CALIFORNIA Science

Teacher's Guide

Reading and Writing in Science

Macmillan McGraw-Hill

Contents

Life Science

Earth Science

Physical Science

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Name _____ Date _____

CHAPTER LEVEL
Concept Map

Structure of Living Things

Complete the concept map with the information you learned about the structure of living things.

Unicellular

all life processes carried out in a single cell

Multicellular

many cells work together to carry out life processes

Bacteria

ancient

live in harsh environments

true

live in or on things; can cause disease, or are helpful to living things

Protists

animal-like

cannot produce their own food

plant-like

produce their own food

fungi-like

breaks down dead organisms

Plants

vascular

has vascular tissue to move food and water

nonvascular

has no vascular tissue

Animals

vertebrates

has a backbone

invertebrates

has no backbone

Fungus

absorbs food from dead organisms

Name _____ Date _____

Cancer-Sniffing Canines

Read the Literature feature in your textbook.

Write About It

Response to Literature In this article, you learned that dogs are being used to detect cancer. Write a letter to the editor of your local newspaper. State your position about using dogs for research. Include convincing evidence that backs up your position.

The letter should be either for or against the use of dogs to identify cancer patients. The position should be supported by identifying and assessing evidence from the text.

Name _____ Date _____ **Outline**

Cells

Use your textbook to help you fill in the blanks.

What are plants and animals made of?

1. Plants, animals, and all living things are made of _____cells_____ .
2. A cell is the _____smallest unit_____ of a living thing that can carry out the basic processes of life.
3. The cells of _____plants_____ are not the same as animal cells.
4. Plants need something in their cells to provide _____extra support_____ .
5. Plant leaf cells produce _____food_____ for the plant.
6. Animals have to eat other living things to get _____energy_____ .

What are the organelles in animal cells?

7. The _____cell membrane_____ is a layer around the outside of the cell.
8. Cytoplasm supports all of the _____organelles_____ inside the cell.
9. The _____nucleus_____ controls all of the activity in the cell.
10. Mitochondria turn food into _____energy_____ for the cell to use.
11. The _____vacuoles_____ store water, food, and wastes.

Outline Name _____ Date _____

What are the organelles in plant cells?

12. The cell wall is an additional layer around the outside of plant cells.

13. The large central vacuoles of plant cells provide support by storing water .

14. Organelles in plant cells that turn energy from sunlight into food are called chloroplasts .

15. A green chemical called chlorophyll makes chloroplasts green.

How can cells be seen?

16. A(n) microscope must be used to see cells.

Summarize the Main Idea

17. What are both plants and animals made of?

Plants and animals are all made of cells. Cells have organelles that perform jobs to help the cells stay alive. Plant cells have some different cell parts.

Name _____ Date _____ **Vocabulary**

Cells

a. cell	**d.** nucleus	**g.** cell wall
b. cell membrane	**e.** mitochrondria	**h.** chloroplasts
c. cytoplasm	**f.** vacuoles	**i.** microscope

Fill in the blank.

1. d A(n) organelle that controls all of the activity of the cell.

2. f Organelles that store water, food, and wastes.

3. i An instrument that magnifies objects.

4. a The smallest unit of a living thing that can carry out the basic processes of life.

5. g An additional layer around plant cells that provides extra support.

6. e Organelles that break down food and turn it into energy for the cell to use.

7. b A layer around the outside of the cell.

8. h Green organelles in plant cells that turn energy from sunlight into food.

9. c A gel-like substance that supports all of the organelles inside the cell membrane.

Name _____ Date _____

Cells

cells	chlorophyll	microscope	sunlight
cell membrane	chloroplasts	mitochondria	vacuoles
cell wall	cytoplasm	nucleus	

Fill in the blanks.

Plants and animals are living things. All plants and animals are made of cells . The cell membrane is a layer around the outside of all cells. Plant cells have an additional layer called the cell wall that provides extra support. Cytoplasm is a gel-like substance inside the cell membrane. All activity in the cell is controlled by the nucleus . Mitochondria break down food and turn it into energy for the cell to use. Water, food, and wastes are stored in the vacuoles of the cell. A green chemical called chlorophyll is in the chloroplasts of plant cells. Plant cells turn energy from sunlight into food. People didn't know that cells existed until they could see them under a microscope .

Name _____ Date _____ **Outline**

From Cells to Organisms

Use your textbook to help you fill in the blanks.

How are living things organized?

1. An individual living thing is called a(n) organism .
2. Unicellular organisms have only one cell.
3. Multicellular organisms have many different kinds of cells.
4. In multicellular organisms, the cells work together to take care of different functions of the organism.

How do cells work together?

5. A group of similar cells called a(n) tissue work together to do the same job in an organism.
6. Muscle tissue can be found in a(n) animal's body.
7. The flesh of fruits is an example of tissue found in plants .
8. Different tissues working together form a(n) organ .
9. The lungs, heart, and stomach are examples of organs found in animals .

Name _____ Date _____

What are some plant and animal organ systems?

10. The roots are the main organ in the root system.

11. Plants also have systems for transporting materials.

12. The salamander has an organ system that breaks down food for energy .

13. The bones , muscles, and brain are part of the organ systems that control movement and responses.

14. The heart is part of the organ system that transports blood and other materials.

Summarize the Main Idea

15. How are cells organized in multicellular organisms?

Cells are organized into tissues, organs, and organ systems.

