Name _____ Date _____ Class _____

What Is Science? (pp. 6–12)

This section explains the skills that scientists use as they observe the natural world. The section also presents the process of scientific inquiry as a means of testing hypotheses and explains the difference between a scientific theory and a scientific law.

Use Target Reading Skill

After you read this section, reread the paragraphs that contain the definitions of the key terms. Use all the information you have learned to write a definition of each key term in your own words on the lines below.

scientific inquiry

A process that includes the different ways that scientists find out about the natural world and try to explain what they have observed

hypothesis

One possible answer to a scientific question

variable

Something that can change in an experiment

manipulated variable

The variable that is changed on purpose during an experiment to test a hypothesis

responding variable

The variable that changes in response to changes in the manipulated variable

controlled experiment

An experiment in which only one variable is manipulated

data

Facts, figures, and other evidence that a scientist collects through observing

scientific theory

A single explanation that connects a large set of related observations or results from experiments

scientific law

A rule of nature that describes what scientists think will happen every time when conditions are the same

Name _____ Date _____ Class _____

What Is Science? *(continued)*

Thinking Like a Scientist (pp. 6–7)

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

2. What are three skills scientists use to learn more about the world?
observing, inferring, predicting

3. What are five important attitudes that help scientists in their work?
curiosity, open-mindedness, creativity, honesty, skepticism

4. What is observing?
using the five senses to gather information

5. The senses a scientist uses in observing include sight, hearing, touch, taste, and smell.

6. What is inferring?
using reasoning to explain or interpret an observation

7. Circle the letter of each item that is true about inferences.
   (a.) Inferences are based on reasoning from what you already know.
   b. Making an inference involves guessing.
   (c.) An inference is an interpretation of observations.
   (d.) People make inferences all the time.

8. Making a forecast of what will happen in the future based on past experience or evidence is called predicting.

Scientific Inquiry (pp. 8–11)

9. Write a sentence that explains what scientific inquiry is.
Scientific inquiry is the process by which scientists study the natural world and propose explanations based on the evidence they gather.

10. Is the following sentence true or false? Scientific inquiry often begins with ~~developing a hypothesis~~. false
Observation

11. Circle the letter of each sentence that is a scientific question.
    - (a.) At what temperature does water boil?
    - (b.) When does the sun rise on April 3?
    - c. How can my team work better together?
    - d. Why does she like science more than he does?

12. A(n) hypothesis is a possible explanation for a set of observations or answer to a scientific question.

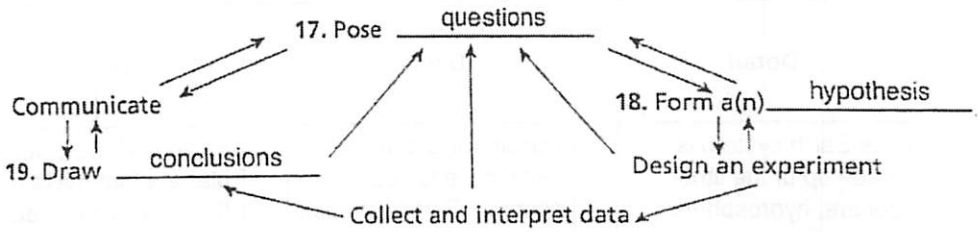
13. Is the following sentence true or false? Scientists consider a hypothesis to be ~~a fact~~ guess. false

14. To test a hypothesis, a scientist designs a(n) experiment. Repeatable

15. The facts, figures, and other evidence gathered through observations are called data.

16. A(n) conclusion is a summary of what you have learned from an experiment.

Complete the Nature of Inquiry diagram by filling in the blanks.



20. Why is scientific inquiry a process with many paths, not a rigid sequence of steps?
Different questions may require different approaches to finding answers.

21. In scientific inquiry, what is communicating?
Sharing experimental findings and ideas with others through writing and speaking

Scientific Theories and Laws (p. 12)

22. What is a scientific theory?
A well-tested explanation for a wide range of observations or experimental results

23. Is the following sentence true or false? Future testing can prove a scientific theory to be incorrect. true

24. You can think of a(n) scientific law as a rule of nature.

25. How is a scientific law unlike a scientific theory?
Unlike a scientific theory, a scientific law describes an observed pattern in nature without attempting to explain it.

Name _____ Date _____ Class _____

The Study of Earth Science (pp. 13–18)

This section introduces the main concepts, or "big ideas," of Earth science; discusses the subject matter of each of the branches of Earth science; and explains why Earth scientists often use models and simulations in their work.

