Chapter 10: Understanding Epistemology

BIG IDEAS

Background

The central focus of this chapter is the question of whether "eyes and ears are bad witness" as the ancient rationalist Heraclitus claimed (and as Plato and later Descartes agreed), or whether sense perception is our foundation for knowledge, as the seventeenth-century British empiricists like Locke and Hume claimed. Understanding the Chapter 10 discussion of Kant's fusion of empiricism and rationalism through transcendental *a priori* concepts sets up the Chapter 11 discussion of language as a prior filter on seeing and knowing, or as Foucault develops the idea, an historical *a priori* way of linguistically/discursively constructing or making up the order of things.

About Chapter 10

Introducing students to epistemology, we first investigate the reliability of our senses and consider philosophies such as Plato's that put reason on a higher plane than perception. By the end of the chapter, students have covered the main differences between rationalism and empiricism as schools of thought, have been introduced to pragmatism, and have started reflecting on intuition, revelation, dreams, and different fields or areas of knowledge. Some important questions in Chapter 10 include:

- How do we know things?
- How can we be certain about our knowledge? Do we know some topics with greater degrees of certainty than others? Is certainty necessary?
- Is knowledge "out there" in the world for us to discover, or do we construct knowledge? If it is constructed, do individuals know things differently? Does gender or culture affect how we know things?

At the end of the chapter, students also confront differences in knowing between men and women, and between cultures, starting the inquiry into epistemological relativism that is deepened in Chapters 11 and 12. The idea of different disciplines using different ways of knowing is introduced, as education is taken up more thoroughly in Chapter 12.

Features

In this chapter, the following features are included to help students make personal connections and/or deepen their understanding of epistemology. You may use all or some of these features as explained in the table that follows.

- Students explore both our reliance on sensory perception, and the limits of this way of knowing. (SE pp. 238, 245-256)
- This chapter presents the main approaches to knowledge, as presented by various philosophers from the rationalist and empiricist schools of philosophy, and discovering how pragmatists take up the problems. (SE pp. 245-256)
- Chapter 10 also compares the ideas of different cultures on how we know, and relates these ideas to metaphysics and religion. (SE pp. 242-245)
- Students are encouraged to develop the capacity for using key concepts in epistemology, such as a priori and a posteriori, realism, etc. (SE pp. 254-255)
- Chapter 10 looks at how skepticism can become a tool or method of investigation in epistemology, focusing on Descartes and Putnam. (SE pp. 251 and 257)
- This chapter explores the diversity of gifts in perception, communication, and reasoning skills among human and non-human animals, and how these influence their ability to know. (SE pp. 238, 274)

Feature	Student Textbook Page	Opportunity for Assessment	Strategies for Classroom Use
Your Unit Challenge	239	Peer assessment of questions and initial answers.	Perhaps post student answers on a wall or have pairs of students share their responses. Alternatively, each student can write a letter to him or herself to open and revise at the end of the unit.
Thought Experiment	259	Students answer questions 1 and 2 on their own, then discuss as a class to compare responses.	Ask students to connect their answers to movies they have seen, such as *The Matrix*, *The Adjustment Bureau*, *Inception*, *The Truman Show*, etc.
Viewpoints	260	Answer questions 1 and 2 as students connect ideas to the Thought Experiment feature and evaluate responses to the problem posed there.	Use this feature to unravel the Thought Experiment feature, considering whether Putnam's answer satisfies students or if it requires further research to comprehend. Relate this feature to the Chapter 11 feature, The *Treeness* of a Tree, as a way of bridging to language philosophy through Putnam's pragmatism.

Teaching Plan 1 (SE pp. 238-250)

Activity Description

As an introduction to epistemology, Teaching Plan 1 contains two lessons that set the stage for teaching the concepts of empiricism and rationalism more fully in Teaching Plan 2. Teaching Plan 1 also begins the investigation into the advantages and drawbacks of basing knowledge on either approach. The focus here is on perception as a way of knowing, and contrasting this with the rationalist pursuit of knowledge through mathematics.

After a brief introduction to empiricism and rationalism, students further their learning by using computer software (e.g., Windows Live Movie Maker or another similar program) to make a short film illustrating the main concepts and addressing the advantages and drawbacks of one approach.

See online tutorials for using appropriate software (student led/voice) to make movies, such as:

http://www.youtube.com/watch?v=je_yJ-qHMFs

http://www.5min.com/Video/How-to-Use-Windows-Movie-Maker-165877130

At this stage, students are forming small groups, learning how to use software to make a short film, and storyboarding their project (i.e., designing the layout and sequence of images and text that will appear in the final film). Note: As students learn more in the unit (Chapters 11 and 12), they may revise or change their topic entirely. Have students submit a topic proposal form, with their group members' names, and update this as you move through the unit.

Assessment Opportunities for Chapter Questions

The table below summarizes assessment opportunities for selected chapter questions, including questions in the Chapter Review, which are relevant to this teaching plan.

