Instructions for Copying

Answers are printed in non-reproducible blue. Copy pages on a light setting in order to make multiple copies for classroom use.
# Contents

## EARTH SCIENCE

### Chapter 4  Relationships Among the Sun, the Moon, and Earth

- **Chapter Concept Map** .......................................................... 47
- **Lesson 1**  Lesson Outline .................................................. 48  
  Lesson Vocabulary ......................................................... 50  
  Lesson Cloze Activity ..................................................... 51  
  Writing in Science .......................................................... 52
- **Lesson 2**  Lesson Outline .................................................. 54  
  Lesson Vocabulary ......................................................... 56  
  Lesson Cloze Activity ..................................................... 57

### Chapter Vocabulary ................................................................. 58

### Chapter 5  Earth's Materials and Features

- **Chapter Concept Map** .......................................................... 60
- **Lesson 1**  Lesson Outline .................................................. 61  
  Lesson Vocabulary ......................................................... 63  
  Lesson Cloze Activity ..................................................... 64
- **Lesson 2**  Lesson Outline .................................................. 65  
  Lesson Vocabulary ......................................................... 67  
  Lesson Cloze Activity ..................................................... 68
- **Lesson 3**  Lesson Outline .................................................. 69  
  Lesson Vocabulary ......................................................... 71  
  Lesson Cloze Activity ..................................................... 72  
  Reading in Science .......................................................... 73
- **Lesson 4**  Lesson Outline .................................................. 75  
  Lesson Vocabulary ......................................................... 77  
  Lesson Cloze Activity ..................................................... 78
- **Lesson 5**  Lesson Outline .................................................. 79  
  Lesson Vocabulary ......................................................... 81  
  Lesson Cloze Activity ..................................................... 82

### Chapter Vocabulary ................................................................. 83

### Unit Literature ................................................................. 85
## TECHNOLOGY: A CLOSER LOOK

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Lesson Outline</th>
<th>Lesson Vocabulary</th>
<th>Lesson Cloze Activity</th>
<th>Technology in Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>140</td>
<td>141</td>
<td>142</td>
<td>143</td>
</tr>
<tr>
<td>2</td>
<td>145</td>
<td>146</td>
<td>147</td>
<td>148</td>
</tr>
<tr>
<td>3</td>
<td>150</td>
<td>151</td>
<td>152</td>
<td>153</td>
</tr>
<tr>
<td>4</td>
<td>155</td>
<td>156</td>
<td>157</td>
<td>158</td>
</tr>
<tr>
<td>5</td>
<td>160</td>
<td>161</td>
<td>162</td>
<td>163</td>
</tr>
</tbody>
</table>
Cells, Systems, and the Environment

Complete the concept map about living things. Some examples have been done for you.

1. water
2. ________
3. ________
4. a place to live

Living Things
- need
- perform five life functions:
  - consume ________
  - ________
  - ________
  - ________
  - get rid of ________

- live in ecosystems

contain biotic factors such as
  - ________
  - ________

And ________ factors such as
  - ________, ________
  - ________, ________

have organisms that are classified as
  - ________
  - ________
  - ________
From Cells to Systems

Use your textbook to help you fill in the blanks.

What do living things have in common?

1. People, ____________________ , and ____________________ are living things.

2. All living things are made of ____________________ .

3. All living things perform five basic jobs, or life functions.
   a. They use ____________________ for energy.
   b. They ____________________ and develop.
   c. They ____________________ more of their kind.
   d. They get rid of ____________________ .
   e. They respond to their ____________________ .

How do plant and animal cells compare?

4. Plant leaves contain ____________________ , a substance that plants use to capture the ____________________ energy to make food.

5. Animals cannot make their own ____________________ because they do not have chlorophyll.

How are cells grouped?

6. Cells are grouped by the ____________________ they do.
7. A group of similar cells that carries out a certain job is called a(n) _________________.

8. Tissues in a group are called a(n) _________________.

9. Plants and animals have many organs that work together in an organ _________________.

How can you see cells?

10. A microscope works like a magnifying glass by making something ________________ look much _________________.

Critical Thinking

11. Which do you think would be more harmful to an organism— a damaged cell or a damaged organ?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
From Cells to Systems

Use the clues below to complete the word puzzle.

Across
1. to make more of one’s kind
2. tissues working together
4. similar cells working together
5. rigid outer covering of plant cell

Down
1. organs working together
3. smallest part of living thing

Vocabulary
From Cells to Systems

Fill in the blanks.

<table>
<thead>
<tr>
<th>food</th>
<th>life functions</th>
<th>respond</th>
<th>wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>grow</td>
<td>living</td>
<td>small</td>
<td></td>
</tr>
</tbody>
</table>

Everything in the world can be placed into one of two groups. There are ____________ things and nonliving things. All living things carry out _____________. For example, they need ____________ for energy. Living things also ____________ and develop. Fourth, they ____________ to their environment. Fifth, living things get rid of ____________.

Living things are made of cells. Cells are too ____________ to see with just your eyes. A tool called a microscope is used.
Environmental Interactions

Use your textbook to help you fill in the blanks.

What is an ecosystem?

1. All of the living and nonliving things in the ________________ make up a(n) ________________.

2. Water, rocks, and soil are some of the nonliving things, or ________________, in an environment.

3. Plants, animals, and microorganisms are the living things, or ________________, in an environment.

How can changes in a habitat affect an ecosystem?

4. Habitats have a limited amount of ________________.

5. The struggle among organisms for the things they need is called ________________.

6. Competition can cause changes in a ________________.

7. Every living thing ________________ its habitat as it meets its needs.

8. Small changes can ________________ other organisms.
What controls the growth and survival of organisms?

9. The growth and survival of organisms is determined by ________________, such as sunlight, wind, water, and soil.

10. Some animals in an ecosystem, called ________________, hunt other animals for food.

11. The number of predators in an ecosystem is limited by the number of ________________.

12. Nonnative, or exotic, organisms often compete with native organisms for limited ________________.

What are populations and communities?

13. Habitats have different ________________ of species.

14. All the populations in an ecosystem make up a(n) ________________.

15. Warm and wet ecosystems usually have larger communities than ________________ and ________________ ecosystems.

Critical Thinking

16. What do you think is the most important factor affecting the size of a community in an ecosystem?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
Environmental Interactions

Read each definition. Write the term in the blank and fill in the crossword puzzle.

**Across**

1. members of one kind of organism in an ecosystem

4. all the populations in an ecosystem

5. a living thing’s place to live in an ecosystem

7. the struggle among organisms for limited resources

**Down**

2. the nonliving factors of an ecosystem, such as rocks

3. all the living and nonliving things in an environment

6. the living factors of an ecosystem, such as plants

8. animals that hunt other animals for food
Environmental Interactions

Fill in the blanks.

<table>
<thead>
<tr>
<th>abiotic factors</th>
<th>dry</th>
<th>predators</th>
</tr>
</thead>
<tbody>
<tr>
<td>biotic factors</td>
<td>ecosystem</td>
<td>prey</td>
</tr>
<tr>
<td>communities</td>
<td>habitats</td>
<td>resources</td>
</tr>
</tbody>
</table>

All the living and nonliving things in an area make up the environment. An environment’s living things are called ____________________. Nonliving things, such as water, rocks, and soil, are called ____________________. The biotic and abiotic factors form a(n) ____________________.

In ecosystems, organisms compete for ____________________. The number of ____________________ in an ecosystem determines the number of predators. If there is not enough prey, some ____________________ may die or move away.

Ecosystems can have very different ____________________. Some ecosystems are hot and ____________________, and others are cold and wet. Ecosystems have ____________________ that are suited to specific living things. For example, a desert habitat is suited to cactuses and lizards.
Energy Needs in Ecosystems

Use your textbook to help you fill in the blanks.

How do plants function in the environment?

1. Jan van Helmont concluded that most of a plant’s material comes from __________________ .

2. Plants use energy from __________________ to make food.

How do organisms depend on one another?

3. The __________________ in an ecosystem make their own food.

4. __________________ cannot make their own food, so they must eat producers for food.

5. __________________ only consume plants, while __________________ consume plants and animals for food.

6. __________________ are animals that eat plant eaters and meat eaters.

What is a food chain?

7. The order in which organisms in an ecosystem are eaten is called a(n) __________________ .

8. Food chains begin with __________________ and end with __________________ .
What is a food web?

9. Food chains in an ecosystem are connected in a(n) ________________.

10. If one organism in a food web takes part in more than one food chain, ________________ can result.

11. A land food web can have many ________________, such as deer, small birds, and mice.

What is an energy pyramid?

12. Energy in an ecosystem travels from the producers to the herbivores and then to the ________________.

13. A model that shows the amount of energy at each level of a food chain is a(n) ________________.

Critical Thinking

14. Where do you think decomposers fit into the energy pyramid?

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Energy Needs in Ecosystems

What am I?

Choose a word from the word box below that answers each question.

- a. herbivore
- b. consumer
- c. carnivore
- d. energy pyramid
- e. food chain
- f. food web
- g. omnivore
- h. producer

1. ______ I am a living thing that can use energy from the Sun to make food. What am I?

2. ______ I am a living thing that must use other organisms as food to get energy. What am I?

3. ______ I am an animal that eats other animals. What am I?

4. ______ I show the order, or sequence, in which organisms in an ecosystem consume one another. What am I?

5. ______ I am an animal that eats plants. What am I?

6. ______ I am formed when food chains are linked together. What am I?

7. ______ I show the amount of energy at each level of a food chain. What am I?

8. ______ I eat plants and animals for food. What am I?
An ecosystem is a community of living organisms that need food and energy to survive. These organisms are in _____________ with each other for limited amounts of water, food, energy, and space to _____________.

Members of an ecosystem can be sorted into three main groups: _____________, consumers, and _____________. The order, or sequence, in which _____________ eat one another is called a(n) _____________. Different food chains can be connected to form a(n) _____________. Energy moves through an ecosystem from plants to herbivores and then to _____________. An energy pyramid shows how energy is distributed in an ecosystem.
Cells, Systems, and the Environment

Circle the letter of the best answer.

1. Water, rocks, and other nonliving things in an environment are called
   a. biotic factors.
   b. abiotic factors.
   c. a population.
   d. an ecosystem.

2. What do all the living and nonliving things in an environment make up?
   a. a living system
   b. a nonliving system
   c. an ecosystem
   d. a biome

3. Each plant and animal in an ecosystem has its own place to live. That is the organism’s
   a. habitat.
   b. location.
   c. ecology.
   d. abiotic factor.

4. All the barrel cactuses in a desert make up a group of organisms called a(n)
   a. ecosystem.
   b. population.
   c. community.
   d. habitat.

5. All of the cactuses, insects, birds, and lizards in the desert are part of the desert
   a. habitat.
   b. population.
   c. community.
   d. food chain.

6. The living things in an environment are called
   a. biotic factors.
   b. abiotic factors.
   c. a population.
   d. an ecosystem.

7. A group of cells that do the same job forms a(n)
   a. organs system.
   b. organ.
   c. cell.
   d. tissue.
Circle the letter of the best answer.

8. How is a plant cell different from an animal cell?
   a. Only plant cells contain cytoplasm.
   b. Only animal cells contain a nucleus.
   c. Only plant cells contain chloroplasts.
   d. Only animal cells have cell walls.

9. Tissues of the same kind are grouped to form a(n)
   a. organ.
   b. cell.
   c. organ system.
   d. cell wall.

10. An animal that consumes only plants is a(n)
    a. omnivore.
    b. carnivore.
    c. herbivore.
    d. decomposer.

11. What type of organism is the source of all of the energy in an ecosystem?
    a. producers
    b. consumers
    c. decomposers
    d. herbivores

12. Which statement best describes a consumer?
    a. Consumers make their own food.
    b. Consumers cannot make their own food.
    c. Consumers get energy from the Sun.
    d. Consumers recycle the remains of dead organisms.

13. The struggle among organisms for food, water, and other needs is called
    a. competition.
    b. a food web.
    c. a food chain.
    d. a predator.

14. What type of diagram is shown below?
    a. food web
    b. food chain
    c. energy pyramid
    d. food pyramid
Reproduction and Survival

Complete the concept map below with the information you learned about the reproduction and survival of organisms.

Organisms

- have a life cycle

- incomplete
- complete

- growth
- reproduction
Continuing the Species

Use your textbook to help you fill in the blanks.

How does reproduction help a species survive?

1. If an organism fails to _______________ , its entire species may disappear.

2. A species must produce _______________ if it is to survive.

3. Food and water are two of the _______________ that offspring need to live and grow.

4. Some species produce _______________ offspring, of which many will not survive to become adults.

5. Mammals and birds produce _______________ offspring, but provide more care to help them reach adulthood.

How do animals reproduce?

6. Budding and regeneration are examples of reproduction with only one _______________.

7. Organisms that reproduce with one parent produce exact copies of themselves, called _______________.
8. A clone has characteristics, or ________________ that are identical to those of its parent.

9. In two-parent reproduction, a male sperm cell and a female egg cell combine during ________________ and produce a(n) ________________.

What is an innate behavior?

11. Blinking and nest building are examples of ________________ behaviors.

12. Bicycling is an example of a ________________ behavior.

Critical Thinking

13. Some animals, such as bats, hibernate in winter. This means they become inactive. How would you describe this kind of animal behavior?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Continuing the Species

What am I?