Name _____ Date _____ Vocabulary

From Cells to Organisms

a. unicellular	**c.** multicellular	**e.** organ
b. organism	**d.** tissue	**f.** organ system

Fill in the blank.

1. f A group of organs that work together to do a certain job.

2. d A group of similar cells that do the same job in an organism.

3. a One-celled organisms that can carry out all of the processes of life.

4. e Made up of tissues of different kinds that come together to do a particular job.

5. c Organisms that are made of many different kinds of cells.

6. b An individual living thing.

Cloze Test Name _____ Date _____

From Cells to Organisms

organisms	multicellular	cells	growth
organ	respiration	tissue	
organ system	response	unicellular	

Fill in the blanks.

Individual living things are called organisms . Cells are the smallest units that can carry out basic life processes. Unicellular organisms carry out all of the life processes within a single cell. In multicellular organisms, different kinds of cells work together to carry out its life processes. The ability to increase in size is a life process called growth . Response is the ability to react to changes in surroundings. The ability to use oxygen to break down food into energy is called respiration . A(n) tissue consists of a group of similar cells that do the same job. Tissues combine to make up a(n) organ . A(n) organ system is a group of organs that work together to do a certain job. Organ systems in the body include the muscular, skeletal, and nervous systems.

Name _____ Date _____ **Outline**

Diversity of Organisms

Use your textbook to help you fill in the blanks.

How are living things grouped together?

1. Classifying organisms shows which organisms are most _____similar_____ to one another.

2. In one classification system, the broadest group into which organisms are classifed is the _____kingdom_____ .

3. A kingdom is divided into smaller groups. Organisms in smaller groups are _____more alike_____ .

What do animals have in common?

4. All animals (1) have to get energy from eating other things and (2) are _____multicellular_____ .

5. An animal that has a backbone is called a(n) _____vertebrate_____ .

What do plants have in common?

6. All of the organisms in the plant kingdom produce their own _____food_____ .

7. The two major groups of the plant kingdom are vascular and _____nonvascular_____ plants.

What are fungi?

8. A fungus absorbs food from decaying or dead organisms in its environment because it cannot _____make its own food_____ .

Outline Name _____ Date _____

What are bacteria?

9. Bacteria are simple, tiny unicellular organisms that do not have a distinct nucleus.

10. Bacteria are classified into two kingdoms called "ancient bacteria" and true bacteria .

What are protists?

11. All protists have a distinct nucleus in their cells and they lack specialized tissues .

12. Plant-like protists contain colored chemicals that they use to produce their own food .

13. An example of a plant-like protist is green algae .

14. Animal-like protists eat food by absorbing it into their cells through their cell membranes .

15. These protists act like fungi and get their food by breaking down dead organisms .

Summarize the Main Idea

16. How are classification systems used to group living things?

Classification systems place living things into groups based upon their similarities.

Name _____ Date _____ Vocabulary

Diversity of Organisms

a. vertebrate	**d.** protist	**g.** invertebrate
b. nonvascular	**e.** bacteria	**h.** vascular
c. fungus	**f.** kingdom	

Fill in the blank.

1. f The broadest group of classification.
2. a An animal that has a backbone.
3. g An animal without a backbone.
4. h Plants with tubes that transport food and water.
5. b Plants that transport water and other substances directly from the ground into their cells.
6. c A unicellular or multicellular organism that absorbs food from dead or decaying organisms in its environment.
7. e Simple, tiny unicellular organisms with cell membranes and cytoplasm but no distinct nuclei.
8. d A unicellular or multicellular organism with a distinct nucleus that does not have specialized tissues.

Cloze Test

Name _____ Date _____

Diversity of Organisms

bacteria	kingdom	similarities
food	nonvascular	vascular
invertebrates	protists	vertebrates

Fill in the blanks.

Scientists have created classification systems that put organisms into groups. When scientists classify organisms, they put them into groups based on shared similarities . In one widely used classification system, the broadest group is a(n) kingdom . In the animal kingdom, vertebrates have backbones, but invertebrates do not. The plant kingdom also divides into two groups. These are vascular and nonvascular . Fungi cannot make food , so they absorb it from dead or decaying organisms in the environment. Ancient bacteria are the oldest living organisms on earth. Protists can be plant-like, animal-like, or fungi-like. Most of these organisms live in the water.

Name _____ Date _____

Reading

Meet Angelique Corthals

Read the Reading in Science feature in your textbook.

Write About It

Summarize Make a chart that tells the steps for preserving cells. Use your chart to write a summary of the process Angelique uses to freeze cells from organisms.

Steps for Preserving Cells
1. Students' charts should correctly list each of the four steps Angelique uses to preserve cells.
2.
3.
4.

Name _____ Date _____

Now summarize, in your own words, what the reading detailed about the steps Angelique uses to preserve cells.

The student's summary should retell only essential information from the passage about Angelique's process for preserving cells. The summary should be written in the student's own words.

Name _____ Date _____ Writing

A Tale of Two Animals

Read the Writing in Science feature in your textbook.

Write About It

Fictional Writing Choose two other organisms that are very different from each other. Write a fictional narrative in which these two organisms are in conflict.

Planning and Organization

Cyndi started her story by introducing one of her two main characters: Gila Monster. Here are five sentences that she wrote. Put them in chronological order. Write 1 by the event that comes first, 2 by the event that comes second, and so on. The last event should be numbered 5.