Assessment Type	Assessment Tool	Feature Questions	Section Questions	Chapter Review Questions
Assessment as Learning	Further inquiry: animal perception			6, SE p. 264
Assessment as Learning	Connect reading to seeing aspects/images in optical illusions		2, SE p. 258 (also see BLM 10.1)	
Assessment as Learning	Text reflections		1-3, SE p. 245	
Assessment for Learning	Text activity: debate Plato vs Aristotle		1, SE p. 250	
Assessment as Learning	Text activity: four-corners debate on J-T-B formula		2, SE p. 250	
Assessment as Learning	Text reflection		3, SE p. 250	

Timing

150 minutes
(two 75-minute classes)

Learning Skills Focus

- Collaboration (group formation for Culminating Activity)
- Initiative (taking interest and exploring questions of perception)

Resources Needed

Make copies of these Blackline Masters:
- BLM 10.1 Exit Card
- BLM 10.2 Unit 4 Culminating Activity, Film Project: Approaches and Issues in Epistemology
- BLM 10.3 Ways of Knowing: Perception
- BLM C Comparison Chart

Possible Assessment of Learning Task

See Teaching Plan 2 for this chapter's assessment of learning task.

Assessment (For/As Learning)

As teachers move through each chapter, opportunities will be highlighted to provide assessment for/as learning in preparation for assessment of learning at the end of each chapter.

Task/Project	Achievement Chart Category	Type of Assessment	Assessment Tool	Peer/Self/ Teacher Assessment	Learning Skill	Student Textbook Page(s)	Blackline Master
Exit card: Why might "eyes and ears be bad witness," as Heraclitus said? (1 paragraph)	Communication; Knowledge	For	Exit card diagnostic	Self	Independent	239	BLM 10.1
Paragraph on Pythagoras, Plato, and Indian philosophy	Thinking	As			Independent	243-247	
Storyboard: progress check	Thinking; Communication; Knowledge; Application	As	Graphic organizer	Self; peer; teacher	Collaboration; self-regulation initiative		BLM 10.2

Prior Learning Needed

Although prior knowledge of how to make movies is beneficial, it is not necessary, as students are expected to collaborate in the creation of their movies.

Words like *perception* and *conception*, *objective* and *subjective* may be clarified for the benefit of all learners. Students often mix up the meanings of empiricism and rationalism, as well as inductive and deductive reasoning.

Teaching/Learning Strategies

1. Minds-on/hook activity: Show images of Julian Beever's chalk drawings to demonstrate how 2-D images can appear 3-D. Using the projector, visit Michael Bach's Web site, 92 Visual Phenomena & Optical Illusions, at:

   http://www.michaelbach.de/ot/

   What is happening, generally, when we see these kinds of optical illusions? (See also optical illusions in Chapter 11, pp. 270-271.)

2. Ask the class to reflect on why the pre-Socratic philosopher Heraclitus said "eyes and ears are bad witness" (quoted in SE p. 239). Then ask students to reflect on how Plato appears to follow this line of thought in his "Allegory of the Cave." (See Introduction, SE pp. 11-13.) Use Plato's Divided Line (SE pp. 246-247) to illustrate how Plato put perception at the bottom of his hierarchical stages in the pursuit of knowledge. Discuss with the class Plato's ideas, influenced by Pythagoras, including: reincarnation or knowledge as recollection, or knowledge of what was known prior to birth (SE p. 246); and the idea that mathematics is a more reliable avenue to knowledge. A common question from students is this: If we all knew everything before birth, then why are some people more knowledgeable now? In the *Ion* dialogue, Plato explains (through Socrates) that people drink more or less from Lethe, the river of forgetting, as their souls cross over into the underworld, resulting in different degrees of forgetfulness.

   Recommended supplementary reading: Have the class read out loud excerpts from Plato's dialogue, *Meno* (available on the Internet), and discuss his account of the doctrine of *anamnesis* (i.e., that all knowledge is recollection), as well as his demonstration of supposedly recollected geometric knowledge through Meno's slave boy. Is Socrates leading the boy to make observations, or does he really seem to know intuitively about proportions in squares? How sure is Socrates in his development of the

justified-true-belief formula (also in the *Theaetetus* dialogue)? (Links to ethics are also opportune, as the topic of *Meno* is whether virtue can be taught.)

Divide the class into those that agree, disagree, or are uncertain about Plato's formula for knowledge as justified true belief. Then ask students to carry out section question 2 (four- corners activity, SE p. 250).

Pythagoras, Plato, and Indian Philosophy (SE pp. 243-247): Ask students to write a brief reflection on whether asceticism or reincarnation (or both) play a role in their formation of knowledge. The following video titles may aid students. Look up these video titles on the Internet (which are available for viewing primarily on YouTube):

Genius: Pythagoras 1-5

Pythagoras of Samos

The Life of Pythagoras

And for additional information on the subject of math as a way of knowing, look up and view the following video title on YouTube:

Fermat's Last Theorem (Complete)

3. Intensify the controversy over the reliability of the senses by looking up the following video titles and showing them to students (most or all are available on YouTube). At the same time, students can be illustrating what they are to create, more briefly, in their assessment activity:

Camera Man – The Miracle of the Brain!!

Stephen Wiltshire Draws Tokyo from Memory

Stephen Wiltshire Draws Manhattan from Memory

Test Your Awareness: Whodunnit Murder Mystery Scene

Selective Attention Test: Gorilla Basketball

Ben Underwood Surfs

Extraordinary People – The Boy Who Sees Without Eyes (2/5)

The Real Superhumans

After seeing these videos, ask students, "Who has changed their mind as to whether perception is a reliable way of obtaining knowledge?" Now discuss synaesthesia, a condition where sensory inputs are combined, as in seeing numbers in colours or operations (division) as movements (downward spiral). Does Daniel Tammet's ability to derive Pi accurately to 22 000 digits without a calculator indicate that he knows math, or that he has uncanny computational ability?

