etc) that would need to be eliminated because it has a computer chip.
• Assign a 5-minute Quick Write to respond to this authors’ question: What would our lives be like without all of the medical, transportation, communication, manufacturing, entertainment, and military technology made possible because our species invented logic?
• Ask students to take out a sheet of notebook paper and fold it in half lengthwise (to divide the page). On the left side, have students list all of their anticipated activities—in detail—between now and when they go to sleep this evening. Then on the right side, have students indicate whether the activity would be impossible to perform without logic or whether they could accomplish the activity even without logic. For those activities that could be accomplished, ask students to evaluate whether they could be done without modifying their behavior or whether it would require modification. Have students share their examples and evaluations with a neighbor or with the whole class.

Thinking Critically: Quick Check Exercise – Identify the Negations, Conjunctions, and Disjunctions (p. 11)

In this quick check exercise students are asked to identify each of ten statements as negations, conjunctions or disjunctions. Use this exercise to review the definition of each of these logical structures before moving on to the next section of the chapter.

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1. Write each expression on the board or read aloud. Ask students to raise their hands if they think the expression is a negation, conjunction or disjunction. Document the number of students saying each of the three options. Consider using a Classroom Response System (Clicker technology) if it is available on your campus.

2. Come to consensus about which logical structure each statement represents. Ask students to offer an explanation for how they made this determination. Make an attempt to include as many students as possible—do not allow the same student or group of students to answer every time. This way you will be better able to monitor all students’ understanding.


4. EXTENSION: Have the students work with a neighbor to come up with two negations, conjunctions and disjunctions of their own. Once the partners have written their expressions, have them exchange their set with another group in the class. With the set they have received, have the partners correctly identify those expressions and explain how they came to their conclusion. Close this extension exercise by having all four students come together to review the correct answers.

**Thinking Critically: Logic Circuits (p. 12)**

The textbook authors employ the circuit as a metaphor for understanding the logic of Truth Tables. Toggling between “on” and “off” in the circuit metaphor is a familiar and easy way to understand representation of the TRUE and FALSE conditions in symbolic logic. Refer students to the appropriate circuit example when discussing Negations, Conjunctions, Disjunctions, and Conditional Statements in class. Introduce the Logic Circuit in its simplest form. Point out to students that the circuit will only “work” if the switch is in the TRUE position because only then does it form a closed circuit.

- Present an unlabeled version of one of the circuits (Negation, Conjunction, Disjunction or Conditional) included in the chapter. Have students name the circuit. This can be an in class activity or a quiz question.
- Present one of the circuits and ask students to describe, in their own words, which logical expression is represented.
- Use the circuits to demonstrate the rows of the Truth Table it is representing. For example, present the Conjunction circuit in four different versions that represent the four rows of a Conjunction Truth Table (i.e., the TRUE and FALSE in varied “on” and “off” positions). Have the students identify whether the circuit is TRUE or FALSE based on whether it is completed.
- With closed books and closed notes, ask students to draw a set of circuits that represents either Negations, Conjunctions, Disjunctions, or Conditional Statements.
Thinking Critically: Quick Check Exercise—Grammatically Correct Expression (p. 14)

The authors provide us with the three basic rules that are necessary to follow when forming grammatically correct expressions in the language of symbolic logic. These rules involve the use of letters to represent statements, the placement of the tilde to represent a negation, and the proper use of ‘&,’ ‘v,’ ‘→,’ and parentheses in grammatically correct sets of expressions. This Quick Check Exercise provides students with an opportunity to analyze a series of symbolic logic expressions and apply these three basic rules to determine if an expression is grammatically correct.

1. Write an expression on the board and ask students to raise their hands if they think the expression is grammatically correct. Document the number of students saying yes and the number saying no. Consider using a Classroom Response System (Clicker technology) if it is available on your campus.
2. For expressions deemed grammatically incorrect, ask students to identify the error(s). Make an attempt to include as many students as possible—do not allow the same student or group of students to answer every time. This way you will be better able to monitor all students’ understanding.
4. EXTENSION: Have the students work with a neighbor to come up with four symbolic logic expressions of their own. These expressions can be grammatically correct or not grammatically correct. Once the partners have written their expressions, have them exchange their set with another group in the class. With the set they have received, have the partners identify those expressions that are grammatically correct and explain what mistakes are contain in the grammatically incorrect expressions. Close this extension exercise by having all four students come together to review the correct answers.