Use Target Reading Skills

As you read about the big ideas of Earth science, fill in the detail boxes that explain the main idea in the graphic organizer below.

the structure of the Earth system, Earth's history, and Earth in the solar system.

Main Idea

The big ideas of Earth science are . . .

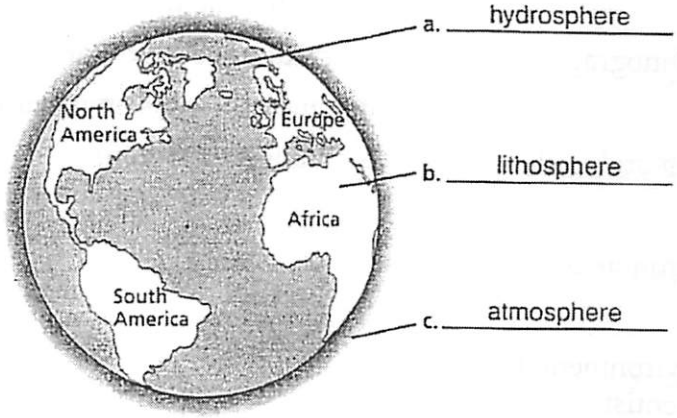
Detail	Detail	Detail
The Earth system is made up of the lithosphere, hydrosphere, atmosphere, and biosphere.	Constructive and destructive forces have changed Earth's surface throughout the planet's long history.	Earth and the other planets that make up the solar system are in orbit around the sun.

Name _____ Date _____ Class _____

Big Ideas of Earth Science (pp. 14–15)

1. The body of knowledge that deals with Earth and its place in the universe is called Earth Science

2. In the diagram below, label the "spheres" that make up the Earth system using the following terms: *lithosphere*, *hydrosphere*, and *atmosphere*.



3. What is a system?
A group of parts that work together as a whole

4. Explain how Earth can be considered a system.
Earth can be considered a system because a change in one of its parts can produce changes in the other parts.

5. What is the source of energy for many processes on Earth's surface? Explain.
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. Compare and contrast the effect of constructive forces and destructive forces on Earth's surface.
Constructive forces build up mountains and landmasses on Earth's surface. Destructive forces wear away mountains and other surface features.

7. What is one reason that scientists are interested in studying other planets and objects in the solar system?
Planets and other objects in the solar system provide evidence that can help scientists understand Earth and its history.

The Study of Earth Science *(continued)*

The Branches of Earth Science (pp. 16–17)

Match the term with its definition.

c 8. geologist

e 9. oceanographer

b 10. meteorologist

a 11. astronomer

d 12. environmental scientist

a. studies the solar system, stars, and galaxies
b. studies the weather and the atmosphere
c. studies the solid Earth
d. studies Earth's environment and resources
e. studies the oceans

13. Venus is the planet that is closest in size to Earth. Venus also has volcanoes and an atmosphere. Which types of Earth scientists would an astronomer most likely ask to help analyze new data from Venus?
    a. environmental scientist and geologist
    b. meteorologist and oceanographer
    c. environmental scientist and oceanographer
    (d.) geologist and meteorologist

14. An Earth scientist who studies the hydrosphere is called a(n)
    (a.) oceanographer.
    b. astronomer.
    c. geologist.
    d. meteorologist

Models in Earth Science (p. 18)

15. Why do Earth scientists often use models and computer simulations?
    Earth scientists use models and simulations to study processes and features that are too large and complex, or take place over too long a time span, to be studied directly.

16. Is the following sentence true or false? Different kinds of models sometimes can be used to represent the same thing. true

Exploring Earth's Surface (pp. 20–24)

This section describes factors that determine the shape of Earth's land surface. The section also describes how scientists divide Earth into four spheres.

Use Target Reading Skills

As you read, complete the compare/contrast table to show the similarities and differences among the types of landforms.

Characteristics of Landforms

Landform	Elevation	Relief
Plain	a. Low	Low
Mountain	b. High	c. High
d. Plateau	High	e. Low

Topography (p. 21)

1. The shape of the land is referred to as topography.

Match the term with its definition.