Daniel Tammet – The Boy With the Incredible Brain (1-5)

Exit cards: Use BLM 10.1 and ask each student to write one paragraph explaining why or why not "eyes and ears are bad witness," responding to Heraclitus' claim.

Acc After collecting the exit cards, diagnose who is struggling with the content. Pair up the strong and weak responses to provide assistance to those who are struggling.

4. Mystery box: Place 12 objects in a box that has an opening for the hand, but which conceals the objects from sight. Select objects that are not dangerous or unpleasant to touch, but that stimulate curiosity instead of immediate recognition. See who can identify the most objects without looking, then reveal the contents. How reliable is our tactile sense?

5. Language awareness exercise (literacy connection: consider the etymologies of words such as *conceive* and *perceive*, or *eloquent/lecture/logic/language*; for the etymology of the word *knowledge* see SE p. 242): Ask students to compile (on their own or as a group

or class) a list of words we use to commend or condemn people, such as brilliant or blind, acute or dim, etc. How many of these terms refer back to our various ways of knowing through the senses? Students can use BLM 10.3 to compile these terms, and then compare them across the class to make generalizations on what attributes we value and which we possibly conceal (e.g., sight over smell).

6. Culminating activity process: Hand out BLM 10.2, which contains the instructions for making a short film, as well as the suggested film topic list. Go over the evaluation criteria on BLM 10.2 to ensure that students know what is required from the start, and when their work is due. Students form groups and select topics (these initial topics may change at a later date) for approval by the instructor (to avoid topic overlap). Suggestion: Instead of first come/first pick, ask each group to submit their members' names and a ranked list of their first three choices of topic; then try to give each group a topic in their top three. If someone is left out of a group, here you might assist them in joining a group with a topic they are also interested in working on. (Use BLM E to track learning skills.)

Text Answers

Page 245: Section questions

1. Encourage respect for divergent views, and appreciation of the role reincarnation plays in some world religions. In Shakespeare's time, it was a put down to call someone a "Pythagorean," as it meant they believed their ancestor may have been an animal (*The Merchant of Venice*).

2. The question asks for reflection on age, and therefore experience, as a criterion for knowledge. The question poses others: Can someone be wizened even though he or she is young? Address matters of ageism, and the developmental process associated with learning. If we think in language, and knowledge is something we convey in words or concepts, what can a pre-verbal human baby know?

3. To many students and adults alike, math remains a cult for the few adepts who understand. This is why it is used as a selector mechanism to drop the number of eligible applicants for limited university positions in non-mathematical fields from 10 000 to 800. Play with this idea, working up justification for the claim that math is a kind of modern-day mystery cult. What makes this kind of claim true or untrue, or gives the impression that the claimant knows something true about math as it is related to our society? How valid are these justifications?

Page 250: Section questions

1. Ask students to use a graphic organizer (such as BLM B or C) to record the similarities and differences between Plato and Aristotle. Conduct the debate between two classmates, one defending Plato and the other Aristotle, to build their understanding of these two early thinkers.

2. If someone claims one sports team is best, we may ask for the team's win-loss record, or some other such evidence of its achievement relative to other teams. With music bands, it is harder, unless there have been juried contests or performance reviews we can point to as evidence of success. Even in these circumstances, strength of justification comes into question, as well as the relativity of judgment.

   In the four-corners activity, try to find problems in the J-T-B formula; then work up additional criteria to shore up problems with the J-T-B formula, such as securing the truth condition by excluding coincidence.

3. Refer back to SE p. 245, section question 3, which addressed math as a mystery cult. Gettier's short, two-page essay on the problem of justified-true-belief is actually

more complex than our simplified explanation suggests. Taking up the problem of whether the justification actually applies to the truth of the situation, or merely coincidentally makes a link, could take this form: although math may have all of the attributes of a mystery cult, as it leaves many people on the outside of its technical language and rules, it is merely a coincidence that it shares this form; in fact, math is anything but a private club today, as conceivably anyone around the world can access this knowledge through public education. Upon inspection, the justification does not match the truth condition.

Learning Goal

Students will become familiar with the main schools of thought in epistemology, differentiating between rationalism and empiricism. They will discover Kant's fusion of these two approaches and pragmatism's avoidance of such dichotomies through practice-based inquiry.

Teaching Plan 2   (SE pp. 251-265)

Activity Description

Using a graphic organizer, students take notes in preparation for the quiz at the end of the chapter, and apply the key concepts to distinguish various kinds of propositions and forms of justification. Working the student textbook features on SE pp. 259-260 into classroom discussion, inquiry revolves around the question of how students know they are really in the classroom and not elsewhere hooked up to a computer or dreaming. This inquiry becomes a catalyst for considering other ways of knowing, such as intuition, dreams, divine revelation, and inspiration. Reading an excerpt of Emerson's essay "Self-Reliance" (BLM 10.6) calls upon students to formulate their own answers to big questions in epistemology.

Assessment Opportunities for Chapter Questions

The table below summarizes assessment opportunities for selected chapter questions, including questions in the Chapter Review, which are relevant to this teaching plan.