Choose the letter that matches the word from the word box below to answer each question.

<table>
<thead>
<tr>
<th>a. clone</th>
<th>e. learned behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. heredity</td>
<td>f. reproductivestrategy</td>
</tr>
<tr>
<td>c. inherited behavior</td>
<td>g. offspring</td>
</tr>
<tr>
<td>d. instinct</td>
<td>h. traits</td>
</tr>
</tbody>
</table>

1. _____ I am the process an organism uses to reproduce successfully. What am I?

2. _____ I am the offspring of only one parent. I am an exact copy of my parent. What am I?

3. _____ I control the traits that are passed on from parent to offspring. What am I?

4. _____ I am the behavior with which an organism is born. What am I?

5. _____ I am a behavior that an organism gains from experience. What am I?

6. _____ I am an example of inherited behavior. What am I?

7. _____ I am the young of an organism. What am I?

8. _____ I am a characteristic of a living thing, such as eye color or height. What am I?
Organisms use many different reproductive strategies.
Mayflies produce many ________________. Most will die, but a few will reach ________________ and continue the species. Although birds have only a few offspring, they provide more _________________. Some organisms can reproduce without a mate by ________________ themselves.

Behaviors are traits that cannot be seen. A(n) ________________, such as blinking, is a(n) example of an ________________ behavior. Nest building by birds, however, is not learned. It is done by ________________.
Meet Ana Luz Porzecanski

Read the Reading in Science feature in your textbook. Work with a partner to answer the following questions.

Characteristics of the Tinamou

1. What kind of animal is the tinamou? How do you know?

2. What colors is the tinamou?

3. In which type of ecosystem does the tinamou live?

Characteristics of Other Animals

Think of an animal that has some things in common with the tinamou. Answer the questions below.

1. What is the other animal? Describe it.

2. What color is the animal?

3. In which type of ecosystem does it live?
Use your answers to the questions on the previous page to fill in the Venn diagram.

**Write About It**

**Compare and Contrast** Work with a partner to compare the tinamou with another animal you know about. List ways the animals are alike and different in a Venn diagram. Then use your diagram to write about the animals.

1. On a separate piece of paper, explain how the two animals are alike and different.

---

- **Different**
  - Tinamou
  - Alike
  - Different

- ___________
- ___________
- ___________
- ___________
- ___________
- ___________
- **in the pampas**

---
Life Cycles and Metamorphosis

Use your textbook to help you fill in the blanks.

What is a life cycle?

1. All animals have a life cycle that follows a pattern of ________________, growth, ________________, and death.

2. Some organisms undergo a(n) ________________ change at each stage of the life cycle, while others undergo ________________ changes throughout their lives.

3. An organism’s ________________ is how long it can usually live in the wild.

What is metamorphosis?

4. The process of ________________ includes a set of separate and completely different growth stages.

5. During incomplete metamorphosis, when an animal gets too large for its exoskeleton, it ________________.

What is complete metamorphosis?

6. Complete metamorphosis includes growth stages in which the insect appears ________________ at every stage.

7. A butterfly begins life as a(n) ________________.
8. During the __________________ stage, a mealworm appears to be a worm.

9. A butterfly develops adult tissues and wings during the __________________ stage.

10. As a mealworm grows, it sheds its __________________ in order to grow larger.

How does metamorphosis help a species survive?

11. After a species goes through metamorphosis, it can __________________ to another area to look for food.

12. __________________ can help an insect find a mate.

Critical Thinking

13. Why do you think different animals have different life cycles?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Life Cycles and Metamorphosis

What am I?

Choose the letter that matches the word from the word box below to answer each question.

- a. complete metamorphosis
- b. exoskeleton
- c. incomplete metamorphosis
- d. life cycle
- e. life span
- f. molt

1. ______ I am the stages through which an animal passes, including birth and death. What am I?

2. ______ I am the length of time that an organism is expected to live. What am I?

3. ______ I am the process that takes place in a series of separate and different growth stages. What am I?

4. ______ I am the process that has a series of growth stages that are similar in appearance to one another. What am I?

5. ______ I am the hard outer covering of an insect. What am I?

6. ______ I am the process of an insect shedding its hard outer covering. What am I?
Life Cycles and Metamorphosis

Fill in the blanks.

<table>
<thead>
<tr>
<th>birth</th>
<th>gradual</th>
<th>life span</th>
<th>produce</th>
</tr>
</thead>
<tbody>
<tr>
<td>complete</td>
<td>growth</td>
<td>metamorphosis</td>
<td>separate</td>
</tr>
</tbody>
</table>

All animals go through stages that make up the life cycle. These stages include ____________, ____________, reproduction, and death. The amount of time an animal is expected to live is called its ____________. An animal is expected to live long enough to ____________ offspring.

The stages of growth can be ____________ or ____________ and different—a process called ____________. When an organism has several different growth stages including egg, larva, and pupa, it is called ____________ metamorphosis. The life cycle of every animal begins with birth and ends with death.
Meet Christopher Raxworthy

Read the passage in your textbook. Look for information about the Mantella poison frog and dwarf dead leaf chameleon.

Write About It

**Compare and Contrast** How does the life cycle of the Mantella poison frog compare to the life cycle of the dwarf dead leaf chameleon?

**Compare and Contrast**

Fill in the Compare and Contrast graphic organizer. Tell how the frog and chameleon are alike and how they are different. Then, answer the question.

<table>
<thead>
<tr>
<th>Frog</th>
<th>Chameleon</th>
<th>Frog and Chameleon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Its body has vivid colors to warn</td>
<td>Its body resembles a(n) ____________ .</td>
<td>Babies hatch from</td>
</tr>
<tr>
<td></td>
<td>The animal hides during the day in dead leaves on the</td>
<td>____________ .</td>
</tr>
<tr>
<td>Females lay eggs in ____________ areas.</td>
<td>Females lay eggs in ____________ .</td>
<td>Frogs and chameleons become ____________ in about</td>
</tr>
<tr>
<td>Eggs hatch when it ____________ .</td>
<td>Eggs hatch in ____________ weeks.</td>
<td>____________ .</td>
</tr>
<tr>
<td>Tadpoles move to a nearby ____________ .</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Compare and Contrast**

Read the paragraph below. Compare and contrast the work of Christopher Raxworthy and the scientists in Madagascar with that of the scientists at the San Diego National Wildlife Refuge.

**San Diego National Wildlife Refuge**

In the 1990s, the people of San Diego began working with government groups to help protect the environment. A wildlife refuge was created. The goals of the San Diego refuge include preserving endangered species and helping endangered species increase in number. The refuge protects all the wildlife native to the area, not just the endangered species. It also protects the habitats of migratory birds. The refuge provides visitors with opportunities to learn about wildlife.

**Write About It**

Write a short paragraph in which you compare and contrast the goals of Christopher Raxworthy and the other scientists in Madagascar with those of the scientists at the San Diego Refuge Complex.
Reproduction and Survival

Circle the letter of the best answer.

1. For a species to survive, organisms must produce
   a. clones.
   b. offspring.
   c. nymphs.
   d. larva.

2. Which is not a stage in complete metamorphosis?
   a. adult
   b. pupa
   c. larva
   d. nymph

3. The stages of growth and development that an organism goes through are
   a. its life span.
   b. its life cycle.
   c. metamorphosis.
   d. reproduction

4. A reproductive strategy describes
   a. an organism’s life span.
   b. the behaviors an animal learns during its lifetime.
   c. the behaviors an animal is born knowing.
   d. all the things an organism does to continue its species.

5. Which of these produces a clone of the parent?
   a. budding
   b. fertilization
   c. complete metamorphosis
   d. incomplete metamorphosis
Circle the letter of the best answer.

6. What is an organism’s life span?
   a. how long an organism usually lives in the wild
   b. the things an organism does to reproduce
   c. the process of going through the stages of egg, larva, and pupa
   d. the process of producing an exact replica of the parent

7. A butterfly develops adult tissues and wings inside a
   a. larva.
   b. nymph.
   c. pupa.
   d. egg.

8. The combination of the traits of two parents is called
   a. budding.
   b. metamorphosis.
   c. regeneration.
   d. fertilization.

9. The passing of traits from parent to offspring is
   a. a life cycle.
   b. heredity.
   c. reproductive strategy.
   d. metamorphosis.

10. An insect’s hard outer covering is called a(n)
    a. pupa.
    b. nymph.
    c. molt.
    d. exoskeleton.
# Adaptations in Ecosystems

Use your textbook to help you fill in the blanks.

## Changes in Ecosystems

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Living Things</strong></td>
<td>harmful changes, like ________________</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>People</strong></td>
<td>helpful changes, like ________________</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Animal Adaptations

Use your textbook to help you fill in the blanks.

What are adaptations?

1. Survival is not easy for organisms because each ecosystem has special _________________.

2. Organisms have traits or _________________ that help them survive in their environments.

3. Physical (body) traits and behavior are two kinds of adaptations that help animals _________________.

4. Organisms that live in desert ecosystems have adaptations for staying _________________ and saving _________________.

5. The fennec fox has large ears that give off _________________ and thin _________________ that helps it stay cool.

6. Kangaroo rats survive in the desert because they get water from the _________________ they eat.

7. Camels have humps to store fat for _________________, and they have _________________ to walk on sand.

What are some other adaptations of animals?

8. Animals living in different _________________ have different adaptations for _________________.

Copyright © Macmillan/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.
9. Animals can avoid cold winters by ________________, or resting until the weather gets warmer.

10. Some animals survive because they can ________________ themselves and blend in with the colors and shapes in their environments.

11. Hover flies can survive because they look like honeybees, which are more dangerous. This adaptation is called ________________.

12. Some animals have adaptations, like the ________________ on a hedgehog, to protect them from ________________.

How do animals obtain oxygen?

13. Oxygen can move in and out of the tissues of ________________ animals, like worms.

14. Large animals have a respiratory system that uses ________________ or ________________ to obtain oxygen.

Critical Thinking

15. Whales spend most of their time under water. How are these animals adapted to obtaining oxygen? Why?

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Animal Adaptations

Choose a word from the word box below that correctly fills in the blank.

<table>
<thead>
<tr>
<th>adaptation</th>
<th>hibernate</th>
<th>mimicry</th>
<th>traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>camouflage</td>
<td>lungs</td>
<td>predators</td>
<td></td>
</tr>
</tbody>
</table>

1. Animals have adaptations that they use to protect themselves from _________________.

2. Some organisms “copy” the traits of other living things in their environment. This adaptation is called _________________.

3. Organisms have _________________ that help them survive in their environments.

4. Any trait that helps an organism survive in its environment is called a(n) _________________.

5. Large animals, such as dogs, use ________________ to obtain oxygen.

6. The fur of an arctic fox changes color so it can blend into its environment. This adaptation is called _________________.

7. Some animals survive the cold winter because they are able to remain completely still for a long period of time, or _________________.

Copyright © Macmillan/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.
All ecosystems present challenges to the organisms that live there. Living things have different ________________ that help them ________________ in their environments.

Some of these are behaviors, such as when a bear ________________ to protect itself from the cold.

An organism using ________________ can hide from ________________ when it blends in with the ________________ and shapes of its environment.

An organism that uses ________________ copies the traits and behaviors of more dangerous organisms. Most animals have specific adaptations for ________________, or the movement from place to place. Animals also have different ways of getting ________________. For instance, mammals use lungs, but fish use ________________. All of these adaptations have the same goal—survival!
Plant Adaptations

Use your textbook to help you fill in the blanks.

How do plants respond to their environments?

1. Plants respond to their __________________ in many different ways.

2. Something in the environment that causes a living thing to respond is called a(n) __________________.

3. The response of a plant to light, water, or gravity is called a(n) __________________.

4. A plant reacts to a stimulus by changing its __________________ or __________________ of growth.

5. Plant stems that grow upward __________________
   a source of light and plant __________________ that grow toward a source of water are tropisms.

6. Plant roots also grow downward because of the pull of __________________.

7. The green __________________ of plants grow __________________, opposite the pull of gravity.

What are other plant adaptations?

8. Plants have __________________ that help them __________________ in different environments.
9. A cactus in the desert has adaptations for saving ________________, such as spongy tissue inside and a very ________________, waxy outer skin.

10. Some trees lose their ________________ every winter because cold weather can ________________ the leaves.

11. The trees live on ________________ food until spring, when new leaves grow and ________________ begins again.

Critical Thinking

12. What do you think would happen to trees if their leaves did not fall off before winter?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
Plant Adaptations

Match the correct word with the description.

<table>
<thead>
<tr>
<th>adaptation</th>
<th>light</th>
<th>tropism</th>
<th>water</th>
</tr>
</thead>
<tbody>
<tr>
<td>energy</td>
<td>stimulus</td>
<td>upward</td>
<td></td>
</tr>
</tbody>
</table>

1. A tree that loses its leaves in the fall survives during the winter by living on stored food for ____________.

2. A cactus has spongy tissue inside for storage and a very thick, waxy skin on the outside to prevent loss of ____________.

3. A trait that helps a plant survive in its environment is called a(n) ____________.

4. Anything in the environment that causes a plant to react, such as chemicals, heat, gravity, or water, is called a(n) ____________.

