Reading and Writing in Science
Instructions for Copying

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

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Kingdoms of Life

Complete the concept map about the classification of living things. Some parts have been done for you.

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

Living Things

- need
- carry out

are classified in six

the five basic

Plants can be classified by their structures and how they reproduce.

Flowering plants follow a process that includes producing seeds and _____________.

spores
Cells

Use your textbook to help you fill in the blanks.

What are living things?

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

2. Living things need water, food, a place to live, and ________________ to survive.

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

4. All living things, also called organisms, are made of ________________ .

How do plant and animal cells compare?

5. All cells have smaller parts that work to keep the cells ________________ .

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

7. Animals cannot make their own ________________ because they do not have chlorophyll.
How are cells grouped?

8. Cells are grouped by the ___________________________ they do.

9. A group of similar cells that carries out a certain job is called a(n) ___________________________.

10. Tissues in a group are called a(n) ___________________________.

11. Plants and animals have many organs that work together in an organ ___________________________.

How can you see cells?

12. A microscope works like a magnifying glass by making something ___________________________ look much ___________________________.

Critical Thinking

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

__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________

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__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________
Cells

Use the clues to fill in the crossword puzzle.

Across

2. living thing
4. young organisms of parents
6. rigid outer covering of plant cells
7. similar cells working together

Down

1. five basic jobs of living things
2. organs working together
3. tissues working together
4. gas in the air
5. smallest part of a living thing
Cells

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

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<th>animal</th>
<th>grow</th>
<th>offspring</th>
<th>oxygen</th>
</tr>
</thead>
<tbody>
<tr>
<td>food</td>
<td>living</td>
<td>organisms</td>
<td>small</td>
</tr>
</tbody>
</table>

Everything in the world can be placed into one of two groups. There are ____________ things and nonliving things. All living things need water, food, a place to live, and ____________. Also, all living things carry out five life functions. They need ____________ for energy. Second, living things ____________ and develop. Third, they respond to the environment. Fourth, they have ____________. Fifth, living things get rid of wastes.

Living things, also called ____________, are made of cells. Cells are too ____________ to see with just your eyes. A tool called a microscope is used. Plant and ____________ cells have many things in common. Plant cells also have some special cell parts.
Classifying Living Things

Use your textbook to help you fill in the blanks.

How are living things classified?

1. Scientists place organisms into one of six groups, or ____________________.

2. Organisms in the same kingdom share basic ________________.

How are organisms grouped within a kingdom?

3. Traits are used to sort organisms into smaller ________________.

4. The smaller groups in a kingdom include
   a. phylum
   b. ________________
   c. ________________
   d. ________________
   e. ________________
   f. species

What kinds of organisms have only one cell?

5. Kingdoms that include organisms made up of one cell are ________________,
   ________________, and ________________.

6. One-celled organisms are also called ____________________.

7. Bacteria have no cell ________________.

8. Protists have a cell nucleus and special cell ________________ that do certain jobs.
9. Fungi have a cell nucleus and a(n) _______________, just as plants do, but they do not have chloroplasts.

**How are organisms named?**

10. The scientific name for an organism is made up of a genus name and _______________ name.

11. Scientists have not yet named _______________ the organisms on Earth.

**Critical Thinking**

12. Look at the chart on page 36 of your textbook. For each level of classification, identify a trait that the red squirrel does not have, and name an organism that would have that trait.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
Classifying Living Things

Match the correct word to its definition by writing the letter of the definition in the space provided.

1. ______ protists  
   a. a group of organisms with some members that make their own food and some that eat other organisms to live

2. ______ diseases  
   b. organisms made up of cells with a cell wall and a nucleus but without chloroplasts

3. ______ trait  
   c. the system used for identifying organisms

4. ______ fungi  
   d. the group made up of one type of organism

5. ______ kingdom  
   e. a characteristic of a living thing used to identify and classify it

6. ______ bacteria  
   f. the largest group into which organisms can be classified

7. ______ species  
   g. the smallest one-celled organisms

8. ______ classification  
   h. the harmful effects of some microorganisms
Scientists study the traits of living things in order to identify and classify them. Scientists divide Earth’s organisms into ______________ groups. The largest group, called a ______________, is divided into smaller groups, known as phylum, ______________, order, ______________, genus, and species.

Organisms in the same kingdom are ______________ to one another and are ______________ from organisms in the other kingdoms. Kingdoms are divided into smaller and smaller groups. The smallest group has only one type of organism and is called a ______________. Scientists use ______________ and species names to identify individual types of organisms. *Canis familiaris* is the scientific name for a dog.
Red Tide: A Bad Bloom at the Beach

You’re ready for some fun in the Sun. But when you get to the beach, it’s closed. Then you notice that the water is a strange color. You can put your swimsuit away. Your beach is a victim of red tide!

Red tide isn’t actually a tide. It is ocean water that is blooming with a harmful kind of algae. These one-celled organisms are poisonous to the sea creatures that eat them. The water isn’t always red, either. Sometimes it’s orange, brown, or green.

An outbreak of red tide can do a lot of damage. On the coast of Florida, one killed tens of thousands of fish, crabs, birds, and other small animals within a few months. It also killed large animals like manatees, dolphins, and sea turtles. Red tides can also make people sick if they eat infected shellfish.

Scientists are working to predict where and when red tides occur. They measure the amount of algae along coastlines. They use data collected from satellites to study wind speed and direction. This information helps scientists predict where blooms may develop. With their predictions, scientists help warn local agencies about future red tides.

Write About It

Infer What could you infer about a closed beach with reddish-colored water? How could the prediction of red tides be helpful to people?
What I Know

Complete each statement about red tides.

► A red tide is ______________ that is blooming with harming ______________ , ______________ organisms.

► Red tides can make people sick if they ______________ infected shellfish.

► A red tide in Florida killed tens of thousands of ______________ animals.

► Scientists are using ______________ to collect data about red tides.

What I Infer

Answer the questions by making inferences about red tides.

1. What could you infer about a closed beach with reddish-colored water?

2. How could the prediction of red tides be helpful to people?
The Plant Kingdom

Use your textbook to help you fill in the blanks.

How do we classify plants?

1. We can classify plants in ________________ groups:
   - those with and those ________________ roots, stems, and leaves.

2. One kind of plant without roots, stems, or leaves is ________________.

How do plants get what they need?

3. Plants make their own food by using ________________ trapped from sunlight.

4. Plants take in water and nutrients from the soil through their ________________.

Why are leaves important?

5. Plants use energy to change carbon dioxide and water into food, called ________________.

6. Plants get carbon dioxide through openings on the undersides of their leaves, called ________________.

7. A process called ________________ controls the amount of water stored in the leaves of a plant.

8. Photosynthesis ________________ food. Respiration ________________ energy.
What are mosses and ferns?

9. Mosses and ferns are plants that use ________________ to reproduce.

10. Spores are ________________ to the air and fall on the ground, where they begin to grow a new plant.

How do we use plants?

11. We use plants and plant parts such as bulbs, tubers, ________________ , ________________ , ________________ , and flowers for ________________ .

12. We also use plants for ________________ and ________________ .

Critical Thinking

13. If your family could grow only one kind of plant, which plant would be best for your family to grow?
The Plant Kingdom

Match the correct word to its description by writing the letter of the word in the space provided.

<table>
<thead>
<tr>
<th>a. epidermis</th>
<th>b. photosynthesis</th>
<th>c. respiration</th>
<th>d. root</th>
<th>e. root hairs</th>
<th>f. spore</th>
<th>g. stem</th>
<th>h. stomata</th>
<th>i. transpiration</th>
</tr>
</thead>
</table>

1. _______ the part of a plant that carries food and nutrients to and from the roots and leaves
2. _______ a cell in a seedless plant that can grow into a new plant
3. _______ tiny holes found on the underside of a leaf
4. _______ a process that breaks down food sugars and releases energy in a plant
5. _______ threadlike cells on a root that take in water and nutrients from the soil
6. _______ a plant part that takes up water and nutrients from the ground and holds the plant in place
7. _______ the thin, protective covering on a leaf that keeps water in the leaf
8. _______ the process that a plant uses to produce plant sugars from water, carbon dioxide, and energy from sunlight
9. _______ a process that allows a plant to control how much water it has
The Plant Kingdom

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

<table>
<thead>
<tr>
<th>energy</th>
<th>organisms</th>
<th>processes</th>
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</thead>
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<tr>
<td>food</td>
<td>photosynthesis</td>
<td>respiration</td>
</tr>
<tr>
<td>leaves</td>
<td>plants</td>
<td></td>
</tr>
</tbody>
</table>

Plants have the same needs as other living things. Plants need air, water, _________________, and a place to live. Plants get the energy they need in order to grow from the _________________ they make in their _________________.

Photosynthesis and respiration are two very important _________________ that happen in _________________. During _________________, food is produced as plant sugars and then stored. During _________________, energy is released for use by the plant. All _________________, not just plants, depend on respiration for survival. All organisms also depend on the food made by plants.
Flowers and Seeds

Use your textbook to help you fill in the blanks.

What kinds of plants have tubes?

1. Vascular plants have _______________ or vessels that transport water, food, and waste to all parts of the plant.

2. Scientists separate vascular plants into seedless plants and _______________.

3. Scientists then divide plants with seeds into plants that produce flowers and _______________.

How are seedless and seed plants different?

4. A seed contains a(n) _______________ and stored food used to develop and grow into a new plant.

5. This new plant shares the _______________ of the two plants that produced the seed.

6. Some vascular plants do not _______________ but grow from spores.

7. Most seed plants produce _______________.

8. _________________, and almost all nuts come from flowering plants.

9. Evergreens are seed plants that _______________.

10. They produce seeds inside a(n) _______________.
What do flowers do?

11. Flowers, the reproductive organ of flowering plants, usually have both ___________ parts.

12. Pollen grains are transferred from a flower’s ___________ to the female part of the flower, the pistil, or to another flower’s pistil.

13. This transfer is called ____________________ .

14. During fertilization, the pollen and egg cell join and ___________.

15. As the seed develops, the ovary enlarges until it becomes a(n) ___________, which protects the seeds inside it.

16. Many flowers smell sweet or have ___________ to attract beetles and flies.

Critical Thinking

17. What are two ways scientists divide vascular plants?

__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________
Flowers and Seeds

Match the correct word to its description by writing its letter in the space provided.