Assessment Type	Assessment Tool	Feature Questions	Section Questions	Chapter Review Questions
Assessment for Learning	Charting schools of thought/notes		4, SE p. 258	3. a), SE p. 264
Assessment as Learning	Discussion		2-3, SE p. 258, (cf. Ch. 11, SE p. 271)	
Assessment as Learning	Threading reflections on dreaming	1 and 2, SE p. 259	1, SE p. 258	1, SE p. 264
Assessment as Learning	Exploring pragmatism	1 and 2, SE p. 260, (cf. SE p. 257 on Putnam)		2, SE p. 264
Assessment as Learning	Comparing disciplines as fields of inquiry; questions of relativism		1-4, SE p. 263	

Timing

300 minutes
(four 75-minute classes)

Learning Skills Focus

- Independent work
- Organization
- Responsibility (for group project and quiz preparation)

Resources Needed

Make copies of these Blackline Masters:

- BLM 10.4 Comparison Chart: Schools of Epistemology (or use BLM C)
- BLM 10.5.A Chapter 10 Matching Quiz
- BLM 10.5.B Chapter 10 Short Answer Quiz
- BLM 10.6 Emerson on Self-Reliance
- BLM 10.7 Film Storyboard Template
- BLM A Venn Diagram (apply to Kant's fusion)

Possible Assessment of Learning Task

Matching or short answer quiz: Determine basic comprehension of key concepts and thinkers (knowledge category). Use BLM 10.5.A Chapter 10 Matching Quiz or use BLM 10.5.B Chapter 10 Short Answer Quiz (for ELL students, or as a make-up quiz for students absent for the matching quiz, or as a retest for improving achievement).

Assessment (For/As Learning)

As teachers move through each chapter, opportunities will be highlighted to provide assessment for/as learning in preparation for assessment of learning at the end of each chapter.

| Task/Project	Achievement Chart Category	Type of Assessment	Assessment Tool	Peer/Self/ Teacher Assessment	Learning Skill	Student Textbook Page	Blackline Master
Chart schools of thought	Knowledge	As	Chapter Review question 3. a)	Peer		264	
Paragraph: Interpret and critique Putnam's solution to brain-in-vat problem	Communication; Thinking; Application	As	Public gallery of responses on board	Peer	Collaboration; initiative	260	
Storyboarding: progress check	Thinking; Communication; Knowledge; Application	As	Graphic organizer	Self; peer; teacher	Collaboration; self-regulation; initiative		BLM 10.7

Prior Learning Needed

Draw on the division between Hume and Kant's ethical theories, studied in Unit 3, as a basis for distinguishing between empiricism and rationalism in epistemology.

Teaching/Learning Strategies

1. Explore rationalism and empiricism further with students, connecting the major thinkers and key concepts of these schools of thought. Ideas within these two schools of thought also make up the content of students' films in the culminating activity (assessment of learning). Use BLM 10.4 or BLM C as a tool to help students sort the two schools—their thinkers and key concepts. (Also see Chapter Review question 3. a), SE p. 264.)

2. Ask students to copy into their notes "Hume's Fork" (see SE p. 254) as a convenient way of organizing the two main approaches to knowledge. Hume's Fork builds upon his statement that knowledge comes either by relations of ideas or matters of fact (see quote, SE pp. 254-255).

a priori	*a posteriori*
true before or without experience (e.g., 2 + 2 = 4)	true based upon repeated experience or observation (e.g., the Sun rises in the east)
necessary	contingent
as in deductive syllogisms, the conclusion necessarily follows from the premises, or is true by definition or by the rules of math and grammar	the results may vary under different circumstances of an experiment, such as ambient room temperature or elevation
analytic	synthetic
analyzes the relations among words or numbers (e.g., all bachelors are single males)	draws conclusions or inferences from synthesizing results (e.g., as pressure increases volume decreases) (Boyle's law)

3. Illustrate Kant's fusion by using a Venn Diagram (BLM A). Kant claims he was awakened by Hume from his "dogmatic slumber," realizing that in order to have an experience of something as common as hitting a baseball out of the park, we need prior concepts of time, space, motion, solidity, and causation. These are synthetic *a priori* concepts, common to all people, and present in our minds before experience (hence rational and 'transcendental' to experience). These synthetic *a priori* concepts are used in coordinating our perceptions and experiences. Address Chapter Review question 8 on the benefits of both approaches.
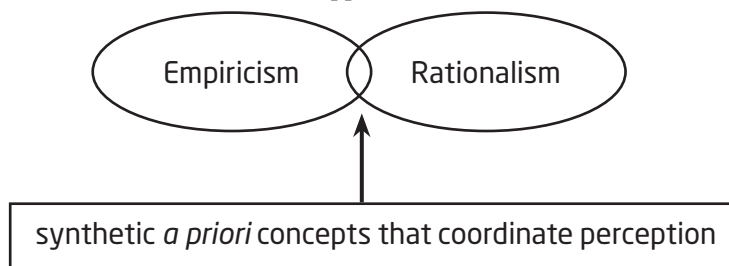
4. Ask students to investigate the concept of *phenomenalism*, or the idea that what we know is merely the appearance of the thing and not the thing itself (as in Kant's *phenomenal* versus *noumenal* realms). (The term phenomenalism is not included in the student textbook, so ask students to look it up in the *Stanford Encyclopedia of Philosophy* or other reputable resource.) Locke's primary and secondary qualities come into play here, as illustrated by the pencil in water appearing to bend (due to refraction of light rays in water; SE Chapter 10, p. 253, Figure 10-13). We also know that the colour of the water, appearing as blue or green, is an illusion.