5. The reaction of plants to any stimulus is called a(n) ____________.

6. Some stimuli that affect plants are chemicals, heat, gravity, water, and ____________.

7. A plant responds to gravity in two ways—its roots grow downward, and its green stems grow ____________.
Plants, like animals, have traits that help them to survive in their environments. Plants in a desert ________________ have ________________ for storing _________________. Deciduous trees lose their ________________ in the fall. They live on stored ________________ until the leaves grow back in the spring and start ________________.

Plants cannot move, but they can ________________ to stimuli. All plant responses are called _________________. A plant can react to a(n) ________________ by changing its ________________ or pattern of growth. Plant roots respond to water, and plant stems respond to ________________ sources. Plant roots also respond to the pull of gravity.
Environmental Changes and Extinction

Use your textbook to help you fill in the blanks.

What happens in a changing environment?

1. Environments do not remain the same. They are always ____________________.

2. Hurricanes, floods, and droughts are all examples of ________________ that can destroy an environment.

3. If there is too much rain, the water can turn a hill into a river of mud, and cause a(n) ________________.

4. Living things can change a(n) ________________ in ways that can be ________________ or harmful.

How do people affect extinction?

5. Some changes that people make to ecosystems are helpful, and some are ________________.

6. Building roads, homes, and shopping malls affects an ecosystem by destroying the ________________ of other living things.

7. Some people use living things as ________________, such as when people collect organisms for food, entertainment, or other uses.
How have Tennessee ecosystems changed?

8. Tennessee has many ________________, such as *Teleoceras*, a type of rhinoceros.

9. In the past, Tennessee received more ________________ and had a(n) ________________ climate.

10. *Teleoceras* no longer lives in Tennessee because the ________________ changed. Because of this, the ________________ disappeared, changing the food web.

How can people prevent extinction?

11. Scientists try to keep animals from becoming endangered or ________________ by protecting their habitats.

Critical Thinking

12. How does an indicator species show how an ecosystem is affected by changes?

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________
Environmental Changes and Extinction

What am I?

Choose a word from the word box below that answers each question.

- a. accommodation
- b. environmental change
- c. endangered
- d. extinction
- e. fossil
- f. pollution

1. ______ I am the name for a species that only has a small number of members left alive and is in danger of dying out. What am I?

2. ______ I am the result when toxic gas, acid rain, and fertilizers affect an ecosystem. I make the air, land, or water in an ecosystem dirty and unsafe. What am I?

3. ______ I can be the result of a flood, a hurricane, a landslide, or a drought. What am I?

4. ______ I am what remains of an organism that lived a very long time ago. What am I?

5. ______ I am what happens to an entire species when its last member dies. What am I?

6. ______ I am the ability of some living things to survive changes in an ecosystem by changing their behavior and habits. What am I?
Environmental Changes and Extinction

Fill in the blanks.

adapt  harmful  pollution
drought  helpful  protecting
extinct  natural

Environments are always changing. An ecosystem can be changed by _______________ events, like a volcano, a hurricane, or a(n) _______________. Living things can also affect ecosystems. Swarms of locusts have a(n) _______________ effect, but alligators can have a(n) _______________ effect. People can harm an ecosystem with _______________ , or help it by _______________ its resources.

When organisms’ ecosystems are changed, they survive by changing their habits and behaviors. If a species cannot _______________, its members die out. If a lot of members die out, the species is endangered. If all the members die out, then the species is _______________. 
Adaptations in Ecosystems

Circle the letter of the best answer.

1. An adaptation that allows an organism to blend into the colors and shapes of its environment is called
   a. tropism.
   b. hibernation.
   c. mimicry.
   d. camouflage.

2. The roots of a plant grow downward in response to what abiotic factor?
   a. nutrients
   b. gravity
   c. sunlight
   d. soil

3. The response of a plant to a ____ is called tropism.
   a. reaction
   b. growth
   c. dehydration
   d. stimulus

4. Some animals survive the cold winter by ____ —saving energy by remaining completely still for a long period of time.
   a. hibernating
   b. accommodating
   c. stimulating
   d. camouflaging

5. When an entire forest is cut down to build roads or buildings, it is called
   a. accommodation.
   b. adaptation.
   c. deforestation.
   d. deconstruction.

6. Some organisms survive because they can ____ , or look like other, more dangerous organisms in their environment.
   a. respond
   b. mimic
   c. camouflage
   d. accommodate
Circle the letter of the best answer.

7. A green plant will grow toward the source of this stimulus because the plant needs it in order to make food.
   a. The stimulus is gravity.
   b. The stimulus is water.
   c. The stimulus is light.
   d. The stimulus is noise.

8. Some animals survive a change in their environment by changing their behaviors or habits. This is called
   a. accommodation.
   b. adaptation.
   c. adjustment.
   d. acceptance.

9. A species is ___ when all its members have died.
   a. environmental
   b. endangered
   c. in the ecosystem
   d. extinct

10. We can learn about organisms that became extinct by looking at their
    a. fossils.
    b. resources.
    c. zoos.
    d. disasters.

11. A species is ___ when only a small number of its kind are left.
    a. environmental
    b. endangered
    c. in the ecosystem
    d. extinct

12. Any harmful substance that enters the air, water, or land can cause
    a. overcrowding.
    b. pollution.
    c. extinction.
    d. danger.

13. A trait that helps an organism survive in its environment is
    a. an adaptation.
    b. a reaction.
    c. an accommodation.
    d. a stimulus.
Sea Otters: Key to the Kelp Forest
From Ranger Rick

Read the Unit Literature feature in your textbook.

Write About It
Response to Literature  Research another place where plants and animals depend on each other. Write a report describing how the plants and animals interact.
Relationships Among the Sun, the Moon, and Earth

Use the facts you have learned from the chapter to fill in the concept map.

**Earth**
Earth and its Moon revolve around the __________ once each year. Earth is tilted on its __________.

**The Moon**
As the Moon __________ around Earth about once every __________, it changes __________.
The Sun and Earth

What causes day and night?

1. Earth completes one rotation on its [ ] every [ ] hours.

2. As Earth [ ], the Sun appears to rise in the [ ] and set in the [ ].

3. The stars, the Moon, and the planets appear to move across the sky each night because of Earth’s [ ].

4. At dawn and dusk, shadows are [ ], and at midday, they are [ ].

What causes seasons?

5. Each year, Earth completes one [ ] around the Sun.

6. In June, the North Pole is tilted [ ] the Sun, so sunlight hits the Northern Hemisphere at a(n) [ ] angle.

7. In summer, the Sun appears [ ] in the sky, and temperatures are [ ].

8. In December, the North Pole is tilted [ ] the Sun, so sunlight hits the Northern Hemisphere at a(n) [ ] angle.
9. When it is winter in the Northern Hemisphere, it is _______ in the Southern Hemisphere.

**How does the Sun’s apparent path change over the seasons?**

10. The Sun rises _______ and sets _______ in summer than it does in winter.

11. The Sun rises _______ in the sky in summer than it does in winter.

12. Near the equator, the Sun’s apparent path changes _______ during the year.

13. The Sun’s path is the same every year, so it is possible to predict the time of _______ and _______ anywhere on Earth.

**Critical Thinking**

14. What do you think would be different if Earth rotated and revolved in the opposite direction? What would stay the same?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
The Sun and Earth

Match the correct word with its description. Write the letter of the word in the space provided.

1. _______ the northern or southern half of Earth
2. _______ an invisible line that runs through the middle of a sphere
3. _______ what Earth does every 24 hours on its axis
4. _______ the path Earth takes around the Sun, or the path the Moon takes around Earth
5. _______ Earth's complete travel around the Sun
6. _______ what occurs because Earth orbits the Sun on a tilted axis
7. _______ the type of “motion” of the Sun as it rises in the east and sets in the west
8. _______ what changes during the day but always points away from the Sun
The Sun and Earth

Fill in the blanks.

Earth spins every 24 hours. This ________________ causes day and night. It is day on the part of Earth facing the ________________ , and in 12 hours, it will be night.

Earth also completes a ________________ around the Sun. Because ________________ is revolving on a tilted ________________ , there are ________________ . During the summer, the Sun rises ________________ in the sky and earlier in the day. During the winter, the Sun is ________________ in the sky. Near the ________________ , the temperature and the Sun’s apparent ________________ change very little. Near the ________________ , the Sun has a shorter apparent path but the same ________________ . Scientists use this information to make predictions.
Without the Sun

Write About It

Fictional Story Write your own story about what would happen if sunlight could not reach Earth.

Getting Ideas

<table>
<thead>
<tr>
<th>First</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Next</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Last</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Planning and Organizing

A good story has characters, a setting, and a plot. Justin wrote three notes to plan his story. Write Character next to the note that mainly describes the character. Write Plot next to the note that mainly describes the plot. Write Setting next to the note that mainly describes the setting.

Note 1. It is the year 5002, and total darkness has covered planet Earth.

Note 2. Professor Jamison is a scientist. Her specialty is the Sun.

Note 3. Professor Jamison and her staff are trying to find out why Earth is suddenly in total darkness.
Revising and Proofreading

Here are some sentences that Justin wrote. He needs to include descriptive details. Choose a word from the box. Write it on the line.

<table>
<thead>
<tr>
<th>black</th>
<th>brilliant</th>
<th>chilly</th>
<th>total</th>
</tr>
</thead>
</table>

At first, there was a hint of darkness. The air became ________________. Then, suddenly, there was ________________ darkness. The sky had been a ________________ blue. Now it was as ________________ as the darkest ink.

Drafting

Begin your story. Start with an exciting sentence to get the reader interested.

________________________________________________________________________________________

Continue your story. Use a separate piece of paper. Include details that tell about the main character and the setting. Make sure your story tells what would happen if sunlight didn’t reach Earth.

Now revise and proofread your writing. Ask yourself:

➤ Did I write an interesting beginning, middle, and end?
➤ Did I describe the characters and the setting?
➤ Did I correct all mistakes?
The Moon and Earth

What is the Moon like?

1. Earth’s closest neighbor in space is the _________________.

2. Moonlight is reflected light from the _________________.

3. The Moon has ________________ similar to those on Earth, but no ________________ or ________________.

4. Temperatures on the Moon can be both ________________ than any place on Earth.

5. The Moon’s surface is covered by ________________ made by ________________.

6. When meteors enter Earth’s atmosphere, ________________ causes them to burn up and create glowing trails.

What are the phases of the Moon?

7. The Moon orbits Earth once about every ________________ days.

8. At any given time, the Sun lights ________________ of the Moon.

9. As the Moon orbits Earth, we see different parts of it lit as it cycles through ________________.

10. The ________________ moon is between Earth and the Sun, and Earth is between the Moon and the Sun during the ________________ moon.
What is an eclipse?

11. Earth casts a shadow on the Moon during a(n) ________________ eclipse.

12. A lunar eclipse happens only when there is a(n) ________________ and the Sun, the Moon, and Earth form a(n) ________________ .

13. The Moon casts a shadow on Earth during a(n) ________________ eclipse.

14. A solar eclipse happens only when there is a(n) ________________, and the Sun, the Moon, and Earth are aligned.

15. All of the Sun’s light is blocked during a(n) ________________ .

Critical Thinking

16. Which do you think occurs more often—a partial solar eclipse or a total solar eclipse? Explain your reasoning.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
The Moon and Earth

Use the words from the word box to fill in the blanks.

<table>
<thead>
<tr>
<th>crater</th>
<th>meteors</th>
<th>phases</th>
<th>solar eclipse</th>
</tr>
</thead>
<tbody>
<tr>
<td>lunar eclipse</td>
<td>new moon</td>
<td>satellite</td>
<td>waning moon</td>
</tr>
</tbody>
</table>

1. An object that revolves around another object is called a(n) _____________.
2. The apparent shapes of the Moon in the sky are called its _____________.
3. The Moon casts a shadow on Earth during a(n) _____________.
4. A hollow pit in the ground is called a(n) _____________.
5. When the lighted side of the Moon faces away from Earth, it is called a(n) _____________.
6. Large rocks that fall from space are called _____________.
7. When less and less of the lighted side of the Moon becomes visible each night, it is a(n) _____________.
8. Earth casts a shadow on the Moon during a(n) _____________.
The Moon and Earth

Fill in the blanks.

<table>
<thead>
<tr>
<th>Earth</th>
<th>half-moon</th>
<th>one-fourth</th>
</tr>
</thead>
<tbody>
<tr>
<td>first-quarter</td>
<td>last-quarter</td>
<td>shadow</td>
</tr>
<tr>
<td>full-moon</td>
<td>new moon</td>
<td>three-fourths</td>
</tr>
</tbody>
</table>

The Moon orbits Earth once every 29 days. When the Moon and the Sun are on the same side of Earth, the part of the Moon that is in faces Earth. This is the phase. In about a week, the Moon has completed of its orbit. This is called the , or , phase.

About a week later, Earth is between the Moon and the Sun. This is called the phase. In another week, the Moon has completed of its orbit, and only half of the lighted side can be seen. This is the phase. During a solar eclipse, the Moon casts a shadow on . During a lunar eclipse, Earth casts a shadow on the Moon.
Relationships Among the Sun, the Moon, and Earth

Circle the letter of the best answer.