<table>
<thead>
<tr>
<th>a. fertilization</th>
<th>c. pistil</th>
<th>e. reproduction</th>
<th>g. stamen</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. ovary</td>
<td>d. pollination</td>
<td>f. spore</td>
<td>h. vascular</td>
</tr>
</tbody>
</table>

1. _______ cell used to reproduce by plants that do not have seeds
2. _______ formation of a seed by the joining of pollen and egg cells
3. _______ female part of a flowering plant, which produces eggs
4. _______ term for plants with tubes that carry water, food, and waste within the plant
5. _______ male part of a flowering plant, which produces pollen
6. _______ process used by all living things to make offspring
7. _______ female part of a flowering plant that turns into a fruit after fertilization
8. _______ movement of pollen from the stamen to the pistil, which may be done by animals
Flowers and Seeds

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

| evergreens | produce | spores | undeveloped |
| flowers    | seedless | tubes  | vascular    |

Many different kinds of plants have special features. Plants with ________________ that transport water, food, and waste to all parts of the plant are called ________________ plants. Vascular plants include ________________ plants and plants with seeds. Most common plants, such as fruits, vegetables, and herbs, ________________ seeds. Seeds contain a(n) ________________ plant and stored food.

Some vascular plants, such as horsetails, spike mosses, and ferns, do not produce seeds. Instead, these plants grow from ________________ . Some plants with seeds produce ________________ , which are the reproductive organ of some plants. ________________ are seed plants that do not produce flowers. These plants produce seeds inside a cone.
**Dandelions and Me**

**Write About It**

**Personal Narrative**  Think about a time you saw seeds being carried from place to place. Write a personal narrative about the event. Tell how it made you feel.

**Getting Ideas**

Picture the event in your mind. Jot down what happened in the chart below. Start with what happened first.

```
[Blank] → [Blank] → [Blank]
```

**Planning and Organizing**

Zoe wanted to write about the time she saw squirrels raiding the birdfeeder for sunflower seeds. Below are three sentences she wrote. Write “1” in front of the sentence that should be first. Write “2” in front of the sentence that should come next. Write “3” in front of the sentence that should be last.

1. At first, some chickadees and blue jays came to the feeder and ate the seeds.
2. After a few days, squirrels raided the feeder and carried seeds away.
3. Last spring, we filled the birdfeeder in our backyard with sunflower seeds.
Revising and Proofreading

Here is a part of Zoe’s personal narrative. Proofread it. She made five errors. Find the errors and correct them.

I laughed when I saw that Rascal of a squirrel run off with some seeds. I watched as the squirrel planted them. It would be fantastic if they grew? I waited about a week. Every day, I looked to see if the seeds had sprooted. Finally, there was a little seedling, I was so excited.

Drafting

Write a sentence to begin your personal narrative. Use “I” to identify youself. Make sure your sentence will grab your readers’ attention so that they will want to read your story.

Now write the first draft of your story. Use a separate piece of paper. Remember to tell what happened in sequence and to use time-order words.

Revising and Proofreading

Now revise and proofread your writing. Ask yourself:

- Did I use the pronoun “I” to tell my story?
- Did I tell what happened in sequence?
- Did I use time-order words?
- Did I correct all of the mistakes?
Kingdoms of Life

Circle the letter of the best answer.

1. A group of cells that do the same job forms
   a. an organ system.
   b. an organ.
   c. a cell.
   d. a tissue.

2. The protective covering on a leaf is its
   a. epidermis.
   b. stomata.
   c. root hairs.
   d. seed covering.

3. Into how many kingdoms do scientists place organisms?
   a. five
   b. six
   c. seven
   d. eight

4. The tiny holes on the underside of a leaf are the
   a. chlorophyll.
   b. epidermis.
   c. stomata.
   d. seeds.

5. How many basic jobs do living things perform?
   a. two
   b. three
   c. four
   d. five

6. A single cell that can grow into a new plant is called a
   a. spore.
   b. cone.
   c. stem.
   d. root.

7. What are the threadlike cells on a root?
   a. seeds
   b. root hairs
   c. runners
   d. cuttings

8. Tissues that form a group are called
   a. an organ.
   b. a cell.
   c. an organ system.
   d. a cell wall.
Circle the letter of the best answer.

9. What process allows extra water to escape from a leaf?
   a. fertilization
   b. pollination
   c. germination
   d. transpiration

10. The smallest group in a kingdom is called
    a. a phylum.
    b. a species.
    c. an order.
    d. a class.

11. The process by which plants release energy stored as food sugars is called
    a. transpiration.
    b. respiration.
    c. germination.
    d. pollination.

12. Which of the following do scientists use to name individual organisms?
    a. genus and species
    b. phylum and class
    c. family and order
    d. order and genus

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

14. What do scientists use to see one-celled organisms?
    a. microscope
    b. test tube
    c. balance scale
    d. tongs

15. The joining of male cells and female cells in a plant is called
    a. pollination.
    b. germination.
    c. respiration.
    d. fertilization.
Animal Kingdom

Complete the concept map about the animal kingdom. Some parts have been done for you.

- **Invertebrates:** have no ____________
  - Sponges: shaped like a sack
  - Cnidarians: have ____________
    - have shells
  - Echinoderm: spiny skins
  - Arthropods: ____________ group
  - Worms: three groups

- **Vertebrates:** have backbone
  - Fish: ____________ groups—jawless, cartilaginous, bony
  - ____________ live on land and water
  - Reptiles: ____________ -blooded
  - Birds: have ____________
  - Mammals: warm-blooded; have ____________

- **All animals have a life cycle.**
  - Birth
  - Growth: may include body change, or ____________
  - Reproduction

All animals have a life cycle.
Invertebrates

Use your textbook to help you fill in the blanks.

What are invertebrates?

1. Scientists keep track of Earth’s animal species by observing their similarities and ________________.

2. An animal with symmetry has body parts that match other body parts around a point or central ________________.

3. Animals can be classified by whether or not they have a(n) ________________.

4. Invertebrates make up the ________________ animal group on Earth.

What are some invertebrates?

5. The simplest invertebrates are ________________.

6. Sponges do not have ________________.

7. Invertebrates that have ________________ on tentacles are called ________________.

8. Clams, squid, and snails are soft-bodied invertebrates with hard shells and are called ________________.

9. Sea stars, sea urchins, and sand dollars are spiny-skinned invertebrates, called ________________.

10. All echinoderms have a support structure inside their bodies, called a(n) ________________.
What are arthropods?

11. Invertebrates with jointed legs and body sections are called ________________.

12. Arthropods have a hard outer covering, called a(n) ________________, that protects their bodies and holds in moisture.

How are worms classified?

13. Worms are classified as flatworms, ________________ , or ________________ worms.

14. Flatworms have ribbon-like bodies, and some types ________________ inside the bodies of other animals.

15. Roundworms have thin bodies with ________________ ends.

Critical Thinking

16. Why do you think the first way an animal is classified is by whether it is a vertebrate or an invertebrate?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

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________________________________________________________________________

________________________________________________________________________
Invertebrates

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

<table>
<thead>
<tr>
<th>arthropod</th>
<th>echinoderm</th>
<th>exoskeleton</th>
<th>mollusk</th>
</tr>
</thead>
<tbody>
<tr>
<td>cnidarian</td>
<td>endoskeleton</td>
<td>invertebrate</td>
<td>sponge</td>
</tr>
</tbody>
</table>

1. The hard outer covering that protects an invertebrate’s body is its ________________.
2. A spiny-skinned invertebrate, such as a sea star, is called a(n) ________________.
3. A(n) ________________ is an animal without a backbone.
4. A soft-bodied invertebrate, such as a clam or snail, is called a(n) ________________.
5. An invertebrate with jointed legs and a sectioned body is a(n) ________________.
6. An internal support structure in an animal is a(n) ________________.
7. An invertebrate with stingers at the end of tentacles is a(n) ________________.
8. The simplest kind of invertebrate is a(n) ________________.
**Invertebrates**

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

<table>
<thead>
<tr>
<th>arthropods</th>
<th>endoskeleton</th>
<th>mollusks</th>
</tr>
</thead>
<tbody>
<tr>
<td>backbone</td>
<td>exoskeleton</td>
<td>segmented</td>
</tr>
<tr>
<td>cnidarians</td>
<td>invertebrates</td>
<td>sponges</td>
</tr>
</tbody>
</table>

Scientists use various traits to classify Earth’s many animals. One way to classify animals is as vertebrates or _________________. Vertebrates have a(n) ____________________, and invertebrates do not.

Insects and arachnids are invertebrates called ________________ and have a hard outer ________________. Echinoderms are invertebrates that have a(n) ________________ inside their bodies. The simplest invertebrates are _________________.

Other invertebrate groups are ________________ with stingers and ________________ with soft bodies protected by hard shells. The final group of invertebrates is worms: flatworms, roundworms, and ________________ worms. Some kinds of flatworms and roundworms live inside the bodies of other animals.
Vertebrates

Use your textbook to help you fill in the blanks.

What are vertebrates?

1. Vertebrates are animals that have a(n) _________________.

2. Some vertebrates are _________________ and maintain their body temperature by breaking down food to make _________________.

3. Some vertebrates, such as fish, amphibians, and reptiles, are _________________ and cannot control their body _________________.

4. There are seven classes of vertebrates: mammals, _________________, reptiles, birds, and the three classes of _________________.

5. The three classes of fish are jawless fish, cartilaginous fish, and _________________ fish.

What are some other vertebrate groups?

6. A vertebrate that spends part of its life in water and part on land is called a(n) _________________.

7. Snakes, lizards, turtles, and crocodiles are _________________. They have tough, dry, scaly _________________ that holds in moisture.

8. The only animals that have feathers are _________________. They are also _________________.

What are mammals?

9. A warm-blooded vertebrate with hair or fur is a(n) _________________.

10. Female mammals produce milk to _________________.

11. Most mammals give birth to live young. Only a few _________________.

12. Kangaroos, koalas, and opossums carry their young in _________________ until they are grown.

13. The platypus and spiny anteater are the only mammals that reproduce by _________________.

Critical Thinking

14. Why do you think there are three separate groups of fish instead of one group for all fish?

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________
Vertebrates

What am I?

Choose a word from the box below that answers each question, and write the correct word in the space provided.

<table>
<thead>
<tr>
<th>amphibian</th>
<th>cartilage</th>
<th>reptile</th>
<th>warm-blooded</th>
</tr>
</thead>
<tbody>
<tr>
<td>bird</td>
<td>cold-blooded</td>
<td>vertebrate</td>
<td></td>
</tr>
</tbody>
</table>

1. ________________ I am a member of the second largest group of animals on Earth. Animals in my group have backbones. What am I?

2. ________________ I can keep my body at one temperature. I do this by breaking down food to make heat energy. What am I?

3. ________________ My body temperature changes with the surrounding temperature. What am I?

4. ________________ I spend part of my life in water and part on land. My skin must be kept moist. What am I?

5. ________________ Snakes and lizards are part of my group. We live on land and have tough, scaly skin. What am I?

6. ________________ I have scales and feathers and hollow bones that make my body light enough to fly. What am I?

