CALIFORNIA

Science

Reading and Writing in Science

Macmillan
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Contents

Life Science

Earth Science

Physical Science

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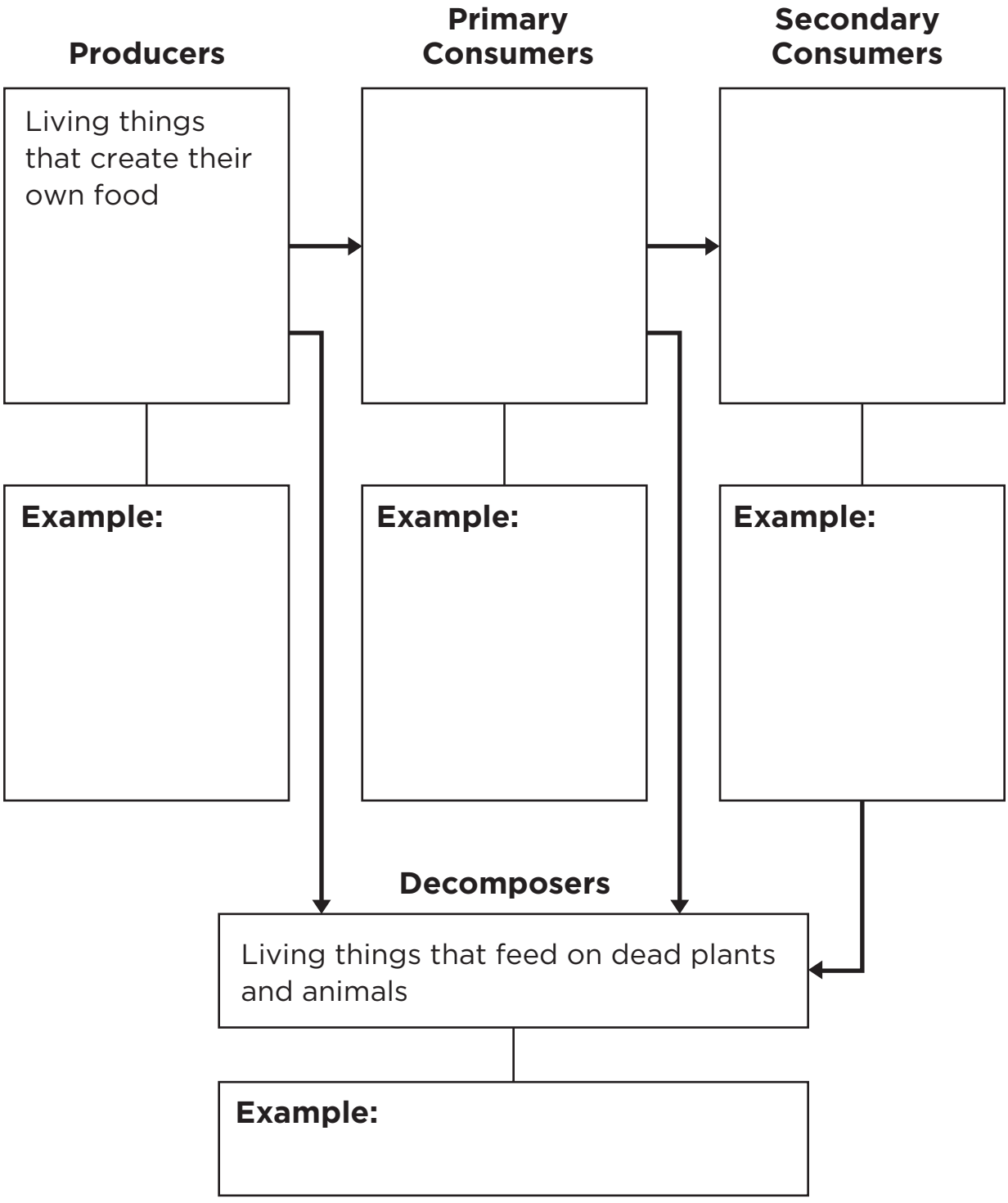
Living Things Need Energy



Name _____ Date _____

The Story Goes On

Read the Literature feature in your textbook.

Write About It

Response to Literature The poet brings to life a sequence of events that happens every day in nature. What do you think happens when the enemy spots the bug? Write a fictional narrative in which you tell what happens next. Make sure you bring the conflict to a reasonable conclusion.

Name _____ Date _____ **Outline**

Plants and Sunlight

Use your textbook to help you fill in the blanks.

What are plants?

1. During photosynthesis, plants give off a gas called _____ , which we breathe.
2. Plants come in all sizes, _____ , and colors.
3. Some plants are so small that _____ or as tall as skyscrapers.
4. Tropical bamboo plants can grow about 4 meters a week, which is about _____ an hour.
5. The world's oldest tree is almost _____ years old.
6. The _____ is the deadliest plant of all.
7. There are about _____ different kinds of plants.
8. The roots of a plant take in _____ and _____ from the soil.
9. Leaves collect _____ from the Sun.

How do plants get energy?

10. The process in which plants make their own food is called _____ .
11. During the daytime, plants take in sunlight, water, and _____ .
12. Plants use energy from the Sun to change carbon dioxide and water into _____ .
13. The green material in the leaves called _____ captures sunlight for the plants.

Name _____ Date _____

14. Energy from the Sun is called _____ .

15. Many plants have a system of _____ to carry water and nutrients from the bottom of the plant to the top.

Why are plants important?

16. Plants provide _____ that travels from one organism to another.

17. When an animal eats a plant, _____ passes from the plant to the animal.

Where do plants grow?

18. A(n) _____ is everything that surrounds a living thing.

19. _____ is a measure of the total mass of living things in an environment.

Summarize the Main Idea

20. Briefly describe the photosynthesis process and then explain why plants use photosynthesis.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Plants and Sunlight

a. biomass	**d.** energy	**g.** oxygen
b. carbon dioxide	**e.** environment	**h.** photosynthesis
c. chlorophyll	**f.** organisms	**i.** solar energy

Match the correct letter with the description.

1. Plants make their own food in a process called _____ .
2. Plants use energy from the Sun to change _____ and water into sugar.
3. A leaf is filled with _____ , which gives it the green color and helps it capture the sunlight.
4. Plants give off _____ into the air.
5. _____ is the total mass of living things in an environment.
6. Energy from the Sun is called _____ .
7. Plants do not eat _____ or other living things for food.
8. A(n) _____ is everything that surrounds a living thing.
9. A plant gets _____ directly from the Sun.

Cloze Test

Name _____ Date _____

Plants and Sunlight

environment	photosynthesis	water	roots
carbon dioxide	more	chlorophyll	sunlight
solar energy	oxygen	amount	

Fill in the blanks. You may use one word twice.

Plants make their own food. This process is called _____ . A plant takes in _____ , _____ , and _____ to produce its own food. The leaves of a plant capture sunlight through the green material called _____ . Energy from the Sun is called _____ . The _____ anchor a plant to the ground and bring water to the stem of a plant. The plant gets the _____ from the air around it. As a result of this process, the plant makes food and gives off _____ , which we breathe in! A(n) _____ is everything that surrounds a living thing. Biomass is a measure of the _____ of living things in an environment. A dense rain forest has _____ living things than a dry desert. Plants make up most of the biomass in an environment.

Name _____ Date _____ **Outline**

Food Chains

Use your textbook to help you fill in the blanks.

What is a food chain?

1. The way energy passes from one organism to another is shown in a(n) _____ .
2. Plants get their energy from the _____ .
3. Plants are called _____ because they can make their own food.
4. Animals are called _____ because they cannot make their own food.
5. Most food chains begin with _____ .
6. Plants, or _____ , are next in the food chain.
7. Decomposers break down organisms and return _____ to the soil.
8. With each step of the food chain, matter and _____ pass from one organism to another.
9. A(n) _____ is an animal that eats only plants.
10. Deer, rabbits, and mice are examples of _____ , which are the first consumers in a food chain.
11. Other animals can consume _____ for food.
12. An animal that is hunted by another animal is called _____ .
13. An animal that hunts another animal for food is called a(n) _____ .

What are carnivores and omnivores?

14. Animals that eat other animals are called _____ .
15. Animals that eat both plants and animals are _____ .

Name _____ Date _____

What are decomposers?

16. Decomposers break down plant or animal life that is no longer _____ .

17. Decomposers work _____ to break down organisms completely.

What are some examples of food chains?

18. Food chains in a pond start with a(n) _____ , contain _____ , and end with decomposers.

19. In the California desert, one producer is the _____ tree.

Summarize the Main Idea

20. Explain the order of a pond food chain beginning with algae.

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Food Chains

a. algae	**d.** decomposers	**g.** herbivore
b. carnivores	**e.** food chain	**h.** omnivore
c. consumers	**f.** fungi	**i.** producer

Match the correct vocabulary word with the description.

1. A(n) _____ shows how energy passes from one organism to another as food.
2. A(n) _____ is also known as a primary consumer.
3. A pond food chain can begin with plant-like producers called _____ .
4. Consumers eat food that is made by a(n) _____ .
5. Animals are called _____ because they cannot make their own food.
6. The food chain continues until _____ break down the organisms and return nutrients to the soil.
7. Animals that eat other animals are _____.
8. Plant-like decomposers called _____ break down what is left of dead animals.
9. A bear is a(n) _____ , an animal that will eat both plants and animals.

Name _____ Date _____

Food Chains

decomposers	cannot	producer	consumers
food chain	fungi	omnivores	
carnivores	earthworm	herbivores	

Fill in the blanks.

Living things need energy in order to survive. A _____ shows how energy passes from one organism to another as food. First, a plant, also called a _____ , uses the Sun's energy to make its own food. Animals _____ make their own food. They are called _____ because they must eat or consume other plants or animals for food. The chain continues until _____ break down the organisms and return nutrients to the soil. A(n) _____ eats plant life that has already died. _____ break down rotting wood and other plant parts. _____ are prey for other animals in the food chain. Animals that eat other animals are called _____ . _____ eat both plants and animals. Plants and animals depend on one another for survival.

Name _____ Date _____ **Outline**

Food Webs

Use your textbook to help you fill in the blanks.

What is a food web?

1. A(n) _____ shows a group of food chains linked together.
2. The struggle of several organisms for the same resource is called _____ .

How can food webs change?

3. Living things in a food web _____ on one another.
4. All the members of a single type of organism in an environment is a(n) _____ .
5. In the 1800s, too many sea otters were hunted for their _____ .
6. Without sea otters, fewer _____ were eaten.
7. Without the sea otter to help control the size of the sea urchin population, the _____ almost disappeared.

How do new organisms change food webs?

8. In 1935, Australia's sugar cane fields were being destroyed by the _____ and _____ .
9. The _____ was brought to the sugar cane fields to eat the beetles.
10. The toads changed the food web because they did not eat the beetles, but they did eat _____ .

Name _____ Date _____

What is an energy pyramid?

11. A picture that shows the amount of energy passed through a food web is called a(n) _____ .

12. There are more _____ than any other living thing in an energy pyramid.

13. The next level on the pyramid is the _____ , which eat plants to stay alive.

14. Each level of the pyramid gets only _____ percent of the energy from the level below.

15. Animals at the top of the pyramid must eat a lot of food to get the _____ they need to stay alive.

Summarize the Main Idea

16. How does the ocean's kelp forest in the 1800s show how producers and consumers are related?

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Food Webs

a. beetles	**d.** energy pyramid	**g.** herbivores
b. cane toad	**e.** food chain	**h.** kelp
c. competition	**f.** food web	**i.** producers

Match the correct letter with the description.

1. _____ A group of food chains linked together.

2. _____ The struggle of several organisms for the same resource.

3. _____ A type of seaweed.

4. _____ In 1935, Australia's sugar cane fields were being destroyed by these insects.

5. _____ Each member of a food web can belong to more than one of these.

6. _____ A model of how energy passes through a food web.

7. _____ The bottom of the energy pyramid.

8. _____ They must eat plants to stay alive.

9. _____ People thought these would help the insect trouble in Australia in 1935.

Cloze Test

Name _____ Date _____

Food Webs

energy	food web	producers	top
energy pyramid	consumers	smaller	

Fill in the blanks.

Energy is passed from one living thing to another. A _____ links together many food chains. A(n) _____ shows the energy as it moves through a food web. The bottom level of the pyramid is the _____ . They use about 90% of that _____ to live and grow. The other 10% is stored. The next level of the pyramid is the _____ . Each level of the pyramid gets a _____ percentage of energy from the level below. An animal at the _____ of the pyramid must eat a lot of food to get the energy it needs.

Name _____ Date _____

Writing

Write About It

Write a persuasive letter to a community leader. Convince him or her that it is important to protect the environment in your area.

Getting Ideas

Do some print and online research. Make a list of plants and animals that would be lost if we don't protect the environment.

Planning and Organizing

A persuasive letter has a special job. Its job is to persuade the reader to agree with your opinion. Here are two sentences Chris wrote. Does each sentence support his position? Write Yes or No.

Opinion: We must protect the environment.

1. The California condor is a beautiful creature. _____
2. Animals are hurt when the places they live are destroyed. _____

Now write three of your own sentences on a separate piece of paper. Include facts and details to support the opinion that we must protect the environment.

Drafting

Your assignment is to write a persuasive letter to a community leader. On the next page, write your letter. Use the guidelines below.

1. Write your complete address and the date.
2. Write the name and address of the person to whom you are writing.
3. Write the word "Dear," the name of the person, followed by a colon.
4. Write an introductory paragraph. Explain your position.
5. Provide facts and reasons that back up your position .
6. Tell what you want to happen in your last paragraph.
7. For the closing, write "Sincerely yours," then a comma. Sign your name on the next line. Print your name under your signature.

Name _____ Date _____

[1] _____

_____

_____

_____

[2] _____

_____

_____

[3] _____

[4] _____

_____

_____

[5] _____

_____

_____

[6] _____

_____

_____

[7] _____

_____

_____

Revising and Proofreading

Now revise and proofread your letter. Ask yourself:

- Have I used convincing facts and reasons to support my opinion?
- Have I corrected all grammar errors?
- Have I corrected all spelling, punctuation, and capitalization errors?

Name _____ Date _____ **Outline**

Microorganisms

Use your textbook to help you fill in the blanks.

What is a microorganism?

1. A(n) _____ is a living thing too small to be seen with just your eye.
2. Many microorganisms are made of only one _____ .
3. Scientists use a(n) _____ to look at tiny cells.
4. Small microorganisms called _____ can cause illness.
5. Some _____ will eat harmful bacteria and keep them under control.
6. Many harmful protists live in _____ and lakes.

Which microorganisms are producers and consumers?

7. Some microorganisms are producers because they carry out _____ .
8. A type of protist that lives in the water is called _____ .
9. Algae acts like a producer because it carries out _____ .
10. A(n) _____ is a protist that acts like an animal and is a consumer.
11. A euglena acts like both a(n) _____ and an animal.
12. In the sunlight, a euglena carries out _____ like a plant.

Name _____ Date _____

Which microorganisms are decomposers?

13. In the forest, _____ is one of the first decomposers to work on dead matter.

14. Mushrooms are _____ . They decompose fallen trees.

15. Different types of bacteria _____ different nutrients in the soil.

How do microorganisms work in our bodies?

16. Many _____ microorganisms live in the liquids in your body.

17. Tears in your eyes keep out _____ microorganisms.

Summarize the main idea

18. Why are plant and animal decomposers considered natural recyclers?

_____

_____

_____

_____

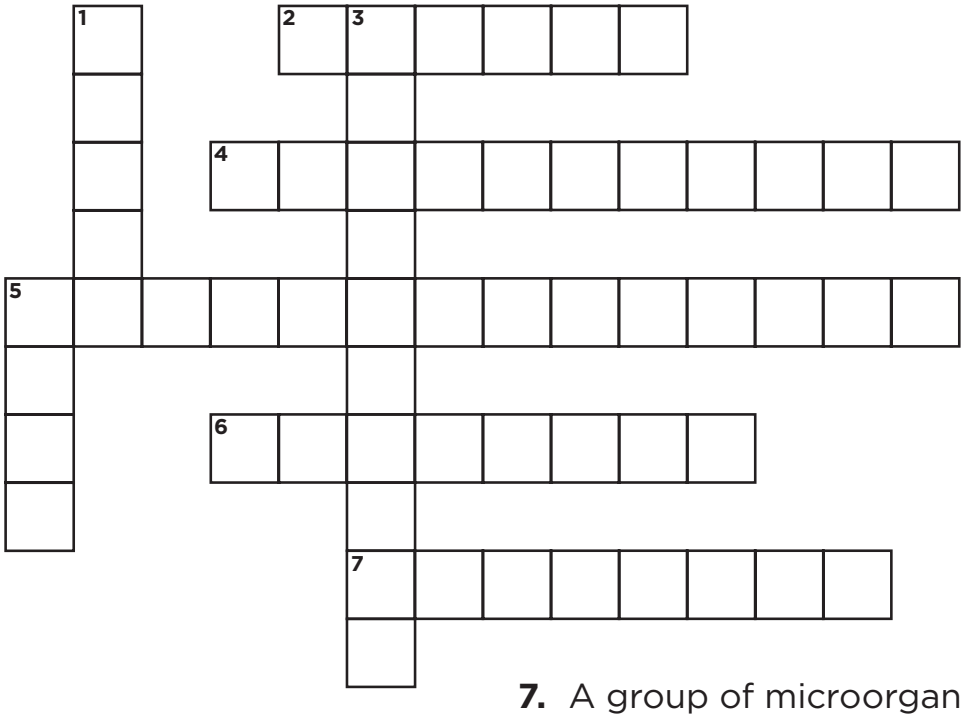
Name _____ Date _____

Vocabulary

Microorganisms

Complete the crossword puzzle using words from the lesson.

fungi	microorganisms	protists	decomposers
mold	bacteria	amoeba	microscope



Across

2. A protist that acts like an animal in most ways _____

4. Break down dead matter so it can be recycled _____

5. Living things too small to be seen with just our eyes _____

6. A microorganism that can be helpful or harmful to humans _____

7. A group of microorganisms. _____

Down

1. First decomposer to attack a tree _____

3. A tool used to see tiny cells _____

5. One of the first decomposers to work on dead matter _____

Cloze Test Name _____ Date _____

Microorganisms

amoeba	euglena	illness	mold
bacteria	fungi	jobs	protists
body	harmful	microorganism	tail

Fill in the blanks.