1. When the North Pole is tilted toward the Sun, it is
   a. summer in the Northern Hemisphere.
   b. winter in the Northern Hemisphere.
   c. daytime in the Northern Hemisphere.
   d. nighttime in the Northern Hemisphere.

2. In June, the South Pole has
   a. almost 24 hours of daylight.
   b. almost 24 hours of darkness.
   c. 12 hours of daylight and 12 hours of darkness.
   d. 6 hours of daylight and 18 hours of darkness.

3. The Sun appears to move from east to west because, when looking down on the North Pole, Earth
   a. revolves counterclockwise.
   b. revolves clockwise.
   c. rotates counterclockwise.
   d. rotates clockwise.

4. When is a shadow longest?
   a. noon
   b. mid afternoon
   c. late morning
   d. dawn

5. When Earth is between the Moon and the Sun, we see a
   a. crescent moon.
   b. full moon.
   c. new moon.
   d. gibbous moon.

6. The phase of the Moon between a quarter moon and a full moon is a
   a. crescent moon.
   b. gibbous moon.
   c. new moon.
   d. half moon.

7. A partial solar eclipse occurs during the
   a. full-moon phase.
   b. new-moon phase.
   c. gibbous-moon phase.
   d. half-moon phase.
8. The Sun seems to move from east to west each day because of
   a. Earth's rotation.
   b. the eclipse effect.
   c. the Moon's phases.
   d. the Sun's rotation.

9. The Moon has more craters than Earth because it has no
   a. atmosphere.
   b. mountains.
   c. plains.
   d. water.

10. The rise and fall of the ocean's surface is a(n)
    a. eclipse.
    b. apparent motion.
    c. phase.
    d. tide.

11. The shape of Earth's orbit is
    a. a circle.
    b. a sphere.
    c. an ellipse.
    d. an eclipse.

12. Which of the following causes the seasons?
    a. Earth's tilt and revolution around the Sun.
    b. Earth's tilt and rotation on its axis.
    c. Earth's rotation and revolution around the Sun.
    d. Earth's rotation and the Sun's revolution.
Earth’s Features and Its Materials

Complete the concept map about how Earth is shaped by different events. On each line, write an example of how that term shapes Earth.

- **weathering**
  - ______________________
  - ______________________

**Earth’s Resources and Processes**

- **Soil is needed for**
  - ______________________
  - ______________________
  - ______________________

- **and is made of**
  - ______________________
  - ______________________

- **people**
  - ______________________
  - ______________________

- **Water is needed by**
  - ______________________
  - ______________________

  - **Fresh water is found mostly in**
    - ______________________
    - ______________________
Geological Features

Use your textbook to help you fill in the blanks.

What are geological features?

1. A physical feature of the land is called a(n) ________________.

2. Examples of landforms include mountains and ________________.

3. Valleys are an example of a feature shaped by ________________.

4. Mounds, called ________________, form where wind blows sand.

How can rivers create geological features?

5. The western border of Tennessee is formed by the ________________.

6. Rivers transport bits of rock, sand, and soil called ________________.

7. When the flow of a river ________________, the sediment is deposited.

8. Sediments form a ________________ where the river meets the ocean.

9. Deltas develop a shape similar to a ________________ as the water fans out.
10. Small curves in rivers become larger as the water
____________________ land on one side and
____________________ sediment on the other.

How can deposition change coastlines?

11. Waves transport ______________________ along
costlines.

12. The size of a ______________________ can increase or
decrease, depending on whether ______________________
are removing or depositing sand.

13. The United States has many ______________________
along the east coast. They are narrow pieces of land
made up of ______________________.

14. Barrier islands are shaped by ______________________
and ______________________.

15. Sand dunes provide a habitat for the
____________________ and ______________________
that live on the island.

Critical Thinking

16. Do you think wind or water was the last factor to affect
the landform where you live?

__________________________________________
Geological Features

Match the correct letter with the description.

| a. deposition | b. delta | c. mountain |
| d. plain | e. plateau | f. valley |
| g. sand dune | h. sediment | i. geological feature |

1. ______ the dropping off of sediment in a different place from where it formed
2. ______ a low area formed by a river with higher ground nearby
3. ______ small pieces of rock, sand, and dirt carried by a river
4. ______ a large geological feature that rises from the land high into the sky
5. ______ a large area of land that is flat
6. ______ mounds of sand formed by wind
7. ______ a triangle-shaped feature formed where rivers meet the ocean
8. ______ a very flat piece of land at a high elevation
9. ______ any natural form that is located on the surface of Earth
There are many types of geological features on Earth. ________________ rise steeply into the sky from flat plains. Rivers flow down mountains, cutting away the land and forming _________________. ________________ can also form geological features, such as sand dunes.

The land that rivers cut away is transported as _________________. Sediment in the river gives it a _________________ look. When the river reaches the ocean, the flow of water ________________ and the sediment is deposited. A triangle-shaped ________________ will form from the sediment.

Waves form ________________ parallel to the coastline. These islands are always changing and sometimes are destroyed completely by storms.
Erosion and Deposition

Use your textbook to help you fill in the blanks.

What is weathering?

1. The slow process that breaks rocks into smaller pieces is called ________________.

2. A rock is broken apart by ________________ weathering if the rock type does not change.

3. If a rock contains iron, air and water can react with the iron through ________________ and form rust.

What is erosion?

4. Weathered pieces of rock are moved from one place to another during ________________.

5. Erosion can be caused by glaciers, wind, moving water, and ________________.

6. When the Colorado River eroded the land around the river in Arizona, the ________________ was formed.

How do ice and wind shape the land?

7. Glaciers form in very cold places as thick ________________ of ice and rock.

8. Glaciers move because a thin layer of ________________ forms on the bottom of them.
9. Wind can act like sandpaper when it blows ________________ from place to place.

10. Wind can slow down after it passes over a hill and deposit sand in a ________________.

11. ________________ help prevent wind erosion by holding the ground in place.

12. Tennessee has ________________ features formed by wind. Most sand erosion takes place in ________________ where there are few plants.

How do people affect erosion?

13. Most processes change land slowly, but people can change the land ________________.

14. Cutting down trees for ________________ can increase soil erosion.

15. Farmers plant lines of ________________ to reduce the amount of soil erosion.

16. ________________ also reduces soil erosion by allowing plants to grow on the land’s natural slope.

Critical Thinking

17. Which do you think changes the land more: frozen water or flowing water?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Erosion and Deposition

Secret Word

Read each clue. Write the answer in the correct squares in the puzzle. Then, figure out what the secret word is, and fill in the rest of the letters.

canyon    dune    glacier    weathering
chemical  erosion  physical

Across
1. a hill made up of sand
2. a slow process that breaks rocks into smaller pieces
3. the carrying away of weathered pieces of rock
4. weathering that breaks down rock without changing the rock type
5. weathering caused by acid, oxygen, and carbon dioxide
6. a thick sheet of ice and rock
7. a v-shaped valley with a river at the bottom

Write the secret word that is running down the puzzle.

Chapter 5 • Earth’s Features and Its Materials
Reading and Writing
Rocks are constantly broken down by two processes called weathering and erosion. Rocks can be broken down into smaller pieces without changing the type of rock through chemical weathering. Minerals in rocks can be changed to other minerals through physical weathering. Erosion is the process that both weathers and removes the weathered rock using water and wind.

Huge moving masses of ice and sediment, called glaciers, also erode land. Moving glaciers weather the rock and move the sediment. When the ice melts, the glacier deposits the sediment as glacial till. Wind erodes rock by blowing sand grains against surfaces.
Earth Materials in Tennessee

How do living things interact with Earth’s materials?

1. Soils can take ___________ of years to form.

2. _______________ breaks down pieces of rock to form soil.

3. Soil is made up of ________________ , decayed plant or animal matter, called ________________, and pockets of air and water.

4. A vertical section of soil that starts at Earth’s surface and moves down to the bedrock is called a(n) _________________.

5. The different layers of a soil profile include topsoil, ________________, and coarse, weathered _________________.

What are mineral resources?

6. Natural, nonliving substances found in Earth are called _________________.

7. An _________________ is a rock that contains a useful mineral.

8. _________________ is used to make metals that resist rust.

9. Tennessee is one of the largest producers of _________________ in the United States.

10. _________________ , which is used to make cement, is very common in Tennessee.
LESSON 11

11. ________________ was used to build the Lincoln Memorial.

12. People use a ________________ to remove resources from underground.

What are fossil fuels?

13. Fuel that is made from the remains of ancient living things is a(n) ________________.

14. Fossil fuels are ________________ resources because once they are used, they are gone forever.

15. Tennessee produces ________________ , natural gas, and ________________.

How can we protect our resources?

16. People can protect our natural resources by using materials wisely, or ________________ them.

17. People can also ________________ old materials to produce new materials.

Critical Thinking

18. Do you think you could go to school without using fossil fuels?

______________________________________________

______________________________________________

______________________________________________

______________________________________________
Earth Materials in Tennessee

What am I?
Choose a word from the word box below that answers each question.

| a. fossil fuel | e. nonrenewable resource |
| b. humus      | f. recycling             |
| c. mine       | g. renewable resource    |
| d. mineral    | h. soil                  |

1. _______ I am a valuable material that is easily replaced by nature. What am I?
2. _______ I am a natural, nonliving substance found in Earth. What am I?
3. _______ I am a valuable resource that cannot be easily replaced by nature. What am I?
4. _______ I am a source of energy made up of ancient organisms that are no longer living. What am I?
5. _______ I am decayed plant and animal material in soil. What am I?
6. _______ I am the process of changing old materials into new materials. What am I?
7. _______ I am made up of weathered rocks, minerals, and humus. What am I?
8. _______ I am an opening in the Earth’s surface used for finding ores. What am I?
Farmers use soil to grow plants that are used for food and other products. Soil is an important resource. It is a mixture of small pieces of rock and decayed plant and animal material, called humus. Soil forms in layers that each have their own properties. The top layer, or topsoil, is rich with humus and minerals.

_________ are found in rocks underground. Valuable materials are removed from Earth by _________. Tennessee is a major producer of ___________ and limestone.

Coal, oil, and natural gas are _________ resources called fossil fuels. By conserving fossil fuels and recycling materials, we can make them last longer.
Meet Sisir Mondal

Read the passage in your textbook. Then use the Compare and Contrast graphic organizer to help you answer the questions.

**Compare and Contrast**

1. How are platinum and chromium alike?
   
   ______________________________________________________

2. How are platinum and chromium different?
   
   ______________________________________________________
Write About It
Classify Read the article again. What does Sisir look for in the rocks he studies? How do you think Sisir classifies the rocks?

Details
List details about Mondal’s field work.


List details about Mondal’s lab work.


Drafting
Use the details to explain how Mondal’s field and lab work are alike.


Use the remaining details to explain how Mondal’s field and lab work are different.


The Water Cycle

Use your textbook to help you fill in the blanks.

Why does water change state?

1. Water in the gaseous state is called _________________.

2. The process during which a liquid slowly changes to a gas is called _________________. Heat from the _________________ causes ocean water to evaporate.

3. The process during which a gas changes to a liquid is called _________________. When the air cools, water vapor condenses on objects; for example, _______________ forms on grass.

Where does water go?

4. Earth’s water is constantly changing state by moving through the _________________.

5. Water evaporates from the leaves of plants during the process of _________________.

6. When it rains, the water that flows over the surface of Earth is called _________________.

7. Rain, snow, sleet, and hail are different forms of _________________.

Chapter 5 • Earth’s Features and Its Materials
Reading and Writing

Use with Lesson 4
The Water Cycle
What are some types of clouds?

8. White, puffy _______________ clouds usually occur during good weather.

9. Low, layered clouds are called _______________ clouds.

10. Thin, wispy clouds high in the sky are called _______________ clouds.

What are other forms of precipitation?

11. In freezing air, bits of ice crystals will fall to the ground as _______________.

12. Hailstones form inside tall _______________ and are usually the size of peas.

13. Snow can melt as it falls to become _______________ rain.

Critical Thinking

14. Describe examples of the water cycle inside your house.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
The Water Cycle

Match the correct word with its description.

1. ______ This is the condition that causes a liquid to change into a solid.
2. ______ This is the ongoing movement of water through many different processes and states.
3. ______ These are small drops of rain that freeze in the air before they hit the ground.
4. ______ This is the process of a liquid becoming a gas.
5. ______ These are ice crystals that form in clouds when the air is cold.
6. ______ This is water that falls from clouds to Earth.
7. ______ This is the gaseous form of water.
8. ______ This is the process of a gas becoming a liquid.
9. ______ This is the process of a solid becoming a liquid.

a. condensation  b. evaporation  c. freezing  d. melting  e. precipitation  f. sleet  g. snow  h. water cycle  i. water vapor
The Water Cycle

Fill in the blanks.

<table>
<thead>
<tr>
<th>cirrus</th>
<th>cumulus</th>
<th>stratus</th>
</tr>
</thead>
<tbody>
<tr>
<td>clouds</td>
<td>evaporates</td>
<td>vapor</td>
</tr>
<tr>
<td>condenses</td>
<td>precipitation</td>
<td>water cycle</td>
</tr>
</tbody>
</table>

Water moves from Earth to the atmosphere and back again. This path is called the ______________________. Water changes to a gas, or ______________________, from the surface of oceans, lakes, and other places. Water ______________________ rises into the air and cools.