7. ________________ I am rubbery and make up the skeletons in lampreys, sharks, and rays. What am I?
Vertebrates

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

<table>
<thead>
<tr>
<th>bony</th>
<th>invertebrates</th>
<th>warm-blooded</th>
</tr>
</thead>
<tbody>
<tr>
<td>cold-blooded</td>
<td>mammals</td>
<td>vertebrates</td>
</tr>
<tr>
<td>fur</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Invertebrates are the largest group of animals on Earth.
The second-largest group is ________________.
Vertebrates have backbones, and ________________ do not.

Some vertebrates keep their bodies at one temperature by eating food to make heat energy. These animals are ________________ and are classified as birds or ________________. Birds have feathers, and mammals have ________________ or hair. Other vertebrates are ________________. Cold-blooded animals are classified as jawless fish, cartilaginous fish, ________________, fish, amphibians, or _________________. The body temperature of cold-blooded vertebrates depends on their surroundings.
Gentle Giants

Write About It
Explanatory Writing  Find out more about another endangered animal. Write a short explanation of why it is endangered.

Getting Ideas
Select an endangered animal. Use the cause-and-effect chart below. Fill it in as you do research.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Planning and Organizing
Here are some sentences that Kristen wrote about lemurs. Circle the part of the sentence that tells the cause. Underline the part that shows the effect.

1. Lemurs are losing their habitat because people cut down trees for farming.
2. Some people hunt lemurs because they are afraid of them.
3. Every year there are fewer lemurs because they are hunted for food.
Revising and Proofreading
Here is part of Kristen’s explanation. She made six capitalization mistakes. Find the mistakes and correct them.

Lemurs live on madagascar and the comoro islands. These are islands off the coast of africa. Before humans arrived, there were many species of Lemurs. over time, at least fourteen species became extinct.

Drafting
Write a sentence to begin your explanation. Tell the name of the animal and your main idea about it.

Now write your explanation. Use a separate piece of paper. Begin with your topic sentence. Include facts and details to explain how the animal became endangered. End by telling what scientists are doing to save this animal.

Revising and Proofreading
Now revise and proofread your writing. Ask yourself:
- Did I explain how the animal became endangered?
- Did I tell what scientists are doing to save it?
- Did I correct all mistakes?
How Animals Change

Use your textbook to help you fill in the blanks.

What are the stages of an animal's life?

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

2. The life span of an animal can range from a few days to many ____________.

3. Organisms usually live long enough to reproduce and take care of their ____________.

What is metamorphosis?

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

5. Incomplete metamorphosis includes separate ____________ stages that are not very different. Complete metamorphosis includes growth stages that are ____________ at every stage.

How do animals reproduce?

6. All animals come from another animal, called a(n) ____________.

7. Some animals are born ____________, and some ____________ from eggs.
8. Budding and regeneration are types of reproduction.

9. Organisms that reproduce with one parent produce exact copies, or .

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

What is inherited?

11. Traits such as eye color, height, and body color are determined by before an organism is born.

12. Parents pass on to their , but other behaviors are learned.

Critical Thinking

13. Which kind of animal do you think would have a longer normal life span: one that had mostly inherited behaviors or one that had mostly learned behaviors? Why?
How Animals Change

What am I?

Choose the letter that matches the word from the box below to answer each question, and write the correct letter in the space provided.

<table>
<thead>
<tr>
<th>a. clone</th>
<th>d. instinct</th>
<th>g. life span</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. heredity</td>
<td>e. learned behavior</td>
<td>h. metamorphosis</td>
</tr>
<tr>
<td>c. inherited behavior</td>
<td>f. life cycle</td>
<td></td>
</tr>
</tbody>
</table>

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

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

3. ______ I am the process that gives some animals very different body forms as they grow. What am I?

4. ______ I am the offspring of only one parent. I am an exact copy of my parent. What am I?

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

6. ______ I am the behavior with which an organism is born. What am I?

7. ______ I am a behavior that an organism gains from experience. What am I?

8. ______ I am an example of inherited behavior. What am I?
How Animals Change

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

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

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

The stages of growth can be ____________________ or ____________________ and different, a process called ____________________ . The life cycle of every animal begins with birth and ends with death.
Meet Christopher Raxworthy

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

Write About It

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

Compare and Contrast

Fill in the Compare and Contrast graphic organizer. Tell how the frog and the chameleon are alike and how they are different. Then, answer the question in the box above on a separate piece of paper.

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

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Chapter 2 • The Animal Kingdom
Reading and Writing
Compare and Contrast
Read the paragraph below. Compare and contrast the work of Christopher Raxworthy and the scientists in Madagascar with that of the scientists at the San Diego National Wildlife Refuge.

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

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

Circle the letter of the best answer.

1. An animal that lives part of its life in water and part of it on land is
   a. an amphibian.
   b. a reptile.
   c. a mammal.
   d. a fish.

2. What is an arthropod?
   a. an invertebrate with a spiny skin that lives in the ocean
   b. an invertebrate that remains anchored to one spot
   c. an invertebrate that lives inside the body of another animal
   d. an invertebrate with jointed legs and a body divided into sections

3. The only warm-blooded animals with a body covering of feathers are
   a. snakes.
   b. birds.
   c. mammals.
   d. fish.

4. One trait that all mammals share is
   a. having hair or fur.
   b. giving birth to live young.
   c. holding young in pouches.
   d. being cold-blooded.

5. An organism that is produced by only one parent organism is called
   a. an egg.
   b. an embryo.
   c. a clone.
   d. a seed.

6. The passing of traits from parents to their offspring is known as
   a. cloning.
   b. heredity.
   c. instinct.
   d. behavior.
Circle the letter of the best answer.

7. A cold-blooded animal
   a. cannot control its body temperature.
   b. can control its body temperature.
   c. uses the food it eats to make heat energy.
   d. has a short life span.

8. What is an instinct?
   a. a learned behavior
   b. a learned trait
   c. an inherited behavior
   d. an inherited trait

9. Which of these animals goes through complete metamorphosis?
   a. ants and spiders
   b. earthworms and damselflies
   c. grasshoppers and termites
   d. mealworms and butterflies

10. A hard protective outer covering that keeps in moisture is
    a. an endoskeleton.
    b. an exoskeleton.
    c. a backbone.
    d. a scale.

11. If an animal’s body parts match around a point or central line, that animal has
    a. endoskeleton.
    b. symmetry.
    c. exoskeleton.
    d. instinct.

12. Animals are classified as vertebrates if they
    a. do not have a backbone.
    b. have a backbone.
    c. can move.
    d. live on land.
Ecosystems contain living factors known as:
1. __________
2. __________
3. microorganisms

Examples of factors are:

Ecosystems can be broken down into six different factors:
1. __________
2. __________
3. tropical rain forest
4. __________
5. __________
6. desert

Ecosystems go through changes:
1. __________
2. __________
3. __________

Ecosystems contain nonliving factors known as:
1. __________

Examples of factors are:

Change can be caused by:
1. natural events
2. __________
3. __________
Introduction to Ecosystems

Use your textbook to help you fill in the blanks.

What is an ecosystem?

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

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

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

4. Ecosystems can be very large or ________________.

5. Living and nonliving things in an ecosystem ________________ on each other to survive.

6. The place in an ecosystem in which each organism lives is that organism’s ________________.

7. Different ecosystems have ________________ types of habitats.

What is a food web?

8. Energy passes from one organism to another in a(n) ________________.

9. Animals that ________________ other animals are predators. The animals they eat are prey. Some animals are ________________ predator and prey.
10. Animals and plants ______________ against each other to obtain food, water, and other things they need. That struggle is called competition.

What are populations and communities?

11. Ecosystems have different ______________ of species.

12. All the populations in an ecosystem make up a(n) ______________.

13. Different ecosystems have different communities of ______________ things.

14. Warm and wet ecosystems usually have larger communities than ______________ and ______________ ecosystems.

Critical Thinking

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

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Introduction to Ecosystems

Read each clue. Write the answer in the blank and fill in the crossword puzzle.

**Across**

1. members of one kind of organism in an ecosystem

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

5. all of the populations in an ecosystem

6. every living thing’s place to live in an ecosystem

8. typical weather pattern in an environment

**Down**

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

3. all the living and nonliving things in an environment

4. how all food chains in an ecosystem are connected

7. the living factors of an ecosystem, such as plants
All the living and nonliving things in an area make up the environment. The living things, such as plants and animals, are called _________________. Nonliving things, such as water and soil, are called _________________. The biotic and abiotic factors in an environment work together to form a(n) _________________.

Ecosystems can be large or _________________. They can also have very different _________________. Some ecosystems are hot and _________________, and others are cold and wet. Ecosystems that are warm and _________________ tend to have more organisms living in them. Different ecosystems have _________________ that are suited to different types of living things. For example, a desert community is suited to cactuses and lizards.
Biomes

Use your textbook to help you fill in the blanks.

What is a biome?

1. A large ecosystem with a unique set of characteristics is called a(n) ________________.

2. Some biomes can be found only in certain places on ________________, while others can stretch across an entire ________________.

What are grasslands and forests?

3. A biome whose plant life includes mostly grasses growing in its ________________ soil is a(n) ________________.

4. During hot, dry summers, ________________ burn, and this produces rich soil for farming.

5. Oaks and maples in ________________ forests lose their leaves each year.

6. The ________________ has three distinct levels where a(n) ________________ of organisms live.

What are deserts, taiga, and tundra?

7. Cactuses and yucca plants survive in the ________________, where the temperature gets as high as ________________ and as low as ________________.

8. Black bears and fir trees live in the ________________, the largest biome in the world.
9. The tundra is home to mammals that _________________
or leave during winter and plants that grow close to the
frozen _________________.

Are there water biomes?
10. Earth has two main water ecosystems: _________________
    and _________________.

11. Freshwater ecosystems include lakes, ponds, rivers,
    _________________, and some _________________.

12. Saltwater ecosystems differ by the water’s _________________,
    and _________________ from shore.

Critical Thinking
13. Why do you think so many different organisms live in
    the tropical rain forest?

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Biomes

Match the correct word to its description by writing its letter in the space provided.

1. ______  This is one of six major ecosystems that has its own special plants, animals, soil, and climate.

2. ______  This biome, such as a prairie, has fertile soil and enough rain for grasses but not enough rain for trees to grow.

3. ______  Many trees in this biome lose their leaves every year in autumn.

4. ______  This biome is located near the equator. It is hot and humid year round. It is home to a large variety of plants and animals.

5. ______  Earth’s northern regions are the location of this forest biome. Its plant life includes large numbers of conifers.

6. ______  This hot, dry biome gets little rain and has few varieties of plant and animal life.