Living things are everywhere even if the naked eye cannot see them. A(n) _____ is a living thing that cannot be seen with just your eye. One of the smallest microorganisms is called _____ . It can be helpful or _____ . Bacteria can cause _____ , or they can help humans swallow and digest food. Organisms called _____ are larger than bacteria and can be found in lakes and ponds. They have structures or parts that do special _____ . A(n) _____ is a protist that acts like an animal. Its _____ changes shape to catch food. A(n) _____ is a protist that carries out photosynthesis in the sunlight. It also has a _____ , which helps it move to get food in the dark. In the forest, _____ clings to dead wood and starts to break it down. Organisms called _____ are decomposers that attach to a tree when it falls. There are many kinds of microorganisms.

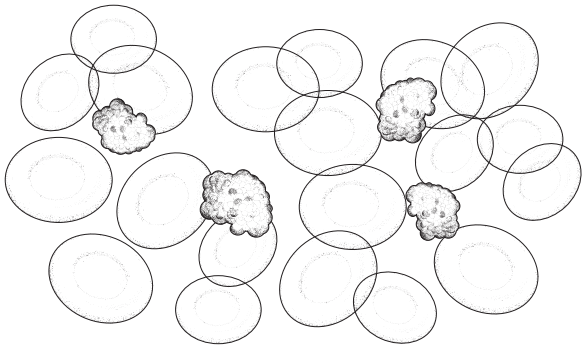
Name _____ Date _____

Reading

Susan Perkins knows that the smallest things can be the most important. She is a scientist at the American Museum of Natural History who studies microorganisms.

Microorganisms are found all over Earth—in soil, air, and water. They are found from the poles to the desert. There are millions of them in just one drop of ocean water.

Some microorganisms live inside the animals they attach to and cause disease. Susan studies the microorganisms that live in the blood of lizards and cause a disease called malaria.



These red blood cells are being attacked by microorganisms that cause malaria, a blood disease that causes severe fever in humans.

Susan studies Anolis lizards from the eastern Caribbean islands.

Sequence

- Look for words that show order, such as *first*, *then*, and *next*.
- Try to retell the sequence in your own words.

How does Susan investigate these tiny creatures? She starts by taking blood from a lizard. Then she takes the blood to a lab and studies the microorganisms. This helps her understand the relationship between the microorganisms and the lizard it lived inside.

Next, Susan tries to understand how different kinds of malaria are related to each other. She studies why these microorganisms are found in different parts of the world and how they react to different medicines. Susan's research is then applied to humans and helps scientists to fight the disease.

Name _____ Date _____

Write About It

Sequence Reread the article with a partner. Make a sequence-of-events chart to describe what Susan does first, next, and last in her research. Then use your chart to write a summary about her work.

Using the comic strip as a model, create simple drawings in the blank strip below to quickly illustrate the four steps that Susan takes to study the microorganisms that cause malaria.

1	2	3	4

Next, in a lengthy paragraph, explain why Susan's first three steps help her work on the fourth and most important step in her studies. Directly answer the prompt in your topic sentence. Use details from the reading in addition to your own ideas to clearly explain why Susan could not go on to the fourth step without accomplishing the first three steps. Discuss the steps in sequential order. Smoothly move from one idea to the next with transitional words. Wrap up your paragraph with a closing sentence that restates the main idea of your paragraph. Write your paragraph on a separate piece of paper.

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Living Things Need Energy

Choose the letter of the best answer.

1. Algae and euglena are examples of
   - **a.** bacteria.
   - **b.** carnivores.
   - **c.** herbivores.
   - **d.** protists.

2. The first consumers in a food chain are
   - **a.** carnivores.
   - **b.** herbivores.
   - **c.** omnivores.
   - **d.** producers.

3. What do plants make through photosynthesis?
   - **a.** meat
   - **b.** carbon dioxide
   - **c.** oxygen
   - **d.** water

4. Many microorganisms are made of
   - **a.** yeast.
   - **b.** millions of cells.
   - **c.** one cell.
   - **d.** two cells.

5. Organisms at the bottom of an energy pyramid are
   - **a.** consumers.
   - **b.** herbivores.
   - **c.** producers.
   - **d.** decomposers.

6. Carnivores eat
   - **a.** other animals.
   - **b.** plants.
   - **c.** plants and animals.
   - **d.** rotting plants and animals.

7. Organisms that cannot make their own food are
   - **a.** producers.
   - **b.** decomposers.
   - **c.** herbivores.
   - **d.** consumers.

Name _____ Date _____

Choose the letter of the best answer.

8. Which item is part of the biomass of a desert?

a. cactus **b.** rock **c.** sand **d.** sunlight

9. What does an omnivore eat?

a. other animals
b. plants
c. plants and animals
d. decomposing plants and animals

10. The struggle of several animals for the same resources is called

a. adaptation.
b. competition.
c. photosynthesis.
d. population.

11. A group of food chains linked together form a(n)

a. energy pyramid.
b. food chain.
c. food pyramid.
d. food web.

12. An organism that makes its own food is a(n)

a. animal. **b.** consumer. **c.** decomposer. **d.** producer.

13. Solar energy comes from

a. oxygen. **b.** soil. **c.** sugar. **d.** sunlight.

14. Organisms that eat rotting plants and animals are called

a. decomposers.
b. herbivores.
c. primary consumers.
d. producers.

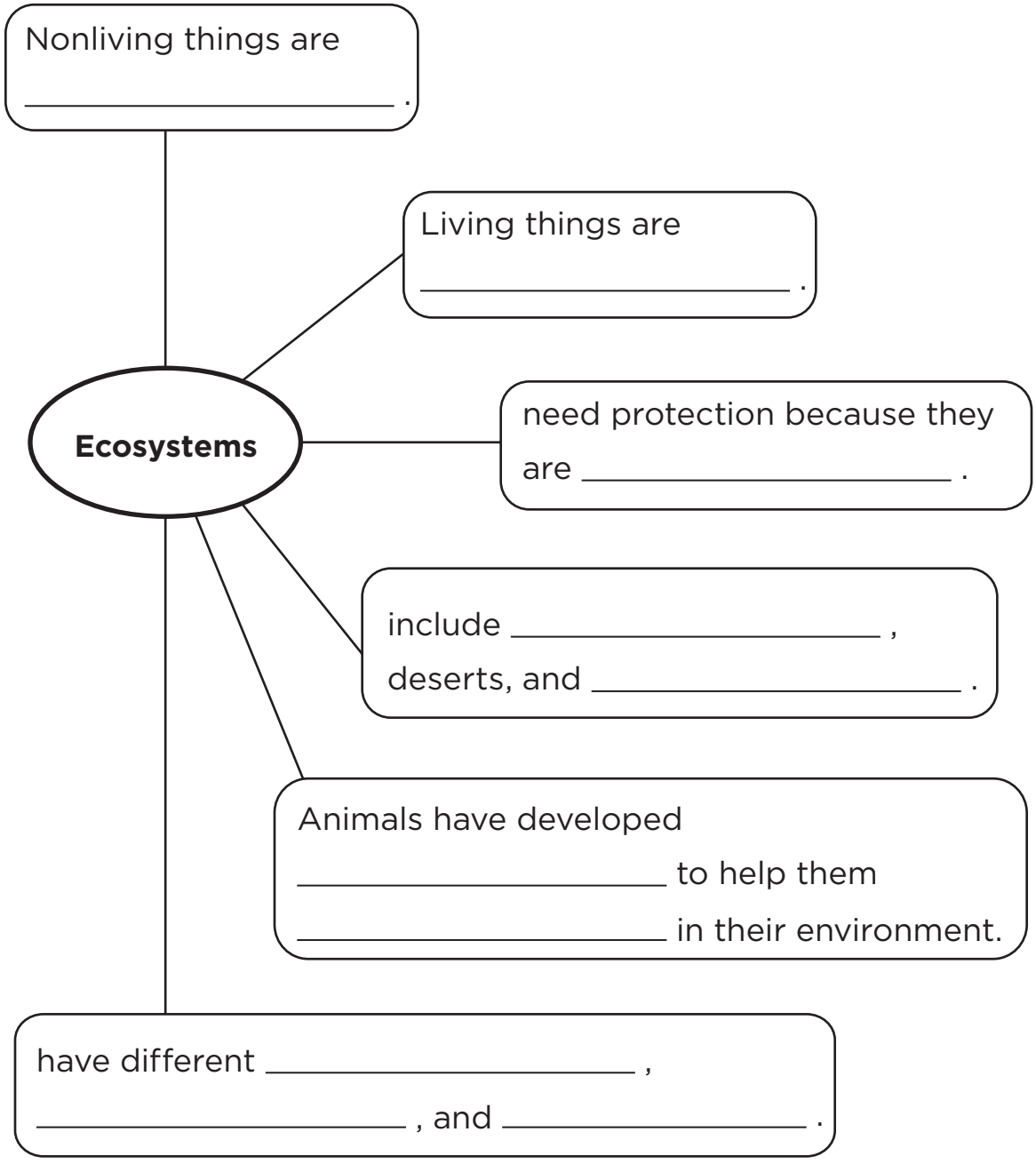
15. What does a food chain represent?

a. all of the animals in an environment
b. all of the plants in an environment
c. all of the abiotic factors in an environment
d. energy passing from one organism to the next

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Living Things and Their Environment



Name _____ Date _____

Welcome to the Sea of Sand

Read the Literature feature in your textbook.

Write About It

Response to Literature The poet uses figurative language and vivid details to describe the desert environment. Write a composition describing your own environment. Tell the impression it creates. Use figurative language and descriptive words to paint a vivid picture.

Name _____ Date _____ **Outline**

Ecosystems

Use your textbook to help you fill in the blanks.

1. _____ and their nonliving environment make up an ecosystem.
2. Plants, animals, and microorganisms are _____ in an ecosystem.
3. Rainfall and temperature are _____ in an ecosystem.

Life in a Pond

4. _____ are needed for plants to live in a pond.
5. A special _____ helps plants grow well in the ecosystem.
6. Abiotic factors that make up a pond include _____ .

Life in a Desert

7. The food that desert animals eat provides _____ .
8. Desert animals survive very hot and very cold weather by living _____ .

What is a rain forest ecosystem like?

9. More life is found in the _____ than any place on Earth.
10. The _____ are called the emergent layer of the rain forest.

Name _____ Date _____

11. Snakes and treefrogs can be found in the _____ layer of the rain forest.

12. Below the rain forest canopy is the _____ layer of the rain forest.

13. Very few plants grow on the _____ because there is little sunlight.

What is a coral reef ecosystem?

14. Organisms that are no longer living form _____ .

15. Coral is an _____ of the reef ecosystem.

Summarize the Main Idea

16. What two things are included in an ecosystem?

_____

_____

Name _____ Date _____

Vocabulary

Ecosystems

a. abiotic factors	**d.** climate	**g.** forest floor
b. biotic factors	**e.** ecosystem	**h.** understory
c. canopy	**f.** emergent layer	

Match the correct letter with the description.

1. _____ A layer of the rain forest just below the emergent layer
2. _____ A group of living things and their nonliving environment
3. _____ The typical weather patterns of an area
4. _____ The place where few plants grow because there is very little sunlight
5. _____ All of the living things in an ecosystem
6. _____ The area beneath the rain forest canopy
7. _____ Nonliving things in an ecosystem
8. _____ The tops of the tallest trees

Name _____ Date _____

Ecosystems

biotic factors	emergent	rain forest	understory
canopy layer	living things	sunlight	water
coral reefs	rainfall	underground	

Fill in the blanks.

An ecosystem includes all _____ and their nonliving environment. You can find plants and animals that are called _____ in an ecosystem. Abiotic factors such as _____ and temperature are also found in an ecosystem. Animals living in a desert ecosystem get their _____ from the food they eat. Desert animals survive extreme temperatures in the desert by living _____ . Most of life on Earth is found in the _____ . The top layer of the rain forest is the _____ layer. Underneath the emergent layer are the _____ and the _____ layer. The forest floor gets very little _____ . _____ are formed from dead organisms. Coral is an abiotic factor found in a reef ecosystem.

Name _____ Date _____ **Outline**

Living Things Need Each Other

Use your textbook to help you fill in the blanks.

How do animals depend on plants?

1. Plants produce _____ for animals to breathe.
2. _____ are eaten by caterpillars and rabbits.
3. Other animals, such as beetles, eat plant _____ .
4. Earthworms and some snails eat plants that are _____ .
5. Plants are the main source of _____ entering food chains.

Plants as Shelter

6. Some animals such as birds use plants to build _____ that they use as their homes.
7. Plants help keep animals _____ from harm.

How do plants depend on animals to reproduce?

8. _____ is the process when male cells are transported to female cells in a flower.
9. The male cells are stored in the _____ of a flower.
10. The _____ holds the female egg cells.
11. After pollination, the _____ , at the base of the pistil, turns into a fruit.

Name _____ Date _____

Moving Pollen Around

12. _____ is a sweet drink found inside the flower.

13. As animals travel from flower to flower, _____ rubs off the flower to the next flower.

14. Animals help flowers _____ by rubbing pollen on different flowers.

How do plants depend on animals to carry seeds?

15. The process of spreading seeds is called _____ .

16. Animals eat fruit and seeds and leave fruit seeds on the ground in their _____ .

17. Some seeds stick to _____ and fall to the ground and grow into new plants.

Summarize the Main Idea

18. What are two ways that animals depend on plants and two ways that plants depend on animals?

_____

_____

_____

Name _____ Date _____

Vocabulary

Living Things Need Each Other

a. nectar	**d.** pollen	**g.** stamen
b. ovary	**e.** pollination	
c. pistil	**f.** seed dispersal	

Match the correct letter with the description.

1. _____ Part of the flower that holds the pollen and contains the male cells
2. _____ A sweet drink inside the flower
3. _____ The female part of a plant that turns into a fruit after pollination
4. _____ Part of the flower that holds the female egg cells
5. _____ Male and female cells from flowers join together
6. _____ A flower's powdery material
7. _____ The process of spreading seeds

Name _____ Date _____

Living Things Need Each Other

fruits	pistil	seed dispersal
nectar	pollen	stamen
nests	pollination	stems

Fill in the blanks.

Plants produce the oxygen in the air we breathe. Every day we eat plants such as _____ and vegetables. Other animals such as rabbits and beetles eat plant leaves, roots, and _____ . Birds use plants to build _____ for protection against danger in the environment. Plants depend on animals for _____ to make new plants. The male part of the plant is called the _____ , and the _____ holds the female cells. Both parts must join to make new plants. Animals such as bees and birds drink _____ from flowers. _____ is transferred by animals as they travel from flower to flower. Animals also help plants by spreading seeds through _____ . Sometimes animals spread seeds when the seeds stick to their skin, fall to the ground, and then grow into new plants.

Name _____ Date _____

Write About It

Write a report that shows how plants are useful to us. Include facts and details that you have learned in this chapter and from your own online research. Use words such as *because* and *since* that show cause and effect.

Getting Ideas

Start with the question: How are plants useful to us? Then do some print and online research to answer this question. Make a chart to record information.

Planning and Organization

Kevin came up with four categories of ways that plants are useful to people. They are

- food
- clothing
- shelter
- transportation

He wants to organize information into these categories. When he writes his report, he will use a new paragraph for each category.

Here are some sentences he wrote. Write the category each sentence fits in.

1. Plants provide fruits and vegetables. _____
2. Native Americans hollowed out tree trunks to make canoes. _____
3. Cotton comes from cotton plants. _____
4. The lumber industry replants trees in the Northwest. _____

For each category, write sentences that you could use in your report. Write five sentences on a separate sheet of paper.

Name _____ Date _____

Drafting

Write a sentence to begin your report. Focus on your most important idea about the topic.

_____

Now write your report. Begin with a paragraph that tells your most important idea about how plants are useful to us. Write paragraphs including facts and details from more than one source. At the end summarize the ways plants are useful to us.

Revising and Proofreading

Help Kevin connect these sentences with words like *because* or *since* to show cause and effect.

1. Wood can be used to make boats. Wood floats on water.

_____

_____

2. The white, fibrous substance around cotton seeds can be made into a soft material. We use cotton for clothing.

_____

_____

Now revise and proofread your report. Ask yourself:

- Have I clearly stated my main idea about plants?
- Have I included facts and details showing plants' usfulness?
- Have I used transition words to show cause and effect?
- Have I ended with a logical conclusion about the value of plants?
- Have I corrected all grammar errors?
- Have I corrected all problems in spelling, punctuation, and capitalization?

Name _____ Date _____ **Outline**

Changes in Ecosystems

Use your textbook to help you fill in the blanks.

How can ecosystems change?

1. When biotic or abiotic factors change, the _____ changes, too.
2. Over time, ecosystems are always _____ .
3. Changes in the ecosystems can make it difficult for plants and animals to _____ .

Natural Events Change Ecosystems

4. _____ and _____ changes affect ecosystems.
5. _____ and tropical storms are examples of a weather change that affects ecosystems.
6. Long periods of no rain are called _____ .

Humans Change Ecosystems

7. Cutting down forests and digging for resources in Earth's surface can change _____ .
8. Many human activities cause _____ and make living things sick.

What happens when ecosystems change?

9. A _____ can change a forest ecosystem quickly.
10. Animals change their behaviors and habits to _____ changes in the ecosystem.

Name _____ Date _____

11. Some fires help a forest ecosystem from becoming too _____ .

12. If there are only a few of a specific plant or animal in an ecosystem, that plant or animal is _____ .

13. When all of a specific plant or animal are destroyed or die, that plant or animal becomes _____ .

How can humans protect ecosystems?

14. _____ are made to limit pollution and make hunting certain animals or picking certain plants illegal.