1. Then Gila Monster seized a small jackrabbit. 4
2. Gila Monster stuck out his long, sensitive tongue to sense for prey. 3
3. Now that warm weather had come, Gila Monster spent his nights searching for small mammals, birds, and prey. 2
4. Gila Monster sunk his teeth into the rabbit and started to chew, sending his poisonous venom into the rabbit. 5
5. During the winter, Gila Monster did not need to find much food, because of all the fat stored in his tail. 1

Getting Ideas

Cyndi chose to center the plot for her story on a conflict between Gila Monster and Tarantula. Think about the similarities and differences of your two characters. How do they bring the characters into conflict? What events might occur that will resolve this conflict? Use the chart on the following page to plan your story.

Name _____ Date _____

Characters/Setting	Conflict
_____	_____

Event 1	Event 2	Event 3/Resolution
_____	_____	_____
_____	_____	_____
_____	_____	_____

Now write your short story on a separate sheet of paper. Describe the setting, introduce the characters, set up the conflict, and show the events that lead to the resolution.

Revising and Proofreading

Cyndi chose to use dialogue in her story. Here is a passage from her story. Proofread it. Correct any punctuation and capitalization problems.

After eating, Gila Monster said, "I think I will curl up and sleep by that big rock." He added, "then I'll hunt again when night falls."

"Who's invading my home?" hissed Tarantula from under the rock. He said to himself, "doesn't everyone know that I like to live alone?"

Then the three-inch spider crept out from under the rock, saw the two-foot-long lizard, and said, "well, I guess I won't be able to wrap him in a ball of silk and save him for a later meal!"

Now revise and proofread your own story. Ask yourself:

- Have I created two characters that are very different from each other?
- Have I provided a sequence of events that leads to a believable resolution of the conflict?
- Have I corrected any grammar problems?
- Have I corrected any errors in spelling, punctuation, and capitalization?

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Structure of Living Things

Choose the letter of the best answer.

1. One widely accepted classification system divides living things into six

   a. cells. **b.** kingdoms. **c.** organs. **d.** vertebrates.

2. The part of a cell that controls all of its activity is the

   a. cell wall. **b.** cytoplasm. **c.** nucleus. **d.** vacuole.

3. Structures in plant cells that turn energy from sunlight into food are called

   a. chloroplasts. **b.** cell walls. **c.** cytoplasm. **d.** mitochondria.

4. An individual living thing is a(n)

   a. nucleus. **b.** invertebrate. **c.** organism. **d.** vertebrate.

5. An animal that has a backbone is called a(n)

   a. bacterium. **b.** invertebrate. **c.** protist. **d.** vertebrate.

6. The smallest unit of a living thing that carries out basic life processes is a(n)

   a. cell.
   b. cell membrane.
   c. cell wall.
   d. chloroplast.

7. In living things, tissues of different kinds come together to make up a(n)

   a. organ. **b.** organism. **c.** organ system. **d.** tissue.

8. The outside layer that controls what moves in and out of the cell is its

   a. cell membrane
   b. tissue
   c. cytoplasm
   d. nucleus

Name _____ Date _____

Choose the letter of the best answer.

9. What cell parts break down food and turn it into energy for the cell to use?

a. cytoplasm **c.** nucleus
b. mitochondria **d.** vacuole

10. Structures in cells that store water, food, and wastes are called

a. chloroplasts. **b.** cytoplasm. **c.** mitochondria. **d.** vacuoles.

11. Organisms that are made of many different kinds of cells are called

a. invertebrate. **b.** multicellular. **c.** unicellular. **d.** vertebrate.

12. Unicellular organisms that have cytoplasm, but no distinct nucleus are

a. bacteria. **b.** fungi. **c.** plants. **d.** protists.

13. The gel-like substance in a cell that supports all of the cell structures is the

a. cell wall. **b.** chloroplast. **c.** cytoplasm. **d.** mitochondria.

14. A one-celled organism is

a. monocellular. **b.** multicellular. **c.** single cellular. **d.** unicellular.

15. Plants that do not have tubes to transport water and food are

a. multivascular. **b.** invascular. **c.** nonvascular. **d.** vascular.

16. A group of organs that work together to do a certain job are a(n)

a. organ. **b.** organ system. **c.** structure. **d.** tissue.