7. ______  The ground is frozen year round in this harsh biome.
Biomes

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

<table>
<thead>
<tr>
<th>biomes</th>
<th>characteristics</th>
<th>harsh</th>
<th>taiga</th>
</tr>
</thead>
<tbody>
<tr>
<td>deciduous forest</td>
<td>cold</td>
<td>hot</td>
<td>tropical rain forest</td>
</tr>
<tr>
<td>populations</td>
<td>organisms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Earth has six major ecosystems. These ecosystems, also known as __________________, have their own __________________, including temperature, precipitation, and soil. Each biome also has a special community made up of different __________________ of plants and animals.

Three of the biomes, the grassland, __________________, and __________________, have a climate suitable to a variety of __________________. The other three biomes have __________________ conditions. The __________________ and tundra have very __________________ environments. Deserts have very __________________, dry environments. There are fewer plants and animals in these three biomes.
Museum Mail Call

Read the selection from your textbook. Look for information about how building affects an ecosystem. On a separate piece of paper, write the sentences that state facts about the mangrove swamp.

Write About It

Draw Conclusions  What might happen to the plants and animals of Florida’s wetlands if people continue to build there?

Fill in the Draw Conclusions graphic organizer about the mangrove swamp.

<table>
<thead>
<tr>
<th>My Prediction</th>
<th>What Happens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many mangroves are being replaced by stores, _____________________________, and parking lots.</td>
<td>Cutting down the mangrove trees will change the __________________________.</td>
</tr>
<tr>
<td>The mangroves are home to many __________________________________________.</td>
<td>Loss of the mangroves will affect the population of the ___________________.</td>
</tr>
<tr>
<td>Mangrove roots provide shelter for ______________________________________.</td>
<td>Animals will have to find a new habitat, and some species may not __________.</td>
</tr>
<tr>
<td>The mangroves protect the __________________________ from wind, waves, and floods.</td>
<td>The coast will not be protected from winds, waves, and ____________________.</td>
</tr>
</tbody>
</table>
Reread Tommy’s message. If you were one of the museum’s scientists, how would Tommy’s note help you? What would you and other museum scientists do to keep the mangroves safe? How would you protect the plants and animals that live in the mangroves? Write an informative response to Tommy and answer his question.

TO: Tommy
FROM: American Museum of Natural History
SUBJECT: Save the Mangroves!

Dear Tommy,

[Paragraphs for students to fill in their responses]
Animal Adaptations

Use your textbook to help you fill in the blanks.

What are adaptations?

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

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

3. Physical (body) traits and ____________ are two kinds of adaptations that help animals to survive.

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

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

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

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

What are some other adaptations of animals?

8. Animals can avoid cold winters by ____________ or by leaving the area until the weather gets warmer.
9. Some animals have adaptations, such as the _______________ on a hedgehog, to protect themselves from _______________ .

10. Some animals _______________ themselves and blend in with the colors and shapes in their environments.

11. Hover flies use _______________ to look like other, more dangerous organisms.

How do animals sense changes?

12. Animals have _______________ systems that let them control their bodies.

13. Invertebrates have a simple nervous system, but the ones in vertebrates are more _______________ .

14. With this system, animals can use their _______________ , such as sight and smell, to learn about their surroundings.

Critical Thinking

15. An animal has large, flat teeth good for chewing tough plants; brown fur; and the ability to run fast. In which biome would these adaptations be useful? Why?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Animal Adaptations

Choose a word or words from the box below that completes each statement, and write the correct words in the space provided.

adaptation  hibernate  nervous system  prey
camouflage  mimicry  predators

1. Some animals have traits that they use to protect themselves from ____________________.

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

3. The brain is an important part of a mammal’s ____________________.

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

5. Animals that serve as food for other animals are called ____________________.

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

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

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

<table>
<thead>
<tr>
<th>adaptations</th>
<th>behavior</th>
<th>challenges</th>
<th>different</th>
<th>predators</th>
<th>avoid</th>
<th>camouflage</th>
<th>colors</th>
<th>mimicry</th>
<th>survive</th>
</tr>
</thead>
</table>

All ecosystems present challenges to the organisms that live there. Living things have different _______________ that make them better suited to the _______________ in their environments and help them _______________.

Survival in _______________ environments requires different adaptations. An organism with _______________ can hide from _______________ because it blends in with the _______________ and shapes of its environment. An organism that has _______________ is copying the physical traits and _______________ of other organisms that predators usually _______________. Different animals have different adaptations and different behaviors, but all of them have the same goal—survival.
Plants and Their Surroundings

How do plants respond to their environment?

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

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

3. The response of a plant to a stimulus is called ___________.

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

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

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

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

What are some plant adaptations?

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

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

11. The trees live on food until spring, when new leaves grow and the plant makes food again.

Critical Thinking

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

______________________________________________________________

______________________________________________________________

______________________________________________________________

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______________________________________________________________

______________________________________________________________
Plants and Their Surroundings

Choose a word from the box below that completes each statement, and write the correct word in the space provided.

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

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

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

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

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

5. The reaction of plants to any stimulus is called ________________.

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

7. A plant responds to gravity in two ways: its roots grow downward, and its green stems grow ________________.
Plants and Their Surroundings

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

<table>
<thead>
<tr>
<th>adaptations</th>
<th>leaves</th>
<th>tropisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>direction</td>
<td>light</td>
<td>water</td>
</tr>
<tr>
<td>ecosystem</td>
<td>respond</td>
<td>stimulus</td>
</tr>
<tr>
<td>food</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plants, like animals, have traits that help them survive in their environments. Plants in a desert ________________ have ________________ for storing ________________. Deciduous trees lose their ________________ in the fall. They live on stored ________________ until the leaves grow back in the spring.

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

Write About It

Descriptive Writing  Do some research about another plant. Write a description of how this plant reacts to its environment.

Getting Ideas

First, choose a plant. Write its name in the center circle in the web below. Do some research. Write details you find about this plant in the outer circles.

Planning and Organizing

Alberto decided to describe the saguaro cactus. Here are some sentences he wrote. Identify the sense to which the details in the sentence appeal. The five senses are sight, hearing, taste, smell, and touch.

1. ___________________ The saguaro cactus has a smooth, waxy skin.
2. ___________________ It has pretty white flowers with yellow centers.
3. ___________________ The cactus makes a sweet nectar.
Drafting

Write a sentence to begin your description. Tell what plant you are writing about.

Now write your description. Use a separate piece of paper. Begin with the sentence you wrote above. Use vivid details and sensory words to describe the plant.

Revising and Proofreading

Here is part of Alberto’s description. He left out some sensory words. Choose words from the box or pick your own. Write them in the blanks.

- hot
- massive
- spiny
- white

The saguaro cactus stood alone in the middle of the ____________ desert. Its long ____________ arms seemed to reach for the Sun. Its ____________ stem was about 20 inches in diameter. Its beautiful ____________ flowers waited for the Sun to go down. Then they bloomed.

Now revise and proofread your writing. Ask yourself:

- Did I describe how a plant responds to the Sun?
- Did I include details and sensory words?
- Did I correct all mistakes?
Changes in Environments

Use your textbook to help you fill in the blanks.

What causes an ecosystem to change?

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

2. Some changes make it difficult for plants and animals to ________________.

3. Some changes are long lasting, such as those caused by a volcano, hurricane, ________________, or fire.

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

How do people change ecosystems?

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

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

7. Some examples of how people change ecosystems are ________________, overpopulation, and ________________.
What happens when ecosystems change?

8. Some living things survive changes by changing their
   __________________________ and habits.

9. An individual organism’s response to changes is
called a(n) __________________.

10. When an entire kind of organism cannot adapt and
    most of its members have died, it is ________________.
    When no members are left, it is ________________.

How can people prevent extinction?

11. Scientists try to keep animals from becoming
    endangered or ________________ by
    __________________________ places where they live.

Critical Thinking

12. Why do you think birds and other small animals might
    move to an alligator hole even if an alligator might
    eat them?
   _______________________________________________
   _______________________________________________
   _______________________________________________
   _______________________________________________
   _______________________________________________
   _______________________________________________
Changes in Environments

What am I?

Choose a word from the box below that answers each question, and write the correct letter in the space provided.

<table>
<thead>
<tr>
<th>a. accommodation</th>
<th>c. endangered</th>
<th>e. overpopulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. deforestation</td>
<td>d. extinction</td>
<td>f. pollution</td>
</tr>
</tbody>
</table>

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

2. _______ I make the air, land, or water in an ecosystem dirty and unsafe. What am I?

3. _______ I am what happens when a forest is cut down to make room for roads and buildings. What am I?

4. _______ I am the result of more and more living things moving into an ecosystem, taking up more space, and using more resources. What am I?

5. _______ I am what happens to an entire kind of organism when its last member dies. What am I?

6. _______ I am the ability of some living things to survive changes in an ecosystem by changing their behavior and habits. What am I?
Environments are always changing. An ecosystem can be changed by ________________ events, like a volcano, drought, or ________________. These changes can be _________________ or long lasting.

Living things can also affect ecosystems. Swarms of locusts have a(n) _________________ effect, but alligators can have a(n) _________________ effect.

People can harm an ecosystem with ________________, or help it by _________________ its resources.

When ecosystems are changed, organisms survive by changing their habits and behaviors through _________________. If a type of organism cannot _________________, its members die out. If all of the members die out, that plant or animal becomes extinct.
Mail Call

In your textbook, read the letter Clara wrote to the museum scientists. Write the sentence that describes the sudden event that caused the change in the chaparral.

________________________________________________________________________

Write the sentences that Clara uses to describe the changes in the chaparral.

1. ______________________________________________________________________

2. ______________________________________________________________________

3. ______________________________________________________________________

4. ______________________________________________________________________

Write About It

Predict  Read the letter again. Predict what the chaparral will be like next year. What might happen to the environment if there is a drought? Write your predictions in the form of a paragraph.
**Predict**

Complete the graphic organizer below. Given the predictions shown, tell what you think will happen.

<table>
<thead>
<tr>
<th>Prediction</th>
<th>What Will Happen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Another drought will occur during summer.</td>
<td></td>
</tr>
<tr>
<td>Another wildfire will occur in the chaparral environment next year because of the lack of rain in summer.</td>
<td></td>
</tr>
<tr>
<td>Seeds from monkey flower and scarlet larkspur will burn in the wildfires.</td>
<td></td>
</tr>
<tr>
<td>Fields of wildflowers will grow.</td>
<td></td>
</tr>
<tr>
<td>Shrubs and bushes will grow.</td>
<td></td>
</tr>
</tbody>
</table>

Now write a paragraph describing what might happen if a drought were to affect the chaparral next year.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Living Things in Their Environments

Circle the letter of the best answer.

1. An animal that blends into the colors and shapes of its environment shows
   a. accommodation.
   b. hibernation.
   c. mimicry.
   d. camouflage.

2. All the pine trees in a forest make up a group of organisms called
   a. a community.
   b. an ecosystem.
   c. a habitat.
   d. a population.