15. An example of an endangered animal is the _____ .

Summarize the Main Idea

16. What causes ecosystems to change?

_____

_____

Name _____ Date _____

Vocabulary

Changes in Ecosystems

a. accommodation	**c.** extinct	**e.** survival
b. endangered	**d.** pollution	

Match the correct letter with the description.

1. _____ Makes living things sick and can even raise the temperatures on Earth
2. _____ An individual organism's response to change
3. _____ An animal or plant that has very few left of its kind
4. _____ An animal or plant that has none left of its kind
5. _____ The ability to stay alive

Name _____ Date _____

Changes in Ecosystems

California condor	extinct	laws	weather
changing	fires	pollution	
endangered	habits	surviving	

Fill in the blanks.

An ecosystem changes when biotic or abiotic factors change. Ecosystems are always _____ . Plants and animals have a difficult time _____ because of changes in the ecosystem. A hurricane is an example of a _____ change that affects ecosystems. Rising temperatures on Earth are caused by _____ . To survive changes in the ecosystem, animals must change their behaviors and _____ . _____ can help with overcrowding in forests. When very few of an animal or plant type are left, it becomes _____ . The _____ is an endangered animal. When there are no longer any animals of a certain kind left, it is _____ . One way to limit pollution and make hunting certain animals or picking certain plants illegal is to make _____ .

Name _____ Date _____

Reading

Mail Call

Scientists at the American Museum of Natural History collect stories from people around the world to learn about local environments.

TO: American Museum of Natural History
FROM: Clara
SUBJECT: The Chaparral After a Wildfire

Dear Museum Scientists,

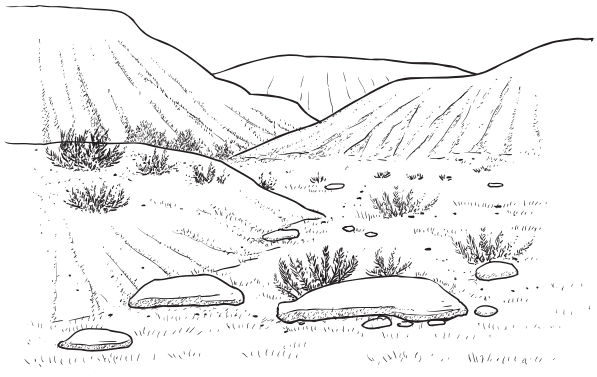
My name is Clara. I live in a small town in Southern California. The hills around our town are covered with evergreen shrubs. The land is very dry and there are not a lot of trees. This environment is called chaparral.

We didn't get a lot of rain here last summer. In August, a lightning storm started a wildfire in the chaparral. When I walked through the area after the fire, all I saw were gray ashes and dead shrubs.

It's April now, and I hiked through the burnt chaparral last week. I brought my field guide with me so I could look up the plants and animals I saw. The chaparral has changed so much! There are fields of wildflowers blooming everywhere. I found a hillside monkey flower and scarlet larkspur. My guidebook told me that these flowers have seeds that can stay dormant for several years. They need fire, heat, or smoke to sprout. The wildflowers have attracted insects like honeybees. The birds and animals are back, too! I saw a cactus wren and jackrabbits. My guidebook explained that the low bushes provide shelter for jackrabbits and nesting for cactus wrens.

I can't wait to go back to see how the chaparral will change even more!

Your friend,
Clara



Name _____ Date _____

Make Predictions

- Use what you know to tell what might happen.
- Use what you read to tell what might happen.

Write About It

Read the letter again. Predict what the chaparral will be like next year.

What might happen if a drought were to affect the chaparral environment? Write your prediction in the form of a paragraph.

Name _____ Date _____ **Outline**

Adaptations

Use your textbook to help you fill in the blanks.

What is an adaptation?

1. _____ are special features that help living things survive in their environment.
2. A fish's gills, a dragonfly's wings, and an eagle's sharp _____ are adaptations.
3. Adaptations help animals move, _____ , and live in certain climates.

How do animals adapt?

4. Some insects look like leaves. Blending into an environment is called _____ .
5. _____ is an adaptation in which animals hide by looking like other organisms.
6. The study of how organisms pass traits from one generation to the next is called _____ .

What are some adaptations of desert plants and animals?

7. Desert plants have many adaptations that help them survive with little _____ .
8. Desert animals have adaptations that keep them _____ .
9. Creosote bushes have mainly shallow roots that help them take in _____ that falls.
10. The jackrabbit has extra large ears to help it keep _____ .
11. Animals that sleep during the day and are active at night are called _____ .

Name _____ Date _____

What are some adaptations of arctic plants and animals?

12. In the arctic tundra, living things have special adaptations to help them _____ .

13. The arctic willow has _____ on its leaves to keep heat in.

14. The smaller an animal is the more quickly it _____ . That's why many arctic animals have very large bodies.

15. The polar bear's waterproof outer fur _____ , and its thick inner fur _____ .

What are some adaptations of living things in the ocean?

16. A thick layer of fat called _____ keeps a whale's body warm in cold ocean water.

17. The leafy sea dragon confuses its predators because it _____ .

Summarize the Main Idea

18. How do adaptations help organisms? Explain how adaptations work.

_____

_____

_____

_____

_____

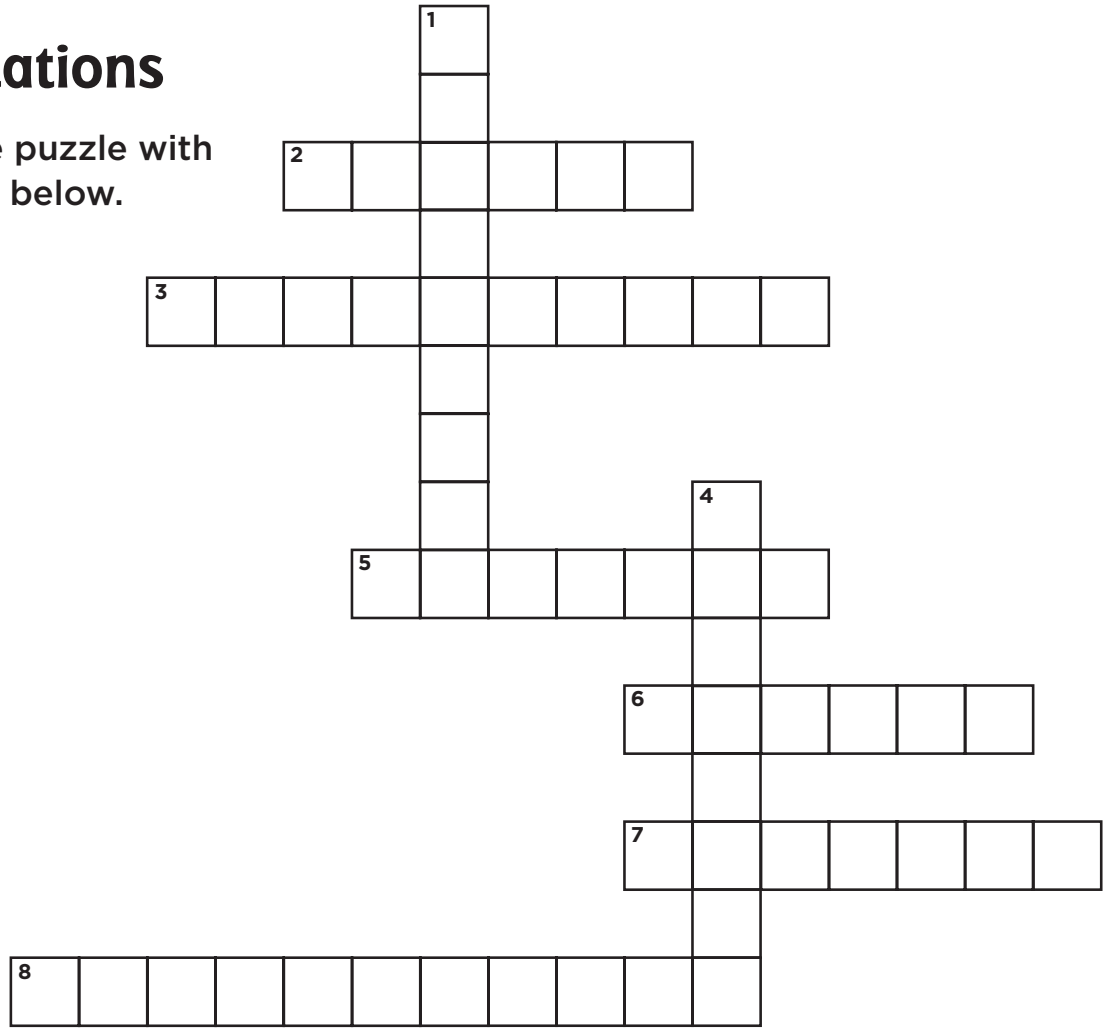
_____

Name _____ Date _____

Vocabulary

Adaptations

Fill in the puzzle with the clues below.



Across

2. an environment that is very cold _____

3. blending into an environment _____

5. a thick layer of fat that keeps a whale's body warm _____

6. a very hot, dry environment _____

7. occurs when one organism imitates another _____

8. special features that help living things survive in their environment _____

Down

1. animals that sleep during the day and are active at night _____

4. the study of how organisms pass traits from one generation to the next _____

Name _____ Date _____

Adaptations

adaptations	camouflage	genetics	nocturnal
arctic	desert	mimicry	polar bears

Fill in the blanks.

Organisms are wonderfully adapted to the environments in which they live. Whether a plant or animal lives in a hot, dry _____ or the cold _____ tundra, they have special features called _____ to help them survive. Examples of adaptations include _____ animals that survive the desert heat by sleeping during the day and being active at night. On the other hand, _____ have two coats of fur to help keep them warm and dry in their very cold environment. Other methods of adaptation include ways animals confuse their predators. Some animals use _____ and imitate other animals. Still other animals adapt by _____ and blend into the environment. Parents pass these useful traits from one generation to the next. The science of _____ studies how these traits are passed from parents to their children.

Name _____ Date _____

Living Things and Their Environment

Choose the letter of the best answer.

1. A hummingbird's narrow beak is an example of
   - **a.** adaptation.
   - **b.** camouflage.
   - **c.** mimicry.
   - **d.** pollination.

2. A living thing that has very few left of its kind is said to be
   - **a.** abiotic.
   - **b.** adapted.
   - **c.** endangered.
   - **d.** extinct.

3. Which is an example of an abiotic factor in an environment?
   - **a.** bacteria
   - **b.** fish
   - **c.** snow
   - **d.** trees

4. Mimicry occurs when
   - **a.** an animal sleeps during the day and is active at night.
   - **b.** an organism cannot adapt to its environment.
   - **c.** an organism is one of a few remaining of its kind.
   - **d.** one organism imitates another organism.

5. Genetics is the study of how organisms
   - **a.** change their environments.
   - **b.** compete for food within their enviroment.
   - **c.** pass traits from one generation to the next.
   - **d.** use sunlight to make food.

6. An ecosystem is
   - **a.** the climate and other abiotic factors of an area.
   - **b.** a group of living things.
   - **c.** a group of living things and their nonliving environment.
   - **d.** the nonliving environment.

Name _____ Date _____

Choose the letter of the best answer.

7. Male and female cells from flowers join together in a process called

a. accommodation. **c.** pollination.

b. adaptation. **d.** seed dispersal.

8. Animals move fruit seeds from place to place in a process called

a. accommodation. **c.** pollination.

b. mimicry. **d.** seed dispersal.

9. Which is an example of camouflage?

a. an insect that looks like a leaf

b. an eagle's sharp claws

c. a rabbit's long ears

d. the thick skin on a cactus

10. The typical weather pattern of an area is its

a. biotic factor. **b.** climate. **c.** ecosystem. **d.** environment.

11. An animal may survive changes to its food supply by

a. becoming endangered.

b. blending into its environment.

c. making an accommodation.

d. passing traits.

12. An animal that is extinct

a. can no longer be found.

b. has only a few left of its kind.

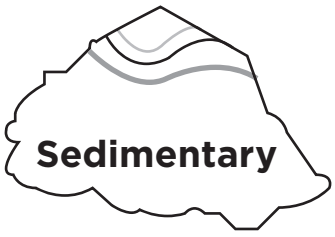
c. has adapted to its environment.

d. will reappear over time.

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Rocks and Minerals



Sedimentary

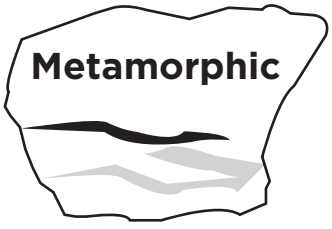
How am I formed?

Names of Rock

Igneous

How am I formed?

Names of Rock



Metamorphic

How am I formed?

Names of Rock

Name _____ Date _____

Rock Secrets

Read the Literature feature in your textbook

Write About It

Response to Literature Every rock has a story to tell about Earth's past. Write a fictional story. A rock collector picks up a rock and it starts to talk, telling its secret story. Make sure your narrative has a beginning, a middle, and an end.

Name _____ Date _____ **Outline**

Minerals: The Building Blocks of Rocks

Use your textbook to help you fill in the blanks.

What is a mineral?

1. Many common substances found on Earth are made up of _____ .
2. Minerals are natural, nonliving substances that make up _____ .
3. Each mineral has its own chemical makeup. They are made of the same _____ .
4. Different minerals have different types of _____ shapes, which are often shaped like cubes and hexagons.
5. Only about 30 minerals are common in rocks. They are called _____ .

How are minerals identified?

Luster

6. Some minerals are shiny while other minerals may be dull. Luster describes _____ .

Cleavage

7. The way a mineral _____ is called cleavage.

Streak

8. Quartz can be white, pink, or purple, and the powder left when it is scratched is called _____ .

Name _____ Date _____

How can hardness be used to identify minerals?

9. The _____ shows the hardness of some common minerals. Hardness is a property of minerals.

10. _____ is the hardest mineral, and talc is the softest.

What are minerals used for?

11. Minerals are used to make _____

_____ .

12. Rocks that are mined because they contain useful substances are called _____ .

13. Diamonds, rubies, and emeralds are some _____ that are removed from Earth's crust.

Summarize the Main Idea

14. What properties do scientists use to identify minerals?

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Minerals: The Building Blocks of Rocks

a. minerals	**d.** luster	**g.** elements
b. cleavage	**e.** crystals	**h.** gems
c. ores	**f.** streak	**i.** rock-forming minerals

Match the correct letter with the description.

1. _____ The natural nonliving substances that makes up rocks

2. _____ What minerals are made up of

3. _____ Shapes of minerals made by the way their atoms are arranged

4. _____ Found in common rocks

5. _____ Describes the way light reflects off the surface of a mineral

6. _____ The property that describes the way minerals split

7. _____ Identifies the mineral by the color of the powder left behind when it is scratched across a plate

8. _____ Rocks that are mined because they contain useful substances

9. _____ Minerals prized for their beauty

Cloze Test

Name _____ Date _____

Minerals: The Building Blocks of Rocks

ores	properties	salt	crystal
soft	atoms	minerals	hexagons
common	textures	hardness	reflects

Fill in the blanks.

No matter where you go in the world, minerals are everywhere. Table _____ is a mineral as is the graphite in your pencil. Scientists have identified about 3,000 different kinds of minerals.

Rocks are made of _____ . About 30 of them make up most _____ rocks. Rocks come in many shapes, colors, and _____ .

Minerals can be _____ or gems. Minerals have a certain _____ shape. Some are shaped like cubes or _____ . The shape of the mineral comes from the way its _____ are arranged.

Scientists identify minerals by their _____ . Luster is one property. It identifies the way light _____ off a mineral. Some minerals are hard while others are _____ . The Mohs hardness scale can be used to identify the _____ of minerals.

Name _____ Date _____ **Outline**

Igneous Rocks

Use your textbook to help you fill in the blanks.

How are igneous rocks formed?

1. The layer of melted rock below Earth's crust is called _____ .
2. Magma that reaches Earth's surface is called _____ .
3. When melted rock cools and hardens, it forms _____ .
4. Igneous rocks are classified according to the way they are _____ .
5. When melted rock cools and hardens _____ , an intrusive igneous rock is formed.
6. Because magma cools very slowly below Earth's surface, _____ mineral crystals are formed.
7. When melted rock cools and hardens _____ , an extrusive igneous rock is formed.
8. Because lava cools rather _____ above Earth's surface, the crystals in extrusive igneous rock are usually small.

What are the properties of some igneous rocks?

9. The properties of an igneous rock depend upon the way it is formed and the _____ that make it up.
10. The _____ of the mineral crystals within a rock gives a rock its texture.
11. Large mineral crystals give granite its _____ texture.
12. Granite's many colors come from the variety of _____ that make it up.

Name _____ Date _____

13. The tiny holes in pumice are caused by _____ that escape as lava cools.

14. Because of the way it forms, pumice is very light and often _____ .

15. The lava that forms obsidian can cool in just a few _____ .

16. Obsidian looks like shiny black _____ .

What are some uses of igneous rocks?