There are three main types of clouds. Puffy white clouds are called ________________ clouds. Low, layered clouds are called ________________ clouds. Wispy clouds high in the sky are called ________________ clouds. Eventually, the water in clouds falls back to Earth as ________________.

The different types of precipitation include rain, snow, sleet, and hail.
Climate

Use your textbook to help you fill in the blanks.

What is climate?

1. The pattern of seasonal weather that happens in an area year after year is called _____________.

2. Two important factors that define climate are _____________ and _____________.

3. Temperate climates often have four _____________.

4. The types of _____________ that farmers can grow depend on climate.

What determines climate?

5. The thin lines that run across the map are lines of _____________.

6. Latitude is a measure of how far a place is from the _____________ and increases as you move north or south.

7. The temperature differences between low and high latitudes cause _____________.

8. The directed flow of a liquid or gas is called a(n) _____________.
How do weather and climate affect the water cycle?

9. Mostly, Tennessee’s weather systems come from western states, such as ________________.

10. If Tennessee’s weather comes from the Gulf of Mexico, it may have more ________________ and lead to storms.

Critical Thinking

11. What do you think the climate would be like if you lived at the base of a mountain near the ocean?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Climate

Match the correct letter with the description.

| a. altitude | d. equator | g. ocean current |
| b. climate  | e. global winds | h. season |
| c. current  | f. latitude     |           |

1. ______ the characteristic weather of a region over the course of several years
2. ______ a measure of how far a place is from the equator
3. ______ the directed flow of a gas or liquid
4. ______ a long period of similar weather patterns
5. ______ a measure of how high a place is above sea level
6. ______ the directed flow of water over long distances through the ocean
7. ______ winds that circulate the air between the equator and the poles
8. ______ where the latitude is set at zero degrees
The weather in a particular region can be averaged over a long period of time. This is called the ___________ , and farmers depend on it to grow their crops. Average yearly ___________ and ___________ define the climate of a region. Areas close to the equator have a(n) ___________ of zero degrees and have ___________ climates. Latitude at the North Pole and South Pole is 90 ___________ , and they have ___________ climates.

Air temperature decreases with ___________ , so higher areas have cooler climates than lower areas. Water warms and cools more slowly than ___________ does. This is why areas near the ocean usually have milder climates than inland areas.
Earth’s Features and Its Materials

Circle the letter of the best choice.

1. Mountains, plains, and plateaus are examples of
   a. avalanches.
   b. geological features.
   c. landslides.
   d. ridges.

2. What is a mineral?
   a. a nonliving substance formed in nature
   b. a nonliving substance made in a power plant
   c. a living substance formed in nature
   d. a living substance found in a mine

3. What types of resources are fossil fuels, such as coal, oil, and natural gas?
   a. renewable
   b. nonrenewable
   c. preserved
   d. unlimited

4. Protecting resources and using them wisely is known as
   a. mining
   b. conservation
   c. erosion
   d. deposition

5. The process during which a liquid changes into a gas is called
   a. condensation
   b. freezing
   c. evaporation
   d. melting

6. Global winds are caused by
   a. temperature differences between high and low latitudes.
   b. temperature differences between high and low altitudes.
   c. ocean currents.
   d. geological features.
Circle the letter of the best choice.

7. Acids and gases break down rocks during
   a. erosion.
   b. deposition.
   c. physical weathering.
   d. chemical weathering.

8. Cycles of freezing and thawing break down rocks during
   a. erosion.
   b. deposition.
   c. physical weathering.
   d. chemical weathering.

9. Acid rain changes the minerals in rocks to other minerals. What is this process called?
   a. chemical weathering
   b. deposition
   c. erosion
   d. physical weathering

10. Which of the following was formed by erosion?
    a. the Grand Canyon
    b. the Great Plains
    c. the Hawaiian Islands
    d. the Mississippi delta

11. What is a large, slow-moving buildup of snow and ice?
    a. an avalanche
    b. a flood
    c. a glacier
    d. a landslide

12. Which of the following is NOT a major force of erosion?
    a. water
    b. wind
    c. sunlight
    d. ice

13. The movement of water between the air and Earth’s surface is called
    a. the water cycle.
    b. condensation.
    c. evaporation.
    d. conservation.

14. Which of the following does NOT affect the climate of a region?
    a. distance to water
    b. latitude
    c. mining
    d. global winds
What a Difference Day Length Makes
From Ranger Rick

Read the Unit Literature feature in your textbook.

Write About It
Response to Literature  Animals respond to changing seasons in many ways. What are some ways you have seen nature change from season to season? Write about it.
Matter and Energy

Complete the concept map with the information you learned about matter and energy. Fill in details or terms that relate to the properties of matter.

Properties of Matter

- states
  - __________
  - __________
  - __________

- measurement
  - __________
  - __________
  - __________
Measuring Matter

Use your textbook to help you fill in the blanks.

How do we measure matter?

1. Anything that has mass and takes up space is a form of ________________.

2. If a metric measurement has units of centimeters, it is a measurement of ________________.

3. The amount of space a substance takes up is its ________________.

How do we measure mass?

4. A ________________ measures mass.

5. Objects with the same ________________ do not always have the same mass.

What is density?

6. The comparison of an object’s mass to its volume describes ________________.

7. The density of a quart of water and the density of a teaspoon of water are the ________________.

8. If an object’s density is ________________ than the density of the material into which it is placed, the object will sink.
9. A hot-air balloon rises because the hot air inside the balloon is ______________ more dense than the cooler air outside the balloon.

10. A helium balloon rises in air because the ______________ of helium is less than the density of air.

What is weight?

11. The measure of the pull of gravity from a planet on the mass of an object describes an object’s ______________.

12. Units of kilograms can be used in measurements of ______________, and units of newtons are used when ______________ is measured.

13. An object’s ______________ changes with gravity, but its ______________ stays the same.

Critical Thinking

14. Do you think that if a marshmallow and a marble are the same size, they would have the same mass, density, buoyancy, or volume?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Measuring Matter

Match the correct letter with the description.

<table>
<thead>
<tr>
<th>a. mass</th>
<th>d. weight</th>
<th>g. temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. matter</td>
<td>e. length</td>
<td>h. volume</td>
</tr>
<tr>
<td>c. density</td>
<td>f. physical property</td>
<td></td>
</tr>
</tbody>
</table>

1. ______ a measurement that you make in degrees Celsius or degrees Fahrenheit
2. ______ the distance from one place to another
3. ______ anything that has mass and takes up space
4. ______ the amount of gravity between an object and a planet
5. ______ the mass of an object divided by its volume
6. ______ the amount of matter that makes up an object
7. ______ the amount of space that an object takes up
8. ______ the general name for a characteristic of a substance that you can observe without changing what the substance is made of
Measurement is a way of using numbers to compare objects. The amount of matter in an object describes its ___________. Mass is measured by using a(n) ___________. The unit in the ___________ that describes mass is the ___________. A measurement of the effect of the force of ___________ on the mass of an object is the ___________ of the object. The metric unit of weight is the ___________.

When the ___________ of a box-shaped object is multiplied by its width and ___________, its ___________ is found. The area of a flat surface can be calculated by multiplying its length by its width.
Physical Changes

Use your textbook to help you fill in the blanks.

What are physical changes?

1. A change that begins and ends with the same kind of matter is a _________________.

2. After a physical change, the ____________________ of matter remain the same.

3. Physical changes in matter can be caused by wind, ________________, freezing, and ________________.

4. When water freezes, it _________________. This is why ice ________________ in liquid water.

What are the states of matter?

5. The state of matter that has a definite shape and definite volume is the ________________ state.

6. Matter in the ________________ state keeps the same volume but takes the shape of its container.

7. Particles in a ________________ have the most energy.

8. Your desk is classified as a solid because it has a definite shape and volume at ________________.
How does matter change state?

9. When matter changes from one form to another, such as from a solid to a liquid, it goes through a change of ________________.

10. A change of state is caused by ________________.

11. Heat energy can change a liquid to a gas during a process called ________________.

What are other real-world physical changes?

12. Reshaping dough is a(n) ________________.

13. The traits of substances do not change when they are combined to form a ________________.

14. Salt will ________________ when it is mixed into water.

Critical Thinking

15. Do you think you can describe an object without using its properties?

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________
Physical Changes

Choose a word from the word box below that correctly fills in the blank.

<table>
<thead>
<tr>
<th>change of state</th>
<th>evaporation</th>
<th>physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>condensation</td>
<td>gas</td>
<td>solid</td>
</tr>
</tbody>
</table>

1. When an ice cube melts into liquid water, it goes through a(n) ________________.

2. Folding, cutting, chopping, and crushing are examples of a(n) ________________ change.

3. Energy can change a liquid into a gas. The process is called ________________.

4. A ________________ has a definite shape and a definite volume.

5. During ________________, a gas changes into a liquid.

6. A material without a definite shape or volume is a ________________.
Physical Changes

Fill in the blanks.

<table>
<thead>
<tr>
<th>change of state</th>
<th>gas</th>
<th>shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>evaporation</td>
<td></td>
<td>solid</td>
</tr>
<tr>
<td>liquid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>physical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>properties</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Matter changes every day. A _______________ change is the simplest type of change because the _______________ remain the same. If water becomes a gas through _______________, or if it freezes and becomes a _______________, that is a _______________.

All materials are classified as a _______________, a liquid, or a gas. Solids have a definite _______________ and a definite volume. _______________ have a definite volume, but take the shape of their container. A _______________ does not have a definite shape or volume.
Mining Ores

Read the Reading in Science feature in your textbook.

**Write About It**

**Infer** Read the article with a partner. Use what you know and what you read in the article to answer this question. Why do you think it is important for people to recycle metals? Write a paragraph to share your ideas.

Use the graphic organizer below to identify what you already know and what you can infer from the passage about obtaining useful metals.

<table>
<thead>
<tr>
<th>Clues</th>
<th>What I Know</th>
<th>What I Infer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>________</td>
<td></td>
<td>I can recognize metals because they are</td>
</tr>
<tr>
<td>every day.</td>
<td>are made of metals.</td>
<td>________ .</td>
</tr>
<tr>
<td>Metals come from</td>
<td>Metals are found in</td>
<td>I infer that there are many ways to separate metals from</td>
</tr>
<tr>
<td>________</td>
<td>________</td>
<td>________ .</td>
</tr>
</tbody>
</table>
Planning and Organizing

Answer the questions to help you write your essay.

1. What does recycling mean?

2. What do you think happens to mountains or the ground where ores are mined?

3. According to the information in the article, what things might be saved if metals are recycled?

Drafting

Write two or three reasons for recycling metals. Have your partner read your work. Does your partner agree or disagree with your reasons? Why?

1. 

2. 
Heat, Radiant Energy, and Chemical Energy

Use your textbook to help you fill in the blanks.

What are some forms of energy?

1. Heat is the flow of ________________ from one object to another.

2. Heat flows from a(n) ________________ object to a(n) ________________ object.

3. ________________ is a form of energy from the Sun.

4. Sunlight is used by ________________ to make food during photosynthesis.

5. ________________ energy includes both light and heat.

6. The food that we eat has stored ________________ energy.

How does energy change?

7. Plants change light energy from the Sun into ________________ energy in food.

8. A lamp changes ________________ energy into light energy.
9. When something is heated, its ________________ changes.

10. Matches use ________________ energy to produce light and heat.

11. ________________ measures the average energy of the particles in a substance.

**How does heat change matter?**

12. Particles of matter are always in ________________.

13. Adding energy makes particles of matter move ________________ and spread farther ________________.

14. Adding enough energy can cause matter to ________________ or ________________.

**Critical Thinking**

15. What materials do you think would make the best pot holders? Hint: What do bakers use to take pizza, bread, and cookies out of the oven?
Heat, Radiant Energy, and Chemical Energy

Match the correct word with its description.

<table>
<thead>
<tr>
<th>a. chemical energy</th>
<th>d. light</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. electrical energy</td>
<td>e. radiant energy</td>
</tr>
<tr>
<td>c. heat</td>
<td></td>
</tr>
</tbody>
</table>

1. _______ the movement of charged particles
2. _______ energy stored in food and fuels
3. _______ the movement of energy from a warm object to a cold object
4. _______ light and heat from the Sun
5. _______ energy that allows us to see objects
Heat, Radiant Energy, and Chemical Energy

Fill in the blanks.

<table>
<thead>
<tr>
<th>electrical energy</th>
<th>increases</th>
<th>sunlight temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>gas</td>
<td>liquid</td>
<td>particles</td>
</tr>
</tbody>
</table>

Energy flows from a warmer object to a cooler object. When heat is added to an object, the object’s _________ rises. ____________ is never lost, it only changes from one form to another. Plants use the energy in ____________ to produce chemical energy in food. A light bulb changes ____________ energy into light energy.

The energy of the particles of matter ____________ when heat is added and ____________ move faster.

Heat can change a solid to a(n) ____________ or a liquid to a(n) ____________ . Heat changes matter in many ways!
A Beam of Light

Read the paragraph below.