3. Which of the following is NOT a biome?
   a. desert
   b. mountain
   c. tropical rain forest
   d. taiga

4. Animals that struggle for the same resources are involved in
   a. adaptation.
   b. competition.
   c. migration.
   d. protection.

5. Some animals save energy during winter by
   a. hibernating.
   b. accommodating.
   c. stimulating.
   d. camouflaging.

6. Cutting down an entire forest to build roads or buildings is called
   a. accommodation.
   b. adaptation.
   c. deforestation.
   d. deconstruction.
Circle the letter of the best answer.

7. Some organisms look like other, more dangerous organisms, which is called
a. response.
b. mimicry.
c. camouflage.
d. accommodation.

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

9. When all of its members have died, a kind of plant or animal is
a. environmental.
b. endangered.
c. in the ecosystem.
d. extinct.

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

11. A food web shows how the organisms in an ecosystem are
a. different sizes and shapes.
b. connected by the need for energy.
c. sharing the same habitats.
d. similar in their adaptations.

12. Which of these biomes has the richest variety of life?
   a. deciduous rain forest  
   b. grassland  
   c. tropical rain forest  
   d. tundra

13. Which group of animals has the simplest nervous system?
   a. birds  
   b. fish  
   c. invertebrates  
   d. mammals
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 the poet is describing? Write a story that tells what might happen next.
The Solar System and Beyond

Complete the concept map about the solar system. Some parts have been done for you.

The Universe
The universe is made up of 100 billion ____________, each with 200 billion ____________. Stars are glowing balls of gases.

The Solar System
The solar system includes an average star, ____________, eight orbiting ____________, many ____________, and smaller bodies, such as ____________ and ____________.

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

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

Use your textbook to help you fill in the blanks.

**How does the Sun’s position in the sky seem to change?**

1. Earth completes one rotation on its ________________
   every ________________ hours.

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

3. The stars and other objects appear to move across
   the sky each night because of Earth’s ________________.

**What causes seasons?**

4. Each year, Earth completes one ________________ around the Sun.

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

6. In summer, the Sun’s light is ________________ intense.

7. In December, the North Pole is tilted ________________ the Sun, so sunlight hits the Northern Hemisphere at
   a(n) ________________ angle.

8. When it is winter in the Northern Hemisphere, it is
   ________________ in the Southern Hemisphere.
How does the Sun affect Earth?

9. Sunlight starts all because plants use its energy to make their own food and then animals eat the plants.

10. Some of the Sun's energy is stored in fossil fuels such as , , and natural gas. By burning these fuels, people can their energy.

11. The Sun controls Earth's weather by warming water to make and air to make .

What is the Sun like?

12. The Sun, like other stars, is full of that burn. It seems brighter than other stars because it is to Earth.

13. The Sun poses dangers, too. It is not safe to look at the Sun. People who will be out in the Sun should wear to protect their skin.

Critical Thinking

14. What would be different if Earth rotated and revolved in the opposite direction? What would be the same?
Earth and Sun

Match the correct word or words with their descriptions by writing its letter in the space provided.

a. apparent  
b. axis  
c. fossil fuel  
d. orbit  
e. revolution  
f. rotate  
g. seasons  
h. shadows

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

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

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

Earth also completes a(n) ____________ around the Sun. Because ____________ is revolving on a tilted ____________, there are ____________. During the ____________, the Sun’s rays hit the Earth at steep angles and the light is bright. In winter, ____________ reaches Earth at a low angle. The seasons in the ____________ Hemisphere are the opposite to those in the Northern Hemisphere.

The Sun is the source of all ____________ on Earth. This includes the energy produced by ____________ and the energy ____________ in fossil fuels. The Sun also controls much of Earth’s weather.
Without the Sun

Write About It

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

Getting Ideas

First

Next

Last

Planning and Organizing

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

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

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

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

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

- black
- brilliant
- chilly
- total

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

Drafting

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

____________________________________________________________________________________

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

Now revise and proofread your writing. Ask yourself:

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

What is the Moon like?

1. Moonlight is reflected light from the ____________.

2. Earth’s closest neighbor in space is the ____________.

3. The Moon has ____________ similar to those on Earth but no ____________ and little ____________.

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

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

What are the phases of the Moon?

6. The Moon orbits Earth once every ____________ days.

7. At any given time, the Sun lights ____________ of the Moon.

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

9. Earth is between the Moon and the Sun during the ____________ Moon.

What is an eclipse?

10. During a(n) ____________ eclipse, Earth casts a shadow on the Moon.
11. During a(n) ________________ eclipse, the Moon casts a shadow on Earth.

12. A solar eclipse happens only when there is a(n) ________________ .

What causes the tides?

13. The pull of the Moon’s gravity causes ________________ to bulge on opposite sides of Earth. Those bulges cause ________________ .

14. When the gravity of the Sun and Moon pull in the same direction, tides are higher than normal. These are called ________________ , and they happen about twice a month.

15. Tides are lower than normal when the Sun and Moon’s gravity pull in ________________ directions. These are ________________ .

Critical Thinking

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

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Earth and Moon

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

- crater
- meteoroids
- phases
- lunar eclipse
- new Moon
- solar eclipse
- tides
- waning Moon

1. Ocean __________________ are caused by the pull of the Moon's gravity on Earth.
2. The apparent shapes of the Moon in the sky are called its __________________.
3. The Moon casts a shadow on Earth during a(n) __________________.
4. A hollow pit in the ground is called a(n) __________________.
5. When the lighted side of the Moon faces away from Earth, it is called a(n) __________________.
6. Large rocks that fall from space are called __________________.
7. When less and less of the lighted side of the Moon becomes visible each night, it is a(n) __________________.
8. Earth casts a shadow on the Moon during a(n) __________________.
Earth and Moon

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

<table>
<thead>
<tr>
<th>Earth</th>
<th>high</th>
<th>spring tides</th>
</tr>
</thead>
<tbody>
<tr>
<td>full Moon</td>
<td>new Moon</td>
<td>Sun</td>
</tr>
<tr>
<td>gravity</td>
<td>shadow</td>
<td>tides</td>
</tr>
</tbody>
</table>

The Moon orbits Earth once every 29 days. When the Moon and the Sun are on the same side of Earth, the part of the Moon that is in ___________ faces Earth.

This phase of the Moon is called the ___________.

When the Moon is on the opposite side of ___________ from the Sun, we see the brightly shining ___________.

The Moon’s ___________ causes the changes in the levels of the ocean, which we call ___________.

When the part of the ocean nearest the Moon bulges, that part of the ocean has ___________ tide. About twice a month, the ___________ and Moon pull on Earth’s oceans in the same direction. This causes ___________, which are higher than normal. Neap tides occur about twice a month, too, and bring lower than normal tides.
The Solar System

What is the solar system?
1. Each planet revolves around the Sun in an orbit shaped like a(n) ____________________ .

2. Newton discovered that the balance between gravity and ____________________ keeps the planets in orbit.

3. In the 1500s, ____________________ proposed that the planets revolve around the Sun.

How do we learn about the solar system?
4. Telescopes use ____________________ or radio waves to view objects in space.

5. Rockets launched by NASA allowed astronauts to explore ____________________ .

6. The United States worked with other countries to build the ____________________ , which can stay in space for a long time.

7. A crewless ship that carries data-recording equipment into space is called a(n) ____________________ .

What are the rocky planets?
8. Earth, Mars, ____________________ , and Venus are closest to the Sun and are called the rocky planets.

9. The atmosphere of Venus is made of ____________________ .
What are the other planets?

10. The four gas giants lie beyond ____________________.

11. All of these planets are made mostly of hydrogen and ________________.

12. The largest planet is ________________, and the next largest is ________________.

What else is in our solar system?

13. When comets get close to the Sun, they form an ________________ of gas and dust.

14. Most asteroids lie in a belt between ________________ and ________________.

Critical Thinking

15. What other planet would you like to live on? What do you think would be the hardest thing to get used to?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
The Solar System

What am I?

Choose a word from the word box below that answers each question, and write the correct letter in the space provided.

- asteroid
- comet
- gravity
- meteor
- meteorite
- planet
- solar system
- telescope

1. _______ I am the Sun and all of the objects that orbit it. What am I?
2. _______ I am one of the eight largest objects orbiting the Sun. What am I?
3. _______ I am an invisible pulling force that keeps the planets in orbit around the Sun. What am I?
4. _______ I can make distant objects appear to be closer. What am I?
5. _______ I am a chunk of ice mixed with rocks and dust. I travel around the Sun in a long, narrow orbit. What am I?
6. _______ I am made of chunks of rock or metal. I lie in a belt between Mars and Jupiter. What am I?
7. _______ I am a meteoroid that falls into Earth’s atmosphere and burns up. What am I?
8. _______ I am a meteoroid that strikes Earth’s surface. What am I?
The Solar System

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

<table>
<thead>
<tr>
<th>comets</th>
<th>gas giants</th>
<th>Neptune</th>
<th>Venus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth</td>
<td>hydrogen</td>
<td>planets</td>
<td></td>
</tr>
<tr>
<td>ellipses</td>
<td>Jupiter</td>
<td>rocky</td>
<td></td>
</tr>
</tbody>
</table>

The solar system consists of an average star, called the Sun, and all of the objects that revolve around it. These include eight _____________, many moons, and several smaller bodies, such as asteroids and _____________.

The _____________ planets are _____________, Mercury, _____________, and Mars. They are closer to the Sun and are made mostly of rock. The planets known as _____________ include _____________, Saturn, Uranus, and _____________. All of these are made mostly of _____________ and helium. The orbits of the planets are shaped like _____________. Earth is the only planet in our solar system that has what living things need to survive.
To the Moon!

How have scientists explored our solar system? What scientists learn about the Moon may help them explore planets and other solar system objects.

Write About It

Main Idea and Details  Reread the introduction and the captions on the time line. Then write a paragraph that explains the main idea and details of this article. Be sure to include facts and examples in your paragraph.

Main Idea and Details

Fill in the Main Idea and Details Chart using information you find in the introduction and captions of the reading feature.

<table>
<thead>
<tr>
<th>Main Idea</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Planning and Organizing
Answer these questions in more detail.

1. What was the first spacecraft to travel in space, and when was it launched?

2. What spacecraft was the first to land a person on the Moon, and when did this happen?

3. What was the last manned spacecraft to travel to the Moon, and when was it launched?

Drafting
Explain how people first learned about the far side of the Moon.

Are scientists still studying the Moon? Why?
The Solar System and Beyond

Circle the letter of the best answer.

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

2. When Earth is between the Moon and Sun, we see a
   a. half Moon.
   b. full Moon.
   c. new Moon.
   d. gibbous Moon.

3. A partial solar eclipse occurs during the
   a. full-Moon phase.
   b. new-Moon phase.
   c. gibbous-Moon phase.
   d. half-Moon phase.