17. Because of its hardness, _____ makes a strong and long-lasting building material.

18. The rough texture of _____ makes it a good substance to scrub off dirt.

Summarize the Main Idea

19. The properties of igneous rocks depend on what two factors?

_____

_____

_____

_____

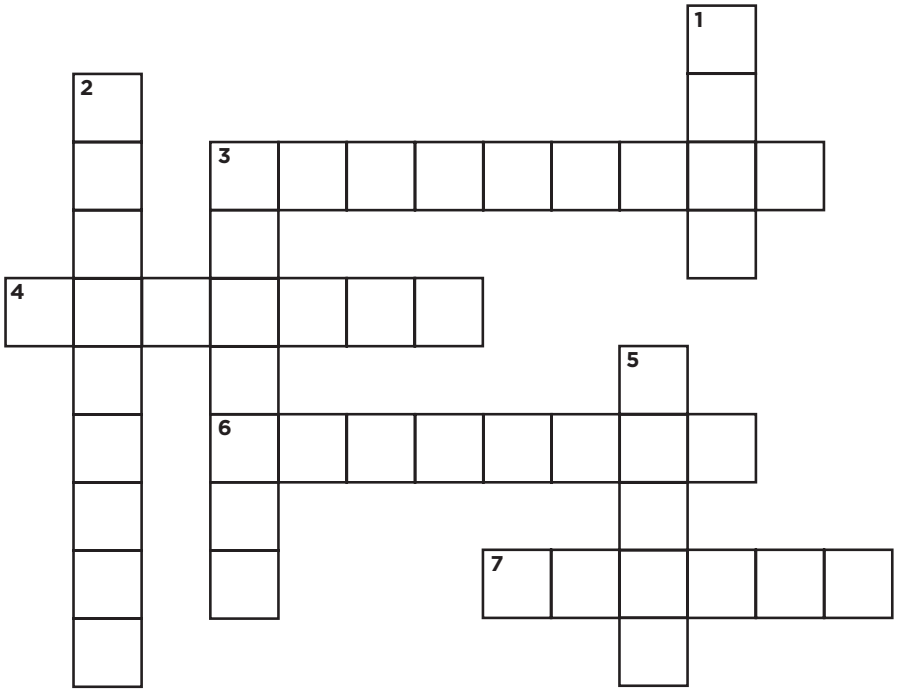
Name _____ Date _____

Vocabulary

Igneous Rocks

Complete the crossword puzzle using words from the lesson.

extrusive
granite
igneous
intrusive
lava
magma
obsidian
pumice



Across

3. Igneous rocks formed below Earth's surface _____

4. A hard igneous rock used in buildings _____

6. A shiny black rock _____

7. A lightweight igneous rock that is full of tiny holes _____

Down

1. Melted rock _____

2. Igneous rocks formed above Earth's surface _____

3. The rocks formed when melted rock cools and hardens. _____ rocks

5. Melted rock below Earth's surface _____

Name _____ Date _____

Igneous Rocks

Use your textbook to help you fill in the blanks.

A layer of melted rock lies beneath Earth's crust. When this melted rock, called _____ , cools and hardens, it becomes _____ rock. Sometimes it remains _____ Earth's surface and hardens slowly over hundreds or thousands of years.

As it slowly cools, large mineral _____ form within it. The rock that results is called _____ igneous rock. An example of this kind of rock is _____ , which has a coarse texture from the large crystals it contains.

When melted rock reaches Earth's surface, it is called _____ . Once above the surface of Earth, it cools rapidly. Only small mineral crystals have time to form before it _____ .

The rocks that form from the cooled lava are called _____ igneous rocks. One example of extrusive igneous rock is _____ , which is full of tiny holes from the gas bubbles that were in the lava when it hardened. Another is _____ , which has a shiny, glass-like texture.

Name _____ Date _____

Reading

Every year, for about a month, Sisir Mondal travels across the globe to places like India and South Africa. Sisir travels to those places to study rocks.

In the field, Sisir studies large layers of igneous rock. Sisir collects rock samples. He studies them closely to figure out their textures and what kinds of minerals the rocks contain. Based on his observations, he makes a geologic map of the area.

Back in the museum, Sisir takes a much closer look at the rock samples he collected. He uses microscopes and other tools to see what stories the rocks tell. Sisir wants to know why certain minerals are found in the rocks. He's particularly interested in finding rocks that contain metallic elements like chromium and platinum. Why are those metals important? People use them every day. Chromium is used to make many things including steel. Platinum is a precious metal, used in everything from jewelry to catalytic converters in cars.

Compare and Contrast

- Look for similarities and differences.
- Use your own experiences to apply to the situation.

Compare and Contrast

1. What is the same about the work Sisir does in the field and the work he does in the lab?

_____

2. What is different about the work Sisir does in the field and the work he does in the lab?

_____

_____

_____

_____

_____

Name _____ Date _____

Write About It

To explore the differences and similarities between Sisir's work in the field and in the museum, write two short journal entries on a separate piece of paper. Treat these entries like games of make-believe, and pretend that you actually are Sisir. Use words such as "I," "me," "my," and "mine" to make it seem as if Sisir were speaking. One entry will be written on the last day of your studies in the field in South Africa. The other entry will be written on your first day back to the museum to study the rocks you found. Each entry should be at least six sentences long and should have a natural flow.

Guidelines—What to write in the entry for South Africa:

- Start with a clear beginning, and discuss the type of day you have had in the field.
- Describe the texture and minerals of the igneous rocks you've found.
- Briefly describe the weather, sights, and sounds in the field.
- Summarize how different your work will be in the museum.

What to write in the entry for Sisir's return to the museum:

- Start with a clear beginning, and discuss whether or not you're glad to be back at the museum.
- Explain whether or not you enjoy working in the field or the museum. Do you enjoy both?
- Describe the atmosphere in the museum.
- Discuss what you accomplished in the museum today and why you couldn't accomplish those same things in the field.
- Sign off. Example: "I am tired from my trip, so I must get to bed. Good night."

Name _____ Date _____ **Outline**

Sedimentary Rocks

Use your textbook to help you fill in the blanks.

How are sedimentary rocks formed?

1. Rocks can be formed from tiny particles called _____ .
2. _____ are rocks formed of layers of sediment pressed together.
3. Over a long period of time, the layers of sediment turn into _____ .

How do layers of rock form?

4. Sediments can be picked up by _____ .
5. Over time, new layers of sediment are dropped on top of _____ .
6. The _____ of the top layers squeezes out the water and air from the lower layers.
7. _____ cement the sediments together forming the sediментary rock.

What are the properties of some sedimentary rocks?

8. Limestone is usually white and forms _____ _____ .
9. Limestone contains _____ .
10. The remains of plants and animals from millions of years ago are called _____ .
11. Another type of sedimentary rock called _____ is made from sand and quartz cemented together.

Name _____ Date _____

12. _____ often cements red sandstone together.

13. A conglomerate rock is formed from _____ .

14. Conglomerate rocks _____ show distinct layers like other types of sedimentary rocks do.

What are some uses of sedimentary rocks?

15. Limestone is useful in the classroom as

_____ .

16. _____ coal is sedimentary rock.

17. Sedimentary rock often contains _____ that can show us what living things in the past looked like.

Summarize the Main Idea

18. What are the three different types of sedimentary rocks, and what are the differences among them?

_____ .

_____ .

_____ .

Name _____ Date _____

Vocabulary

Sedimentary Rocks

a. conglomerate	**d.** limestone	**g.** sediments
b. fossils	**e.** sandstone	
c. iron oxide	**f.** sedimentary rock	

Match the correct letter with the description.

1. _____ Tiny particles of rocks or minerals

2. _____ Remains of animals or plants from millions of years ago

3. _____ Rock made up of rounded pebbles, stones, or even boulders once carried by fast-flowing waters

4. _____ Bits of sand that had become cemented together

5. _____ The type of rock formed from sediments that become pressed together

6. _____ Rocks formed from the remains of once-living things on the bottom of the ocean

7. _____ Often the cementing material, stains the rock red

Name _____ Date _____

Sedimentary Rocks

congolomerate	iron oxide	moving water	sediment
fossils	limestone	sandstone	weight

Fill in the blanks.

Most sedimentary rocks are formed over a long period of time. _____ , or tiny particles, is pressed together in layers to form a rock. Most often, these particles are carried by _____ and dropped off in a new place. The _____ of the top layer presses out the water and air from the lower layers to form the sedimentary rock. _____ is formed on the bottom of the ocean. Plant and animal remains, called _____ , help create the layers of limestone. _____ is another type of sedimentary rock made up of bits of sand cemented together. Sometimes _____ stains the rocks red. Another type of sedimentary rock is a _____ , which is formed from larger rocks lumped together.

Name _____ Date _____ **Outline**

Metamorphic Rocks

Use your textbook to help you fill in the blanks.

How are metamorphic rocks formed?

1. Heat and pressure can cause the physical _____ and mineral contents of rocks to change.
2. Extreme heat and pressure cause _____ to form deep inside Earth.
3. Examples of metamorphic rocks are _____ and slate.

What are properties of some metamorphic rocks?

4. The amount of heat and pressure a metamorphic rock undergoes determines its _____ .
5. Gneiss has mineral layers called bands and its texture is _____ .
6. A metamorphic rock with a medium texture is _____ .
7. The texture of marble depends on the size of the _____ inside it.
8. Slate feels _____ because it contains small crystals.

What are some uses of metamorphic rocks?

9. Statues and buildings can be made from _____ .
10. _____ can be created from the rock lapis lazuli.

Name _____ Date _____

11. Small chunks of metamorphic rocks can be found in _____ .

12. _____ is a metamorphic rock found deep inside Earth. It is used as a fuel.

How can you be a rock detective?

13. To identify a rock, geologists examine physical properties, crystal size, layers, and _____ .

14. A(n) _____ might contain a fossil.

15. An igneous rock looks smooth and might _____ when held in the light.

16. A metamorphic rock will have certain minerals and _____ .

What is the rock cycle?

17. The _____ occurs when a rock changes from one form to another.

Summarize the Main Idea

18. How is a metamorphic rock created?

_____

_____

_____

_____

_____

_____

Name _____ Date _____ **Vocabulary**

Metamorphic Rocks

anthracite	lapis lazuli	metamorphic	rock cycle
igneous	marble	quartzite	sedimentary

Fill in the blanks with the correct vocabulary word. Then use the clues to solve the message.

1. I am a rock used in statues. ☐ ☐ ☐ ☐ ☐ ☐
5

2. I am a rock found deep in Earth and used as fuel.
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
11

3. I am a type of rock that may contain fossils.
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
1 2

4. I am a smooth and shiny rock. ☐ ☐ ☐ ☐ ☐ ☐ ☐
6

5. I am the process by which rocks change from one form to another.
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
7 8

6. I am a rock with a medium texture, and I am used in swimming pools and ceramics. ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
4

7. I am a rock used in jewelry.
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
9 10

Use the numbered letters from your vocabulary words to solve the message below.

Extreme heat and pressure can cause rocks to become

☐ ☐ t ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
5 1 9 2 7 4 10 11 6 8

Name _____ Date _____

Metamorphic Rocks

clues	gneiss	physical
colored bands	igneous	properties
crystals	metamorphic rocks	texture

Fill in the blanks.

The extreme heat and pressure within Earth squeezes rocks together. This causes the _____ properties of rocks to change. _____ are formed deep inside Earth. Metamorphic rocks can be made from _____ , sedimentary, or other metamorphic rocks. For example, traces of the igneous rock granite can be found in the metamorphic rock _____ . The physical _____ of metamorphic rocks are different. The minerals and _____ in metamorphic rocks determine their _____ and appearance. A geologist can classify a rock by looking for _____ . One clue to help identify metamorphic rocks are _____ . Because of their useful properties, metamorphic rocks are used to make items such as tile, jewelry, statues, and even gravel.

Name _____ Date _____

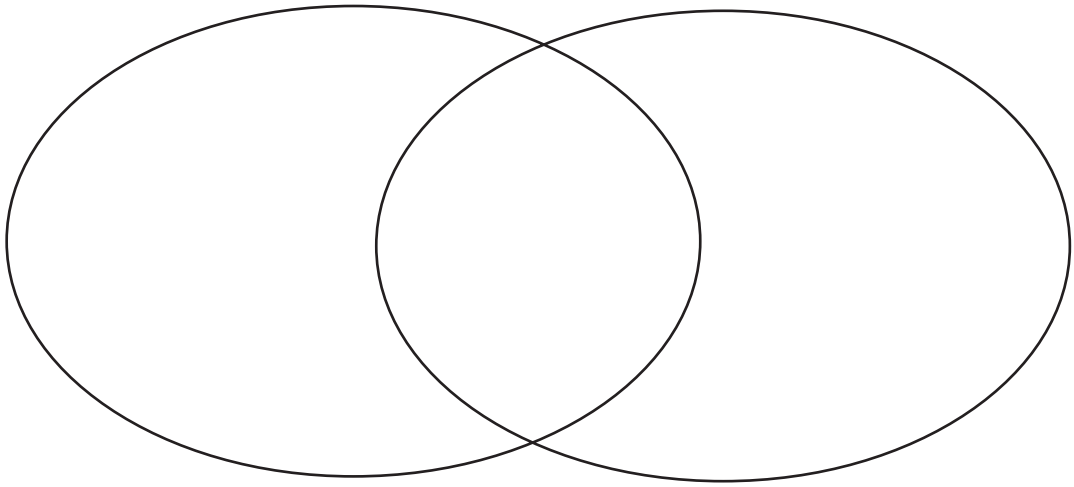
Writing

Write About It

Compare two things made from rocks. Use words that tell about likenesses, such as "both," "like," and "too." Use words that tell about differences, such as "but" and "unlike."

Getting Ideas

Select two different things made of rocks. Write the name of each thing above each circle below. In the outer part of each circle, tell how it is different. In the part that overlaps, tell how they are the same.



Planning and Organizing

On her trip to the Children's Museum, Kirsten learned that the little balls in the game "marbles" are made from marble, obsidian, and other rocks. She wants to compare and contrast the two types. Here are two sentences that she wrote. Write Compare by each sentence that tells how they are alike. Write Contrast by each sentence that tells how they are different.

1. The ones made from marble were pink or red or yellow, but the ones from obsidian were dark green or black. _____
2. Both marble and obsidian are igneous rocks. _____

Name _____ Date _____

Write three sentences comparing and contrasting your two objects made from rocks.

1. _____

_____

2. _____

_____

3. _____

_____

Drafting

Write your own sentence to begin your comparison. It should tell your topic and your main idea.

_____

Now write to compare and contrast two things made of rock. Use a separate piece of paper. Arrange your sentences in a way that makes sense. Remember to use words that tell about likenesses and differences.

Revising and Proofreading

Here are some sentences Kirsten wrote. Proofread them. Find five grammar errors she made and correct them.

Both sets of marble was beautiful, but I likes the obsidian ones more. They was so bright and shiny. They has such a rich, dark color. I couldn't wait to shot them.

Now revise and proofread your writing. Ask yourself:

- Have I used words that show likeness and words that show difference?
- Have I corrected all grammar errors?
- Have I corrected all spelling, punctuation, and capitalization errors?

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Rocks and Minerals

Choose the letter of the best answer.

1. The way a mineral splits is called

a. cleavage. **b.** hardness. **c.** luster. **d.** streak.

2. The rock cycle is the process by which rocks

a. are identified.
b. change into gems.
c. change into their final form.
d. change from one form to another.

3. Melted rock beneath Earth's surface is called

a. lava. **b.** magma. **c.** ore. **d.** sedimentary.

4. How is a streak formed?

a. A light is shined on a mineral.
b. A mineral is rubbed across a plate.
c. A mineral is scratched by a diamond.
d. A mineral is split.

5. Once melted rock reaches Earth's surface, it is called

a. lava.
b. magma.
c. a mineral.
d. ore.

6. The way light reflects off the surface of a mineral is called

a. cleavage.
b. hardness.
c. luster.
d. streak.

7. Which type of rock is formed when melted rock cools near Earth's crust?

a. igneous
b. magma
c. metamorphic
d. sedimentary

Name _____ Date _____

Choose the letter of the best answer.

8. Intense heat and pressure deep beneath Earth's surface can cause some rocks to change into

a. igneous rock. **c.** metamorphic rock.

b. sedimentary rock. **d.** obsidian.

9. Layers of tiny particles are compressed over time to form

a. igneous rock. **c.** metamorphic rock.

b. magma. **d.** sedimentary rock.

10. The building blocks of rocks are

a. gems. **c.** minerals.

b. ores. **d.** sedimentary rocks.

11. A mineral that can scratch another mineral has a greater

a. cleavage. **b.** hardness. **c.** luster. **d.** streak.

12. Tiny particles of rocks, minerals, plants, or other animal materials are called

a. fossils. **b.** gems. **c.** ores. **d.** sediments.

13. Bauxite is considered an ore because

a. it is rare. **c.** it is a useful mineral that is mined.

b. it is a gem. **d.** it is the hardest mineral.

14. Mohs hardness scale is used to

a. compare the luster of different minerals.

b. determine the hardness of a mineral.

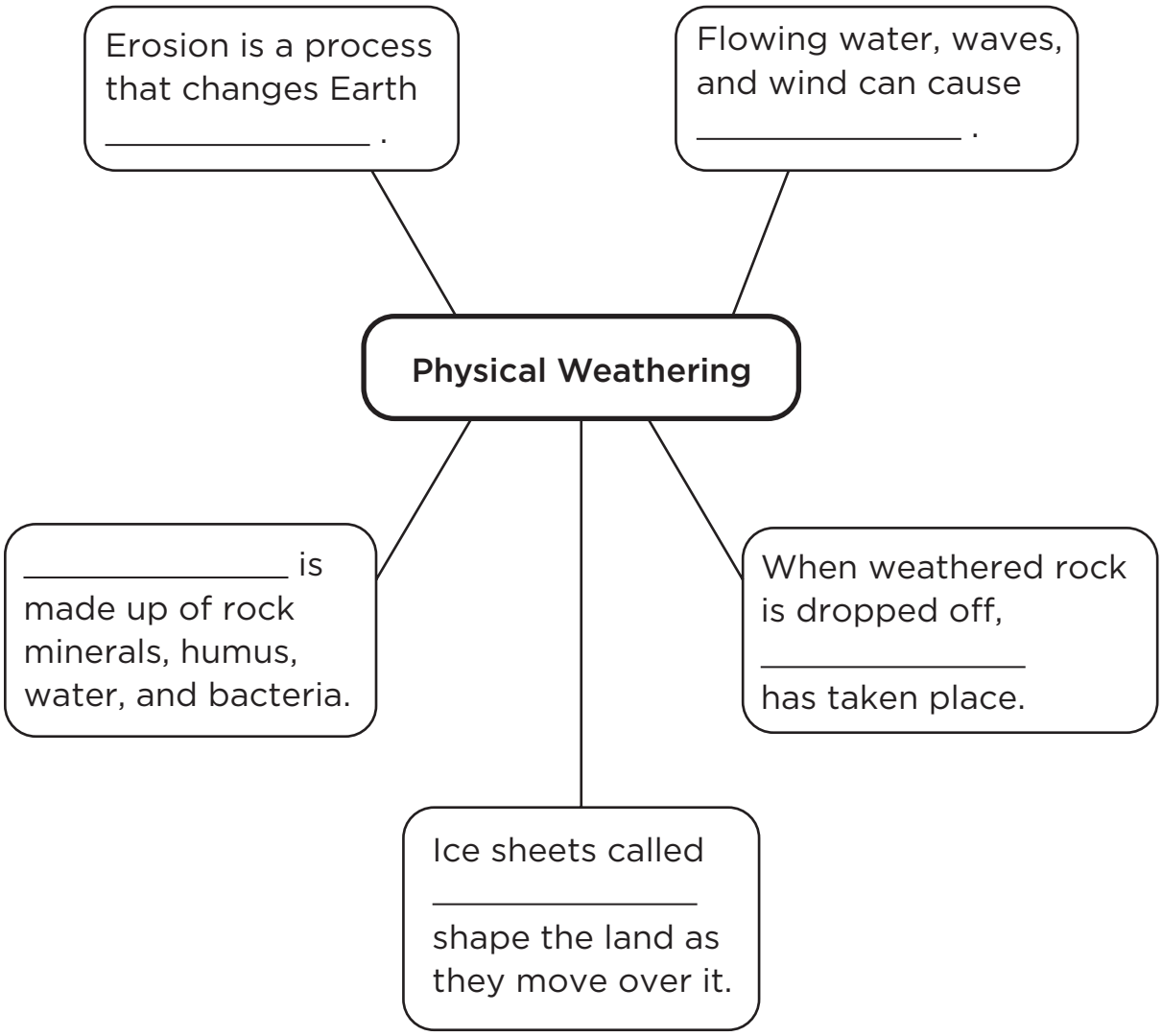
c. measure the cleavage of a mineral.

d. weigh minerals.