Thinking Critically: Quick Check Exercise—From Symbols to English (p. 15)

Facione and Gittens point out that if we know the declarative statement each statement letter stands for we can translate grammatically correct symbolic logic expressions into English. The chapter contains four helpful guidelines, “rules of thumb,” for rendering symbolic logic expressions. This Quick Check Exercise provides students with an opportunity to analyze a series of grammatically correct symbolic logic expressions and apply these four translation rules to develop natural language expressions. It is important to note that the translation rules will produce accurate English translations but these translations may not be the most elegant expressions. Therefore the authors encourage us to create the accurate translation and a more elegant rendering of the same idea.

1. Refer students’ attention to the interpretation of the statement letters and the symbolic expressions in the text box.
2. Determine if you will run this exercise as a whole class, in small groups, or individual students working independently.
3. If you have students work independently or in small groups, have them write out their translations for each of the ten expressions.
4. Bring the whole class together and ask different students to provide an English translation for each of the ten expressions.
5. Before moving on to the next expression, ask if anyone came up with an alternative translation. For the more complex expressions there may be variability in the wording used in the translation.

6. If appropriate, ask for possible rewordings that would make the accurate English translations more elegant.

7. Access www.MyThinkingLab.com to check the class’s answers.


9. EXTENSION: Have the students work with a neighbor to come up with a set of four declarative statements. Ask the partners to write four grammatically correct symbolic logic expressions. Once the partners have written their expressions, have them exchange their set with another group in the class. With the set they have received, have the partners translate the symbolic logic expressions into English. If appropriate, ask students to provide both an accurate translation and an elegant rewording. Close this extension exercise by having all four students come together to review the correct answers.

Thinking Critically: Quick Check Exercise—From English to Symbols (p. 17)

Run this exercise in the same fashion as the "Quick Check Exercise—From Symbols to English.” Have students refer to the table of English Constructions and Symbolic Language Constructions to formulate accurate translations. When sharing the translations as a whole class, be sure to ask for alternative rendering as the English construction options are many. The English constructions can be tricky! Encourage students to view the table of constructions during the whole class (or small group) sharing to check for accuracy.

MyThinkingLab.com: Who Ate the Pizza? (p. 21)

This exercise provides students with an opportunity to apply their newly acquired skill of reasoning through conditional statements. Divide students into groups of 2–3 and ask them to solve the puzzle of who ate the pizza. Once every group has come up with a solution bring the class together. Ask for a show of hands for those who believe Abe (and Bob, Carl, or Dave) ate the pizza. If there is 100% agreement, ask for a volunteer to explain why that answer is correct. What you are looking for is an explanation of the reasoning that the group engaged in to come to the correct answer. If there is a difference of opinion regarding who ate the pizza ask representatives from each perspective to explain their reasoning. Work through this puzzle until there is consensus around the answer. Access www.MyThinkingLab.com to check the class’s answer. Repeat this exercise with the puzzles that are available at www.MyThinkingLab.com, or assign additional puzzles as homework or extra credit.

Thinking Critically: Quick Check Exercise—Tautology, Inconsistent Statement, or Contingent Statement (p. 21)

Run this exercise in the same fashion as the other Quick Check Exercises in this Instructor’s Manual. Have students build Truth Tables to classify each symbolic logic expression as a tautology, inconsistent statement, or contingent statement. Access www.MyThinkingLab.com to check the class’s answers.

CHALLENGE: Ask students to work in small groups to develop three expressions, one that is a tautology, another that is an inconsistent statement, and a third that is a contingent statement. Allow groups to work for 10–15 minutes. Then bring the whole class together. Ask if there was any difference in terms of how challenging it was to develop these expressions.