Surgeons are doctors who perform operations to fix injuries or treat diseases. They can use scalpels—special tools with sharp blades—to cut through skin, muscles, and organs of the human body. Today, surgeons have another tool they can use to do operations. This tool is a beam of light!

This beam of light is called a laser. Lasers are very powerful. They can cut through the human body without causing much bleeding.

Lasers were first used to remove birthmarks on children’s skin. Today, surgeons also use lasers to treat injuries to the brain, the heart, and many other parts of the body. Lasers are also used to improve people’s eyesight.

Write About It

Summarize Read the article again. List the most important information in a chart. Then use the chart to summarize the article.
Planning and Organizing

- List the most important information from the article in the chart below.

<table>
<thead>
<tr>
<th>Most Important Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Drafting

- Start by writing a clear statement that describes the main idea of the article.
- Write three supporting details.
- Read what you have written. Cross out anything that does not directly support the main idea.
- Exchange papers with your partner and ask him or her to check your choice of a main idea. Have your partner also check your choice of supporting details.

Summarize  Write your summary on a separate piece of paper. Use your own words. Include the main ideas and details you wrote.
Light

Use your textbook to help you fill in the blanks.

What is light?

1. Light is a form of ________________ that travels in ________________.

2. When light hits the surface of an object, the light is ________________ by the object.

3. When light bounces off the surface of an object, the light is ________________ in a different direction.

What is refraction?

4. Light rays ________________ as they pass from one transparent material to another.

5. Light travels more slowly through ________________ materials.

6. A lens is a tool used to ________________, or bend, light.

7. A lens that bends light outward, making objects look smaller, is called a(n) ________________ lens. A lens that bends light toward its center, making objects look bigger, is called a(n) ________________ lens.

8. The lens of an eye focuses the image on the _________________. Optic nerves send the image to the _________________.

Chapter 6 • Matter and Energy
Reading and Writing
What happens when light hits different objects?

9. Materials that block the passage of light are ________________.

10. The dark space formed by an object that blocks light is a(n) ________________.

11. Materials are ________________ when they scatter the light that passes through.

Why can you see colors?

12. Light from the Sun is a(n) ________________ of different colors.

13. A piece of glass called a(n) ________________ separates white light into the colors that make it up.

14. An object looks black when ________________ light is absorbed. It looks white when all light is ________________.

Critical Thinking

15. What facts about light allow you to see that a ball is blue with white stripes?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
# Light

Match the correct word with its description.

<table>
<thead>
<tr>
<th>a. convex lens</th>
<th>d. reflection</th>
<th>g. transparent</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. opaque</td>
<td>e. refraction</td>
<td>h. absorption</td>
</tr>
<tr>
<td>c. prism</td>
<td>f. translucent</td>
<td>i. concave lens</td>
</tr>
</tbody>
</table>

1. ______ a tool used to separate white light into all of its colors
2. ______ a lens that bulges inward
3. ______ the bending of light rays as they pass through different materials
4. ______ a material through which light cannot pass
5. ______ a material through which light can pass
6. ______ a material through which light can pass but will be scattered in different directions
7. ______ the property of light in which light rays strike a mirror and bounce off
8. ______ a lens that bulges outward
9. ______ when light that hits an object is taken in by the object
Light

Fill in the blanks.

<table>
<thead>
<tr>
<th>blocked</th>
<th>reflection</th>
<th>transparent</th>
</tr>
</thead>
<tbody>
<tr>
<td>concave</td>
<td>refraction</td>
<td>two</td>
</tr>
<tr>
<td>mirrors</td>
<td>translucent</td>
<td></td>
</tr>
</tbody>
</table>

Light has certain properties. It passes through some materials and is _____________ by others.

Opaque materials block light, ________________ materials let some light pass through, and ________________ materials allow all light to pass through.

The process in which light waves bend as they pass from one transparent material to another is called ________________ . Lenses refract light in different ways. Two kinds of lenses are ________________ and convex lenses.

Light can also bounce off an object. This is called ________________ . Smooth, shiny surfaces, such as ________________ , reflect the most light. Reflection involves ________________ light rays: an incoming ray and an outgoing ray. The angles of both rays are equal.
Matter and Energy

Circle the letter of the best answer.

1. What property is being measured when the unit of measurement is meters?
   a. length
   b. density
   c. mass
   d. volume

2. A book keeps its shape and volume when it is moved from place to place. A book is a(n)
   a. gas.
   b. liquid.
   c. solid.
   d. form of energy.

3. Measurements of mass and volume are used to calculate
   a. area.
   b. density.
   c. weight.
   d. length.

4. All matter has
   a. mass and area.
   b. mass and volume.
   c. state and area.
   d. weight and volume.

5. When bromine is poured from a bottle to dish, its volume remains the same, but it takes the shape of the container. Bromine is a
   a. solid.
   b. liquid.
   c. gas.
   d. measurement.

6. What type of change occurs when liquid water is cools to ice?
   a. change of shape
   b. change of use
   c. change of state
   d. change of place
7. The transfer of energy from warmer objects to cooler objects.
   a. heat  
   b. reflection  
   c. change of state  
   d. physical change  

8. What type of materials allow most light to pass through unscattered?
   a. transparent  
   b. translucent  
   c. opaque  
   d. solid  

9. Plants change light energy into
   a. heat.  
   b. radiant energy.  
   c. electrical energy.  
   d. chemical energy.  

10. A green leaf is reflecting
    a. no light.  
    b. red light.  
    c. green light.  
    d. all light.  

11. Which term describes how light bends as it passes from one transparent material into another?
    a. reflection  
    b. refraction  
    c. absorption  
    d. shadow  

12. The measure of gravity’s pull on an object is
    a. mass.  
    b. weight.  
    c. volume.  
    d. density.
Motion and Forces

Fill in the blanks in this concept map by using the information you have learned about forces.

**Motion**

- is a change in the __________ of an object and has speed, __________, __________, and sometimes __________.

**Forces**

- can start or __________ motion, or they can __________ the direction of motion. Forces include __________ and __________.
Position, Motion, and Speed

Use your textbook to help you fill in the blanks.

What is position?

1. Motion occurs when an object changes its location or its ____________________.

2. Words like left, ____________________, ____________________, below, ahead, and ____________________ give clues about position.

3. The word used to describe how far apart two points or places are is ____________________.

4. The ____________________ of anything is the distance it has moved in a certain period of time.

5. Average speed is equal to ____________________ divided by time.
What is velocity?

6. A moving object’s ________________ describes its ________________ and the ________________ it moved.

7. An object’s ________________ can be described as a velocity by adding a direction.

8. A ________________ changes its velocity on every swing.

Critical Thinking

9. Describe the position of your desk in the classroom.

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
Position, Motion, and Speed

Match the correct word with the description.

| a. distance | c. position | e. velocity |
| b. motion   | d. speed    |

1. ______ the speed and direction in which an object is moving
2. ______ the space between two objects
3. ______ a constantly changing position
4. ______ the distance that an object moves in a certain amount of time
5. ______ the location of an object
Position, Motion, and Speed

Fill in the blanks.

<table>
<thead>
<tr>
<th>distance</th>
<th>time</th>
</tr>
</thead>
<tbody>
<tr>
<td>position</td>
<td>velocity</td>
</tr>
<tr>
<td>speed</td>
<td></td>
</tr>
</tbody>
</table>

The position of an object is described by comparing its location to nearby objects. A moving object changes its __________________________. An object can move quickly or slowly, but the average __________________________ of an object is equal to the __________________________ traveled divided by the __________________________ spent moving. The speed and direction in which an object is moving is called its __________________________. A pendulum changes its velocity on each swing.
Wheels in Motion

Write About It

Explanatory Writing  Research how the brakes on a bike work. Write a description that explains how friction helps the bike stop moving.

Getting Ideas

First find out how brakes work. Then fill out the chart below. Write the steps in the process.

First

Next

Last

Planning and Organizing

Jada wrote three steps for her explanation. Put the steps in the correct order. Write 1, 2, and 3.

1. This causes friction between the brake and the wheel. It makes the bike come to a complete stop.

2. The brake cable attaches to the back wheel. When you squeeze the brake cable, it tightens the brake.

3. The handlebar brake lever is on the front handlebar. It is attached to the brake cable.
Revising and Proofreading

Here are some sentences that Jada wrote. Combine each pair. Use the word in parentheses. Put a comma before the word.

1. Don’t press the brakes quickly. You might topple over the front wheels. (or)

2. Friction is created between the brake and the wheel. This causes the bike to come to a stop. (and)

Drafting

Begin your explanation. Write a topic sentence. Tell what your explanation is about.

Now write your explanation. Use a separate piece of paper. Start with the sentence you wrote above. Write easy-to-follow details to tell how the brakes on a bicycle work.

Now revise and proofread your writing. Ask yourself:

- Did I describe how the brakes on a bicycle work?
- Did I give clear, easy-to-follow details?
- Did I correct all mistakes?
Forces Affect Motion

Use your textbook to help you fill in the blanks.

How do forces change motion?

1. You must apply a(n) ________________ to put an object in motion or ________________ an object from moving.

2. A ________________ is a push or a pull on an object.

3. An object in motion will stay in motion because of ________________.

4. An object at rest will stay at rest because of ________________.

5. ________________ is a force that acts against motion between the surfaces of objects.

6. All objects with ________________ have inertia.

7. Acceleration is any change in the ________________ or direction of a(n) ________________ object.
8. Objects in motion can be slowed down or stopped by ______________ once they touch each other.

What is gravity?

9. The force that pulls objects together is called ______________.

10. The pull of gravity between two objects is affected by the amount of ______________ in each object and the ______________ between the objects.

Critical Thinking

11. Do you think you need a lot of force to change an object’s inertia?

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Forces Affect Motion

Match the correct word with the description.

Matching Table:
- a. acceleration
- b. force
- c. friction
- d. gravity
- e. inertia

1. _______ a change in the speed or direction of a moving object
2. _______ a push or a pull that can move a still object or stop a moving object
3. _______ the physical property that keeps an object in motion or an object at rest
4. _______ the type of force when the surfaces of two objects touch
5. _______ the force that pulls objects together
Forces Affect Motion

Fill in the blanks.

<table>
<thead>
<tr>
<th>force</th>
<th>inertia</th>
</tr>
</thead>
<tbody>
<tr>
<td>friction</td>
<td>rest</td>
</tr>
<tr>
<td>gravity</td>
<td>stop</td>
</tr>
</tbody>
</table>

All objects are steady until a force acts on them.

They have _________________ —the property that keeps an object at _________________ or in motion.

A(n) _________________ is required to _________________ a moving object, or to put a stopped object in motion.

Some of the forces that affect motion are _________________ and _________________. A change in velocity is called acceleration.
Motion and Forces

Circle the letter of the best answer.

1. A train is traveling west at 80 kilometers per hour. The words *80 kilometers per hour* describe the train’s
   a. speed.
   b. velocity.
   c. acceleration.
   d. direction.

2. What physical property of objects is described in the following statement?
   *A moving object will stay in motion until a force acts on it. An object at rest will stay at rest until a force acts on it.*
   a. inertia
   b. acceleration
   c. speed
   d. velocity

3. The force that acts on the surfaces between objects that touch is
   a. inertia.
   b. velocity.
   c. gravity.
   d. friction.

4. What force between objects is affected by the amount of matter in the objects and the distance between the objects?
   a. inertia
   b. gravity
   c. friction
   d. speed
Circle the letter of the best answer.

5. Force is measured in units called  
   a. newtons.  
   b. kilometers per hour.  
   c. centimeters.  
   d. meters.

6. Velocity describes an object’s  
   a. speed and position.  
   b. speed and direction.  
   c. position and acceleration.  
   d. position and direction.

7. The strength of gravity between two objects depends on  
   a. mass and distance.  
   b. weight and distance.  
   c. size and distance.  
   d. the material between the objects.

8. What slows a marble rolling on a flat surface?  
   a. inertia  
   b. friction  
   c. gravity  
   d. velocity
Electricity and Magnetism

Complete the concept map about light and electricity. Some parts have been done for you.

**Nature and Movement**
electrical charge can be ________________
similar charges: ________________ ; ________________
charges: attract charged particles: ________________ in electric current

**Control of Movement**
made easier by ________________ ; ________________ by insulators;
carried along circuit; made of power source, ________________, and load

**Uses**
converted into heat, light, ________________, sound, or ________________
Electrical Charges

Use your textbook to help you fill in the blanks.

What is electrical charge?

1. Electrical charge is a(n) ____________________.

2. Scientists call the two types of electrical charges ____________________ and ____________________.

3. When positive and negative charges cancel each other out, the matter is said to be ________________.

4. Like charges repel or ________________ each other away, but opposite charges ________________, or pull toward each other.

5. When two objects touch, ________________ move between them.

6. Negative charges move more ________________ than positive charges.

7. The buildup of electrical charges on an object is called ________________.

8. Rubbing one object against another causes a ________________ of one kind of charge.

9. When you rub a balloon on wool, negative charges build up in the ________________.
10. When you place the balloon against a wall, it _____________ positive charges in the wall.
Because of that, the balloon _________________ against the wall.

What is an electrical discharge?