For the later positivists (twentieth century), who built upon British empiricism (seventeenth-eighteenth century), to speak of solid objects instead of our sense impressions of them is metaphysical as opposed to scientific talk. With these concepts in mind, as a class, address Chapter Review question 7 (SE p. 265). Note: In Chapter 11, we revisit this topic, seeing epistemology as an attempt—perhaps an impossible one—to close the gap between knowing subjects and external objects.

Acc Use a word wall (as well as graphic organizers or illustrations) to post definitions of problematic terms (e.g., primary and secondary qualities).

5. Reintroduce the metaphysical concepts of realism and idealism, and ask students to apply these to the philosophers charted in step 4 above (completing Chapter Review question 3. a) and b), SE p. 264). Example: Plato's ideal realm of the forms is idealistic, whereas Aristotle's notion that forms are enjoined to the matter of things is realistic. How does pragmatism avoid the dichotomies of realism and idealism? How does Putnam's thought-experiment, the brain in the vat, illustrate a pragmatic solution to the skeptical problem of whether we can know that we are existing in the world?

Pair up students and ask them to write a short interpretation and critique of Putnam's solution; post these on the board for the class to see, in a public gallery display. As a class, discuss the different responses to Putnam's thought-experiment and its possible solutions.

6. Expose students to other ways of knowing, as in the differences between human and animal perception, and in different approaches such as divine revelation, intuition, or innate knowledge. Address Chapter Review question 4 (SE p. 264), and conduct the Chapter Review question 9 activity (SE p. 265) in which students consider different sources of justification. Based on this reflection, ask students to consider further what they may want to know but feel they can never know. Ask students to write anonymous responses and post them for the class to compare.

7. Have students explore the online tutorials available for Windows Live Movie Maker, as suggested in the Unit Opener. (http://www.youtube.com/watch?v=je_yJ-qHMFs) Confirm each group's topic for the culminating activity (initial topic may have changed slightly through inquiry) and ask students to begin to storyboard the short film by designing the layout and sequence of images, text, and music that will be used.

    Use BLM 10.7 (or other planning tool) to assist students in planning each frame of their film. Use Google Images to find other examples of storyboards.

    DI In doing the storyboard, some groups might decide they would prefer to create a Manga-style comic book, doing illustration instead of making a film. Alternatively, students could write a play to dramatize the theme.

8. Review for and then run the vocabulary matching quiz on BLM 10.5.A. (You may wish to create a second version of the matching quiz to help prevent students from copying one another—that is, students seated beside one another would be given a different version of the quiz. Do this by using the same "descriptions" as provided on BLM 10.5.A, but then change the letters associated with each term, creating a new set of correct answers.) Take up answers and clarify any common misconceptions before proceeding to Chapter 11, which provides a deeper exploration of the theories explored in Chapter 10.

    Acc For ELL and some Special Education (IEP) students, matching quizzes may present problems of semantics, where the grammar of the question impedes their success. Use BLM 10.5.B, which provides the option of students writing short-answer responses, where they will demonstrate knowledge through exposition (not marking for grammar and spelling, but content).

Text Answers

Page 258: Section questions

1. How could it be that Zhuangzi (Chuang Tzu) was tricked by a dream into thinking he was a butterfly, and upon waking how would he know he wasn't then a butterfly dreaming he is a man? There is a condition called vivid or lucid dreaming, where the dreamer may reasonably be unsure of whether he or she is dreaming. In most dreams, however, there is some degree of self-awareness or consciousness of dreaming, even if only at moment of waking from the surreal circumstances that cast doubt on the reality of the scene (e.g., as one takes to flying instead of running). The Czech surrealist author Franz Kafka recorded in his diary that he tried to capture these twilight or liminal states of consciousness, which show up in his writing (e.g., his parables and novel *The Trial*). Look up the following link on YouTube to see a brief video on lucid dreaming:

    http://www.youtube.com/watch?v=ASf55cov5F8

2. Unscrambled, the passage reads:

    According to research at Cambridge University, it doesn't matter in what order the letters in a word are. The only important thing is that the first and last letter be at the right place. The rest can be a total mess and you can still read it without problem. This is because the human mind does not read every letter by itself, but the word as a whole. Amazing, huh?

    More drastic alternations do impede the flow of reading, but the example here shows how, once fluent in the language, we read words symbolically instead of phonetically. For your ELL readers, this example may not be very clear.

Philosopher Ludwig Wittgenstein drew the conclusion that our ability to *continuously see aspects* (as opposed to aspect dawning, as in seeing the old and then the young woman in the same drawing; SE Chapter 11, p. 271, Figure 11-6) is essential for reading, showing the importance of our early training in language as a way of conditioning how we see and think about the world.

Ludwig Wittgenstein calls this *continuous seeing of an aspect* (for example, seeing an arrow as pointing or recognizing a particular word in a sentence) as opposed to *aspect-dawning* (e.g., seeing a duck, then a rabbit in the same drawing). Unlike aspect dawning, which we can control by shifting perspective, continuous seeing of aspects is hard to turn off. In *Philosophical Investigations* (part two)*,* Wittgenstein explains that we can scarcely stop ourselves from seeing a fork *as* cutlery.