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You are likely to hear that contingent statements were easiest, with tautologies being a close level of challenge, but the inconsistent statements were very challenging. Ask students to reflect on why that might be the case. Was anyone able to write an inconsistent statement? What did they have to do in order to create this expression?

**Thinking Critically: Logical Circuits Again (p. 23)**

As the authors state, the biconditional function is false whenever the values on both sides of the statement are different, otherwise it is true. In this text box students are asked to consider again the electrical circuit metaphor for logical statements. Remind students that toggling between “on” and “off” in the circuit metaphor is a familiar and easy way to represent the TRUE and FALSE conditions in symbolic logic. Ask students to consider whether the diagram in the text box accurately represents the biconditional function. ASK: Why or why not? Point out to students that the circuit will only “work” if the switch is in the TRUE position because only then does it form a closed circuit.

**Thinking Critically: Quick Check Exercise—Implication and Equivalence (p. 23)**

Run this exercise in the same fashion as the other Quick Check Exercises in this Instructor’s Manual. Have students build Truth Tables to determine whether the statement in column A implies the statement in column B, and whether the statements in column C and D are equivalent. Students should refer to the definitions of Implication [If (A → B) is a tautology, then A implies B] and Equivalence [A and B are equivalent if (A ≡ B) is a tautology]. Have students work in small groups for this exercise. Come together as a whole class to share the conclusions of the groups. Access www.MyThinkingLab.com to check the class’s answers.

**Thinking Critically: Quick Check Exercise - Are these Symbolic Logic Arguments Valid? (p. 26)**

Run this exercise in the same fashion as the other Quick Check Exercises in this Instructor’s Manual. The authors demonstrate the three steps to follow when evaluating the validity symbolic logic arguments. First we form the conditional that uses the conclusion as its consequent. Then we add the conjunction of the premises as its antecedent. Secondly, we build the Truth Table for this conditional. Third, we refer to the table to determine whether the conditional is a tautology. If it is, then we can conclude that the argument is deductively valid at this level of logic. Have students follow these three steps to determine whether the six arguments are valid. Divide the class into six groups and assign an argument to each group. Give groups 10 minutes to develop their answer. Call groups to the board one at a time to write out their conditional expression, draw the Truth Table and state their conclusion. Ask the class to monitor the group’s work for accuracy. Access www.MyThinkingLab.com to check the class’s answers.

**End of Chapter Exercises: Check for Equivalence (p. 29)**

This exercise provides additional opportunities for students to build Truth Tables and evaluate pairs of expressions for equivalence. This activity adds an additional step of translating a natural language expression into symbolic logic before the Truth Tables can be built.
Divide the five pairs of expressions among your class, forming five working groups. Give groups at least 10 minutes to develop their answer. Call groups to the board one at a time to write out their pair of expressions in symbolic logic, draw the Truth Table, and state their conclusion. Ask the class to monitor the group’s work for accuracy.

**End of Chapter Exercises: Translate and Evaluate (p. 29)**
This exercise provides additional opportunities for students to translate natural language expressions into symbolic logic, construct arguments by forming a conditional that uses the conclusion as the consequent and conjunctions of the premises as the antecedent, and building Truth Tables to evaluate the argument for deductive validity. Divide the five arguments among your class, forming five working groups. Give groups at least 10 minutes to develop their answer. Call groups to the board one at a time to write out their argument in symbolic logic, draw the Truth Table and state their conclusion. Ask the class to monitor the group’s work for accuracy.

**End of Chapter Exercises: Reflective Log—Find a Reliable Short Cut (p. 29)**
This exercise asks students to think critically about the process of evaluating symbolic logic arguments for deductive validity using Truth Tables. More specifically, the authors are suggesting that it is not always necessary to fully complete all rows and/or columns of a Truth Table if we are cognizant of the cases which make the consequent come out false. The author asks students to design a reliable shortcut procedure of evaluating arguments for deductive validity. The authors even give a hint to students for where to start. Assign this reflective log activity as a homework assignment, work through this log activity as a whole class as part of a chapter review, or assign it to groups as an out-of-class activity. Have students submit a narrative or perhaps a PowerPoint show (if it is an out-of-class assignment) explaining their short cut procedure.