Term	Definition
b 2. elevation	a. Difference in elevation
a 3. relief	b. Height above sea level
c 4. landform	c. Feature of topography

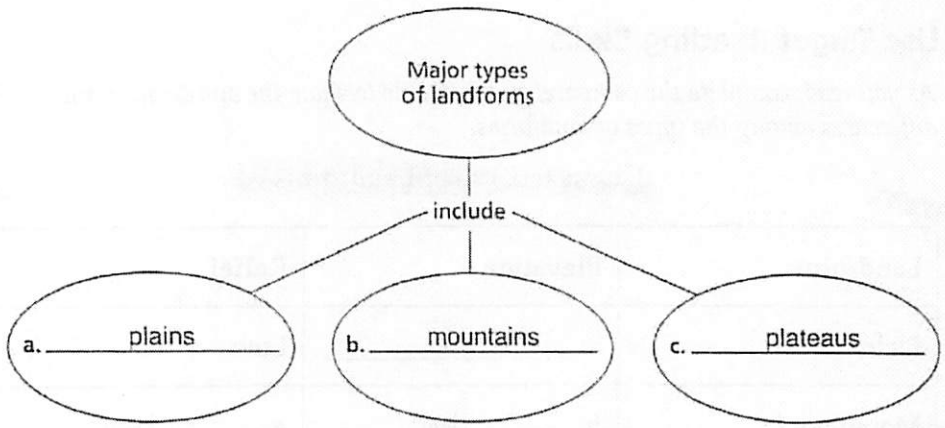
Types of Landforms (pp. 22–24)

Match the type of landform with its characteristics.

Landform	Characteristics
c 5. plain	a. High elevation and high relief
a 6. mountain	b. High elevation and level surface
b 7. plateau	c. Flat land and low relief

Exploring Earth's Surface *(continued)*

8. Complete the concept map.



9. A plain that lies along a seacoast is called a(n) coastal plain.
10. A plain that lies away from the coast is called a(n) interior plain.
11. Is the following sentence true or false? Interior plains may have high low relief. false
12. How is a plateau similar to a plain?
Like a plain, a plateau has low relief.

13. Complete the table to show how the different types of mountain landforms are related to one another.

Mountain Landforms	
Type of Mountain Landform	**Description**
a. Mountain range	Group of mountains
b. Mountain system	Group of mountain ranges
c. Mountain belt	Group of mountain ranges and systems

Explain how the types of mountain landforms are related to one another.
Mountain ranges combine to form a mountain system. Mountain ranges and mountain systems combine to form a mountain belt.

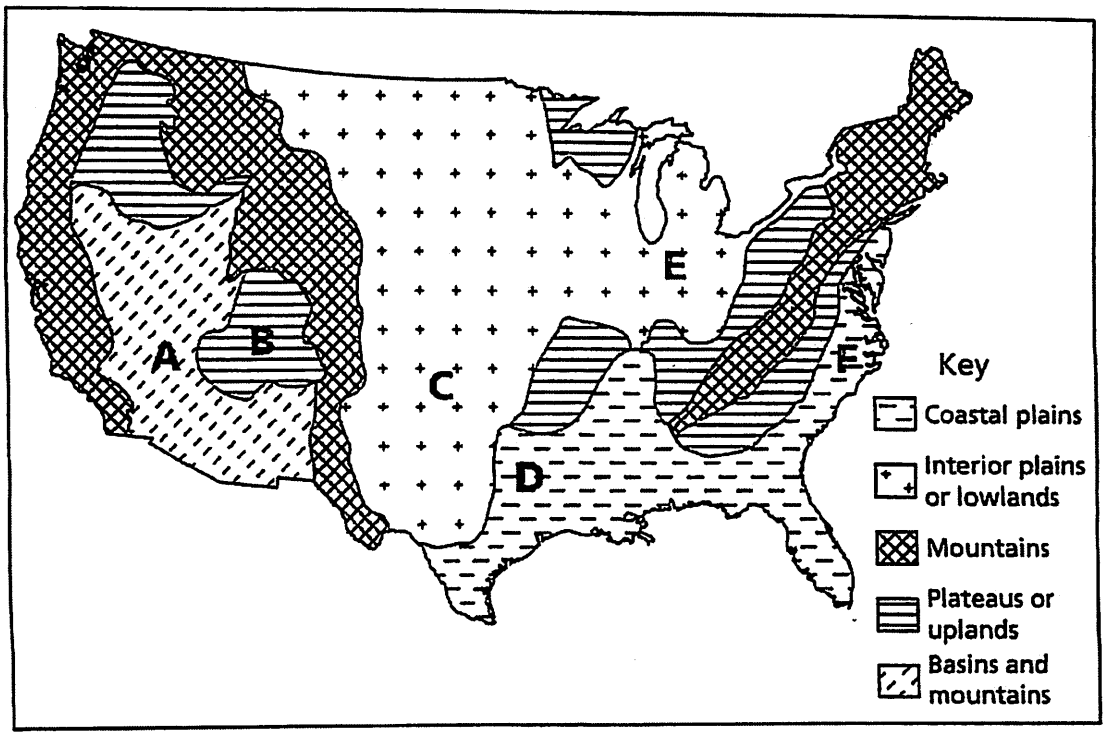
14. The Bitterroot Mountains in Idaho are a(n) mountain range .