4. The largest bodies that orbit the Sun are called
   a. asteroids.
   b. comets.
   c. meteors.
   d. planets.

5. The shape of Earth’s orbit is
   a. a circle.
   b. an ellipse.
   c. a rectangle.
   d. a triangle.

6. The Sun seems to move from east to west each day because of
   a. Earth’s rotation.
   b. the eclipse effect.
   c. the Moon’s rotation.
   d. the Sun’s phases.

7. Which of these is NOT a fossil fuel?
   a. coal
   b. gas
   c. oil
   d. wood
Circle the letter of the best answer.

8. Space craft that do not carry people but explore other worlds are called
   a. astronauts.
   b. probes.
   c. radio telescopes.
   d. rockets.

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

10. What is the name for the lowest tides, which occur when the Sun and Moon pull on the oceans in opposite directions?
    a. crescent tides
    b. gibbous tides
    c. neap tides
    d. spring tides

11. Which of the following is a chunk of ice mixed with rocks and dust?
    a. comet
    b. asteroid
    c. meteoroid
    d. meteorite

12. Which planet has a pole pointed toward the Sun?
    a. Saturn
    b. Uranus
    c. Mars
    d. Neptune

13. Besides Earth, which other planet has ice caps?
    a. Venus
    b. Mars
    c. Mercury
    d. Uranus

14. Which star is closest to Earth?
    a. Sirius
    b. Proxima Centauri
    c. Ross 154
    d. Sun
Weather and Climate

Complete the concept map about weather and climate. Some parts have been done for you.

Properties of Weather
Temperature: how hot or cold air is
how much water vapor in air
Air pressure: downward

Measuring Weather
Thermometer: measures temperature
measures air pressure
Hygrometer: measures: shows amount of rainfall

Climate
Climate: of weather over time
: near the equator, warm and humid
: between poles and equator,
four

Weather
Air masses: similar
: form where air masses meet
Severe storms:
, and hurricanes
Air and Weather

Use your textbook to help you fill in the blanks.

What is in the air?

1. The blanket of air surrounding Earth is called the ________________

2. The atmosphere is made up mostly of ________________ and ________________

3. The four layers of Earth’s atmosphere, from lowest to highest, are ________________ , ________________ , mesosphere, and thermosphere.

4. All living things are in the ________________

What are some properties of weather?

5. The condition of the atmosphere at a given time and place is called ________________

6. When you measure how hot or cold something is, you measure its ________________

7. Winds start to blow when the air temperature ________________.

8. A measure of the amount of water vapor in the air is ________________

9. Water vapor comes from ocean water that ________________ from a liquid to a gas.
10. As air cools, the air pressure ________________.

11. Any form of water that falls to Earth is called ________________.

How can you measure weather?

12. Scientists collect and analyze data from different ________________ to track and predict the weather.

13. To measure rainfall, researchers collect rain in a tube called a(n) ________________.

14. A tool used to measure air pressure is called a(n) ________________.

Critical Thinking

15. What weather tools do you think are used in the desert, the humid tropical rain forest, and the frozen tundra?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Air and Weather

What am I?

Choose a word from the box below that answers each question, and write the correct letter in the space provided.

<table>
<thead>
<tr>
<th>a. air pressure</th>
<th>b. barometer</th>
<th>c. humidity</th>
<th>d. rain gauge</th>
<th>e. temperature</th>
<th>f. thermometer</th>
<th>g. wind</th>
<th>h. wind vane</th>
</tr>
</thead>
</table>

1. _______ I am the weight of the air above you. What am I?
2. _______ I am moving air. What am I?
3. _______ I can tell you how hot or cold the air is. What am I?
4. _______ I can tell you how much it rained. What am I?
5. _______ I can tell you what the air pressure is. What am I?
6. _______ I point to where the wind is coming from. What am I?
7. _______ I am the amount of water vapor in the air. What am I?
8. _______ I am a measure of how hot or cold something is. What am I?
Air and Weather

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

<table>
<thead>
<tr>
<th>air pressure</th>
<th>lowest</th>
<th>thermometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>barometer</td>
<td>predict</td>
<td>troposphere</td>
</tr>
<tr>
<td>higher</td>
<td>temperature</td>
<td>weight</td>
</tr>
</tbody>
</table>

Weather is the condition of Earth’s atmosphere at any given time and place. All weather takes place in the ____________ level of the atmosphere, called the ____________. Scientists use many tools to help them track and ____________ the weather. A measure of how hot or cold the air is, or ____________, is found with a(n) ____________.

A measure of the ____________ of the air pushing down on an area is called ____________. It is measured with a(n) ____________. Cool air has a(n) ____________ air pressure than warm air. A difference in air temperature causes the movement of air, or wind.
Watching Spring Weather

Write About It
Expository Writing  Observe the weather in your area every day for two weeks. Record the temperature, air pressure, precipitation, clouds, and wind speed. Write a newspaper article about the changes you observed.

Getting Ideas
Use the information you recorded to fill out the chart below. Under main idea, write an important idea about the weather. Then write facts and details that support your main idea.

<table>
<thead>
<tr>
<th>Main Idea</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Planning and Organizing
Here are some sentences Zack wrote about the weather in his area. Write “MI” if the sentence tells the main idea. Write “D” if it tells a detail.

1. _____ At first, the temperature was in the 70s.
2. _____ The weather has changed a lot during the last two weeks.
3. _____ There wasn’t a cloud in the sky.
Revising and Proofreading

Here are some sentences Zack wrote. Combine each pair of sentences. Use the transition word in parentheses.

1. There has been a big threat of forest fires. It hasn’t rained in two weeks. (because)

2. Brush fires start. Leaves and grass dry out from the wind. (when)

3. The weather report said to expect thunderstorms. There is a warm air mass moving through our region. (because)

Drafting

Write a sentence to begin your article about weather in your area. Tell your main idea about how it changed.

Now write your article. Use a separate piece of paper. Remember to include specific details such as the amount of rainfall.

Now revise and proofread your writing. Ask yourself:

- Did I tell a main idea about the weather?
- Did I include facts and details to back up this idea?
- Did I correct all mistakes?
The Water Cycle

Use your textbook to help you fill in the blanks.

Why does water change state?

1. Water moves from Earth’s surface to the ________________ and back again.

2. Water in the gas state is called ________________.

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

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

5. Liquid water becomes a solid when it ________________.

Where does water go?

6. Earth’s water is constantly changing state by moving through the ________________.

7. When water vapor rises, it cools and ________________ onto a surface.

8. As water vapor condenses in the atmosphere, ________________ form.

9. Rain, snow, sleet, and hail are different forms of ________________.
What are some types of clouds?

10. Low, layered clouds are called ________________ clouds.

11. White, puffy ________________ clouds can become thick and dark ________________ clouds that produce precipitation.

12. Thin, wispy clouds high in the sky are called ________________ clouds.

What are other forms of precipitation?

13. In freezing air, bits of ice crystals will fall to the ground as ________________.

14. Hailstones form inside tall ________________ and are usually the size of peas.

Critical Thinking

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

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
The Water Cycle

Match the correct word to its description by writing its letter in the space provided.

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

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

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

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

Water moves from Earth to the atmosphere and back again. This path is called the _________________.

Water changes to a gas, or ________________, from the surface of oceans, lakes, and other places.

Water ________________ rises into the air and cools. Then it ________________ onto tiny particles of dust and forms ________________.

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

The different types of precipitation include rain, snow, sleet, and hail.
Tracking the Weather

Use your textbook to help you fill in the blanks.

What are air masses and fronts?

1. A large region of air with nearly the same temperature and water vapor throughout is called a(n) _____________.

2. Dry air masses form over land, and moist air masses form over _____________. Warm air masses form near the equator, and cold air masses form near the _____________.

3. The boundary between two air masses is a(n) _____________.

4. A warm air mass that overtakes and pushes into a cold air mass is called a(n) _____________.

5. A cold air mass that pushes under a warm air mass is called a(n) _____________.

6. Two air masses that are not moving into each other form a(n) _____________.

What does a weather map show?

7. Weather maps use half circles or triangles to show _____________. and colors to show _____________.

8. Predicting weather conditions is called _____________.

9. In the United States, fronts tend to move from _____________. to _____________.

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Chapter 5 • Weather and Climate
Reading and Writing

Lesson 3
Tracking the Weather
What are thunderstorms?

10. Thunderstorms develop when warm, moist air ____________________.

11. Movement of air upward is called a(n) ____________________.

12. Thunderstorms bring ____________________ caused by the movement of particles of ice and rain and ____________________, the sound of air expanding quickly when heated by lightning.

What are tornadoes?

13. Some thunderstorms develop violent wind storms called ____________________.

What are hurricanes?

14. Some thunderstorms develop over warm ocean water near the ____________________ . The can become hurricanes, with winds ____________________ around the eye at very high speeds and carrying heavy rain.

Critical Thinking

15. Why do you think the weather usually becomes cool and clear after a severe thunderstorm?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Tracking the Weather

Match the correct word to its description by writing the word in the space provided.

<table>
<thead>
<tr>
<th>cold</th>
<th>hurricanes</th>
<th>tornadoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>forecast</td>
<td>mass</td>
<td>warm</td>
</tr>
<tr>
<td>front</td>
<td>thunderstorm</td>
<td></td>
</tr>
</tbody>
</table>

1. The boundary between two air masses is called a ________________.

2. Meteorologists study weather patterns and maps so that they can predict or ________________ the weather.

3. If a front brings stormy weather, then it is a ________________ front.

4. A large region of air with nearly the same temperature and water vapor throughout is an air ________________.

5. When a ________________ front pushes under cold air, it brings light, steady rain.

6. Although ________________ are very wide storms that form over the ocean, they can also cause severe damage on land.

7. Heavy rain and lightning are signs of a ________________.

8. Rotating columns of air form ________________ that can reach speeds of 500 km (300 mi) per hour.
The weather pattern on the ground depends on what is happening in the air. The body of air that slowly passes over a wide area of water or land is called a(n) _____________ . For example, cold, dry, air masses form over _____________ and close to the _____________ . Warm, moist air masses form over _____________ and close to the _____________ .

The place where two different air masses meet is called a(n) _____________ . A cold air mass overtaking and pushing under a warm air mass is called a(n) _____________ . A warm air mass overtaking a cold air mass is called a(n) _____________ . To forecast the weather, scientists locate fronts and track how they are moving.
Hurricane Season

Read the passage in your textbook. On the lines below, write the information that lets you know when and where hurricanes occur.

Write About It
Fact and Opinion

1. What technologies help scientists study hurricanes?
2. What do you think would happen during a hurricane in your neighborhood?
Fill in the Fact and Opinion graphic organizer. Then answer the questions.

