Section: Scientific Methods

Pacing

1 block = 45 minutes

<table>
<thead>
<tr>
<th>Schedule</th>
<th>with lab(s):</th>
<th>without lab(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Schedule</td>
<td>3 days</td>
<td>2 days</td>
</tr>
<tr>
<td>Block Schedule</td>
<td>1.5 days</td>
<td>1 day</td>
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</tbody>
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Objectives

1. List and describe the steps of the experimental method.
2. Describe why a good hypothesis is not simply a guess.
3. Describe the two essential parts of a good experiment.
4. Describe how scientists study subjects in which experiments are not possible.
5. Explain the importance of curiosity and imagination in science.

National Science Education Standards Covered

UCP 3: Change, constancy, and measurement.
SAI 1: Abilities necessary to do scientific inquiry.
SAI 2: Understandings about scientific inquiry.
ST 2c: Creativity, imagination, and a good knowledge base are all required in the work of science and engineering.
SPSP 6d: Individuals and society must decide on proposals involving new research and the introduction of new technologies into society. Decisions involve assessment of alternatives, risks, costs, and benefits and consideration of who benefits and who suffers, who pays and gains, and what the risks are and who bears them. Students should understand the appropriateness and value of basic questions—“What can happen?”—“What are the odds?”—and “How do scientists and engineers know what will happen?”

KEY
SE = Student Edition
ATE = Annotated Teacher Edition
CRF = Chapter Resource file

Block 1

FOCUS 10 minutes

☐ Using the Figure Chapter Opener, ATE. Ask students to consider how videos of Weddel seals might help scientists.
Bellringer Bellringer Transparency, ATE. Ask students why the scientists in Figure 1 are measuring the wolf’s tail and how they might use the information.

MOTIVATE 5 minutes

Identifying Preconceptions Scientific Methods, ATE. Experiments sometimes result from observations about a different subject. (Basic)

TEACH 30 minutes

Quick Lab Hypothesizing and Predicting, ATE. Have students form a hypothesis and test it.

Activity Park It Right Here, ATE. Introduce scientific methods to students by showing them different ways to explain an observation. (Basic)

Skill Builder Writing Skills, ATE. Have students pick something in the classroom and write down observations about it for 5 minutes. (Basic)

HOMEWORK 15 minutes

Pre-Reading Activity SE. Have students make the FoldNote as a study tool.

Block 2

LAB 45 minutes

Skills Practice Lab: Demonstration Scientific Investigations, SE. Students formulate a hypothesis, test the hypothesis, and analyze data in a scientific investigation. (General)

Datasheet for In-Text Lab Scientific Investigations, CRF. Students use the datasheet to complete In-Text Lab. (General)

Block 2

TEACH 35 minutes

Group Activity The Metric Game, ATE. Have students practice measuring using the metric system. (Advanced)

Using the Figure Drought in Jamestown, Figure 5, ATE. Have students examine and draw conclusions about the data for rainfall in the Jamestown area. (General)

Teaching Transparency Rainfall and Tree Ring Width. Use this graphic to show students how data from a cross section of a tree trunk can be translated into a graph of rainfall.

Internet Activity Dendrochronology Tutorials, ATE. Students learn how dendrochronologists analyze tree-ring data from around the world to establish a record of Earth’s climate. (Advanced)

Teaching Transparency John Snow’s Cholera Spot Map. Use this graphic to show students how creativity and imagination helped John Snow end a Cholera epidemic.
CLOSE 10 minutes

❖ Section Quiz Section 1, CRF. Students answer 10 questions that review the lesson content. (General) Also in Spanish

❖ Concept Review Worksheet Tools of Environmental Science, CRF, Study Guide. Complete worksheet that reviews concepts for this section. (General) Also in Spanish

HOMEWORK 30 minutes

❖ Section Review Section 1. Assign questions 1–6 for review, homework, or quiz.

❖ Active Reading Worksheet Section 1, CRF. This exercise assesses reading comprehension of the material covered in the section. (Basic)

OTHER RESOURCE OPTIONS

❖ Inclusion Strategies ATE. Students observe their classroom environment and then label four index cards as follows: See, Hear, Smell, Touch. Students record their observations for each of these senses.

❖ Reteaching Scientific Methods, ATE. Have students think of questions to investigate, and decide whether scientists could answer them or not. (Basic)

❖ Alternative Assessment Identifying Scientific Methods, ATE. Have students highlight articles from popular science magazines that demonstrate the scientific method. (General)

❖ Design Your Own Lab Onion Conundrum, CRF. Students strive to explain an observation using scientific methods. (General)

❖ Interactive Explorations CD-ROM Exploration 7: Shut Your Trap! Students observe the characteristics of the Venus’ Flytrap.

❖ go.hrw.com For resources and reference materials that go with the textbook, visit the HRW website and type in the keyword HE8 Home.

❖ Video Select Videos related to the chapter topics may be found at go.hrw.com. Type in keyword HE8 TOOV.

❖ Internet Connect Experimenting in Science, SciLinks code: HE80556. Students use Internet sources to conduct research on how to perform scientific experiments.

❖ Guided Reading Audio CD Program Tools of Environmental Science Script. Assign Section 1. The audio program is a reading of the chapter content for ELL students, auditory learners, and struggling readers.

❖ Holt PowerPoint® Resources Use this customizable presentation tool to enhance your lectures or to help students practice standardized test-taking skills.

❖ Holt PuzzlePro® Use this software to create crossword puzzles and word searches that make learning vocabulary fun.