15. The Rocky Mountains make up a(n) mountain system .

16. The Rocky Mountains combine with other mountain ranges to form a(n) mountain belt .

17. A large area of land for which the topography is mainly one type of landform is called a(n) landform region .

Exploring Earth's Surface *(continued)*



18. What type of landforms would you expect to find in Region A? Region B?

Region A is a landform region made up of basins and mountains. Region B is a region made up of plateaus.

19. Which landform region would you expect to have a higher elevation, C or D? Explain.

Because D is a region of coastal plains, its elevation is probably lower than C, which is an interior plain.

20. If you traveled in a straight line from Region E to Region F, how would the topography change?

The topography would change from interior plains, to a plateau, to mountains, then back to a plateau before the coastal plains were reached.

Name _____ Date _____ Class _____

Models of Earth (pp. 25–29)

This section describes how maps and globes are used as models of Earth. The section also explains how to locate points on Earth's surface using maps and globes.

Use Target Reading Skills

Complete the first column in the chart by previewing the red headings and asking a what, how, *or* where *question for each. As you read the section, complete the second column with the answers.*

Models of Earth

Question	Answer
a. What are maps and globes?	b. Maps are flat models of all or part of Earth's surface as seen from above. Globes are spheres that represent Earth's entire surface.
c. What is meant by Earth's grid?	d. Just like a checkerboard, a grid system is needed to locate points on Earth.
e. How can you show Earth's topography on a map?	f. A topographic map can be used to represent the surface features of an area.

Maps and Globes (p. 26)

1. A flat model of all or part of Earth's surface is a(n) map.
2. A sphere that represents Earth's entire surface as seen from space is a(n) globe.

Match the map feature with the role it plays.

Map Feature	Role It Plays
b scale	a. Stands for a feature on Earth's surface
a symbol	b. Relates distance on a map to distance on Earth's surface
c key	c. Lists and explains all the symbols on a map

Models of Earth *(continued)*

6. What are some of the physical and human-made features that map symbols can represent?

Physical features include rivers, lakes, mountains, and plains. Human-made features include highways, cities, and airports.

7. What does a map scale of 1 : 25,000 mean?

It means that one unit on the map equals 25,000 units on the ground.

Earth's Grid (pp. 27–28)

8. The units scientists use to measure distances around a circle are _____degrees_____.

9. The imaginary line that circles Earth halfway between the North and South poles is the _____equator_____.

10. Half of Earth's surface is called a(n) _____hemisphere_____.

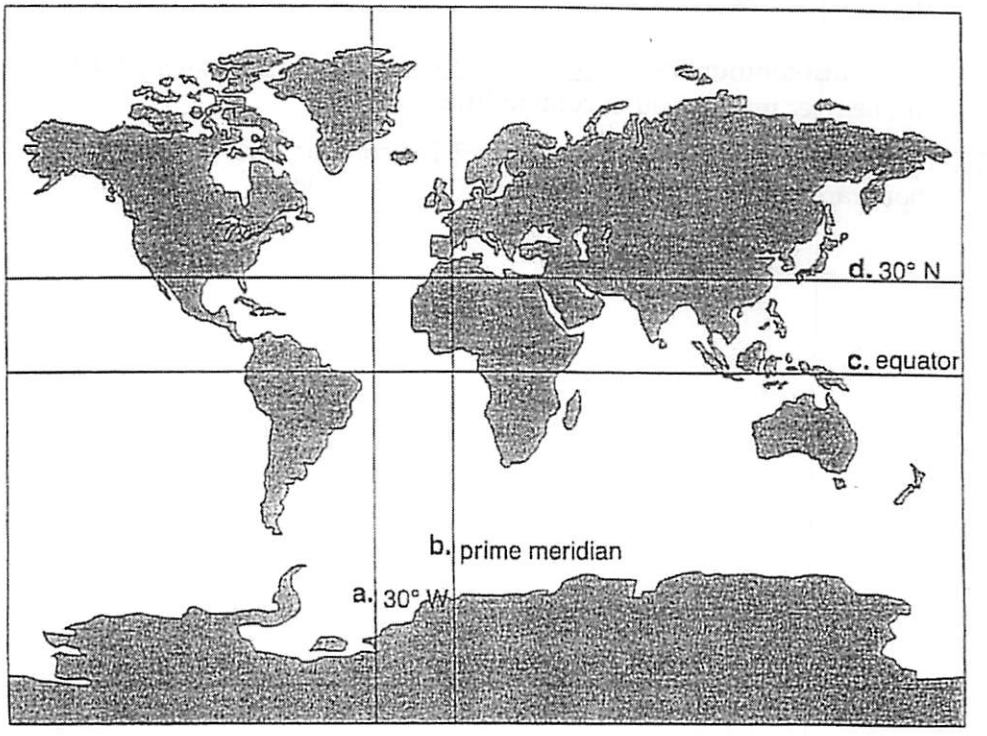
11. Circle the letter of each sentence that is true about the prime meridian.