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Slow Changes on Earth



Name _____ Date _____

Sierra

Read the Literature feature in your textbook.

Write About It

Response to Literature The poet uses personification to describe how rock is slowly worn away. Write a letter to the poet. Tell if you liked the poem. Discuss how making the mountain seem human made you feel. What did it help you understand?

Name _____ Date _____ **Outline**

Weathering

Use your textbook to help you fill in the blanks.

What is weathering?

1. Rocks are constantly _____ .
2. Freezing and thawing, plants, wind, and pressure can break rocks into _____ .
3. This breaking down of rocks is called _____ .
4. _____ involves ways that rock breaks down without changes to _____ .
5. Over time, repeated _____ of water breaks rocks apart.
6. As plant roots grow larger, they cause cracks in rocks to _____ .
7. Outer layers of rock peel off like the layers of _____ in a kind of weathering called _____ .
8. The wearing away of rock by _____ is called _____ .

What are some other causes of weathering?

9. A rock can break down when _____ in the rock are _____ .
10. When _____ in air dissolves in water, it can react with iron in rocks to form _____ and cause the rocks to break down.

Name _____ Date _____

11. Decaying plants leave _____ in soil that are dissolved by _____ .

12. Dissolved acids _____ when they come into contact with a rock's minerals and cause it to _____ .

13. Carbonic acid that can react with the minerals in some rocks forms when _____ combines with _____ .

How is soil formed?

14. Soil is mostly bits of _____ .

15. Soil also contains _____ .

16. It can take _____ of years for weathering to break rocks down to form soil.

17. Soil layers are called _____ , and each has its own _____ .

18. Soil horizons are different from place to place because the _____ that make up soil are different from place to place.

Summarize the Main Idea

19. How do physical weathering and chemical weathering affect rocks in the same way?

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Weathering

a. abrasion	**d.** exfoliation	**g.** physical weathering
b. carbonic acid	**e.** horizon	**h.** weathering
c. chemical weathering	**f.** humus	

Match the correct letter with the description.

1. _____ A layer of soil

2. _____ Breaks rock down without changing the rock material

3. _____ Weathering that causes layers of rock to peel like an onion

4. _____ The breaking down of rocks

5. _____ Breaks rock down by changing its minerals

6. _____ Decayed plant or animal material

7. _____ Sharp edges of blowing sand wearing rocks away

8. _____ A substance that forms when carbon dioxide combines with rainwater

Name _____ Date _____

Weathering

acid	chemical	humus
carbon dioxide	exfoliation	water
changes	horizons	weathering

Fill in the blanks.

Rocks are under constant attack by many forces and eventually break down. The breaking down of rocks is called _____ . Physical weathering breaks rock into smaller pieces without causing _____ changes. Physical weathering can be caused by freezing, thawing, plants, _____ , and abrasion. Chemical weathering causes _____ in the minerals in rocks. Oxygen and _____ can combine with _____ to form a weak _____ that can react with rock to break it down. Soil is mostly made from bits of weathered rock, minerals, and _____ , which is decayed plant or animal material. Soil forms into layers or _____ over many years. Soil is different from place to place because the rocks and living things that make up soil are different from place to place.

Name _____ Date _____ **Outline**

Erosion and Deposition

Use your textbook to help you fill in the blanks.

What causes erosion?

1. The transport of weathered rock is called _____ .
2. The shape of the land is changed as _____ work together.
3. The biggest cause of erosion is _____ .
4. Eventually, _____ are _____ in a new place.
5. Waves also cause _____ as they break rocks apart and then _____ the rocks and sand.
6. Wind _____ small pieces of rock, sand, and soil and carries them to _____ .
7. Wind _____ by _____ at the same time.
8. _____ takes place when weathered rock, sand, and soil are _____ by wind or water.

What affects erosion?

9. A _____ soil is eroded more easily than _____ clay.
10. Erosion is also affected by the _____ of _____ .

Name _____ Date _____

11. The strength of _____ and the growth of _____ also affect the rate of erosion.

12. In 1930, a _____ began that allowed bare, dry soil to _____ in an event known as the _____ .

13. Many animals died because there were no _____ for them to eat, and thousands of _____ had to _____ .

How can soil erosion be slowed?

14. From the Dust Bowl, people learned that it was important to _____ soil by using methods to save it and _____ .

15. Farmers _____ between fields to slow _____ .

16. Farmers use a method called _____ when they plant _____ of food crops and other plants to _____ .

17. Farmers prevent soil from eroding when they _____ their fields _____ a slope in a method called _____ .

Summarize the Main Idea

18. How do erosion and deposition affect the land?

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Erosion and Deposition

a. conservation	**c.** deposition	**e.** erosion
b. contour plowing	**d.** Dust Bowl	**f.** strip farming

Match the correct letter with the description.

1. _____ Plowing across slopes rather than up and down
2. _____ Carrying away weathered rock
3. _____ Methods used to save soil and slow erosion
4. _____ Planting rows of food crops next to rows of plants that hold soil
5. _____ Dropping off weathered rock
6. _____ Event during which a great deal of soil eroded, affecting plants, animals, and people

Cloze Test Name _____ Date _____

Erosion and Deposition

conserve	erodes	plants	strip farming
contour plowing	erosion	size	strength
deposition	flowing water	weathers	wind

Fill in the blanks.

Sediments and small rocks are often carried along in flowing water. The carrying away of weathered rock is called _____ . The biggest cause of erosion is _____ . Blowing _____ picks up small pieces of rock, sand, and soil as it _____ and _____ rock. Bits of eroded rock, sand, and soil are dropped off when _____ takes place. The rate of erosion can be affected by the _____ of sediments, the _____ of wind or water, and the presence of _____ . Farmers can _____ soil by planting rows of crops and soil-holding plants in a method called _____ . They can also prevent the soil on slopes from eroding by using _____ .

There are many methods that farmers can use to conserve soil.

Name _____ Date _____ **Outline**

Landforms: Changing Over Time

Use your textbook to help you fill in the blanks.

What is a landform?

1. Huge, vast stretches of land without any hills or mountains are called _____ .
2. Natural features on Earth's surface are called _____ .
3. Most landforms take shape over _____ periods of time.
4. A _____ is a deep, narrow _____ with _____ .

How can running water change land?

5. Water flows from the _____ to the _____ .
6. As rivers journey downhill, they cut away land along their sides and _____ .
7. When land becomes flatter, a river runs _____ and becomes _____ .
8. A slowly running river that drops sediments at its _____ forms an area of land called a _____ .

How can waves change land?

9. Waves pounding at a cliff can break _____ off its bottom and _____ the base of the cliff.
10. _____ are long, narrow strips of land that protect coastlines from _____ .

Name _____ Date _____

How does wind change land?

11. Wind can blow sand into hills called _____ .

12. Sand dunes can be shaped like _____ or _____ that are shaped like long, wavy ridges.

How can ice change land?

13. Thick sheets of ice that slowly creep over the land in colder parts of Earth are called _____ .

14. Glaciers form when _____ falls than can melt.

15. Thick snow changes into _____ , which begins to _____ downhill and freeze onto _____ .

16. Glaciers widen, deepen, and straighten valleys into a _____ .

Summarize the Main Idea

17. How do natural processes create landforms?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Landforms: Changing Over Time

a. barrier island	**c.** delta	**e.** landform
b. canyon	**d.** glacier	**f.** sand dune

Match the correct letter with the description.

1. _____ An area of land that forms at the mouth of a river

2. _____ A hill formed by blown sand

3. _____ A long, narrow strip of land that runs parallel to a coast

4. _____ A natural feature on Earth's surface

5. _____ A deep, narrow valley with steep sides

6. _____ A large, thick sheet of ice

Name _____ Date _____

Landforms: Changing Over Time

barrier islands	delta	landforms	sand dunes
canyon	erode	mouth	steep sides
deposited	glaciers	rocky cliffs	U-shaped

Fill in the blanks.

Earth's surface is always changing. Natural features on Earth's surface are called _____ . Running water can carve a _____ , a deep narrow valley with _____ . Rivers curve when one bank is eroded and the sediments are _____ on the other bank. Sediments deposited at the _____ of a river form an area of land called a(n) _____ . The constant action of waves can move sand and cause _____ to collapse. Long, narrow strips of land that run parallel to a coast are called _____ . Wind carrying sand and bits of rock _____ rocks over a period of many years. Wind blows sand into hills called _____ . Large, thick sheets of ice called _____ creep slowly over land and form _____ valleys. Forces change the surface of Earth in many ways over time.

Name _____ Date _____ **Writing**

Write About It

Write a paragraph in which you summarize "Land Over Time," on a separate piece of paper. In your own words, tell the main idea. Write only the most important details.

Getting Ideas

Make sure you understand the purpose of a summary before you start to write. Write True or False by each statement below.

1. A summary is the same length as the article. _____
2. A summary is shorter than the article. _____
3. A summary contains only important information. _____
4. A summary contains all the information. _____
5. When you write a summary, you put information in your own words. _____
6. When you write a summary, you use the exact words from the article. _____

Planning and Organizing

Reread the article "Land Over Time." Underline important information that belongs in a summary. Cross out unimportant information.

Land Over Time

Mountains seem like mighty giants. But are they? Weathering can break down even the mightiest mountain. Let's see how.

Wind carries seeds. Some seeds may land on patches of soil on rock and sprout. The roots find small cracks in the rock. The roots grow larger. At the same time, rain fills the cracks. When it gets cold, the water freezes. As a result, the ice expands and widens the cracks more. Eventually the roots get thicker. The cracks widen more until some pieces of the rock break off. In time, these smaller pieces of rock will become smaller yet. Over millions of years, weathering will break the mountain down.

Name _____ Date _____

Drafting

Write the main idea of "Land Over Time" on the lines below. Remember that the main idea is the most important idea.

_____

_____

Write a topic sentence for your summary. Put the main idea of the article in your own words. Tell the title of the article.

_____

_____

Now write the first draft of your summary on a separate sheet of paper. Start with your topic sentence. Then tell the important facts and details in your own words. Draw a conclusion at the end.

Revising and Proofreading

Proofread these sentences from one student's summary. Correct the five spelling, punctuation, and capitalization errors.

"Land Over time shows that nothing lasts forever. It may take millons of years, but even great mountains can be destroyed? The process of wethering begins with the wind.

Now revise and proofread your summary. Ask yourself:

- Have I begun with a topic sentence that tells the main idea of "Land Over Time"?
- Have I left out minor details?
- Have I used my own words?
- Have I corrected all spelling, punctuation, and capitalization errors?

History of Science

Looking Back at Yosemite National Park

Yosemite Valley once looked very different than it does now. How can geologists find out how it has changed? They can read the rocks to investigate how Yosemite Valley got to look the way it does today.

- **500 million years ago**

  A sea covers the area that is now Yosemite. Sediments slowly build up on the ocean floor, growing thousands of feet high. The lower layers become rock.

- **90 million years ago**

  Underground, magma rises and cools into a huge block of granite.

- **10–5 million years ago**

  The Sierra Nevada is formed as the block of granite is pushed upward. The Merced River carves Yosemite Valley into a canyon.

- **3–1 million years ago**

  An ice age brings glaciers that fill the V-shaped valley. They widen it, deepen it, and carve it into a U-shaped valley.

- **10,000 years ago**

  The last glacier finally melts. Lake Yosemite is formed when rocks dam the valley. Creeks plunge off cliffs creating Yosemite's waterfalls.

Name _____ Date _____

Summary
- states the main ideas.
- includes the most important details.
- uses your own words.

In 1906, President Theodore Roosevelt made Yosemite Valley and its surrounding forests a national park. Now each year millions of people visit Yosemite National Park to explore and learn about its geological clues for themselves.

Write About It

Summarize Write a few sentences that tell about the history of Yosemite National Park from long ago to the present. Use a summary chart to help organize your writing.

Name _____ Date _____

Slow Changes on Earth

Choose the letter of the best answer.

1. Which is an example of chemical weathering?
   - **a.** Carbonic acid reacts with limestone.
   - **b.** Sand wears away the edges of rocks.
   - **c.** Sediment is deposited at the mouth of a river.
   - **d.** Waves crash on a shore.

2. Deposition occurs when
   - **a.** bits of sand, soil, and rock are carried away by wind or water.
   - **b.** bits of sand, soil, and rock are deposited by wind or water.
   - **c.** sand blasts away the sharp edges of a rock.
   - **d.** water reacts with the minerals in a rock.

3. Sediment that collects near the mouth of a river forms an area of land called a
   - **a.** canyon.
   - **b.** delta.
   - **c.** sand dune.
   - **d.** plain.

4. Sand dunes are formed by
   - **a.** chemical weathering.
   - **b.** exfoliation.
   - **c.** waves.
   - **d.** wind.

5. A deep, narrow valley with steep sides is known as a
   - **a.** canyon.
   - **b.** glacier.
   - **c.** sand dune.
   - **d.** U-shaped valley.

Name _____ Date _____

Choose the letter of the best answer.

6. The breaking down of rocks is called

a. deposition. **c.** thawing.

b. formation. **d.** weathering.

7. A large, thick sheet of ice that slowly creeps across land is a

a. canyon. **c.** glacier.

b. delta. **d.** horizon.

8. Exfoliation is an example of

a. chemical weathering. **c.** physical weathering.

b. deposition. **d.** thawing.

9. The carrying away of weathered rock is called

a. contour plowing. **c.** erosion.

b. deposition. **d.** weathering.

10. Natural features on Earth's surface are called

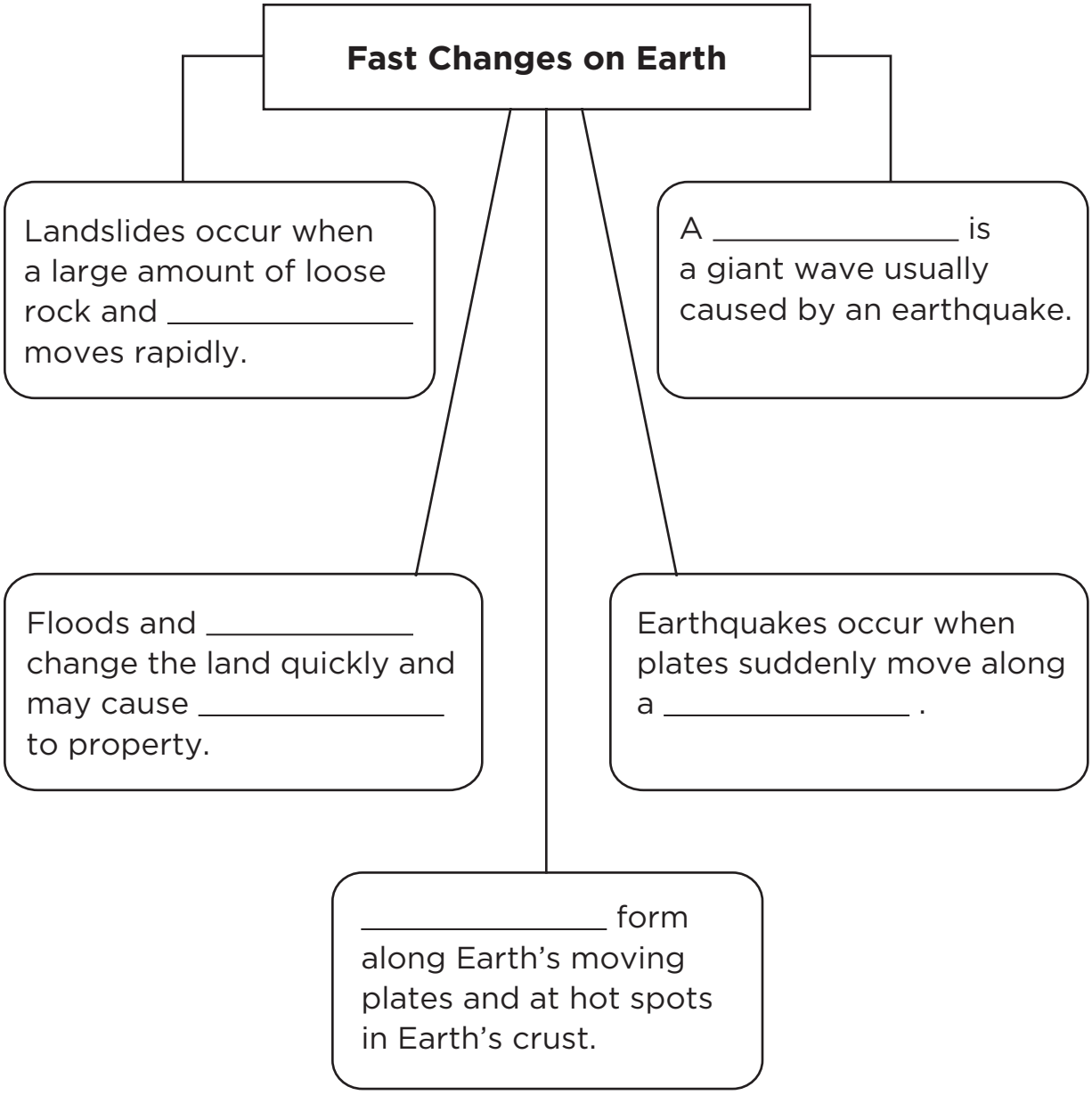
a. humus. **c.** minerals.

b. landforms. **d.** sediments.