17. An animal without a backbone is called a(n)

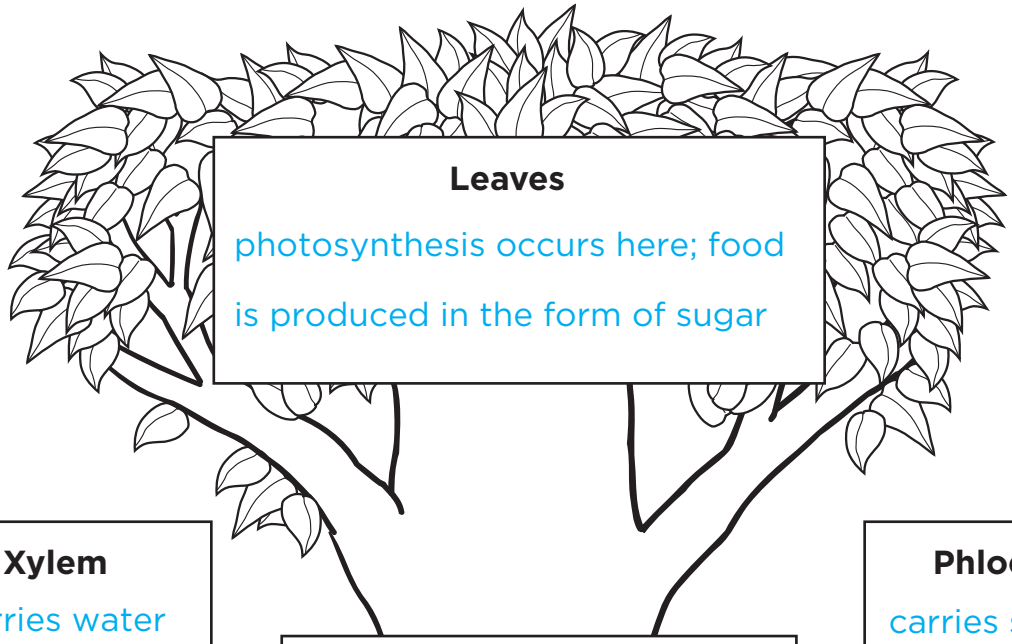
a. invertebrate. **c.** unicellular.
b. nonvascular. **d.** vertebrate.

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Plant Structures and Functions

Complete the concept map with the information you learned about plant structures and functions.



Leaves

photosynthesis occurs here; food is produced in the form of sugar

Xylem

carries water and minerals from roots through the stem to the leaves

Trunk/Stem

moves materials up and down; stores water and food; provides support for the plant

Phloem

carries sugar from leaves to stem and roots

Roots

absorb water and minerals; stores food; holds the plant in place

Name _____ Date _____

Branches

Read the Literature feature in your textbook.

Write About It

Response to Literature **The poet creates a vivid impression of a leaf collecting light and water. Do print and online research to find out what happens as a plant grows new leaves. Then write an explanation of this sequence of events.**

Composition should present a sequence of events in the growth of a new leaf. The composition should demonstrate understanding of the poem by mentioning leaves, veins, some aspect of photosensitivity, and water collection. Good compositions will address the prompt, stay on topic, have vivid word choice, include correct usage of grammar and mechanics, and use proper transition from one idea to another.

Name _____ Date _____ Outline

Vascular Plants

Use your textbook to help you fill in the blanks.

What are vascular plants?

1. Vascular plants have specialized cells that work together to transport water, food, and waste to all parts of the plant.
2. Scientists separate vascular plants into seedless plants and plants with seeds .
3. Scientists then divide plants with seeds into plants that produce flowers and plants that do not produce flowers .

How are seedless and seed plants different?

4. A seed contains an undeveloped plant and stored food used to develop and grow into a new plant.
5. This new plant shares the characteristics of the two plants that produced the seed.
6. Some vascular plants do not produce seeds or grow from them; instead, they grow from spores.
7. A spore is a single cell that can develop into new plant that is exactly like the plant that produced it.
8. Angiosperms are seed plants that produce flowers .
9. Fruits, vegetables, grains , and almost all nuts come from angiosperms.
10. Gymnosperms are seed plants that do not produce flowers .
11. Gymnosperms produce seeds inside a cone.
12. Most gymnosperms are evergreens , trees that lose only a few leaves at one time and constantly replace the leaves they have lost.

Name _____ Date _____

What do flowers do?

13. Flowers, the reproductive organ of angiosperms, usually have both male and female parts.

14. Pollen grains are transferred from a flower's stamen to the female part of the flower, the *pistil*, or to another flower's pistil.

15. This transfer is called pollination .

16. During fertilization, the pollen and egg cell join, and form a seed .

17. As the seed develops, the ovary enlarges until it becomes a fruit , which protects the seeds inside it.

18. Many seeds have structures that enable them to be carried by the wind; others are carried by animals , either by attaching to fur or by being eaten in fruit.

Summarize the Main Idea

19. What are two ways scientists divide vascular plants?

Scientists separate vascular plants by whether or not they produce spores or seeds and flowers or no flowers.

Name _____ Date _____

Vocabulary

Vascular Plants

a. angiosperms	**d.** gymnosperms	**g.** spore
b. capsule	**e.** seedless	**h.** vascular
c. evergreens	**f.** seed	

Fill in the blanks.

1. d Seed plants that do not produce flowers.

2. a Seed plants that produce flowers.

3. b Filled with thousands of tiny spores.

4. g A single cell that can develop into a plant that is exactly like the plant that produced it.

5. f Contains an undeveloped plant and stored food.

6. h Plants that have specialized cells which work together to transport water, food, and waste.

7. e Plants such as horse tails, club mosses, and ferns that grow from spores.

8. c Trees that lose only a few leaves at one time and constantly replace the leaves they have lost.

Cloze Test Name _____ Date _____

Vascular Plants

angiosperms	produce	spores
flowers	seedless	undeveloped
gymnosperms	specialized cells	vascular

Fill in the blanks.

Many different kinds of plants grace our planet, and we have to be able to identify special features in them. For example, plants that have specialized cells which work together to transport water, food, and waste to all parts of the plant, are called vascular plants. Scientists have separated vascular plants into two categories: seedless plants, and plants with seeds. Most common plants such as fruits, vegetables, and herbs, produce seeds. Seeds contain an undeveloped plant and stored food. Some vascular plants, such as horsetails, club mosses, spike mosses, and ferns, do not produce seeds or grow from them. Instead, these plants grow from spores . Some plants with seeds produce flowers and some do not. Angiosperms are seed plants that produce flowers. Flowers are the reproductive organ of angiosperms. Gymnosperms are seed plants that do not produce flowers. These plants produce seeds inside a cone.