> "It would have made as little sense for me to say 'Now I am seeing it as...' as to say at the sight of a knife and fork 'Now I'm seeing this as a knife and fork.' This expression would not be understood. Any more than: 'Now it's a fork' or 'It can be a fork too.'
>
> One doesn't *'take'* what one knows as the cutlery at a meal *for* the cutlery, any more than one tries to move one's mouth as one eats, or aims at moving it.
>
> The importance of this concept lies in the connection between the concepts of 'seeing an aspect' and 'experiencing the meaning of a word.' For we want to ask: 'What would you be missing if you did not *experience* the meaning of a word?'"

Wittgenstein's remarks refer to the concept of *semantic holism*—that is, how we understand words in relation to an entire alphabet, vocabulary, and rules of grammar.

Although optical illusions give us reason for caution when relying on our vision, we have to be careful not to disparage our sense of sight as it remains one of our most reliable sources of information. As we see in Chapter 11 and in Unit 5: The Philosophy of Science, the natural sciences depend on empirical observation for validation and falsification.

3. How is evidence gathered, and how are inferences arrived at within different fields (according to rules, or by observing patterns)? Which of the fields listed rely mostly on inductive or deductive reasoning? Which areas of knowledge lend the most certainty? How do we know within these different fields?

4. Comparing and contrasting: Hume, Locke, and Berkeley are empiricists, but only Berkeley is an idealist. Despite their phenomenalism, or belief that we only know things as we can perceive them and not as they really are, Hume and Locke are realists in the sense that things are really there to be perceived. From Berkeley's position, things are there because we perceive them, or because God perceives them even when we do not.

When Locke says, "Our knowledge ... is real only so far as there is a conformity between our ideas and the reality of things," he sets up a problem in epistemology. How does the mind know when its ideas conform with things, and how do things convey to us such conformity? Locke identifies himself as a realist by adhering to correspondence theory of truth: our propositions or knowledge is true only if it conforms to the way things really are, in nature or reality. Here is the crux of the problem we have discussed as a matter of bridging the gap between the knower and the known, or between the perceiving subject and the object of perception. The answer we provide becomes the basis of knowledge (and for epistemology as a field of inquiry), or the floor boards in our metaphorical house of knowledge.

Descartes and Kant are both rationalists, but whereas Descartes arrives at innate reason as the only sure thing by methodically doubting the evidence of his senses, Kant builds upon Hume and fuses empiricism and rationalism into a new hybrid concept. He throws off the "dogmatic slumber" of raw empiricism, which seeks to bundle together a series of sense impressions to arrive at cognition (e.g., realization of an event). For Kant, we require transcendental reason or *a priori* concepts in order to perceive things; without space, time, motion, and solidity, how could we see, for instance, a soccer ball go into the net?

Page 259: Thought Experiment

1. Call for student reflection. This question appears again in the Chapter Review section, again asking how students know, or how they can justify their claims to being in the classroom. Perhaps one student can play "devil's advocate" and ask another student: "But why?" or "How do you know?"

2. Putnam would not have been impressed with the Police Department's three-point questionnaire, as none of these would presumably defeat the programming that leads one to think he/she was not a brain in a vat, that they had a hand they could hold up as theirs, or that he/she had a mother born of one's grandparents, etc. Following the clue in the text, we need to turn to the next feature on Semantic Externalism to glean what Putnam sees as the solution (SE pp. 260-261). The idea that for words to have meaning they must rub up against causal connections in the real world fits with the pragmatist idea that meaning occurs within contexts of useful practices, and within natural environments that we experience and know through trial and error. The idea that one has parents does not make sense in a vat, outside the animal world where placental mammals like us dwell. Here is another example to illustrate:

   "If you still don't get it, then consider the following analogy. Imagine an alien from a distant planet where there are no hamburgers. Purely by chance, the alien comes across a blob of paint that looks just like a hamburger, and the image that forms in its mind is exactly the same as the image that you have of hamburgers. But what's in the alien's mind is not really a representation of a hamburger. There is simply no causal connection between the image and an actual hamburger. The same goes for brains in vats. Whatever mental images they have, they no more represent and refer to the external world than do the hamburger images of hamburgerless aliens represent hamburgers."

   Perhaps frustrated by this line of inquiry, analytic philosopher G.E. Moore (1873–1958) famously affirmed the role of sense perception by grabbing his hand and declaring "*This* is my right hand and," switching his grip, "*this* is my other hand." Another analytic philosopher, Ludwig Wittgenstein (1889–1951), uses this curious scene as the starting point for what has been published as *On Certainty*. What would it be like to raise children, he wonders, as idealists, uncertain of the material substances at hand? Would they speak to each other like this? "Go over to what appears to be the cupboard and take out the apparent flour for the imaginary birthday cake. We'll conceive of your birthday party when the illusory aroma of cake clears the air of this artificial abode." Can we really raise children to think the gifts are only there so long as someone is present? Akin to pragmatism, Wittgenstein's pursuit of this line of thought takes us back to seeing ourselves as beings (social animals) rooted in natural and social environments where we are trained to follow instructions and behave according to socialization (our second nature or custom) within communities of language users and fellow practitioners. As we see in Chapter 11, our doubting stops

here—on shallow bedrock for certainty—within shared practices that give meaning to our utterances. (Although Wittgenstein was not a pragmatist, Putnam uses him in his neo-pragmatism, as do Richard Rorty and many others.)