<table>
<thead>
<tr>
<th>Fact</th>
<th>Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricanes usually happen in the____________ and northeast____________ oceans.</td>
<td>The National Hurricane Center in____________ thinks there will be more hurricanes this year than last year.</td>
</tr>
<tr>
<td>There must be certain____________ for a hurricane to form.</td>
<td>The temperature of the ocean water isn’t____________ enough for a hurricane to form until late June.</td>
</tr>
<tr>
<td>Hurricanes are storms that bring violent winds, large____________,<strong><strong><strong><strong><strong><strong>, and lots of</strong></strong></strong></strong></strong></strong>.</td>
<td>Violent____________ may knock down trees, and large____________ may cause____________.</td>
</tr>
<tr>
<td>Data about hurricanes comes from buoys,<strong><strong><strong><strong><strong><strong>,</strong></strong></strong></strong></strong></strong>, and supercomputers.</td>
<td>People tell what they____________ about hurricanes.</td>
</tr>
</tbody>
</table>

1. Why would a prediction be considered an opinion rather than a fact?

________________________________________________________________________
________________________________________________________________________
Climate

Use your textbook to help you fill in the blanks.

What is climate?

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

2. Two important factors that define climate are ________________ and _________________.

3. Temperate climates often have four _________________.

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

What determines climate?

5. The thin lines that run across maps are lines of _________________.

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

7. The lower the latitude, the _________________ the climate.

8. The temperature differences between low and high latitudes cause _________________.

Name __________________________ Date __________
9. Warm air near the equator ________________
   and moves toward the poles; cold air near the poles
   ________________ and moves toward the equator.

10. A directed flow of water through the ocean is called
    a(n) ________________.

11. Water heats more slowly and cools more ________________
    than land does.

12. Climates near the ocean are milder than climates
    ________________.

**How do mountains affect climate?**

13. The climate at the base of a mountain is always
    ________________ than the climate at the peak.

14. As a(n) ________________ travels over a mountain,
    it dries out. So the ________________ on one side
    will be wetter than the climate on the other side.

**Critical Thinking**

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

Match the correct letter with its description by writing its letter in the space provided.

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

1. ______ the characteristic weather of a region over the course of several years
2. ______ a measure of how far a place is from the equator
3. ______ the directed flow of a gas or liquid
4. ______ a formation that can separate two different types of climates
5. ______ a measure of how high a place is above sea level
6. ______ the directed flow of water over long distances through the ocean
7. ______ winds that circulate in the air between the equator and the poles
8. ______ where the latitude is set at zero degrees
Climate

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

- altitude
- climate
- cold
- degrees
- latitude
- land
- precipitation
- temperatures
- tropical

The weather in a particular region can be averaged over a long period of time. This is called the ____________ , and farmers depend on it to grow their crops. Average yearly ____________ and ____________ define the climate of a region.

Areas at the equator have a(n) ____________ of zero degrees and have ____________ climates.

Latitude at the North and South poles is 90 ____________ , and these areas have ____________ climates.

Air temperature decreases with ____________ , so higher areas have cooler climates than lower areas.

Water warms and cools more slowly than ____________ does. This is why areas near the ocean usually have milder climates than inland areas.
Weather and Climate

Circle the letter of the best answer.

1. Which tool is used to measure air pressure?
   a. hygrometer
   b. anemometer
   c. barometer
   d. thermometer

2. The most abundant gases in the atmosphere are nitrogen and
   a. oxygen.
   b. carbon dioxide.
   c. water vapor.
   d. hydrogen.

3. Which is the lowest layer of the atmosphere?
   a. stratosphere
   b. thermosphere
   c. ionosphere
   d. troposphere

4. Humidity is a measure of
   a. the weight of the air.
   b. the amount of water vapor in the air.
   c. precipitation.
   d. how hot or cold the air is.

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

6. Dew forms on grass when water vapor from the air
   a. condenses.
   b. evaporates.
   c. melts.
   d. freezes.

7. Wispy clouds that form high in the sky are called
   a. cumulus clouds.
   b. stratus clouds.
   c. cumulonimbus clouds.
   d. cirrus clouds.

8. An air mass that forms over tropical ocean water will be
   a. warm and dry.
   b. cold and dry.
   c. warm and moist.
   d. cold and moist.
Circle the letter of the best answer.

9. A cold air mass pushing under a warm air mass is called
   a. a warm front.
   b. a cold front.
   c. a stationary front.
   d. an occluded front.

10. Fronts in the United States tend to move from
    a. west to east.
    b. east to west.
    c. north to south.
    d. south to north.

11. A large storm with an eye at its center is called a
    a. tornado.
    b. thunderstorm.
    c. winter storm.
    d. hurricane.

12. Global winds are caused by
    a. temperature differences between high and low latitudes.
    b. temperature differences between high and low altitudes.
    c. ocean currents.
    d. mountain ranges.

13. Which of the following will cause a climate to be cooler?
    a. lower altitude
    b. higher altitude
    c. lower latitude
    d. ocean current from the equator

14. Where does the latitude measure 0°?
    a. North Pole
    b. South Pole
    c. equator
    d. polar current

15. Which of the following is a measure of the weight of air pressing down on an area?
    a. air pressure
    b. temperature
    c. precipitation
    d. humidity
Tornado Tears Through Midwest
From *Time for Kids*

Read the Unit Literature feature in your textbook.

**Write About It**

**Response to Literature** What would happen if a tornado struck your community? Write a fictional story. Describe how your community would stay safe. How would it rebuild after the disaster?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Light and Electricity

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

### Light

#### Nature and Movement
part of
__________
spectrum
travels in
__________

#### Refraction
can be
__________,
or refracted, when
passing to different
__________

#### Reflection
colors that
__________
surface of object
makes
__________
work
__________
gives objects
__________

### Electricity

#### Nature and Movement
result of electrical
charge; can be
__________
similar charges:
__________;
__________
charges: attract
charged particles:
__________ in
electric current

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

#### Uses
converted into heat,
light, or
__________
Light

Use your textbook to help you fill in the blanks.

What is light?

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

2. A tool used to separate white light into different colors is a(n) ________________.

3. The colors that make up white light are called the ________________.

How does light travel?

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

5. Light travels more slowly through ________________ materials.

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

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

8. The lens of an eye focuses the image on the ________________. Optic nerves send signals about the image to the ________________.
What is reflection?

9. Reflection occurs when light strikes and then ______________________ a surface.

10. Smooth, shiny surfaces, such as ______________________, reflect the most light.

11. The law of reflection involves ______________________ light rays: the ______________________ ray and the outgoing ray. The angles of both rays are ______________________.

What can light pass through?

12. Opaque material blocks light, ______________________ material allows light to pass through, and translucent material allows some light to pass through but ______________________ it in different directions.

Critical Thinking

13. The iris of the eye narrows to let less light in through the pupil or widens to let in more light. Which action would it take on a sunny day? What about in the early evening? Why?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
**Light**

Match the correct word or words with their descriptions by writing its letter in the space provided.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
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<tr>
<td>d.</td>
<td></td>
<td>g.</td>
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<tr>
<td>e.</td>
<td></td>
<td>h.</td>
</tr>
<tr>
<td>f.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

g.  transparent

1. ______ a tool used to separate white light into all of its colors

2. ______ the spectrum that encompasses all the wavelengths of light

3. ______ the bending of light rays as they pass through different materials

4. ______ all the colors we see that make up white light

5. ______ description of a material through which light cannot pass

6. ______ description of a material through which light can pass

7. ______ description of a material through which light can pass but will be scattered in different directions

8. ______ the property of light in which light rays strike a mirror and bounce off
Light

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

| blocked | reflection | transparent |
| concave | refraction | two |
| mirrors | translucent | |

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

Opaque materials block light, ____________

materials let some light pass through, and ____________ materials allow all light to pass through.

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

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

How do you get color from white light?

1. Sir Isaac Newton passed light through a(n) __________ and saw all the colors of the rainbow.

2. When he passed the colors through a second prism, the colors were combined again and made __________ light.

3. Newton noticed that each color __________ at a different angle.

4. We see rainbows because __________ in the sky act like a prism and divide white light into colors.

How do colors look in colored light?

5. Objects called __________ change the color of an object by absorbing some colors and letting others __________.

6. If you look at an object that is red through a red filter, it will still look red. If you look at it through a(n) green filter, the filter blocks out every color except __________. A red object will look __________ because the object can only reflect red light.

7. We see colors because our eyes have special __________ that react to colors.
8. Some of the cells react to red, some to ________________, and some to ________________.

9. Red, blue, and green are ________________, and they can be combined to make other colors.

What happens when color is reflected?

10. Objects have colored substances called ________________ that reflect some colors and absorb others.

11. All the colors that are reflected join to give an object ________________.

12. For example, leaves ________________ red and blue light and ________________ green light. That is why they look green.

13. If an object reflects all colors, the colors join together to make the object look ________________.

14. If an object ________________ all the colors, it looks black.

15. Objects that are transparent, like glass, let light ________________.

Critical Thinking

16. Why would an object change color when it is given a fresh coat of paint?

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
# Seeing Light and Color

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

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. absorbed</td>
<td>d. primary color</td>
<td>g. spectrum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. filter</td>
<td>e. prism</td>
<td>h. transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. pigment</td>
<td>f. reflected</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. ______ type of light that gives an object its color
2. ______ material that blocks some kinds of light and lets others through
3. ______ type of light that is not reflected in the color of an object
4. ______ band of different colors
5. ______ substance in objects that reacts with light to produce color
6. ______ material that lets all light pass through
7. ______ red, green, or blue
8. ______ object that can be used to split light into different colors
Objects have colors because they have pigments. These substances ________________ a particular color. The light that is reflected gives the object its _________________. Objects have different pigments that each reflect ________________ colors. The color they have is a(n) ________________ of all the reflected colors. Transparent objects do not reflect light but instead let it _________________. Objects look ________________ if they reflect all light. Those that look ________________ absorb all light.

We see colors because our ________________ have cells that react to one of three colors, green, red, and blue. These are called the ________________ colors. They can be ________________ in different combinations to make different colors. If equal amounts of red, blue, and green reach these cells, you will see white.
A Beam of Light

Read the paragraph below.

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

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

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

Write About It

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

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

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

Drafting

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

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

Use your textbook to help you fill in the blanks.

What is electrical charge?

1. Electrical charge is a(n) ________________ .

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

3. When positive and negative charges ________________ , the matter is said to be neutral.

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

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

6. Negative charges move more ________________ than positive charges.

What is static electricity?

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

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

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

What is an electrical discharge?

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

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

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

14. The safest place in a lightning storm is .

What are conductors and insulators?