Name _____ Date _____ Outline

Plant Transport Systems

Use your textbook to help you fill in the blanks.

How do different materials move in plants?

1. Water and minerals move up from the roots into the leaves.
2. Sugar is transported from the leaves to the roots or other parts of the plant.
3. A root is the part of a plant that absorbs water and minerals, stores food, and holds the plant in place .
4. A stem is the main stalk of a plant. The stem develops buds and shoots and usually grows above the ground.
5. Inside the stem, materials move up and down through the transport system.
6. The leaf uses water and carbon dioxide to produce sugar , which the transport system moves throughout the plant so other plant cells can use it as food.

What is the transport system made of?

7. Under a microscope, you can see the tissues that form the transport system.
8. Xylem moves water and minerals up from the roots .
9. Phloem moves food from the plant's leaves to its other parts.
10. Many woody stems have a layer of cells called the cambium that separates the xylem from the phloem .
11. Bark is a tough outer covering that serves as a protective layer for the tree.

Name _____ Date _____

12. Each year, a new layer of xylem forms an annual ring .

How are roots different?

13. Taproots have one large root with a few branching hairy roots .

14. Fibrous roots are made up of thin, branching roots.

15. Prop roots grow like fingers out of the bottom of the stem .

16. Some plants have aerial roots , or roots that never touch the ground.

Summarize the Main Idea

17. Describe the transport system in vascular plants.

Xylem moves water and minerals up from the roots. Phloem moves food from the plant's leaves to its other parts. Water moves up from roots into leaves, and food moves down from leaves to other plant parts.

Name _____ Date _____ Vocabulary

Plant Transport Systems

a. cambium	**d.** roots	**g.** veins
b. leaf	**e.** stem	**h.** xylem
c. phloem	**f.** vascular plants	

Fill in the blanks.

1. **1.** f Plants that constantly move materials through the specialized cells in their transport system.
2. **2.** d Part of a plant that absorbs water and minerals, stores food, and holds the plant in place.
3. **3.** e The main stalk of a plant.
4. **4.** b Uses water and carbon dioxide to produce sugar.
5. **5.** g Transports minerals throughout the leaves.
6. **6.** h Moves water and minerals up from the roots.
7. **7.** c Moves food from the plant's leaves to its other parts.
8. **8.** a Where new xylem and phloem are produced.

Cloze Test Name _____ Date _____

Plant Transport Systems

cambium	roots	transport system
leaf	sugar	vacuoles
microscope	tissue	water and minerals

Fill in the blanks.

How does a vascular plant eat and grow? Vascular plants are constantly moving materials through the specialized cells in their transport system . The roots absorb water and minerals from the soil. Then, water and minerals travel up through the stem and into the leaves. When sunlight hits a leaf , it uses photosynthesis to make sugar from water and carbon dioxide. Then, the leaf sends sugar to the rest of the plant for nutrition. When you cut a thin slice of a plant stem or root, and look at it under a microscope , you can see the tissues that form the transport system. As water moves up the plant, some of it is stored in the vacuoles , or spaces, of the xylem tissue cells. The other transport system tissue is phloem. It moves food from the plant's leaves to its other parts. Many woody stems have a layer of cells that separate the xylem from the phloem, called the cambium .

Name _____ Date _____ **Outline**

Photosynthesis and Respiration

Use your textbook to help you fill in the blanks.

What do leaves do?

1. Leaves use energy from the Sun to make food from water and carbon dioxide in a process called photosynthesis .
2. Photosynthesis is carried out in the chloroplasts of the cells that are underneath the epidermis.
3. Chloroplasts contain chlorophyll, which is the chemical that absorbs and stores the energy of sunlight .
4. Tiny pores, called stomata, in the bottom of leaves take in carbon dioxide from the air.
5. When a plant has enough water, the guard cells swell and pull open the stomata so the plant can breathe.
6. Scientists express what happens during photosynthesis using this chemical equation: CO_2 + energy (Sun) + H_2O = sugar + O_2 .

What is the photosynthesis and respiration cycle?

7. During photosynthesis, plants produce carbohydrate , a compound made from carbon, hydrogen, and oxygen.
8. Cellulose, the main substance that makes up the cell wall in plants, is a carbohydrate.
9. When plants store sugar, they store it as starch, a molecule made up of long chains of sugars .
10. When you eat a vegetable, your body gets energy from the carbohydrates stored in the plant.

Name _____ Date _____

Where does respiration happen?

11. When the plant needs energy to grow or repair itself, starches and sugars are broken down in a process called cellular respiration .

12. The chemical equation for cellular respiration is: $C_6H_{12}O_6 + O_2 = 6CO_2 + 6H_2O$ + energy, which means sugar + oxygen = carbon dioxide + water + energy .

13. Cellular respiration takes place in the mitochondrion .

14. Photosynthesis produces food that stores energy, while respiration releases energy.

Summarize the Main Idea

15. How do plants make and use energy?

Photosynthesis uses light energy, carbon dioxide, and water to produce oxygen and sugar. Sugar is used for food in plants. Respiration is the process by which plants break down sugar chemically to release their energy.