11. Lightning is the discharge of _________________ inside a storm cloud.

12. A(n) _________________ is the movement of static electricity from one object to another.

13. When lightning strikes, _________________ in a cloud push down on the negative charges in the ground.

14. The safest place in a lightning storm is _________________.

What are conductors and insulators?

15. Copper and silver are good _________________ because charges flow through them easily.

16. The outside of an electrical wire is covered by a(n) _________________ such as rubber or plastic.

17. The insulator keeps the electricity inside the wire and _________________.

Critical Thinking

18. Suppose you walked on a carpet and built up a charge of static electricity. Would you feel a shock if you touched a plastic cup? Why or why not?

______________________________
Electrical Charges

Match the correct word or words to their definitions by writing the letter in the space provided.

a. attract  d. electrical charge  g. repel
b. conductors  e. insulators  h. static electricity

c. discharge  f. neutral

1. ______ Rubber, plastic, and glass are good examples of these materials.

2. ______ Two objects that both have negative charges will do this to each other.

3. ______ This property of matter has two types, positive and negative.

4. ______ When clothes stick together after coming out of a clothes dryer, they might have this buildup.

5. ______ Copper and other metals are good examples of these materials.

6. ______ Walking across a carpet and then touching something metal can cause this movement of electricity.

7. ______ Objects with a negative charge will do this to objects with a positive charge.

8. ______ Objects that have an equal number of positive and negative particles are said to be this.
Electricity powers traffic lights, appliances, and computers. There are different kinds of electricity, but all electricity is the result of _________________.

There are two types of electrical charges. Scientists call these charges ________________ and ________________. When two objects touch, ________________ can move from one object to the other.

The buildup of electrical charges is called ________________. It is what makes clothes stick together.

Metals such as copper and silver are good ________________ because they let charges flow through them easily. Rubber, plastic, and glass are examples of good _________________. These materials do not let charges flow through them easily.
Other Energy Sources

Write About It
Persuasive Writing Write a persuasive letter to a community leader. Tell why you think it is important to find other sources of energy. Be sure to follow the form of a formal letter.

Getting Ideas
Use the chart below to help you get started. Write your opinion in the top box. Write convincing reasons, facts, and examples in the bottom boxes.

Opinion:

Planning and Organizing
Here are three sentences that Daria wrote. Does the sentence support the opinion that we need to find other sources of energy? If so, write yes. If not, write no.

1. _________ We hurt the land when we mine for coal.
2. ________ We are using up our supply of oil.

3. ________ Some cars run on electricity as well as oil.

**Drafting**
Write a sentence to begin your letter. Tell your opinion about finding other sources of energy.

__________________________

Now write your letter. Use a separate piece of paper. Follow the format of a formal letter. Begin with the sentence above. Then give facts, reasons, and examples to support it.

**Revising and Proofreading**
Here is a part of Daria’s letter. She made five punctuation errors. Find the mistakes and correct them.

Dear Mr. Alvarez

We must find other sources of energy before it’s too late. We are using up our oil? Will there be any left when I am grown up. We are hurting the land by digging for coal.

**Now revise and proofread your writing. Ask yourself:**

- Did I follow the format of a formal letter?
- Did I clearly tell my opinion?
- Did I include convincing facts, reasons, and examples?
- Did I correct all mistakes?
**Electrical Circuits**

Use your textbook to help you fill in the blanks.

**What is an electrical current?**

1. Electrical _______________ can be made to flow continuously through materials.

2. A flow of electrical charges is known as a(n) _______________.

3. The path along which electrical charges flow is called a(n) _______________.

4. A complete, unbroken path is called a(n) _______________.

5. Electric current cannot flow in a(n) _______________.

6. A(n) _______________ is a part of a circuit that opens and closes the circuit.

7. An electric circuit begins at a(n) _______________.

8. Current needs to flow through a connector such as _______________.

9. Current reaches a(n) _______________, such as a lamp or a computer that uses the electricity.

**What is a series circuit?**

10. In a series circuit, all of the electrical charges flow _______________ and along _______________.

11. If any part of a series circuit is removed or broken, the circuit is _______________.

Chapter 8 • Electricity and Magnetism

Reading and Writing
What is a parallel circuit?

12. A parallel circuit is a circuit in which the electric current flows through ________________.

13. The ________________ of a parallel circuit divide the electric current between them.

What affects electrical current?

14. The amount of electric current that can flow through a circuit depends on ________________ and ________________.

15. Voltage is measured in units called ________________.

16. Increasing the ________________ of a circuit decreases the flow of electrical charges through it.

17. A(n) ________________ can stop the rest of the circuit from operating properly and can be dangerous.

Critical Thinking

18. Do you think the material inside a light bulb is a conductor or has resistance? Why?

_________________________________________________________________________________________________________________________________________________________________________________________________________________________
Electrical Circuits

Use the clues to unscramble each of the words. Take the letters that appear in the boxes marked with circles and unscramble the letters for the final message.

Clues

1. a property of matter
2. a flow of electrical charges
3. can build up as static electricity and can be discharged
4. the unbroken path along which an electric current flows
5. status of a circuit that is complete and unbroken with flowing electric current
6. status of a circuit that has breaks or openings in which electric current cannot flow
7. opens and closes the circuit
8. a circuit in which all electrical charges flow in the same direction and along the same path
9. the strength of a power source that is measured in volts
10. the ability of a substance to slow down electric current
11. circuit in which the electric current follows two or more paths that are called branches
Electrical Circuits

Use the words in the box to fill in the blanks.

charges  electric current  parallel circuit

current  open  series circuit

People depend on electricity to light up rooms and to power televisions and computers. The electricity that people use relies on a(n) ________________ of electrical charges. A flow of electrical charges is known as a(n) ________________ . Electric currents keep ________________ moving.

All electrical charges flow in the same direction and along the same path in a(n) ________________ . If any part of a series circuit is removed or broken, the circuit is ________________ . That means the current no longer flows.

A(n) ________________ is a circuit in which the electric current follows more than one path. If any part of a parallel circuit is removed or broken, the current continues to flow.
Magnetic Interactions

How do magnets attract and repel one another?

1. When you bring two magnets together, they will either __________ or attract each other.

2. The strongest parts of the magnet are called the __________.

3. When two magnets are brought together, a north pole and a(n) __________ attract each other.

4. Magnets point north because they line up with __________ magnetic field.

5. A(n) __________ is the area of magnetic force around a magnet.

What is an electromagnet?

6. When an electric current flows through a wire, it creates a(n) __________ around the wire.

7. A(n) __________ is a coil of wire wrapped around a core, usually an iron bar.

8. When the current stops flowing through the wire of an electromagnet, the __________ will no longer be produced.

How does a loudspeaker work?

9. A(n) __________ is a device that changes electrical energy into sound.
10. The _________________ is the part of the loudspeaker that vibrates to create sound.

11. A telephone receiver is actually a(n) _________________.

12. The telephone mouthpiece is like a loudspeaker in _________________.

13. A(n) ________________ is a device that uses a magnet to convert sound into electric signals.

How else are electromagnets used?

14. Electromagnets are often more useful than ordinary magnets because they can be _________________.

15. Electromagnets are used in _________________ that increase or decrease the voltage of electric currents.

16. They are also found in many household _________________, such as doorbells and speakers.

Critical Thinking

17. Why are electromagnets more useful than permanent magnets?

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
Magnetic Interactions

Match the correct letter with the description.

<table>
<thead>
<tr>
<th>a. compass</th>
<th>d. magnetic attraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. electromagnet</td>
<td>e. pole</td>
</tr>
<tr>
<td>c. magnetic field</td>
<td>f. repel</td>
</tr>
</tbody>
</table>

1. _____ the region of force around a magnet
2. _____ the attraction caused by a magnetic force
3. _____ the place where a magnet’s pull is strongest
4. _____ what happens when like poles are placed near each other
5. _____ a device that uses Earth's magnetic field to find direction
6. _____ this is a coil of wire wrapped around a core of iron
Electromagnets are very useful in our daily lives. In the 1820s, __________ and Joseph Henry discovered that magnets could generate a(n) __________. When the current is flowing, it creates a(n) __________ around the wire. When the current is turned off, the __________ is no longer magnetic.

A loudspeaker is a device that changes electrical energy into __________. The __________ is the part of the loudspeaker that vibrates to create sound. A telephone also has a tiny __________. A friend’s voice on the phone is changed into __________. The mouthpiece of the phone contains a(n) __________ that uses a magnet to convert sound into electrical signals. Electromagnets are used in many household appliances and toys.
Electricity and Magnetism

Circle the letter of the best answer.

1. The strength of a power source is its
   a. charge.
   b. discharge.
   c. resistance.
   d. voltage.

2. Charges do not flow easily through
   a. conductors.
   b. copper wire.
   c. insulators.
   d. silver.

3. The continuous flow of electrical charges is
   a. discharge.
   b. electric current.
   c. static electricity.
   d. voltage.

4. A material that has an equal number of positive and negative charges is
   a. positive.
   b. negative.
   c. neutral.
   d. magnetic.

5. The buildup of electrical charges on an object is called
   a. a discharge.
   b. static electricity.
   c. electromagnetism.
   d. electric current.

6. What is a material that does not allow electric charges to pass easily?
   a. a circuit
   b. a magnet
   c. a conductor
   d. an insulator
Circle the letter of the best answer.

7. The fast movement of an electrical charge is called a
   a. fuse.
   b. insulator.
   c. resistor.
   d. discharge.

8. Resistance is the ability of a substance to
   a. change the charge of an object.
   b. provide power to a circuit.
   c. slow down electric current.
   d. speed up electric current.

9. Electric current flows through different paths in a(n)
   a. fuse.
   b. open circuit.
   c. parallel circuit.
   d. series circuit.

10. The path of electric current is called a
    a. circuit.
    b. fuse.
    c. switch.
    d. switch.

11. What does a compass needle use to indicate direction?
    a. discharge
    b. resistance
    c. voltage
    d. Earth’s magnetic field

12. A complete, unbroken circuit is called a(n)
    a. long circuit.
    b. short circuit.
    c. open circuit.
    d. closed circuit.
Magnetic Migration
From Ranger Rick

Read the Unit Literature feature in your textbook.

Write About It
Response to Literature Have you ever traveled to a different place? Where did you go? How did you get there? Write about a trip you have taken. Tell how you figured out the directions.

[Blank lines for writing]
Science and Technology

Use your textbook to help you fill in the blanks.

1. An important scientific discovery, or ________________, can lead to new technology.

2. Galileo’s more powerful ________________ observed the Moon and Venus.

3. Galileo could not see beyond our solar system, but the ________________ can observe distant galaxies.

New Technologies

4. New tools and technology come from a ________________, or need, such as ________________, clean water, and ________________.

5. Some technologies, like cars and trains, are not essential for life, but they improve the ________________ of life.

Critical Thinking

6. If a pollution-free car were developed, what would eventually happen to gasoline-powered cars? Explain your answer.

______________________________

______________________________

______________________________

______________________________
Science and Technology

What am I?
Choose a word from the word box to answer each question.

| 1. I am an important scientific discovery, such as the discovery of electricity. What am I? |
| 2. I am a need from which new tools and technology come. What am I? |
| 3. I can make observations of distant galaxies. What am I? |
| 4. Because I vibrate at a constant rate, I am used in modern watches. What am I? |
| 5. I am everything that is designed, made and used to solve problems. What am I? |

a. demand  
b. *Hubble Space Telescope*  
c. quartz crystal  
d. scientific advance  
e. technology
**Science and Technology**

Use the words in the box to fill in the blanks.

<table>
<thead>
<tr>
<th>demand</th>
<th>technology</th>
<th>wristwatches</th>
</tr>
</thead>
<tbody>
<tr>
<td>galaxies</td>
<td>train</td>
<td>vibrate</td>
</tr>
<tr>
<td><em>Hubble Space Telescope</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

New technology can come from scientific advances. One example of this was the discovery that electricity causes quartz crystals to **vibrate** at a constant speed.

This discovery was applied to making today’s **wristwatches**.

The development of the **Hubble Space Telescope** is an example of how **technology** can aid science. With this tool, observations can be made of distant **galaxies**.

New technology comes from a **demand**, such as food or clean water. Some technologies improve the quality of life, such as the steam-powered **train**.

Yet the need to travel at increased speeds led to other technologies, such as cars and planes.
Getting Ideas

Think about how you would like to help the environment. What would you like to clean up most? What would your tool or process be called? What would it do? Use a concept map like the one below to record your ideas.

Planning and Organizing

Carla chose to write about a tool that cleans up soil pollution. Here are some sentences she wrote. Write Yes if the sentence relates to the topic. Write No if it does not.

1. _______ When an oil spill or other kind of pollution occurs, this liquid must be poured onto the soil.

2. _______ Sometimes industries cause pollution.

3. _______ The faster the liquid is poured into the soil, the better chance the organisms in the area have to survive.

Write About It

Patent Application Design your own tool or process that could be used to clean up the environment. Apply for a patent for your idea. Explain the idea in detail. Use both words and pictures to help you.

Eating Away at Pollution
Drafting

Now write the first draft of your patent application. Begin with a paragraph that establishes your idea and how it will help to clean the environment. Then describe the details that support the main idea. Remember to include a picture.