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

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

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

Critical Thinking

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

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

| a. attract | d. electrical charge | g. repel |
| b. conductors | e. insulators | h. static electricity |
| c. discharge | f. neutral |

1. ______ Rubber, plastic, and glass are good examples of these materials.
2. ______ Two objects that both have negative charges will do this to each other.
3. ______ This property of matter has two types, positive and negative.
4. ______ When clothes stick together after coming out of a clothes dryer, they might have this buildup.
5. ______ Copper and other metals are good examples of these materials.
6. ______ Walking across a carpet and then touching something metal can cause this movement of electricity.
7. ______ Objects with a negative charge will do this to objects with a positive charge.
8. ______ Objects that have an equal number of positive and negative particles are said to be this.
Electricity

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

<table>
<thead>
<tr>
<th>charged particles</th>
<th>insulators</th>
<th>static electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>conductors</td>
<td>negative</td>
<td></td>
</tr>
<tr>
<td>electrical charges</td>
<td>positive</td>
<td></td>
</tr>
</tbody>
</table>

Electricity powers traffic lights, appliances, and computers. There are different kinds of electricity, but all electricity is the result of __________.

There are two types of electrical charges. Scientists call these charges __________ and __________.

When two objects touch, __________ can move from one object to the other.

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

Metals such as copper and silver are good __________ because they let charges flow through them easily. Rubber, plastic, and glass are examples of good __________. These materials do not let charges flow through them easily.
Electric Circuits

Use your textbook to help you fill in the blanks.

What is electric current?

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

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

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

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

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

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

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

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

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

What is a series circuit?

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

11. If any part of a series circuit is removed or broken, the circuit is ________________.
What is a parallel circuit?

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

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

What affects electric current?

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

15. Voltage is measured in units called ________________.

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

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

Critical Thinking

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

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

Clues

1. a property of matter

2. a flow of electrical charges

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

4. the unbroken path along which an electric current flows

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

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

7. opens and closes the circuit

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

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

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

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

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

- charges
- electric current
- open
- parallel circuit
- series circuit

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

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

A(n) ________ is a circuit in which the electric current follows more than one path. If any part of a parallel circuit is removed or broken, the current continues to flow.
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(n) ________________ that glows when it receives current.

3. A fluorescent bulb uses a(n) ________________ to produce light. It also glows when it receives current.

4. Electrical energy can be converted into ________________ .

5. Electric motors change electrical energy into ________________ .

How does electrical energy get to your home?

6. Electrical energy is produced in ________________ .

7. As it travels, ________________ change the voltage of electric current.

8. Electric current from a power plant enters a(n) ________________ transformer. Electric current leaves the transformer with a strength of about ________________ volts.

9. Before reaching homes, the current must pass through a(n) ________________ transformer to be made weaker.

10. Appliances in a home usually run on ________________ volt circuits.
How can homes use electrical energy safely?

11. Short ________________ can cause electrical fires.

12. A(n) ________________ stops the flow of charges by switching off the current if it gets too high.

13. A short circuit might happen when the ________________ of a wire frays.

14. A(n) ________________ melts and breaks the circuit if the electric current in the circuit gets too high.

15. Plugging too many devices into one circuit can also cause too much current to go through a(n) ________________.

16. Surge ________________ stop the flow if there is too much electric current.

Critical Thinking

17. Is the circuit connecting a power plant and the homes in your neighborhood a series circuit or a parallel circuit? Why?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Using Electrical Energy

Read each clue. Write the answer in the blank and fill in the crossword puzzle.

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 heat through a glowing wire

Down
1. a bulb that uses gas to produce light

3. changes the voltage of electric current
Using Electrical Energy

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

<table>
<thead>
<tr>
<th>devices</th>
<th>fluorescent</th>
<th>incandescent</th>
<th>transformers</th>
</tr>
</thead>
<tbody>
<tr>
<td>filament</td>
<td>heat</td>
<td>motion</td>
<td>voltage</td>
</tr>
</tbody>
</table>

Electrical energy has many uses. Electrical _____________ 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(n) _____________ . A(n) _____________ bulb uses a gas to produce light.

Electrical energy can be converted into _____________ . Electric motors change electrical energy into _____________ . Electrical energy travels from a power station through wires and _____________ to a home. Transformers are used to change the _____________ of an electric current.

Safety devices such as fuses and circuit breakers protect homes and stores from an electric overload.
Hybrid Power

Read the passage in your textbook. As you read, write down the topic sentence of each paragraph.

Topic sentence:
1. ____________________________________________________________
2. ____________________________________________________________
3. ____________________________________________________________
4. ____________________________________________________________
5. ____________________________________________________________

Write About It

Summarize Read the article again. How do hybrid cars work? How do hybrid cars help the environment?

1. How do hybrid cars help people?
   ____________________________________________________________

2. How do hybrid cars work?
   ____________________________________________________________
   ____________________________________________________________

3. How does that help the environment?
   ____________________________________
Reread the article. As you read, record the details that support each of the sentences in the Summarize graphic organizer.

<table>
<thead>
<tr>
<th>Main Idea</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid cars that use ______ and ______ energy can lessen our ______ on gasoline and reduce ______ pollution.</td>
<td>The gasoline we use is made from oil, a nonrenewable ______.</td>
</tr>
<tr>
<td></td>
<td>In a traditional car, the ______ engine runs all the time.</td>
</tr>
<tr>
<td></td>
<td>Hybrid cars use two power sources: ______ and ______.</td>
</tr>
<tr>
<td></td>
<td>A hybrid car uses less ______ and switches to a(n) ______ motor powered by ______ when the car slows down or comes to a stop.</td>
</tr>
<tr>
<td></td>
<td>The batteries ______ when the car comes to a stop.</td>
</tr>
<tr>
<td></td>
<td>The gasoline engine in a(n) ______ car is small and ______ efficient.</td>
</tr>
</tbody>
</table>
Light and Electricity

Circle the letter of the best answer.

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

2. 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. Light is blocked completely by material that is
   a. opaque.
   b. reflective.
   c. translucent.
   d. transparent.

6. Which of these is NOT a primary color of light?
   a. blue
   b. green
   c. red
   d. yellow

7. You can produce all the colors of the rainbow using a
   a. glass.
   b. mirror.
   c. prism.
   d. table.
Circle 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. 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.

10. Visible light is the part of the electromagnetic spectrum
    a. with the shortest wavelength.
    b. with the longest wavelength.
    c. that travels through space.
    d. that we can see.

11. Eyeglasses contain this kind of lens because it bends light inward, making objects larger.
    a. concave
    b. convex
    c. optic
    d. reflective

12. Objects in the world have color because they
    a. absorb all the Sun’s light.
    b. reflect some of the Sun’s light.
    c. give off their own light.
    d. glow from making light.

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

14. The path of electric current is called a
    a. circuit.
    b. fuse.
    c. switch.
    d. transformer.
What causes a magnetic field to be produced around a wire?

What items in your house use electromagnetics?

How can an electromagnet be made?

How many poles do all magnets have?

When is a magnetic force stronger? When is it weaker?
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 a(n) _________________.

3. The strongest parts of the magnet are called the _________________.

4. When two magnets are brought together, a north pole and a(n) ________________ 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.

What is a magnetic field?

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

9. A(n) ________________ is the area of magnetic force around a magnet.
10. The magnetic field allows a magnet to __________________ an object without even touching it.

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

12. The iron creates a magnetic field that ________________ 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.

What is a compass?

15. A(n) ________________ is an instrument that uses Earth’s magnetic field to help people find directions.

Critical Thinking

16. How does a compass work?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Magnets

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

attract    geographic    magnetite
axis       magnet        poles
compass    magnetic field

1. Earth’s magnetic north pole is near its _______________ North Pole.

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. A natural magnet containing iron is ________________.
Magnets

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

<table>
<thead>
<tr>
<th>magnetite</th>
<th>permanent</th>
<th>push</th>
</tr>
</thead>
<tbody>
<tr>
<td>metal</td>
<td>poles</td>
<td>repel</td>
</tr>
<tr>
<td>north</td>
<td>pull</td>
<td>temporary</td>
</tr>
</tbody>
</table>

Magnets come in many shapes and sizes. A magnet that always has a magnetic force is a _________________ magnet. The strongest part of a magnet is the _________________ . Unlike poles attract each other and like poles _________________ each other. The mineral _________________ is a natural magnet containing iron. When you bring a magnet near certain _________________ objects such as paper clips, tiny particles in the object 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!
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(n) ________________ around the wire.

2. A(n) ________________ 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 electromagnet stops, the metal core
   is no longer ________________.

How does a loudspeaker work?

5. A(n) ________________ 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 diaphragm is what we hear as
   ________________.
9. A telephone receiver is actually a(n) _________________.

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

11. A(n) ________________ is a device that uses a magnet 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.

Critical Thinking

15. Why are electromagnets more useful than permanent magnets?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Electromagnets

Match the correct letter with the description.

<table>
<thead>
<tr>
<th>a. current</th>
<th>d. electromagnet</th>
<th>g. microphone</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. diaphragm</td>
<td>e. generate</td>
<td></td>
</tr>
<tr>
<td>c. electric signals</td>
<td>f. loudspeaker</td>
<td></td>
</tr>
</tbody>
</table>

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. _____ This part of a loudspeaker vibrates to create sound.
4. _____ This device changes electrical energy into sound.
5. _____ This means to make an electric current.
6. _____ When this is turned off, the electromagnet is no longer magnetic.
7. _____ This is a coil of wire wrapped around a core of iron.
Electromagnets are very useful in our daily lives. In the 1820s, ________________ and Joseph Henry discovered that magnets could generate a(n) _________________. When the current is flowing, it creates a(n) _________________. When the current is turned off, the _________________.

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

Circle 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. Objects with magnetic force are called
   a. alternating.
   b. fields.
   c. generators.
   d. magnets.

4. The north and south ends of Earth’s axis are Earth’s
   a. geographic poles.
   b. equatorial poles.
   c. magnetic poles.
   d. electromagnetic poles.

5. A diaphragm makes sound when it
   a. becomes magnetic.
   b. vibrates.
   c. senses light.
   d. generates electricity.
6. To work properly, loudspeakers and microphones need both
   a. electricity and magnetism.
   b. light and sound.
   c. curved and straight magnets.
   d. a stereo and a television.

7. Electromagnets are used in
   a. compasses.
   b. pianos.
   c. appliances.
   d. door knobs.

8. A magnet can attract or repel another object that enters its
   a. alternating current.
   b. direct current.
   c. pole.
   d. magnetic field.

9. A device that changes electrical energy into sound is a
   a. turbine.
   b. loudspeaker.
   c. microphone.
   d. motor.

10. An electromagnet is a magnet that
    a. attracts any object.
    b. can be switched on and off.
    c. is permanent.
    d. is weak.

11. A compass needle points
    a. east.
    b. north.
    c. south.
    d. west.
Magnetic Migration
From *Ranger Rick*

Read the Unit Literature feature in your textbook.

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