Name _____ Date _____

Vocabulary

Photosynthesis and Respiration

a. CO_2 + energy (sun) + H_2O = sugar + O_2		**f.** chloroplasts
b. carbohydrate	**d.** cellulose	**g.** photosynthesis
c. cellular respiration	**e.** chlorophyll	**h.** stomata

Fill in the blanks.

1. g The process that uses energy from the Sun to make food from water and carbon dioxide.

2. f Photosynthesis is carried out in these, which are located in the cells that are underneath the epidermis.

3. e The chemical that absorbs and stores the energy of sunlight.

4. h Tiny pores in the bottom of leaves take in carbon dioxide from the air.

5. b A compound made from carbon, hydrogen, and oxygen.

6. d The main substance that makes up the cell wall in plants.

7. c Starches and sugars are broken down in the cells in this process.

8. a Scientists express what happens during photosynthesis using this chemical equation.

Name _____ Date _____

Photosynthesis and Respiration

carbohydrate	chloroplasts	starch
cellular respiration	energy	stomata
chlorophyll	photosynthesis	water

Fill in the blanks.

How does the Sun give you the energy you need to do your school work? When a plant gets enough water, the guard cells in the leaf swell and pull open the stomata . The Sun shines on the plant so its leaves can make food from water and carbon dioxide. This process is called photosynthesis . Photosynthesis takes place in the chloroplasts of the cells underneath the epidermis, or skin of the leaf. Chloroplasts contain chlorophyll , a green chemical that absorbs and stores the energy of sunlight. Sugar is a carbohydrate made from carbon, hydrogen, and oxygen. Plants store sugar as a starch . When the plant needs energy to grow or repair itself, it breaks down starches and sugars in a process called cellular respiration . When you eat a vegetable, or when you eat meat from an animal that eats plants, your body gets energy from the sugars and carbohydrates stored in the plant.

Name _____ Date _____

Reading

A Year in the Life of a Forest

Did you know that forests breathe? Scientists can measure the gases in the forest air to gather data about the photosynthesis and respiration of the trees, animals, and other organisms that live there.

Take a look at the carbon dioxide data that scientists measured in the air from Howland Forest, a deciduous forest in Maine. Howland Forest has cold and snowy winters and hot and humid summers. How do these changes in seasons affect the amount of carbon dioxide in the air?

Spring

As the days become longer and warmer, activity in the forest grows. This increased activity results in higher levels of respiration, so the amount of carbon dioxide measured in the air starts to rise. The trees sprout new leaves and begin to photosynthesize.

Summer

Summer days are the longest and warmest of the year. Because the forest is so active, a lot of photosynthesis and respiration occurs. During the day, the amount of carbon dioxide is low. That's because the trees are transforming the carbon dioxide into food to store in their roots. During the night, the amount of carbon dioxide is high. That's because all of the life forms in the forest are still respiring, and the trees are not photosynthesizing. These two processes together result in the different day and night carbon dioxide levels you see in the graph.

Fall

Shorter days mean fewer hours of sunlight. Trees begin to lose their leaves and the forest becomes less active. The forest is photosynthesizing and respiring less. Day and night carbon dioxide levels become more similar.

Winter

Winter days are the shortest and coldest of the year. The forest is much less active. Most of the trees have lost their leaves, and there is no photosynthesis. Day and night carbon dioxide levels are very similar as all the life forms continue to respire.

Name _____ Date _____

Sequence of Events

- The sequence of events is the order in which events happen in time.
- Look for the event that happens first, then fill in what happens next and last.

Write About It

Sequence Create a sequence of events timeline based on the information in the article. Tell what happens first, next, and last as the seasons change in Howland Forest. Then use your timeline and the chart from the article to summarize the data collected from Howland Forest.

Timeline should explain what happens first, next, and last in Howland Forest as the seasons change. Summary should retell only essential information from the passage about the data collected from Howland Forest. The summary should be written in his or her own words.

Name _____ Date _____ Writing

Saving Water the Yucca Plant Way

Read the Writing in Science feature in your textbook.

Write About It

Explanatory Writing Write an article for young gardeners. Explain the process of CAM photosynthesis. Research facts and details for your article.

Planning and Organizing

Help Ray create an outline for his article. Here are some topics he wants to cover. Place them in the outline form below.

- What happens during the day in CAM photosynthesis?
- What is the purpose of CAM photosynthesis?
- What is photosynthesis?
- What happens at night during CAM photosynthesis?
- How does the process of CAM photosynthesis work?

I. What is photosynthesis?

II. What is the purpose of CAM photosynthesis?

III. How does the process of CAM photosynthesis work?

A. What happens at night in CAM photosynthesis?

B. What happens during the day in CAM photosynthesis?

IV. Why is the yucca plant special?

Now create an outline for your own article on a separate sheet of paper. Make it as detailed as possible. Add A, B, C points and subpoints (1, 2, 3) under these as necessary.

Name _____ Date _____

Now use a separate sheet of paper to write the first draft of your article.

Revising and Proofreading

Here is part of the report that Ray wrote. Help him combine his sentences. Use the transition word in parentheses. Make sure you punctuate the new sentence correctly.

1. In CAM photosynthesis, the stomates open at night. The air is cooler and the humidity is higher. (when)

   In CAM photosynthesis, the stomates open at night when the air is cooler and the humidity is higher.