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Fast Changes on Earth



Name _____ Date _____

California's Weather Woes

Read the Literature feature in your textbook.

Write About It

This article tells how during one week in February, California got very heavy rains. Write a summary of the article. Start by telling the main idea. Then include the effects of the heavy rains. Leave out unimportant details. Reach a conclusion at the end.

Name _____ Date _____ **Outline**

Landslides

Use your textbook to help you fill in the blanks.

How do landslides change the land quickly?

1. _____ is a _____ that acts on all objects.
2. _____ pulls materials such as weathered rocks and soil from a _____ to a _____ .
3. A _____ occurs when a large amount of loose rock and soil _____ .
4. A landslide is sometimes caused by things that quickly shift the land such as an _____ or rocks that _____ .
5. A landslide can carry_____ with it and also cause _____ .

How do floods change the land quickly?

6. _____ can also cause the land to _____ .
7. When the ground is not able to hold any more water, it runs on top of _____ and may flow into streams and rivers.
8. A _____ occurs when the banks of a _____ or _____ overflow.
9. Flood waters _____ quickly.

Name _____ Date _____

10. Some floodwaters are so strong that they may _____ soil that supports bridges and roads, causing them to _____ .

11. When land becomes full of water, it may change into a river of _____ called a _____ .

12. Materials left behind by a mudslide may keep _____ from going down as quickly.

What are some safety tips for landslides and floods?

13. During heavy rains, listen to _____ for warnings.

14. Watch and listen for _____ , new cracks in the _____ , and tilting _____ .

15. If you are near a landslide, _____ .

16. A _____ means that flooding is possible.

17. A _____ means that a flood is occurring or will occur soon.

18. If there is a warning for your area, _____ .

19. If caught in a flood, do not _____ .

Summarize the Main Idea

20. What do landslides and floods have in common?

_____

_____

Name _____ Date _____

Vocabulary

Landslides

a. flood	**c.** flood watch	**e.** mudslide
b. flood warning	**d.** landslide	

Match the correct letter with the description.

1. _____ Flooding is possible.
2. _____ A river of mud and rock.
3. _____ The banks of a river or stream overflow.
4. _____ A large amount of loose rock or soil moves rapidly.
5. _____ A flood is occurring or will occur soon.

Answer the questions.

6. What is the difference between a flood watch and a flood warning?

   _____

   _____

7. If you are caught in a flood, you should avoid

   _____ .

Name _____ Date _____

Landslides

earthquake	flood watch	landslide	overflow
erode	freezing	local news	rivers
flood warning	gravity	mudslide	

Fill in the blanks.

Some forces can change the land quickly. When _____ pulls materials rapidly downhill, a _____ occurs. These can occur when land shifts rapidly during an _____ or by the _____ and thawing of rocks. When the ground is not able to hold any more water, it runs on top of the land and may flow into streams and _____ . When streams or riverbanks _____ , a flood occurs. Flood waters _____ soil quickly and can wash away anything in their path. When the land becomes full of water, it may change into a river of mud and rock called a _____ . During heavy rains, you should listen to _____ and watch for signs of a possible landslide. A _____ means that flooding is possible, and a _____ means that a flood is occurring or will occur soon. If caught in a flood, do not walk in moving water.

Name _____ Date _____ **Outline**

Earthquakes

Use your textbook to help you fill in the blanks.

What are earthquakes?

1. Fast changes take place on Earth's _____ or the crust.
2. The crust is made up of giant slabs of rock called _____ that fit together like the pieces of a puzzle.
3. A place where the plates come together and rocks move along one or both sides of a crack is called a _____ .
4. Earthquakes in Earth's crust are caused by a sudden shift of Earth's _____ .
5. Many earthquakes happen in an area around the _____ where some of Earth's plates meet.

What causes an earthquake?

6. Most earthquakes happen where Earth's _____ meet.
7. Large earthquakes do not usually occur where Earth's slow movement called _____ takes place along faults.
8. Different kinds of faults form because Earth's plates move in _____ .
9. Plates pull apart in a _____ , and rocks above the fault surface _____ .
10. Plates push together in a _____ , and rocks above the fault _____ .
11. The _____ Fault is an example of a _____ where rocks slide past each other in different directions.

Name _____ Date _____

12. The vibrations of an earthquake are strongest where the earthquake _____ .
13. Earthquakes' vibrations move through Earth's crust in _____ like the ripples from a pebble dropped in a pond.

What is a tsunami?

14. A giant ocean wave called a _____ is usually caused by an earthquake on the _____ .
15. As a tsunami moves closer to shore, it slows and gets _____ .
16. A tsunami may be one _____ of water or a series of _____ .

What are some safety tips for earthquakes and tsunamis?

17. Your family should hold _____ and arrange a _____ outside your home for when the earthquake is over.
18. If outside during an earthquake, you should move quickly to an _____ , and if in a car, you should not stop under a _____ .
19. If you live near the coast, you should listen for tsunami advisories, watches, and warnings after an _____ .
20. If there is a tsunami warning for your area, you should _____ right away.

Summarize the Main Idea

21. Why do earthquakes occur?

_____

_____

Name _____ Date _____

Vocabulary

Earthquakes

a. creep	**d.** normal fault	**g.** strike-slip fault
b. earthquake	**e.** plates	**h.** tsunami
c. fault	**f.** reverse fault	**i.** vibrate

Match the correct letter with the description.

1. _____ Gigantic slabs of rock that make up Earth's crust

2. _____ Movement in Earth's crust caused by a sudden shift in Earth's plates

3. _____ Crack where plates come together and rocks move along one or both sides

4. _____ Rocks slide past one another in different directions.

5. _____ Giant ocean wave

6. _____ Slow movement along faults

7. _____ Plates push together and rocks above the fault move upward.

8. _____ To shake

9. _____ Plates pull apart, and rocks above the fault surface move down.

Name _____ Date _____

Earthquakes

begins	normal fault	reverse fault
earthquakes	Pacific Ocean	strike-slip
fault	plates	tsunamis

Fill in the blanks.

Earth's surface is always changing. Earth's crust is made up of gigantic slabs of rock called _____ that fit together like the pieces of a puzzle. A place where plates come together and move along one or both sides is called a _____ . _____ occur when Earth's plates undergo a sudden shift. Many earthquakes happen in an area around the _____ . A _____ occurs when plates pull apart and rocks above the fault surface move down. When plates push together and rocks above the fault move upward, a _____ occurs. Rocks that slide past one another in different directions form a _____ fault. The vibrations from an earthquake are strongest where the earthquake first _____ . Earthquakes on the ocean floor can cause giant waves called _____ .

Writing in Science

Write About It

Narrative Writing Write a personal narrative about a natural event that you experienced. What happened? What did you do? How did you feel? Why do you still remember the experience? Use the "I" point of view. Include time-order words to show the order of events.

Getting Ideas

Use a separate piece of paper to write down ideas for your narrative. Write the natural event at the top of the page. Then brainstorm. Then make four lists on your page:

- What happened
- What I did
- Why I remember it
- How I felt

Planning and Organizing

Antonio decided to write about an earthquake he experienced. Here are some sentences that he wrote. Put them in time order. Write 1 by the sentence that should come first. Write 2 by the sentence that should come second. Number the last sentence 5.

1. I ran to the doorway and put one arm on each side to hold myself steady. _____
2. A low rumbling sound filled my room. _____
3. Something woke me up, but I wasn't sure what. _____
4. The quake lasted only a minute, but it felt like a year. _____
5. Then my bed began to shake. _____

Now write five sentences about your natural event on a separate piece of paper. Put the sentences in time order.

Name _____ Date _____

Drafting

Try to grab your reader's interest in the first sentence of your personal narrative. Here are two sentences that Antonio wrote. Circle the one he should use to begin his narrative.

October 15, 2003 is a date I shall never forget.

I had an interesting experience in October.

Now write the first draft of your personal narrative on a separate piece of paper. Begin with an attention-grabbing sentence. Tell the events in time order. Use details and end by telling what the event meant to you.

Revising and Proofreading

Here are some sentences that Antonio wrote. Rewrite each sentence using the "I" point of view.

1. He screamed when the bed started to shake.

   _____

2. He didn't know what was happening, and this made him scared.

   _____

3. He looked around for a place where he could take cover.

   _____

Now revise and proofread your personal narrative. Ask yourself:

- Have I used the I point of view?
- Have I organized the events in time order?
- Have I corrected all grammar errors?
- Have I corrected all spelling, punctuation, and capitalization errors?

Name _____ Date _____ **Outline**

Volcanoes

Use your textbook to help you fill in the blanks.

What is a volcano?

1. A _____ is a mountain that builds up around an opening in _____ .
2. An _____ occurs when melted rock, gases, and pieces of rock are _____ of a volcano.
3. Gases that build up pressure in magma can cause an _____ .
4. Magma can rise through a _____ called a _____ .
5. Magma is called _____ once it reaches the _____ where it cools and hardens to form a _____ .

Where do volcanoes form?

6. When one Earth plate is pushed beneath another, the plate moving down melts and is changed to _____ .
7. Heated magma _____ up through Earth's crust to form _____ .
8. Volcanoes that form in the middle of a plate may occur when magma partially melts through Earth's crust in an area called a _____ .

Name _____ Date _____

What are some kinds of volcanoes?

9. A _____ has steep sides and is formed when gases in thick magma explode and cause lava to burst into the air.

10. When lava falls in pieces around the volcano, it forms a cuplike shape around the vent called a _____ .

11. A _____ has wide, flat sides and is formed by layers of lava that flow _____ .

12. A _____ is made up of layers of _____ and _____ .

13. Eruptions seem to _____ , with an _____ eruption followed by a quiet period when lava _____ .

14. The layers of a composite volcano build up to form a _____ shape that is usually _____ , with the shape of one side matching the shape on the other side.

How can you be safe around volcanoes?

15. If you live near a volcano, you should have a _____ available for each member of your family.

16. If told to do so, you should _____ .

17. If you are indoors near an erupting volcano, close all _____ and make sure your _____ are inside.

Summarize the Main Idea

18. How does a volcano cause sudden changes to Earth's surface?

_____

_____

Name _____ Date _____

Vocabulary

What is a volcano?

a. cinder-cone volcano	**e.** hot spot	**i.** shield volcano
b. composite volcano	**f.** lava	**j.** vent
c. crater	**g.** magma	**k.** volcano
d. eruption	**h.** rift volcano	

Match the correct letter with the description.

1. _____ Melted rock beneath Earth's surface

2. _____ A mountain that builds up around an opening in Earth's crust

3. _____ A volcano that forms along the edges of spreading plates

4. _____ A volcano with steep sides that forms when pieces of lava fall around the vent

5. _____ A cuplike shape that forms around the vent of a volcano

6. _____ Happens when melted rock, gases, and pieces of rock are forced out of a volcano

7. _____ A wide, flat volcano formed by layers of lava that build up over time

8. _____ A cone-shaped volcano that has explosive eruptions and quiet periods when lava flows gently

9. _____ Central opening in a volcano

10. _____ Place where magma partially melts through Earth's crust

11. _____ Melted rock that reaches Earth's surface

Name _____ Date _____

What is a volcano?

active volcano	dormant volcano	shield volcanoes
cinder-cone	eruption	vent
compositive volcanoes	lava	
crater	rift volcanoes	

Fill in the blanks.

A volcano is a mountain that builds up around an opening in Earth's crust called a(n) _____ . Gases trapped in melted rock beneath Earth's surface can be forced out of a volcano during a(n) _____ . Once magma reaches Earth's surface, it is called _____ . Volcanoes that form along the edges of spreading plates are called _____ . A volcano that is still erupting is a(n) _____ , and a volcano that is no longer erupting is a(n) _____ . A(n) _____ volcano has steep sides and forms from explosive eruptions. The cuplike shape that forms around the vent of a volcano is called a(n) _____ . _____ have wide, flat sides and are formed by layers of lava that build up over time. Volcanoes that are made up of layers of lava and ash are _____ . There are many things people can do to stay safe in areas where volcanoes are active.

Name _____ Date _____

Reading

Ro Kinzler is fascinated by volcanoes and volcanic rocks, and she'd go just about anywhere to find out more about them. She is a scientist at the American Museum of Natural History.

Ro travels to the Cascades in Northern California to collect lava samples from active volcanoes like Mount Shasta and Medicine Lake. She wants to study how magma moves through Earth. Back in the lab, Ro does experiments to heat and squeeze the lava samples she collected to find out how they were formed in Earth.

You don't just find volcanoes on land. There are lots of them on the ocean floor. Ro and other scientists have gone to the bottom of the ocean to study them in special underwater vehicles called submersibles. The scientists visited the Mid-Atlantic Ridge, part of the longest volcano chain in the world. Ro is one of the few people to have ever seen it. She peered out the portholes of the submersible Alvin with other scientists to make careful observations of the rock formations. They used these to create geologic maps of the ocean floor.

Cause and Effect

- The *cause* answers the question "Why did something happen?"
- The *effect* answers the question "What happened as a result?"

Research

Find out more about the Mid-Atlantic Ridge. Use library books and the Internet to research the Mid-Atlantic Ridge. You will use your research to make a chart and to write a lengthy paragraph covering the causes and effects of activity along the Mid-Atlantic Ridge.

Name _____ Date _____

Write About It

Focus Questions

- What happens along the Mid-Atlantic Ridge?
- What is the cause?
- What are the long-term effects of this activity?

Make a chart that summarizes the main ideas about the causes and effects of the activity along the Mid-Atlantic Ridge.

Cause	Effect

Next, describe the activity along the Mid-Atlantic Ridge and then discuss what causes this activity and what the effects of it are. Directly answer the prompt in your topic sentence. Use details from your research to clearly explain the causes and effects. Discuss each cause and effect carefully. Wrap up your paragraph with a closing sentence that restates the main idea of your paragraph.

_____

_____

_____

_____

_____

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Fast Changes on Earth

Choose the letter of the best answer.

1. A river that overflows its sides may cause a(n)

   a. earthquake.
   b. flood.
   c. landslide.
   d. tsunami.

2. Earth's crust is made up of gigantic slabs of rock called

   a. craters.
   b. faults.
   c. hot spots.
   d. plates.

3. A large amount of rock and soil that rapidly moves downhill is a(n)

   a. earthquake.
   b. fault.
   c. landslide.
   d. tsunami.

4. An earthquake on an ocean floor can cause a

   a. river of mud.
   b. tsunami.
   c. volcano.
   d. wall of sand and mud.

5. Earthquakes are caused by

   a. a mudslide.
   b. gravity
   c. a sudden shift in Earth's plates.
   d. a tsunami.

Name _____ Date _____

Choose the letter of the best answer.

6. Where are hot spots located?

a. at the top of a volcano

b. where magma partially melts through Earth's crust

c. where two plates meet

d. a ring around the Pacific Ocean where most earthquakes happen

7. A mountain built up around an opening in Earth's crust is a(n)

a. crater.

b. eruption.

c. tsunami.

d. volcano.

8. A cuplike shape formed at the vent of a volcano is a

a. composite.

b. crater.

c. hot spot.

d. shield.

9. Heavy rains can soak the soil on a slope of land and cause a(n)

a. crater.

b. earthquake.

c. mudslide.

d. tsunami.