(a.) It makes a half circle from the North Pole to the South Pole.
b. It passes through Washington, D.C.
c. It divides Earth into the Northern and Southern Hemispheres.
(d.) It passes through the Northern and Southern Hemispheres.

12. Circle the letter of each sentence that is true about latitude.
    a. The prime meridian is the starting line for measuring latitude.
    b. Latitude measures distance in degrees north or south of the equator.
    c. All lines of latitude are parallel to the equator.
    d. The latitude of the North Pole is 90° North.

13. Circle the letter of each sentence that is true about longitude.
    a. The equator is the starting line for measuring longitude.
    b. Longitude measures distance in degrees east or west of the prime meridian.
    c. All lines of longitude meet at the equator.
    d. Lines of longitude cross lines of latitude at 45° angles.

14. Label the lines on the map with the following terms: equator, prime meridian, 30° N latitude, 30° W longitude.



Models of Earth *(continued)*

15. What is the longitude of the prime meridian?
The longitude of the prime meridian is 0°.

Mapping Earth's Topography (p. 29)

16. A map that shows the surface features of an area is called a(n) topographic map.

17. List three types of information about the ground surface that are provided by topographic maps.
a. elevation
b. relief
c. slope

18. Every fifth contour line, or index contour, is usually darker and heavier than the other contour lines.

19. Is the following sentence true or false? The contour interval for a given topographic map is always the same. true

Name _____ Date _____ Class _____

Safety in the Science Laboratory (pp. 31–35)

This section explains why preparation is important when carrying out scientific investigations. It also describes what you should do if an accident occurs.

Use Target Reading Skill

As you read, make an outline about science safety that you can use for review. Use the red headings for the main ideas and the blue headings for supporting ideas.

Safety in the Science Laboratory
I. Safety in the Lab
A. Preparing for the Lab
B. Performing the Lab
C. End-of-Lab Procedures
D. Safety in the Field
II. In Case of an Accident

Safety in the Lab (pp. 32–34)

1. Is the following sentence true or false? No amount of preparation can help you with safety when doing science activities in the laboratory. false

2. Circle the letter that states when you should begin preparing for a lab.
   a. 1 hour ahead of the lab
   b. 10 minutes ahead of the lab
   c. the morning of the lab
   (d.) 1 day before doing the lab

3. In preparing for a lab, it is important to review the general safety guidelines, which can be found in Appendix A of your book.

4. What should you do if something is unclear to you about the lab before you begin?
   Ask the teacher.

5. What is the most important safety rule when performing a lab?
   Always follow your teacher's instructions and the textbook directions exactly.

6. Is the following sentence true or false? You should never try anything on your own in the lab without asking your teacher first. true

Safety in the Science Laboratory *(continued)*

7. Circle the letter of each sentence that is true about safety symbols.
   (a.) They identify safety equipment that you should use.
   (b.) They alert you to possible dangers in doing the lab.
   c. They give you specific instructions about each lab in the book.
   (d.) They remind you to work carefully.

Match the symbol with its meaning by writing the correct letter beside each symbol.

b 8. 

c 9. 

a 10. 

a. Corrosive Chemical
b. Breakage
c. Disposal

11. When you have completed a lab, you should clean up your work area.

12. How should lab wastes be disposed of?
Follow your teacher's instructions about proper disposal.

13. Is the following sentence true or false? You should wash your hands after working in the laboratory even if you don't think they're dirty. true

Safety in the Field (p. 34)

14. Circle the letter of each step you should take whenever you do field work.
   a. Work alone as much as possible.
   (b.) Dress appropriately for any conditions you will encounter.
   (c.) Tell an adult where you will be.
   (d.) Ask an adult or classmate to accompany you.

15. Possible hazards that you might encounter during a field investigation include
   a. traffic.
   b. severe weather.
   c. poisonous plants.
   (d.) all of the above

In Case of an Accident (p. 35)

16. What should you do immediately whenever an accident occurs?
Notify your teacher.

17. Circle the letter of each step you should take if you spill something on your skin while doing a lab.
   a. Cover the skin with a clean dressing.
   b. Wash your hands.
   (c.) Flush the skin with large amounts of water.
   d. Do nothing unless the skin blisters.