

14. theory
15. manipulated variable

### What Is Science?

#### Enrich

1. They both hit at the same time.
2. marble weight; rate of fall
3. Height of fall, moment fall begins, landing area, shape and material of falling objects, air temperature

### The Study of Earth Science Guided Reading and Study

**Use Target Reading Skills** This is one possible way to complete the graphic organizer. Accept all logical answers.

Sample answer:

**Main Idea:** The big ideas of Earth science are: the structure of the Earth system, Earth's history, and Earth in the solar system.

**Detail:** The Earth system is made up of the lithosphere, hydrosphere, atmosphere, and biosphere.

**Detail:** Constructive and destructive forces have changed Earth's surface throughout the planet's long history.

**Detail:** Earth and the other planets that make up the solar system are in orbit around the sun.

1. astronomy
2. hydrosphere, lithosphere, atmosphere
3. a group of parts that work together as a whole
4. Earth can be considered a system because a change in one of its parts can produce changes in the other parts.
5. The sun provides energy for many processes on Earth's surface. For example, the sun's energy causes water to evaporate from the surface of oceans, lakes, and rivers. Evaporation is part of the water cycle.
6. Constructive forces build up mountains and landmasses on Earth's surface. Destructive forces wear away mountains and other surface features.
7. Planets and other objects in the solar system provide evidence that can help scientists understand Earth and its history.

8. c
9. e
10. b
11. a
12. d
13. d

14. a
15. Earth scientists use models and simulations to study processes and features that are too large and complex, or take place over too long a timespan, to be studied directly.
16. true

### The Study of Earth Science Review and Reinforce

1. atmosphere
2. biosphere
3. lithosphere
4. hydrosphere
5. sun
6. radiation
7. Earth's interior
8. system
9. energy
10. destructive forces
11. true
12. meteorologists
13. environmental scientists

*Sec. 2*

### The Study of Earth Science Enrich

1. A representation of a complex object or process
2. Often a model is made for the purpose of representing some specific characteristic of an object or process.
3. It shows the relative sizes of the different planets.
4. Sample answer: Missing from the model are the relative distances of the planets from the sun.
5. It shows the relative distances of the planets from the sun.
6. Sample answer: Missing from the model are the relative sizes of the planets.
7. Sample answer: Neither model is better than the other. They each represent a different characteristic of the solar system.

### Speeding Up Evaporation Skills Lab

For answers, see the Teacher's Edition.

### The Nature of Technology Guided Reading and Study

#### Target Reading Skill

Sample answer:

#### What You Know

1. Examples of technology include electronic devices.

2. Engineers design and build many different things.
3. New technologies are being invented all the time.

**What You Learned**

1. Technology refers to more than just objects that people make. Technology includes processes and knowledge that people use to change the world and solve practical problems.
2. An engineer is a person who is trained to use scientific and technological knowledge to solve practical problems.
3. When new technologies become available, they often have an impact on society by changing the way people live.

1. Technology is how people change the world around them to meet their needs or to solve practical problems.
2. a, b, d
3. true
4. To improve the way people live
5. Communication, telephone
6. Manufacturing, tent
7. Biological and chemical, insect repellent
8. Energy and power, lantern
9. Construction, highway
10. Transportation, car
11. Science is the study of the natural world to understand how it functions, while technology modifies the natural world to meet human needs.
12. a, d
13. false
14. A group of people who live together in an area and have certain things in common, such as a form of government
15. technology
16. b, c

**The Nature of Technology Review and Reinforce**

1. To improve the way people live
2. Science is the study of the natural world to understand how it functions, while technology modifies the natural world to meet human needs.
3. Sample answer: The development of airplanes changed society by making it possible for people to travel long distances much more quickly than ever before.
4. engineer
5. Technology

Sec. 3

**The Nature of Technology Enrich**

1. Prehistory is the time of humans before writing.
2. The Stone Age was the period of prehistory beginning about 3.5 million years ago when humans began making tools out of stone.
3. The Bronze Age began in the Middle East in about 3500 B.C. It got its name from the tools and weapons made out of the metal bronze.
4. The Iron Age followed the Bronze Age. Tools made out of iron mark the Iron Age.
5. Sample answers: computers, fax machines, cellular phones

**Safety in the Science Laboratory Guided Reading and Study**

**Use Target Reading Skills**

Safety in the Science Laboratory

- I. Safety in the Lab
  - A. Preparing the Lab
  - B. Performing the Lab
  - C. End-of-Lab Procedures
- II. Safety in the Field
- III. In Case of an Accident
  1. false
  2. d
  3. Appendix A
  4. Ask the teacher.
  5. Always follow your teacher's instructions and the textbook directions exactly.
  6. true
  7. a, b, d
  8. b
  9. c
  10. a
  11. clean up
  12. Follow your teacher's instructions about proper disposal.
  13. true
  14. b, c, d
  15. all of the above
  16. Notify your teacher.
  17. c

**Safety in the Science Laboratory Review and Reinforce**

1. Thinking about the lab ahead of time allows you to anticipate any problems that may arise.
2. Always follow your teacher's instructions and the textbook directions exactly.
3. The symbols alert you to possible dangers in performing the lab and remind you to work carefully.