**End of Chapter Exercises: Challenge Exercise—“The Teeter-Totter Coach” (p. 30)**
This last end-of-chapter exercise is aptly titled “challenge.” Have students read the scenario. As the authors state, the coach is a logic star and has figured out how to use the teeter-totter exactly three times to determine which of the twelve players is a different weight than the other eleven (and whether that player is heavier or lighter!). Run this challenge exercise either as a whole class or in small groups of 3–5 students. Give students at least 10–15 minutes in class to work on their solutions or, alternatively, assign this exercise as an out-of-class project. Have groups develop a visual symbolic expression to represent their solution and a narrative explanation of the coach’s three uses of the teeter-totter. Bring the class back together and ask for volunteers to share their answers with the class. If possible, bring a set of 12 identical objects (11 of equal weight and one that is different in weight but not appearance) and a balance. Allow groups to demonstrate their solution with these manipulatives. Alternatively, as part of the problem solving activity, perform ‘teeter-totter’ actions using these manipulatives based on the suggestions of the class. Repeat attempts until the solution is achieved. Ask the class to write the expression and describe in narrative terms the solution that was achieved through trial and error with the objects.
EXTENSIONS: SUGGESTED LECTURE, EXERCISES AND ASSIGNMENTS

Questions to pose as discussion, in-class exercises, or out-of-class writing prompts:

1. Translate the Decision Making Flow Chart.
   Conduct this exercise in class. Use a set of increasingly complex chart examples. Provide students with a Decision Making Flow Chart example (several may be retrieved from the Internet by searching Google Images). Have students translate the decision tree into a complex symbolic logic expression. EXTENSION: Have students obtain the example and perform the translation as a homework assignment.

2. Logic Jeopardy!
   Engage students in creating questions that could be used in a Logic Jeopardy! Game. Throughout the days in which you focus on this chapter, ask students to write and submit QUESTIONS with ANSWERS (as part of in-class activities or as homework assignments) for the following thematic categories:
   - Translating English to Symbols
   - Translating Symbols to English (with statements letters defined)
   - True or False (a nearly complete Truth Table with a blank space in one row)
   - Name the structure (Negation, Conjunction, Disjunction, Conditional, Biconditional)
   - Grammatically correct?
   Review students’ work to identify a set of five progressively more difficult questions and the correct answers to use in the Logic Jeopardy! Game. Retain the full set of questions so that you can alternate the questions if the game activity is repeated. (Alternatively, assign students to one of the five categories listed above and ask them to write five progressively more difficult questions for their category. This will not leave a surplus of unused questions, but your pool of questions will increase each time you teach this course and use this activity.)

Create a game board by drawing tables on the board containing 5 columns and 6 rows. Put the category labels in the first row of the table. Fill the remaining cells with increasing values—only substituting ‘points’ for dollars on the game board (e.g., 50, 100, 150, 200, 250). Run the game like the popular television show. Form the class into two or three “teams.” Have students take turns coming up to the front of the room to represent their team. Questions (labeled with the appropriate category and point value) should be written on index cards and available to the instructor who will act as host. After a question is read aloud, the student can confer with their teammates to develop an answer. Students should raise their hand if they believe they know an answer to a question. The instructor will determine which student raised his or her hand first. The team with the most points at the end of the game wins bragging rights. Shuffle teams each time the game is played.

Please refer to the THINK Critically Web site for additional exercises and assignments.
**ACCESSING RESOURCES for THINK Critically**

Students can access chapter summaries, exercises and video files of the complete chapter at [www.MyThinkingLab.com](http://www.MyThinkingLab.com).

[http://www.pearsonhighered.com/educator](http://www.pearsonhighered.com/educator) and search for *THINK Critically*. Click on the book cover and select "Resources." Download the Instructor's Manual or Chapter PowerPoints for *THINK Critically*. Follow the on-screen instructions to register (or log in if you already have a Pearson user name and password). After you have registered and your status as an instructor is verified, you will receive an e-mail with a login name and password. Use your login name and password to download the instructor resources.

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