Page 260: Viewpoints

1. Small group discussion. Build on section question 1, SE p. 258, where we visited the question through a man dreaming he was a butterfly.

2. As British philosopher A.C. Grayling explains, to understand Descartes we must not trivialize his skepticism, as though he were insane. It is not that he really is unsure of whether he is in his study, sitting before the fireplace in his bathrobe. Doubting the obvious is a way of methodically stripping away everything that could be produced by an illusion, or by the deceptions of an evil genie or malicious god. The goal is to arrive at a first philosophy, or a basis upon which knowledge may be built, hence making Descartes' skeptical demolition of taken-for-granted knowledge a landmark effort in foundationalism.

   Putnam's brain-in-a-vat thought experiment does similar work by employing skepticism, but he does not arrive at self-consciousness ("I think, therefore I am") as the sole residue of the reductive exercise. As a pragmatist thinker, Putnam turns to the context of our thinking and speaking, which is a world that has both natural causes and social meaning. Semantic externalism points to how our language rubs up against these two, making it possible for us to communicate with each other about trees even though a Japanese person might be thinking of a tiny bonsai tree and a person in California of a giant sequoia.

   Causal connections with our environment are emphasized by the pragmatists, as is avoidance of dualistic thinking—we are not detached bodies, or souls trapped in bodies, but beings immersed in our environment, doing useful things with these causal links.

Page 263: Section questions

1. See BLM 10.6 Emerson on Self-Reliance, which also asks students to reflect on and discuss these questions.

   Refer to SE p. 255 for discussion of degrees of certainty in different types of propositions, using Hume.

2. Refresh the concepts of objectivity and subjectivity for students. Consider cases to exemplify: 1) Only I can know if I am truly worried or sad, but others may have some evidence from my facial expressions or mood. The room temperature, on the other hand, is something we can objectively measure, unlike my mood. 2) Are students more likely to contest a mark on an English composition, believing the teacher is being subjective in his or her appraisal and that a range of responses might suffice, than on a math test, which seems to have singular, objective answers?

3. Ask students to contemplate how we create knowledge, and different kinds of knowledge. Although British philosopher Gilbert Ryle does not appear until Chapter 11, his distinction between knowing *how* and knowing *that* helps here. I know *how* to ride a bike (through experience or training), whereas I know (through facts of geography as relayed in maps) *that* it is a long ride to the coast.

   When someone classifies your learning style, you might also differentiate between learning to swing a golf club (or kicking a soccer ball) and learning physics. Why would one assume that it is the same style of learning that is used in both? Most people are both applied and academic learners.

4. Here we encounter the problems of *perspectivism* and relativism in relation to knowledge. If we didn't agree, for the most part, how would we communicate and develop as a society or culture (e.g., improve our technology)? The problem of epistemological relativism appears at the end of Chapter 11 (SE pp. 284-288), and arises again through local and indigenous knowledge(s) at the end of Chapter 12 (SE pp. 298-299).

Dr. Louann Brizendine explains, in her books *The Female Brain* and *The Male Brain,* that men and women sometimes process information differently (e.g., a math problem or reading a map), arriving at the same answer but utilizing different areas of the brain. Watch about 15 minutes of her lecture on YouTube (see the Web link that follows) to open this discussion, taking into account the issue of generalizations (as opposed to stereotypes) or averages within distributions (the bell curve and its mean):

http://www.youtube.com/watch?v=Lu_uGr1ZOn4

Pages 264-265: Chapter Review

1. If, while dreaming, I place my hand on a stove-top burner, I may have the sensation of being burned, but not likely the smell or tactile feeling of charred flesh. The visual cues that may prompt a pain reaction do not make for a very complete simulation of our actual experience of burning. Unlike the dreamer, the brain in the vat might be programmed to have these olfactory and tactile senses, too, and even to heal over time, giving a greater impression of having been burned. Putnam's point, however, is that "being burned" only makes sense semantically, as words conveying meaning, in a world where carbon is altered by heat and other carbon-based things like logs turn into embers in the fireplace. On this basis, too, I can understand how the Sun will one day (five billion years hence) turn into a brown dwarf star, or a carbon cinder that is not hot enough to fuse hydrogen or helium atoms and emit light.

2. Whereas Plato is both a rationalist and idealist, Putnam is a pragmatist (see SE p. 257). Pragmatists seek to avoid dualisms between idealism and realism, empiricism and rationalism, by grounding their inquiry in actual practice, sometimes called instrumentalism (thinking or knowing in useful practice), or contextualism (working in actual, natural, and social settings). Putnam's book *The Collapse of the Fact/Value Dichotomy and Other Essays* is such an effort to resolve the antagonism between binary concepts, artificially constructed by philosophers. Whereas Plato's notion of knowing through recollection is metaphysical, or artificial, Putnam's is highly practical and down to earth. Whereas for Plato, our words refer back to ideal forms (the metaphysical form of chair, tree, or circle), or essences, for Putnam they only have purchase in so far as they refer to things here on Earth, which we rub up against and describe as worldly creatures instead of disembodied brains.

If you are confused by the introduction of the term *eliminative*, it is for good reason. It actually refers to French philosopher Henri Bergson's ideas, as quoted by Dr. C.D. Broad, giving us a different picture of knowledge accumulation:

> "The suggestion is that the function of the brain and nervous system and sense organs is in the main *eliminative* rather than productive. Each person is at each moment capable of remembering all that has ever happened to him and of perceiving everything that is happening everywhere in the universe. The function of the brain and nervous system is to protect us from being overwhelmed and confused by this largely useless and irrelevant knowledge, by shutting out most of what we should otherwise perceive or remember at any moment, and leaving only that very small and special selection which is likely to be particularly useful."