Sec. 4

4. Clean up your work area. Turn off and unplug any equipment and return it to the proper place. Follow your teacher's instructions about proper disposal of wastes. Be sure to wash your hands thoroughly.

5. Doing a field investigation means to do an investigation in an outdoor area.

6. Good preparation

7. Notify your teacher immediately. Then, listen to your teacher's directions and carry them out quickly.

### Safety in the Science Laboratory Enrich

1. He should be wearing goggles.

2. You should avoid inhaling fumes directly.

3. He should have followed the instructions in his book exactly.

4. She should have told the teacher, and she should have flushed the skin with large amounts of water.

5. He should not have planned to do field work by himself without telling anyone or receiving his teacher's permission.

6. They should have disposed of wastes properly, and they should not have put a leaking test tube in a cupboard. They should also have washed their hands.

7. She should have told the teacher. She should also have covered the cut with a clean dressing and applied direct pressure to the wound to stop the bleeding.

### Use Key Terms

1. observing
2. science
3. manipulated variable
4. astronomer
5. geologist
6. scientific theory
7. variables
8. hypothesis
9. technology
10. Earth science

**Key Term: Oceanographer** A scientist who studies Earth's oceans

### How to Use a Balance Laboratory Investigation

1. 50 g; by subtracting the mass of the empty beaker from the mass of the beaker with 50 mL of water in it

2. The middle (heaviest) rider should be moved first. This rider measures the largest unit of mass used.

3. Answers may vary. Generally, 610 g is the largest mass that can be measured using a standard triple-beam balance.

4. The smallest mass that can be measured accurately is 0.1 g.

5. When the balance reads zero, it means that the mass of the object being measured and the mass shown by the riders are equal.

6. The reading would be inaccurate because you would be starting from a point below or above zero.

7. By dividing the mass of 50 mL of water by 50 g, students should find out the mass of 1 mL of water is 1 g.

8. First, find the combined mass of the milk and drinking glass. Pour the milk into another container and then find the mass of the empty glass. Subtract the mass of the empty glass from the combined mass.

9. Place a piece of paper or a light food container on the balance and find its mass. Add 250 g to the mass of this object and set the riders for that amount. Slowly add sugar until the pointer balances on zero.

### More to Explore

Student designs will vary, but they should mimic the action of a double-pan balance.

Two holding devices may be attached to a lever that is balanced on a fulcrum, like a seesaw, or suspended from a fixed point using string. For example, cans can be placed on the far ends of a ruler. Objects of known mass can be placed in one holding device, while small objects such as pennies or paper clips can be placed in the other holding device. When the two holders and their contents are level, both sides have equal mass. Specific suggestions for improvement may include using hanging devices with less friction or using holding devices that are equal in mass.

Introduction to Earth Science • Key Terms

**Key Terms: Sections 1-4**

Answer the questions by writing the correct Key Terms in the blanks. Use the numbered letters in the terms to find the hidden Key Term. Then write the definition for the hidden Key Term.

Clues

Key Terms

1. A way of learning about the world

S C I E N C E

2. Scientist who studies the solar system, stars, and galaxies

A S T R O N O M E R

3. Scientist who studies the characteristics of rocks and the forces that have shaped Earth

G E O L O G I S T

4. A well-tested explanation for a wide range of observations or experimental results

S C I E N T I F I C  
T H E O R Y

5. How people change the world around them to meet their needs and solve practical problems

T E C H N O L O G Y

6. The science concerned with Earth and its place in the universe

E A R T H  
S C I E N C E

**Section 1: Pages 6 & 12**

Answer the following questions on a separate sheet of paper.

1. What is science? Science is both a way about learning about the natural world and the knowledge gained through that process.

**Building Vocabulary**

Fill in the blank to complete each statement.

2. A scientific Law is a statement that describes what scientists expect to happen every time under a particular set of conditions.
3. A scientific Theory is a well-tested explanation for a wide range of observations or experimental results.