Now revise and proofread your writing. Ask:

- Have I mentioned the tool or process that helps to clean up the environment?
- Have I explained the concept and described the important ideas?
- Have I corrected all grammar errors?
- Have I corrected all errors in spelling, punctuation, and capitalization?
Ideas and Inventions

Use your textbook to help you fill in the blanks.

1. The invention that made Thomas Edison famous was the ____________.

2. One important challenge Edison had was finding a material to use as a ____________.

3. Edison, Knight, and all inventors take certain steps to bring about their ideas. The steps are known as the ____________.

Steps in the Design Process

4. The steps of the design process involve identifying a ____________, thinking of a possible ____________, building a ____________, ____________ the design, and explaining the invention.

5. When an invention doesn’t work, the inventor has to ____________ the design.

Critical Thinking

6. Why is it important to advertise an invention? What are some ways to advertise?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
I Ideas and Inventions

Use the words in the box to fill in the blanks below.

<table>
<thead>
<tr>
<th>design process</th>
<th>solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>patent</td>
<td>test</td>
</tr>
<tr>
<td>prototype</td>
<td></td>
</tr>
</tbody>
</table>

1. An idea to solve a problem is called a ________________.

2. A ________________ gives a person the right to claim an invention as their own.

3. The ________________ are the steps that inventors follow when they want to invent something.

4. To know if a design will work, an inventor must ________________ the design.

5. A life-size working model of a design is called a ________________.
All inventors see needs. Thomas Edison saw a need for an affordable _______________. Margaret Knight saw a need for a paper bag that could stand up. She became the first woman to get a _______________ for her invention. No matter what people invent, they follow a sequence of steps called the _______________.

The first step is to identify a _______________. The next step is to think of a possible _______________, or way to solve it. Then you sketch ideas, identify challenges, talk to people, and do _______________. You build a life-size working model or _______________ that you can test. A smart inventor asks people to test the design and listens to their _______________. If something does not work, you may need to _______________ the design. The final step is where you explain how the invention will solve the problem.
Designed for Speed

Write About It
Expository Nonfiction Research other aerodynamic objects, like cars and airplanes. How are they designed to cut down on drag?

Getting Ideas
Think of another object that uses aerodynamics, such as a race car. Research and compare how this object cuts down on drag compared to speed skaters. Use a Venn diagram like the one below to organize your ideas.

Planning and Organizing
Zack used a Venn diagram to write his expository nonfiction essay. He has written some transitional words to use in some of his sentences. Circle the words that can be used to compare and contrast.

<table>
<thead>
<tr>
<th>first</th>
<th>next</th>
<th>difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>alike</td>
<td>after</td>
<td>under</td>
</tr>
<tr>
<td>same</td>
<td>similar</td>
<td>over</td>
</tr>
<tr>
<td>different</td>
<td>without</td>
<td>finally</td>
</tr>
</tbody>
</table>
Drafting

Write a sentence or two to begin your essay. Explain what you are writing about. Tell what you are comparing and contrasting.

Now write your expository nonfiction essay. Use a separate piece of paper. Begin with the sentence or sentences you wrote above. Compare and contrast how speed skaters and race car drivers use aerodynamics to cut down on drag.

Revising and Proofreading

Here is a part of Zack’s explanatory essay. He made four mistakes in grammar. Find the mistakes and correct them. Cross out the error and write the correction above it.

Both speed skaters and race car drivers must use object designed to cut down on drag. Race cars is designed to let wind pass quickly over the top of the car. For instance, they do not has objects such as mirrors on the side of the car. These things helps to cut down on drag.

Now revise and proofread your writing. Ask yourself:

- Did I compare and contrast the different ways aerodynamics are used?
- Did I use transitional words that compare and contrast?
- Did I correct all mistakes in grammar, spelling, punctuation, and capitalization?
Technology in Industry

Use your textbook to help you fill in the blanks.

1. People in the __________________ designed and manufactured your clothing.

2. Raw ________________ are made into goods and sold to ________________.

3. Many industries use ________________ to make presentations about a company and its ________________.

Workers and Industry

4. There are four stages of building construction. They include the ________________ stage, followed by laying a ________________.

5. After the foundation is built, the ________________ can begin.

6. During the ________________, the walls are painted and the floor is set.

Mass Production

7. In mass production, goods are built piece-by-piece on an ________________.

Critical Thinking

8. Why do robots improve productivity in industries?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Technology in Industry

Match each word in the box with its description. Then write its letter in the space provided.

1. ______ doing more work in less time
2. ______ how raw materials are made into goods
3. ______ building goods piece-by-piece on an assembly line
4. ______ the money a company makes after paying its costs
5. ______ all the work people do, including making goods and providing services
6. ______ someone who buys things
7. ______ a machine that can repeat the same task over and over very precisely

a. consumer       d. mass production       g. robot
b. industry       e. productivity
f. profit

Use with Lesson 3
Technology in Industry
Technology
Reading and Writing
Technology in Industry

Use the words in the box to fill in the blanks.

<table>
<thead>
<tr>
<th>assembly line</th>
<th>construction</th>
<th>planning</th>
<th>robots</th>
</tr>
</thead>
<tbody>
<tr>
<td>building</td>
<td>consumers</td>
<td>productivity</td>
<td>textil</td>
</tr>
<tr>
<td>computer</td>
<td>manufacturing</td>
<td>profits</td>
<td></td>
</tr>
</tbody>
</table>

There are many different kinds of industry. The _________________ industry involves _________________ clothes. Cloth is made into goods which are later sold to _________________.

Many industries rely on another industry, the _________________ industry, for tasks such as storing data and determining a company’s earnings, or _________________.

Workers in the _________________ industry build homes and other buildings. For example, architects and engineers work during the _________________ stage. Plumbers and electricians work during the _________________ stage.

Many materials are mass produced in an effort to increase _________________. Many factories use _________________ on an _______________. They can complete tasks that are too dangerous for people.
Positively Plastic!

Write About It

Cause and Effect  This article is about plastics. Research more about how plastics are made or recycled. Then write a report. Use facts and details from the article in your research.

Getting Ideas

Think about how recycling plastics has affected the products available. How has recycling affected the plastics industry? Use the cause-and-effect chart below to record your ideas.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastics can be recycled.</td>
<td>New products can be made from recycled materials.</td>
</tr>
<tr>
<td>New products are made from recycled materials.</td>
<td>Using recycled plastic saves natural resources and cuts down on garbage.</td>
</tr>
</tbody>
</table>

Planning and Organizing

Angie will use the cause-and-effect graphic organizer to help write her report about the effects of recycling. She will make sure that she makes the main idea and details clear to the reader. Look at the sentences she has written below. Put an M next to those that tell the main idea. Put a D next to those that tell details.

1. _______ Recyclable plastics are marked with a number that shows what kind of plastic it is.

2. _______ The recycling of plastics has allowed us to save natural resources and reduce the amount of garbage.

3. _______ Americans use more than a million plastic bottles every day.
Drafting

Write a sentence to begin your paragraph. Mention the topic of the paragraph so that readers will know what to expect as they read.

______________________

Revising and Proofreading

Here is a part of Angie's report. Add words that show cause and effect relationships. Choose from the words from the box below.

<table>
<thead>
<tr>
<th>because</th>
<th>as a result</th>
<th>before</th>
</tr>
</thead>
</table>

___________ Americans recycled plastic bottles, landfills were being filled with plastic garbage that would not quickly decompose. _____________, recycling became an important step in helping our environment. _____________ plastics can be recycled, we have reduced the amount of trash placed in landfills.

Now revise and proofread your writing. Ask yourself:

- Did I discuss the effect that recycling has had on landfills and the plastics industry?
- Did I include a clear main idea and details?
- Did I include words that show cause and effect relationships?
- Did I correct all mistakes?
Technology, Society, and the Environment

Use your textbook to help you fill in the blanks.

1. One of the earliest _______________ we know of lived during the _______________.

2. During the _______________ and _______________ Ages, people used the metals to make tools and weapons.

3. Most of the technology we use today was developed during the Industrial _______________.

4. Today, we live in the _______________ age, where computers are used by most industries.

Technology and Nature

5. Technology can _______________, or affect the environment in negative ways.

6. Before the 1970s, there were not many _______________ to protect the environment.

Critical Thinking

7. Which technological age probably affected people most? Why?

____________________________________________________

____________________________________________________

____________________________________________________
Technology, Society, and the Environment

Match each word in the box with its description. Then write its letter in the space provided.

1. ______ a rule that tells people what they can and cannot do
2. ______ an effect or consequence of something
3. ______ a period of time characterized by rapid advances in technology, such as the steam engine
4. ______ a period of time in early technology that followed the Bronze Age
5. ______ a group of people living as members of a community
6. ______ all the living and nonliving things of an area
7. ______ a period of time in modern technology that began with the launch of the first artificial satellite
8. ______ a building material that can cause lung disease

a. asbestos  
b. environment  
c. impact  
d. Industrial Revolution  
e. Iron Age  
f. law  
g. society  
h. space age
Early societies used different materials to make their tools and weapons. During the ____________, tools and weapons were made from rocks. During the ____________, people used a metal made from copper and tin.

The ____________ was a time of rapid advances in technology. The launch of the first ____________ began the space age. One thing that links all societies is how they change when there is an important ____________.

The way we use technology can have good or bad effects on the ____________. An oil spill, for example, ____________ living things. Today, there are laws to protect us from many harmful chemicals.
Down in the Dumps

Write About It

Persuasive Writing Write a letter persuading your mayor to make sure landfills in your area help conserve Earth’s natural resources. Use facts and details in your letter.

Getting Ideas

Think about what you would write to the mayor about landfills that conserve natural resources. Use a concept map like the one below to record your ideas.

Planning and Organizing

Paolo will use his concept map to write his letter. Help Paolo put the points he would like to discuss in the correct order. Number the points in order from 1 to 4.

1. When a landfill is sealed, methane gas can be collected.

2. Our local landfill does not use these new technologies.

3. The methane gas can be used for new energy.

4. There are new technologies that can seal landfills.
Drafting

Now write the first draft of your persuasive letter. Begin with a paragraph that introduces yourself and explains your opinion. Use facts and details and include words that will persuade the reader to understand your point of view. Remember to use the letter-writing format, including a greeting and closing.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Now revise and proofread your writing. Ask yourself:

- Have I written a persuasive letter to the mayor?
- Have I discussed a landfill that conserves natural resources?
- Have I corrected all grammar errors?
- Have I corrected all errors in spelling, punctuation, and capitalization?
Technology and the Future

Use your textbook to help you fill in the blanks.

1. Scientists predict the ____________ by studying the ____________.

2. Scientists are working on a faster way to communicate in the future called ______________.

3. The way technology makes the world seem smaller is known as ______________.

Energy to Burn

4. Most of today’s energy comes from ______________, such as oil, coal, and natural gas.

5. Ethanol, or grain alcohol, is an example of ______________ energy that may be used to power cars in the future.

6. Some sunscreens and scratch-resistant sunglasses are made using ______________.

Critical Thinking

7. What generalization can you make about the impact of technology in the past and in the future?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Technology, Society, and the Environment

Match each word in the box with its description. Then write its letter in the space provided.

a. biomass  d. Internet
b. ethanol    e. nanotechnology
c. globalization f. predict

1. ______ a fuel that can be made from dead leaves, grass clippings, and other living things

2. ______ to use what you know to make a guess about something

3. ______ a fast way to communicate

4. ______ uses tiny materials to make products

5. ______ the way technology makes the world seem like a smaller place

6. ______ matter from living things that, when dried and burned, can provide energy for electricity, heat, and fuels
Scientists are always trying to predict how we will live in the future. They make educated guesses by studying the past. They compare past hypotheses to what is known today.

Today, we can communicate with the rest of the world in just seconds using the Internet. In the future, this way of communicating will become even faster. The way technology makes the world seem smaller is called globalization.

In the future, we may power our cars with fuels made from biomass. Scientists also think that nanotechnology will be used to make many products. It may even help fight medical problems.
Go for the Glow!

Write About It

Fictional Narrative This article tells about a kind of nanotechnology used in fabrics. Review what you’ve read in the article. Then write a fictional story about a kind of nanotechnology in your life 20 years from now.

Getting Ideas

Think about what kind of new technology you would like to see in the future. Imagine what life would be like in that world and how the new technology would change the way we live.

Planning and Organizing

Karol imagined a future in which all cancers could be cured by a single medicine. She writes about the main idea and gives details that support it. Look at her sample sentences below. Put an M next to the sentences that tell a main idea. Put a D next to the sentences that tell details.

1. _______ The medicine will be tested for many different kinds of cancers.

2. _______ The pills will be made by pharmacists or drug companies.

3. _______ A single pill will be able to cure all types of cancers.

4. _______ Both adults and children can be cured by the medicine.

5. _______ The pill will save millions of lives.
Drafting

Now write the first draft of your fictional narrative. Remember to write a first-person narrative. Begin with a paragraph that establishes your topic and briefly describes the main idea. Then describe the details that support the main idea. End with a short summary of how the new technology will affect society.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

Now revise and proofread your writing. Ask yourself:

► Have I written a fictional narrative about a technology 20 years in the future?
► Have I written a clear main idea and supporting details?
► Have I written in the first-person?
► Have I corrected all grammar errors?
► Have I corrected all errors in spelling, punctuation, and capitalization?