In *The Doors of Perception,* Aldous Huxley describes seeing landscapes and trees through a higher state of Buddha vista. Reminiscent of the Pagan concept, he sees the flowers in the garden as though they were breathing. His inspiration comes from a mixture of Indian and Japanese Buddhist concepts: the Dharma-Body, Beatific Vision, and *Sat Chit Ananda*—Being-Awareness-Bliss. Citing Broad's explanation of Bergson (above), Huxley continues:

> "According to such a theory each one of us is potentially Mind at Large. But in so far as we are animals, our business is at all costs to survive. To make biological survival possible, Mind at Large has to be funnelled through the reducing valve of the brain and nervous system. What comes out the other end is a measly trickle of the kind of consciousness which will help us to stay alive on the surface of this particular planet."

Based on this interpretation, our written, symbolic languages—what we consider knowledge—are the contents of this reduced awareness. Indeed, this world as we know it is the universe of reduced awareness. Against this reduced image of reality, what Huxley tried to capture in the Now moment was the *is*-ness of things in their being and becoming.

3. a) Table for comparing philosophers:

Rationalist		Empiricist	
Pythagoras	Rationalists rely mainly on reason and distrust the evidence of the senses.	Aristotle	Empiricists rely mainly on observation and experience, on which reason works to derive knowledge.
Plato		Locke	
Descartes		Hume	
		Berkeley	

b) Of the philosophers listed in the table in part a), only Berkeley is an idealist (oddly, an empiricist idealist).

4. Tread carefully with this reflection, as it questions the reliability of revelation if we cannot corroborate the truths given over through divine inspiration. We may accept the words of prophets and saints, and sometimes artists and philosophers, too, over "mad people," but the line is often a thin one or crossed (e.g., Nietzsche as prophet, herald, or avatar in *Thus Spoke Zarathustra*). Here is where faith enters into a question of certainty, which will draw different reactions depending on religious affiliations.

Of possible help is this YouTube video clip:

http://www.youtube.com/watch?v=ClKCEZgtQQw

5. Note the contradiction of quoting Emerson on not quoting philosophers, rather like Aquinas' advice that we not rely on appeals to authority (itself authoritative advice). Use BLM 10.6 to deepen this line of inquiry through Emerson's essay "Self-Reliance." Connect it to questions on epistemology.

Ageism is another aspect of this question, in that we usually defer to our elders who have more experience. When is that not the case, and why? How might an older generation be out of touch with adolescent realities?

6. There are many examples of animals who use sonar or echolocation (bats, dolphins) or who have heightened olfactory senses or tentacles (dogs and ants). Some birds pick out mates by observing their health in ultraviolet wavelengths. Human sensory knowledge is limited, but can be expanded through technology (e.g., infrared satellite images, or MRIs). Look up the Web links on the next page to check out some videos on this topic:

http://www.youtube.com/watch?v=GCVYgTwNGB4

http://blip.tv/lift/chris-woebken-animal-superpowers-4381839

http://video.google.com/videoplay?docid=5716027131114003862#

7. Humans rely on sensing things, such as seeing the secondary appearances instead of the primary qualities of a thing that we may infer through our senses. As a result, we have *indirect* contact with the external reality, so this approach is referred to as *indirect realism*.

Look up the term *phenomenalism* (Google, or *Stanford Encyclopedia of Philosophy*), which refers to the positivist idea that we can only refer with a degree of certainty to primary sense data (what we receive through perception) if we are to remain 'positive' in our assertions and avoid falling into metaphysics (i.e., speculations as to the hidden nature of things).

8. See Unit 5: The Philosophy of Science for examples, such as Einstein's rational (mathematical) discovery of relativity and cosmic expansion, demonstrated empirically through observations and experiments. Another example is cosmic neutrinos: the number of these particles (which are produced in the Sun's core) that reach Earth was estimated correctly through mathematics and counted correctly through empirical apparatus (a vat of chlorine). History uses empirical evidence in terms of primary documents (archives with letters, etc.); when history delves into causes of events, is it also using rationalism to make logical inferences?

9. and **10**.

Question 9, Type of proposition: A = Analytic S = Synthetic	Question 10, Types of justification:
a) A	viii) logic (math)
b) S	vii) sense perception x) common knowledge
c) S	vii) sense perception
d) A/S? We cannot travel at the speed of light, but we can infer the occurrence of these events based on the theory of relativity. If we could travel that fast, however, this could be derived or validated empirically.	iv) authority (Einstein) viii) logic v) intuition
e) A	viii) logic iv) authority (Cosmic String Theory) ii) faith v) intuition
f) S	vii) sense perception
g) A and S: By definition, a BA degree may be a four-year program, or one could do a survey of schools to arrive at the conclusion inductively (as a generalization).	iv) authority x) common knowledge
h) S	vii) sense perception
i) S	vii) sense perception (Galileo's experiments)
j) A	x) common knowledge i) value judgment ii) faith
k) A (The typographical error in the SE should read: *The square of the hypotenuse* of a triangle equals the sum of the squares of the other two sides–that is, the Pythagorean theorem.)	viii) logic (math)