10. A break in Earth's crust is known as a(n)

a. crater

b. earthquake

c. fault

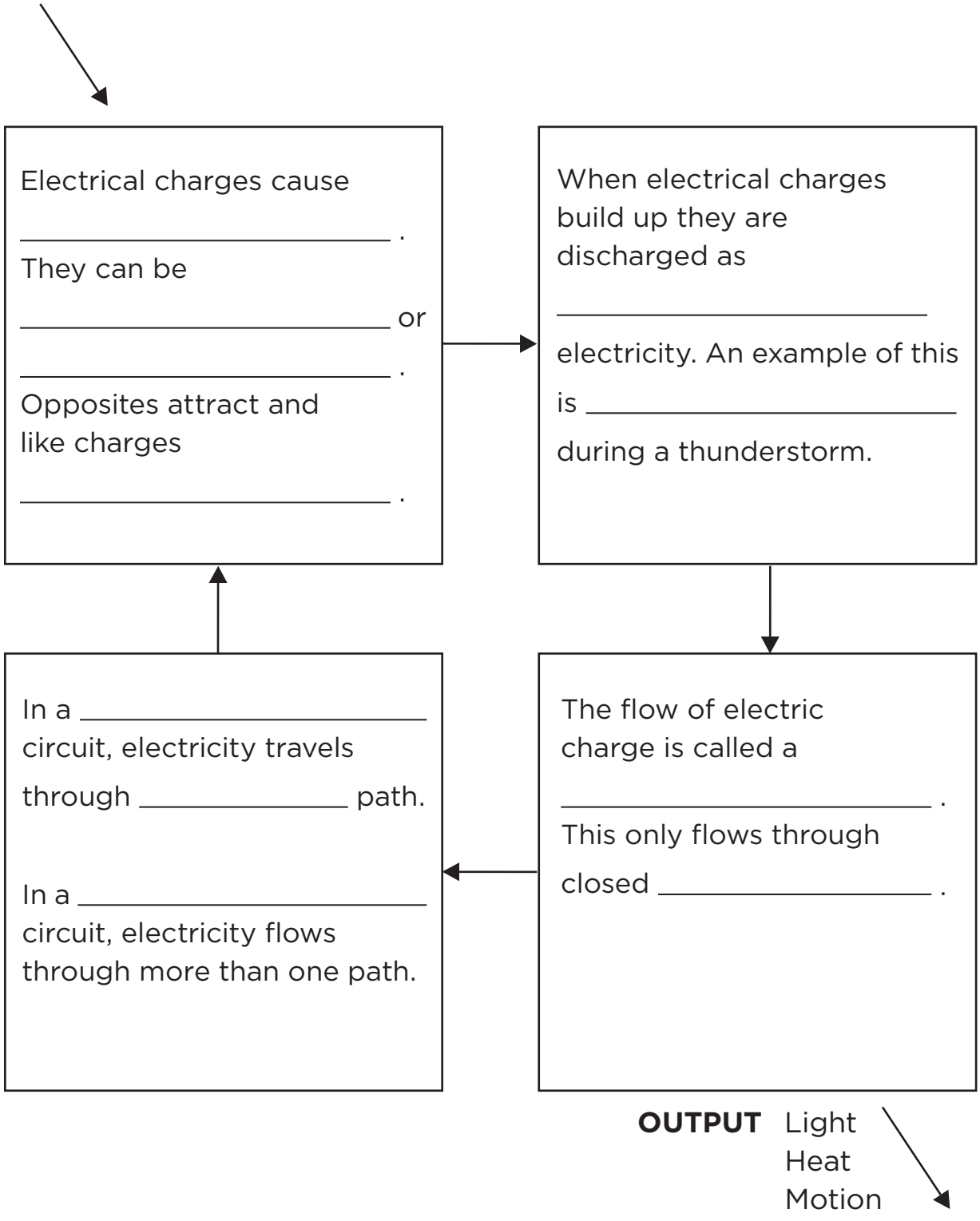
d. plate

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Electricity

INPUT



OUTPUT Light
Heat
Motion

Name _____ Date _____

Benjamin Franklin

Read the Literature feature in your textbook

Write About It

Response to Literature This poem shows how Ben Franklin made an incredible discovery. Do some research to find out more about Ben Franklin and electricity. Then write a report. Include facts and details from more than one source.

Name _____ Date _____ Outline

Static Electricity

Use your textbook to help you fill in the blanks.

What is an electrical charge?

1. Electrical charge is a _____ .
2. Scientists call the two types of electrical charges _____ and _____ .
3. When positive and negative charges _____ , the matter is said to be neutral.
4. A positive charge and a negative charge _____ one another.
5. The word "electricity" comes from the ancient Greek word for _____ .

What is static electricity?

6. When two objects touch, _____ between the objects.
7. The buildup of electrical charges on an object is called _____ .
8. When you hold a negatively charged balloon near a wall, it _____ the negative charges in the wall.

Outline Name _____ Date _____

What is an electrical discharge?

9. Lightning is the discharge of _____ inside a storm cloud.

10. A _____ is the movement of static electricity from one object to another.

11. _____ in a cloud push down on the negative charges in the ground.

12. The safest place in a lightning storm is _____ _____ .

What are conductors and insulators?

13. Copper and silver are examples of _____ because charges flow through them easily.

14. Electricians often wear rubber gloves to _____ themselves from getting an electrical shock.

15. The outside of an electrical wire is covered by an _____ such as rubber or plastic.

16. The insulator keeps the electricity inside the wire and _____ .

Summarize the Main Idea

17. What causes static electricity?

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Static Electricity

Match the vocabulary word with the correct description.

1. _____ electrical charge

2. _____ discharge

3. _____ conductors

4. _____ insulators

5. _____ static electricity

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

b. Positive and negative are the two types of this property of matter.

c. When clothes stick together after coming out of the dryer, they might have this buildup.

d. Walking across carpet and touching something metal can cause this movement of electricity.

e. Copper and other metals are good examples of these materials.

Cloze Test

Name _____ Date _____

Static Electricity

charged particles	electrical charges	negative
conductors	insulators	positive
discharge	movement	static electricity

Fill in the blanks.

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. Negative charges move more easily than positive charges.

The buildup of electrical charges is called _____ . It is what makes clothes stick together. A small shock can be received from a _____ of static electricity. A discharge is the _____ of static electricity from one object to another.

Metals like 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.

Name _____ Date _____ **Outline**

Electric Currents

Use your textbook to help you fill in the blanks.

What is electric current?

1. _____ can be made to flow continuously through materials.
2. A flow of electrical charges is known as an _____ .
3. The path along which electrical charges flow is called a _____ .
4. A complete, unbroken path is called a _____ .
5. Electric current cannot flow in an _____ .
6. A _____ is a part of a circuit that opens and closes the circuit.
7. Electric current travels from a _____ through one wire and prong.

Name _____ Date _____

What is a series circuit?

8. In a series circuit, all of the electrical charges flow _____ and along _____ .

9. If any part of a series circuit is removed or broken, the circuit is _____ .

What is a parallel circuit?

10. A parallel circuit is a circuit in which the electric current flows through _____ .

11. The _____ of a parallel circuit divide the electric current between them.

What affects electric current?

12. The amount of electric current that can flow through a circuit depends on _____ and _____ .

13. Voltage is measured in units called _____ .

14. Increasing the _____ of a circuit decreases the flow of electrical charges through it.

15. A _____ can stop the rest of the circuit from operating properly and can be dangerous.

Name _____ Date _____

Vocabulary

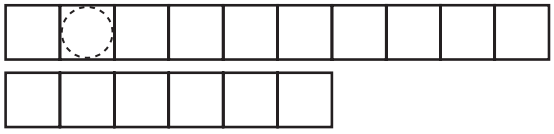
Electric Circuits

Unscramble each of the clue words. Take the letters that appear in the boxes marked with circles and unscramble the letters for the final message.

QUESTIONS

1. A property of matter

REIGELTCRALCACHE



2. A flow of electrical charges

RUTCENR

3. Can build up as static electricity and can be discharged

GESAHCR

4. The unbroken path along which an electric current flows

TIRCIUC

5. Status of a circuit that is complete and unbroken with flowing electric current

SECDOL

6. Status of a circuit that has breaks or openings in which electric current cannot flow

NEPO

7. Opens and closes the circuit

CHTISW

8. A circuit in which all electrical charges flow in the same direction and along the same path

SISREE

9. The strength of a power source that is measured in volts

EVLOGTA

10. The ability of a substance to slow down electric current

CANSETSERI

11. Circuit in which the electric current follows two or more paths that are called branches

LLLAPREA

Name _____ Date _____

Electric Currents

series circuit	parallel circuit	electric current
voltage	current	open
charges	branches	

Fill in the blanks.

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

All electrical charges flow in the same direction and along the same path in a _____ . If any part of a series circuit is removed or broken, the circuit is _____ .

A _____ is a circuit in which the electric current follows more than one path. These different paths are often called _____ .

The strength of a power source is its _____ .

Name _____ Date _____ **Outline**

Using Electrical Energy

Use your textbook to help you fill in the blanks.

How is electrical energy used?

1. An incandescent bulb produces _____ and light.
2. Inside incandescent bulbs is a thin wire called a _____ .
3. A fluorescent bulb uses a _____ to produce light.
4. Electrical energy can be converted into _____ .
5. Electric motors change electrical energy into _____ .

How does electrical energy get to your home?

6. _____ are used to change the voltage of electric current.
7. Electric current from a power plant enters a transformer. Electric current leaves the transformer with a strength of about _____ volts.
8. Appliances in a home usually run on _____ volt circuits.

Name _____ Date _____

How can homes use electrical energy safely?

9. _____ can cause electrical fires.

10. A _____ stops the flow of charges by switching off the current if it gets too high.

11. A short circuit might happen when the _____ of a wire frays.

12. A _____ melts and breaks the circuit if the electric current in the circuit gets too high.

13. Plugging too many devices into one circuit can also cause too much current to go through a _____ .

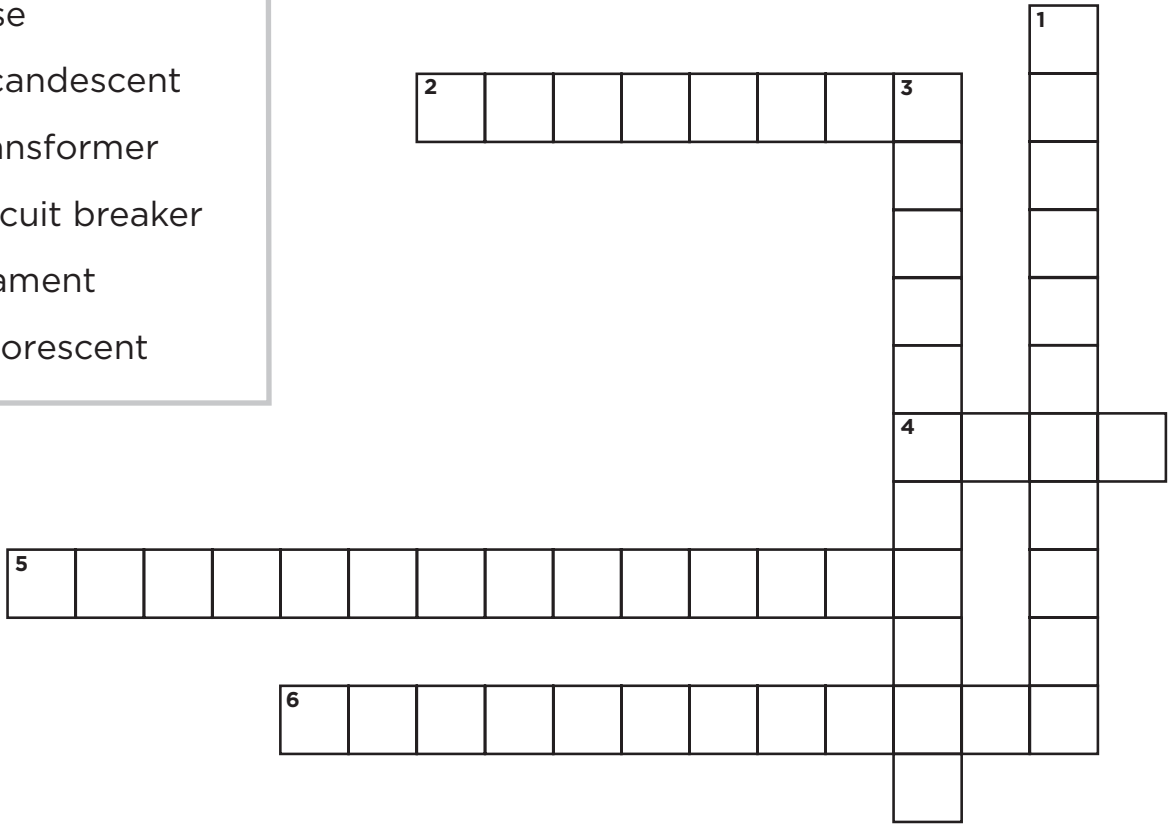
14. _____ stop the flow if there is too much electric current.

Name _____ Date _____

Vocabulary

Electrical Energy

fuse
incandescent
transformer
circuit breaker
filament
fluorescent



Across

2. A thin wire found in incandescent bulbs _____

4. Can melt to break the flow of electric current in a circuit _____

5. Can stop the flow of charges by switching off the current _____

6. A bulb that produces light and much heat _____

Down

1. A bulb that uses gas to produce light _____

3. Changes the voltage of electric current _____

Name _____ Date _____

Electrical Energy

fluorescent	heat	motion	transformers
electrical devices	incandescent	filament	

Fill in the blanks.

_____ change the energy in the electric current into other kinds of energy such as light, heat, and motion.

A(n) _____ bulb uses high temperatures to produce light. Inside incandescent bulbs is a thin wire called a _____ . A _____ bulb uses a gas to produce light. When an electric current passes through this gas, it glows.

Electrical energy can be converted into _____ . Electric motors change electrical energy into _____ . Electrical energy travels from a power station through wires and transformers to a home. _____ are used to change the voltage of an electric current. Safety devices such as fuses and circuit breakers are used to protect homes and stores from an electric overload.

Name _____ Date _____

Writing

Write About It

What do you use that works by electricity that you would have trouble doing without? Write an essay that explains how you use an electrical device. Use time-order words or spatial words to make your directions easy to follow.

Getting Ideas

Make a list of things you use that run on electricity. Choose one item to write about.

Planning and Organizing

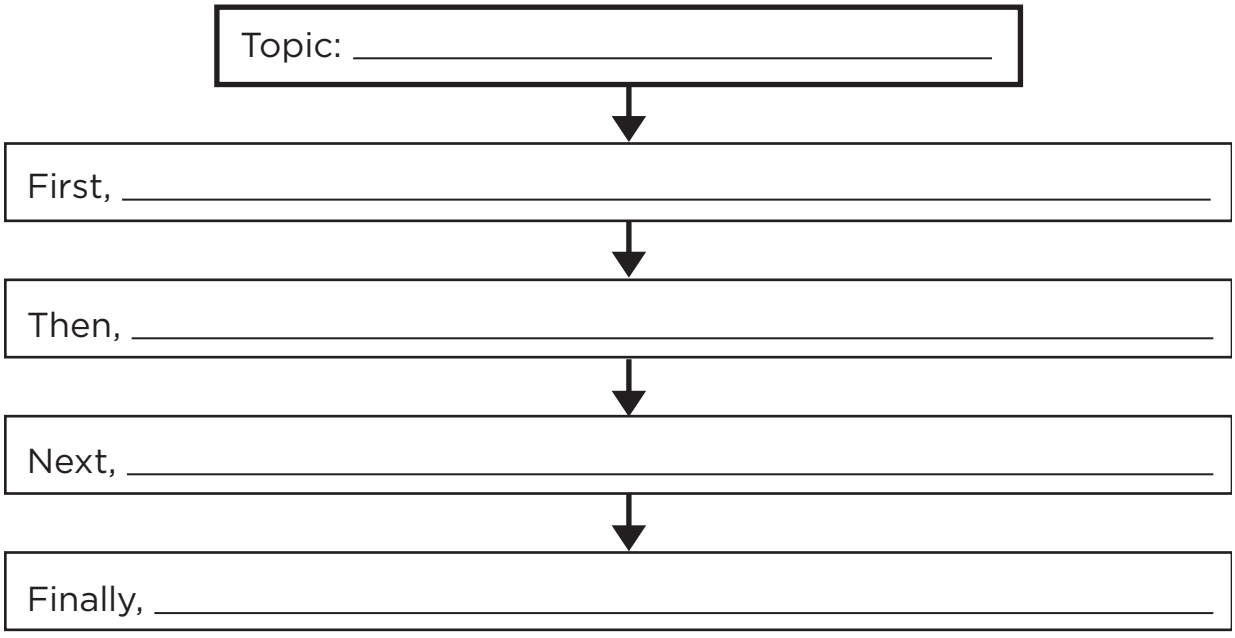
Jenna uses a hair dryer after every swim practice. Here are some steps that she wrote. Put 1 by the step that comes first. Put 2 by the step that comes second and so on. Number the last step 5.

1. _____ This makes electric current flow through the dryer and heat up the heating element.
2. _____ Lift your hair with a hairbrush and blow the hot air on it.
3. _____ Plug the hair dryer into an electrical outlet.
4. _____ Then the current makes the electric motor spin, turning the fan.
5. _____ Find the "on" switch and move it to the "hot" or "warm" position.

Name _____ Date _____

Drafting

Write steps you could use in your explanation. Use the chart below to help you. Write the name of the device on the line.



Now write the first draft of your explanation on a separate piece of paper. Write the steps in time order. Use transition words to connect the steps.

Revising and Proofreading

Here are some sentences that Jenna wrote. Combine each pair of sentences. Turn the second sentence into a prepositional phrase.

1. Make sure nothing blocks the airflow. It comes from the nozzle.

_____

2. Remove the plug. Take it from the electrical outlet.

_____

Now revise and proofread your explanation.

Name _____ Date _____

Reading

Hybrid Power

In cities like Los Angeles and Sacramento, millions of people drive cars. Most of the cars run on gasoline. There is a limited supply of gasoline in the world, and our cars make us very dependent on it. Also, the more gasoline the cars burn, the more they pollute the air. Pollution from cars contributes to a cloud of smog that sometimes covers a city like a blanket.

How can we become less dependent on gasoline and cut down on air pollution?

One way is to build better cars. Car companies have been working to develop hybrid cars. "Hybrid" is a word that describes something that is a mix of two different things. Hybrid cars use two different power sources—gasoline fuel and electrical energy.

In a traditional car, the gasoline engine runs all the time. But when the car is stopped at a light, sitting in traffic, or slowing down, power from the gasoline engine is not needed at all. At these times, the fuel that is used to keep the engine running is just being wasted.

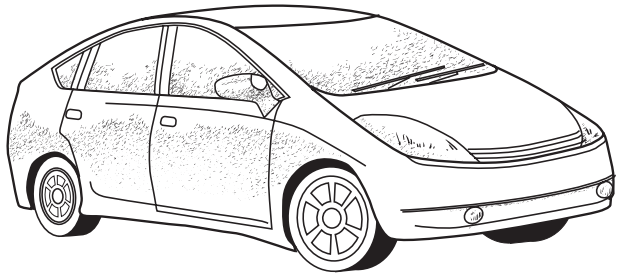
A hybrid car is designed so that it uses much less fuel than a traditional car. It combines a gas-powered engine with an electrical motor powered by batteries. When the car is stopped or slowing down, the gas-powered engine shuts off. The battery-powered motor takes over to keep the lights, air conditioning, and radio working. The batteries get recharged when the car slows to a stop. The car changes its energy of motion into electrical energy.