2. It needs to avoid losing water. The yucca plant closes its stomates during the day. (because)

   Because it needs to avoid losing water, the yucca plant closes its stomates during the day.

3. CAM photosynthesis is effective. It results in more efficient water use. (since)

   CAM photosynthesis is effective, since it results in more efficient water use.

Now revise and proofread your article. Ask yourself:

- Have I introduced my main idea about photosynthesis in yuccas?
- Have I included facts and details to show how this process works?
- Have I used examples and language appropriate for my audience?
- Have I used transition words and phrases to connect ideas?
- Have I ended with a strong conclusion about why yucca plants are special?
- Have I corrected all grammar errors?
- Have I corrected all problems in spelling, punctuation, and capitalization?

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Plant Structures and Functions

Choose the letter of the best answer.

1. What food do plants produce during photosynthesis?

a. carbohydrates
b. seeds
c. spores
d. starch

2. Seed plants that produce flowers are

a. angiosperms.
b. cambium.
c. gymnosperms.
d. phloem.

3. What tissue moves food from a plant's leaves to its other parts?

a. cambium **b.** phloem **c.** vein **d.** xylem

4. An undeveloped plant and stored food is contained in a(n)

a. angiosperm.
b. gymnosperm.
c. seed.
d. spore.

5. Energy stored during photosynthesis is released during a process called

a. carbohydrate.
b. cellular inspiration.
c. cellular perspiration.
d. cellular respiration.

6. New xylem and phloem are produced in the

a. cambium.
b. photosynthesis.
c. seed.
d. spore.

Name _____ Date _____

Choose the letter of the best answer.

7. When plants store sugar, they store it as

a. carbohydrates.

b. seeds.

c. spores.

d. starch.

8. Seed plants that do not produce flowers are

a. angiosperms.

b. gymnosperms.

c. phloem.

d. xylem.

9. Leaves use energy from the Sun to make food for a plant during the process of

a. cellular inspiration.

b. cellular respiration.

c. photogenesis.

d. photosynthesis.

10. A single cell that can develop into a new plant exactly like the old plant is a(n)

a. capsule.

b. seed.

c. spore.

d. unicell.

11. What tissue moves water up from a plant's roots?

a. cambium

b. phloem

c. vein

d. xylem

Name _____ Date _____

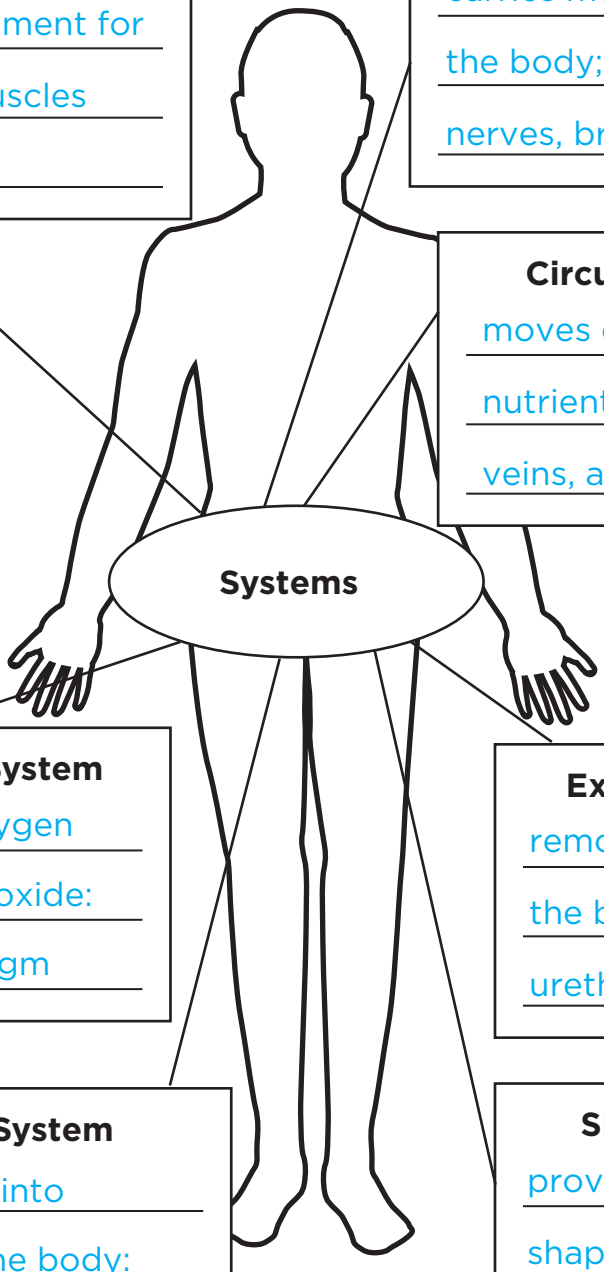
CHAPTER LEVEL
Concept Map

Human Body Systems

Complete the concept map with the information you learned about human body systems.

Muscular System
provides movement for body parts: muscles

Nervous System
carries messages throughout the body; controls senses: nerves, brain



Circulatory System
moves oxygen and nutrients to cells: heart, veins, arteries, capillaries

Respiratory System
exchanges oxygen and carbon dioxide: lungs, diaphragm

Excretory System
removes waste from the body: kidneys, urethra

Digestive System
converts food into nutrients for the body: mouth, stomach, intestines

Skeletal System
provides support and shape for the body: skull, bones

Name _____ Date _____

Bigger Muscles or a Stronger Heart?