The gasoline engines in hybrid cars can be smaller and more energy efficient and still provide enough power to keep the car cruising on the freeway. This makes us less dependent on gasoline — and makes for a cleaner environment!

Name _____ Date _____

Main Idea

- The main idea is the focus of the entire article.
- Details support and explain the main idea.



Write About It

How do hybrid cars help people and the environment?

How does a hybrid car produce electrical energy?

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Electricity

Choose the letter of the best answer.

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

2. A safety device that switches off dangerous currents is a
   - **a.** circuit breaker.
   - **b.** insulator.
   - **c.** resistor.
   - **d.** transformer.

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

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

5. Rubbing wool on a balloon causes a buildup of electrical charges called
   - **a.** discharge.
   - **b.** resistance.
   - **c.** static electricity.
   - **d.** voltage.

6. Electric current flows through one path in a
   - **a.** transformer.
   - **b.** open circuit.
   - **c.** parallel circuit.
   - **d.** series circuit.

7. A device that protects against dangerous amounts of current is a
   - **a.** filament.
   - **b.** fuse.
   - **c.** volt.
   - **d.** transformer.

Name _____ Date _____

Choose the letter of the best answer.

8. The voltage of an electric current can be increased by a(n)

a. fuse.
b. insulator.
c. resistor.
d. transformer.

9. Charges flow easily through

a. conductors.
b. insulators.
c. plastic.
d. rubber.

10. 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.

11. Electric current flows through different paths in a

a. fuse.
b. open circuit.
c. parallel circuit.
d. series circuit.

12. The path of electric current is called a

a. circuit.
b. fuse.
c. switch.
d. transformer.

13. A property of matter that can be positive or negative is

a. electrical charge.
b. electric current.
c. resistance.
d. voltage.

14. Static electricity that moves from one object to another is a(n)

a. circuit.
b. discharge.
c. electric current.
d. transformer.

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Magnetism

ELECTROMAGNETISM

What causes a magnetic field to be produced around a wire?

_____

_____

How can an electromagnet be made?

_____

_____

How many poles do all magnets have?

_____

When is a magnetic field stronger? When is it weaker?

_____

_____

_____

What items in your house use electromagnetics?

_____

_____

Name _____ Date _____

Cruising on Air

Read the Literature feature in your textbook.

Write About It

In this article, you learned that Maglev trains use magnets to travel at very fast speeds. What are some ways you use magnets? Write a report about uses of magnets. Include facts and details from this article and your experience to support your writing.

Name _____ Date _____ **Outline**

Magnets

Use your textbook to help you fill in the blanks.

What is a magnet?

1. When you bring two magnets together, they will either _____ or attract each other.
2. A magnet is an object with _____ .

Magnetic Poles

3. The strongest parts of the magnet are called the _____ .
4. When two magnets are brought together, a north pole and a _____ attract each other.
5. The magnetic force between two magnets is _____ when the magnets are far apart.

How do magnets attract?

6. Most magnets are made of _____ .
7. Inside a magnet, the tiny particles are lined up with _____ facing one direction and south poles facing another.

Name _____ Date _____

What is a magnetic field?

8. Magnets point north because they line up with _____ magnetic field.

9. A _____ is the area of magnetic force around a magnet.

10. The magnetic field allows a magnet to _____ without even touching it.

11. Much of the inside of Earth is made of _____ .

12. The iron creates a magnetic field which _____ our planet.

13. Earth spins on its _____ , an imaginary line through the center of Earth.

14. The _____ is a display of lights near the South Pole.

15. A _____ is an instrument that uses Earth's magnetic field to help people find directions.

Summarize the Main Idea

16. How does a compass work?

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Magnets

a. attract	**d.** iron	**g.** magnetite
b. axis	**e.** magnet	**h.** poles
c. compass	**f.** magnetic field	

Use your textbook to help you fill in the blanks.

1. The inside of the Earth is made up of melted _____ .
2. Earth spins around on a(n) _____ , which is an imaginary line through the center of Earth.
3. A(n) _____ is any object with magnetic force.
4. A(n) _____ is the area of magnetic force around a magnet.
5. When two magnets are brought together, the north pole and the south pole _____ each other.
6. A(n) _____ is an instrument that uses Earth's magnetic field to find direction.
7. The parts of a magnet where the magnetic force is strongest are called the magnetic _____ .
8. _____ is a natural magnet containing iron.

Name _____ Date _____

Magnets

magnetite	permanent	push
metal	poles	repel
north	pull	temporary

Fill in the blanks.

Magnets come in many shapes and sizes. _____ magnets always have magnetic force. The strongest part of a magnet is the _____ . Like poles attract each other and unlike poles _____ each other. The mineral _____ is a natural magnet containing iron. When you bring a magnet near certain _____ objects like paper clips, tiny particles in the metal will line up. The tiny particles _____ and _____ in all different directions until they come in contact with a magnet. Then, the tiny particles line up facing the _____ pole and the south pole. The paper clip becomes a _____ magnet. It can attract other metal objects as well!

Name _____ Date _____ **Outline**

Electromagnets

Use your textbook to help you fill in the blanks.

What is an electromagnet?

1. When an electric current flows through a wire, it creates a _____ around the wire.
2. An _____ is a coil of wire wrapped around a core, usually an iron bar.
3. The magnetic field in the coil of wire causes _____ inside the metal core to become magnetic.
4. When a current in an elecromagnet stops, the metal core is no longer _____ .

How does a loudspeaker work?

5. A _____ is a device that changes electrical energy into sound.
6. The _____ is the part of the loudspeaker that vibrates to create sound.
7. When electric current flows through the electromagnet, it is pushed and pulled by the _____ .
8. The movement of the air is what we hear as _____ .

Name _____ Date _____

Telephones

9. A telephone receiver is actually a _____ .

10. The telephone mouthpiece is like a loudspeaker in _____ .

11. A _____ is a magnet used to convert sound into electric signals.

How else are electromagnets used?

12. Electromagnets are often more useful than ordinary magnets because they can be _____ .

13. Electromagnets are used in _____ that increase or decrease the voltage of electric currents.

14. They are also found in many household _____ such as doorbells, vacuum cleaners, and dishwashers.

Summarize the Main Idea

15. Why are electromagnets more useful than permanent magnets?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Vocabulary

Electromagnets

a. current	**d.** electromagnet	**g.** microphone
b. diaphragm	**e.** generate	
c. electric signals	**f.** loudspeaker	

Match the correct letter with the description.

1. _____ When a friend calls you on the phone, his or her voice is changed into this.
2. _____ This device uses a magnet to convert sound into electrical signals.
3. _____ The part of the loudspeaker that vibrates to create sound
4. _____ A device that changes electrical energy into sound
5. _____ To make an electric current
6. _____ When this is turned off, the electromagnet is no longer magnetic.
7. _____ A coil of wire wrapped around a core of iron

Name _____ Date _____

Electromagnets

diaphragm	electromagnet	Michael Faraday
electric current	loudspeaker	microphone
electric signals	magnetic field	sound

Electromagnets are very useful in our daily lives. In the 1820s, _____ and Joseph Henry made discoveries about electric current and magnets. They discovered that magnets could generate an _____ . When the current is flowing, it creates a _____ 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 _____ that uses a magnet to convert sound into electrical signals. Electromagnets are used in many household appliances and toys.

Name _____ Date _____ Outline

Motors and Generators

Use your textbook to help you fill in the blanks.

What is an electric motor?

1. A motor is a device that changes energy into _____ or motion.
2. A simple electric motor has a power source, a permanent magnet, a rotating loop of wire, and a _____ .
3. The _____ is a rod that can spin and move.
4. The electric current runs through the wire loop, making a _____ .
5. In larger motors, the _____ is made into a coil that is wound hundreds of times around an iron cylinder.

What is a generator?

6. An electric generator is a device that turns motion into _____ .
7. A generator changes _____ into electrical energy.
8. Generators produce nearly all of our _____ .

Name _____ Date _____

9. Fossil fuels, like _____ , coal, and _____ , can be burned to heat water, producing steam.
10. _____ power splits atoms that contain large amounts of energy.
11. _____ heat is used from inside Earth to produce steam.
12. Hydropower uses _____ to turn turbines and create energy.

What kinds of electric current are there?

13. AC or _____ flows in one direction and then flows in the opposite direction.
14. When the flow of current is always in one direction, it is called _____ , or DC.
15. A _____ is an example of a DC power source.

Summarize the Main Idea

16. How is an electrical generator the opposite of a motor?

_____

_____

_____

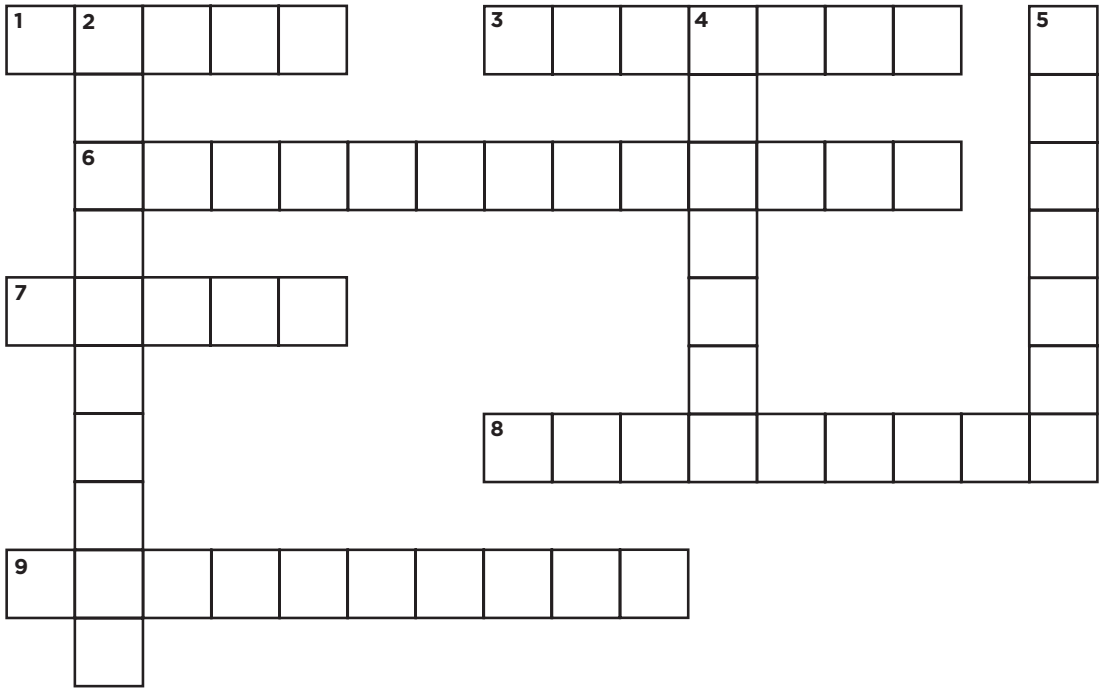
_____

Name _____ Date _____

Vocabulary

Magnets in Motion

Use words from the lesson to solve the crossword puzzle.



Across

1. A rod that can spin and move _____

3. An example of a DC power source _____

6. When the flow of a current is always in one direction _____

7. A device that changes energy into motion _____

8. A device that changes motion into electrical energy _____

9. Heat used from inside Earth to produce steam _____

Down

2. Flowing water used to create energy _____

4. A simple electric fan _____

5. Power source that splits atoms that contain large amounts of energy _____

Name _____ Date _____

Magnets in motion

alternating current	mechanical energy	shaft
battery	motor	turbines
direct current	nuclear	
generator	power source	

Fill in the blanks using the words in the box above.

An electric _____ is a device that changes electrical energy into _____ . It has a _____ , a permanent magnet, a rotating loop of wire, and a motor _____ . The opposite of an electric motor is an electric _____ , which changes motion into electrical energy. Different power plants use different sources of energy. Flowing water can turn _____ and create electrical energy. _____ power plants split atoms that contain large amounts of energy. Most generators produce _____ , which flows in one direction and then flows in the opposite direction. _____ always flows in one direction. A _____ is an example of a DC power source.

Write About It

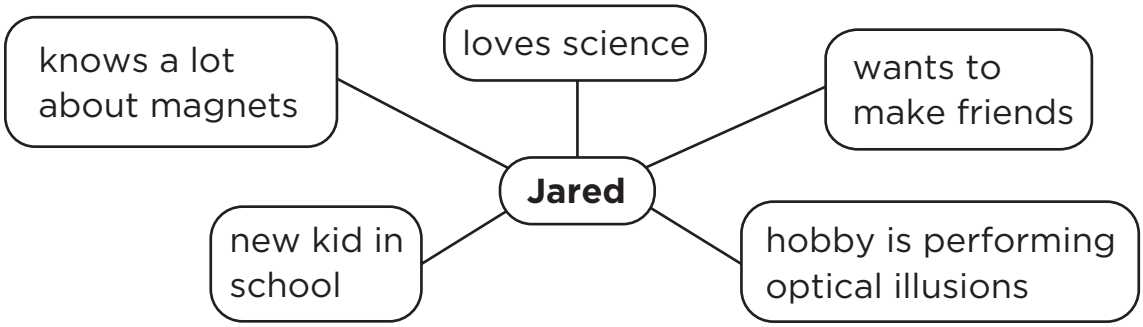
Write a story about a special way that a character uses a magnet.

Getting Ideas

A good story contains a problem that must be solved. On a separate piece of paper, make a list of problems you could solve using a magnet.

Planning and Organizing

Sam decided that his main character would be Jared. Here are some notes he made.



Now help Sam plan his story. Answer these questions:

1. What problem does Jared have?

_____

2. What does Jared know a lot about?

_____

3. What is his hobby?

_____

4. Put together everything you know about Jared. How do you think he can solve his problem?

_____

Name _____ Date _____

Drafting

Write a sentence to begin your story. Introduce your main character and the problem.

_____

_____

Now write the first draft of your story on a separate piece of paper. Introduce your main character and the problem. Tell how the character uses magnets to solve the problem. Put the events in order. At the end, show how the problem is solved.

Revising and Proofreading

Sam used dialogue in his story, but he didn't use punctuation correctly. Here is part of his story. Proofread it. Add quotation marks where needed.

I'll show you how the trick works, said Jared to his new friend. It's really a simple trick.

First, let me guess, Jorge cut in. I bet it has something to do with magnets.

Jared laughed. The chess pieces have magnets in their base. You can make them move by moving a magnet under the table.

Now revise and proofread your story. Ask yourself:

- Have I provided details that create a vivid setting?
- Have I included a plot with a problem?
- Have I developed my characters, or made them seem like real people?
- Have I put the events in sequence?
- Have I included a believable solution to the problem?
- Have I corrected all grammar errors?
- Have I corrected all spelling, punctuation, and capitalization errors?

Name _____ Date _____

Reading

Motors at Work

Refrigerators, vacuum cleaners, hair dryers, and fans have one thing in common. They all have a motor. You can use those motors today because of people such as Joseph Henry and Michael Faraday. In 1831 these two scientists discovered how to use electromagnets to turn electrical energy into motion.

A few years later, Thomas Davenport, a blacksmith in Vermont, learned about electromagnets and built the first simple motor. He used the device to separate iron from iron ore.

It wasn't long before people started inventing new devices that used motors. Washing machines, invented in the 1930s, use a motor to turn and wash your clothes. Another motor in a washing machine turns the water faucet on and off. Some of the first automobiles ran on electrical energy. Today many new cars use electric motors in addition to gasoline engines. Motors are useful for a lot of things! Can you think of any other machines that use electrical motors?

Problem and Solution

- A problem is something that needs to be solved.
- A solution is a plan that helps you solve a problem.

Name _____ Date _____

Write About It

Problem and Solution **How did Thomas Davenport first use his motor?**

- 1831 Michael Faraday and Joseph Henry each produce motion using electromagnets.
- 1834 Thomas Davenport builds motors for his tools, as well as an electric model train.
- 1888 The electric car, or "horseless carriage," is invented.
- 1891 Electric fans are sold by Westinghouse Electric & Manufacturing Company.
- 1901 H. Cecil Booth patents the vacuum cleaner.
- 1908 Washing machines use motors to spin and clean clothes.

Write about a problem you have had such as a messy room or a really hot summer day. How did an electric motor help you solve it? Brainstorm and write your ideas on a separate piece of paper.

Write a lengthy paragraph on a separate piece of paper. Discuss how an electrical motor helped you solve the problem you were facing. Directly answer the prompt in your topic sentence. Use details and your personal observations to clearly explain why this electrical motor helped you. Smoothly move from one idea to the next with transitional words. Wrap up your paragraph with a closing sentence that restates the main idea of your paragraph—how an electrical motor helped you solve a problem.

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Magnetism

Choose the letter of the best answer.

1. Magnetic force is strongest at the

   a. axis.
   b. center.
   c. magnetic field.
   d. poles.

2. A device that changes sound into electrical signals is a

   a. generator.
   b. loudspeaker.
   c. microphone.
   d. motor.

3. The device that changes electrical energy into mechanical energy is a

   a. generator.
   b. loudspeaker.
   c. motor.
   d. turbine.

4. Objects with magnetic force are called

   a. alternating.
   b. fields.
   c. generators.
   d. magnets.

5. Electric current that flows back and forth is called

   a. alternating current.
   b. direct current.
   c. magnet.
   d. open current.

Name _____ Date _____

Choose the letter of the best answer.

6. Which device changes mechanical energy into electrical energy?

a. generator **c.** motor

b. loudspeaker **d.** turbine

7. Electric current that flows in one direction is called

a. alternating current. **c.** turbine.

b. direct current. **d.** common wall outlet.

8. A magnet can attract or repel another object that enters its

a. alternating current. **c.** pole.

b. direct current. **d.** magnetic field.

9. A device that changes electrical energy into sound is a

a. turbine. **c.** microphone.

b. loudspeaker. **d.** motor.

10. An electromagnet is a magnet that

a. attracts any object. **c.** is permanent.

b. can be switched on and off. **d.** is weak.

11. A compass needle points

a. east. **c.** down.

b. north. **d.** west.