Read the Literature feature in your textbook.

Write About It

Response to Literature In this article, you learned about the difference between aerobic and anaerobic exercise. Write a summary. Start by telling the main idea of the article. Then include important facts and details. Reach a conclusion at the end.

Summary should present a main idea that addresses what exercise does for the circulatory and respiratory systems. Sentences should contain significant facts on the effects of aerobic and anaerobic exercise on circulation and breathing. Look for development of ideas using simple facts, details, examples, and explanations of exercise, and of the circulatory and respiratory systems. Good reports will address the prompt, stay on topic, have vivid word choice, include correct usage of grammar and mechanics, and use proper transition from one idea to another.

Name _____ Date _____ **Outline**

The Human Body

Use your textbook to help you fill in the blanks.

What are the organ systems in your body?

1. A group of similar cells that work together to carry out a function make up a(n) tissue .
2. Different tissues are organized into various organs .
3. The organs then work together as part of a(n) organ system to perform specific activities or functions .

What do your organ systems do?

4. The nervous system carries messages from one part of the body to another and controls your senses.
5. The skeletal system gives the body its shape, protects organs, and works with muscles to move the body.
6. The muscular system is made up of muscles to move bones.
7. The integumentary system includes skin and hair that cover your body and act as a barrier to protect it.
8. The immune system helps your body to heal and prevents it from getting sick.
9. The endocrine system produces chemicals that regulate and control the body's functions.

Name _____ Date _____

10. The digestive system turns the food you eat into nutrients that are suitable for use by the body's cells.

11. The respiratory system carries oxygen into the lungs where it is transferred to the blood.

12. The circulatory system moves oxygen and nutrients to the cells, and takes carbon dioxide and waste from the cells.

13. The excretory system moves waste materials out of the body.

How are body materials transported?

14. The digestive system breaks down food for use by your cells.

15. The circulatory system transports nutrients to your cells.

16. The respiratory system moves oxygen into your body through your mouth and nose.

17. The excretory system carries waste from your body.

Summarize the Main Idea

18. How is the body organized to carry out life processes?

The body is organized into organ systems to carry out life processes. Each organ system has a specific function. Some organ systems work together to protect and control the body. Other organ systems move materials through the body.

Name _____ Date _____

Vocabulary

The Human Body

COABNR C A R B O N

ITCOYRURLAC C I R C U L A T O R Y

SIEDEVGIT D I G E S T I V E

UENMIM I M M U N E

RAIH H A I R

Unscramble the words using the hints, then solve the puzzle.

1. The respiratory system brings in oxygen and takes out _____carbon_____ dioxide.
2. The _____circulatory_____ system moves nutrients into cells and waste out of cells.
3. The _____digestive_____ system turns food into nutrients for the cells.
4. A person with a strong _____immune_____ system does not catch many colds.
5. The body's integumentary system includes its skin and _____hair_____ .

It works like a well-oiled machine when all its systems work together. It's the

H U M A N B O D Y

Cloze Test

Name _____ Date _____

The Human Body

cells	excretory system	organs
circulatory system	nervous system	organ system
digestive system	immune system	respiratory system
endocrine system	integumentary system	

Fill in the blanks.

The human body is well equipped to carry out all the necessary processes of life. The body has similar cells, which work together and make up a tissue. Different tissues are organized into organs. A complex activity, such as the breakdown of food for use by the cells, requires a(n) organ system. This specific function is performed by the digestive system. Other organ systems are involved in the transport of materials into, through, and out of the body. These systems are the respiratory system, the circulatory system, and the excretory system. Two organ systems that control the body's activities are the nervous system and the endocrine system. Two other organ systems that protect the body are the immune system and the integumentary system. To do all the wonderful things that humans do, it is necessary that all the body's organ systems work together.

Name _____ Date _____ Outline

The Digestive System

Use your textbook to help you fill in the blanks.

What is digestion?

1. Your cells get energy from the _____food_____ you eat.
2. _____Digestion_____ breaks down big food into simple substances so that tiny _____cells_____ can use it.
3. The body breaks down food both physically and _____chemically_____ .
4. The body's _____glands_____ produce chemicals to help break down food.

Where does digestion begin?

5. When you bite into food, your teeth tear and grind the food into a small ball called a(n) _____bolus_____ .
6. Your _____tongue_____ , attached to the back of your mouth, has many _____taste buds_____ that allow you to taste sweet, salty, sour, and bitter things.
7. When the bolus is moved to the _____pharynx_____ or throat, it is finally swallowed into the _____esophagus_____ , the long muscular tube that connects to the stomach.
8. The teeth used for biting food are found in the front of the mouth and are called _____incisors_____ .
9. The _____molars_____ , the flat teeth in the back of your mouth, are used for crushing and grinding food.

Name _____ Date _____

10. The esophagus is lined with mucus , which makes the inside slippery.

11. Muscles in the esophagus squeeze the food and move it along to the stomach .

How is food broken down further?

12. After 4 to 6 hours in the stomach, the food is released into the small intestine .

13. Finally the nutrients are absorbed inside the small intestine, which has hairy finger-like bumps called villi .

What are the parts of the large intestine?

14. Food that could not be digested moves along to the large intestine .

15. The colon is the widest part of the large intestine.

Summarize the Main Idea

16. What are the basic steps of the digestion process?

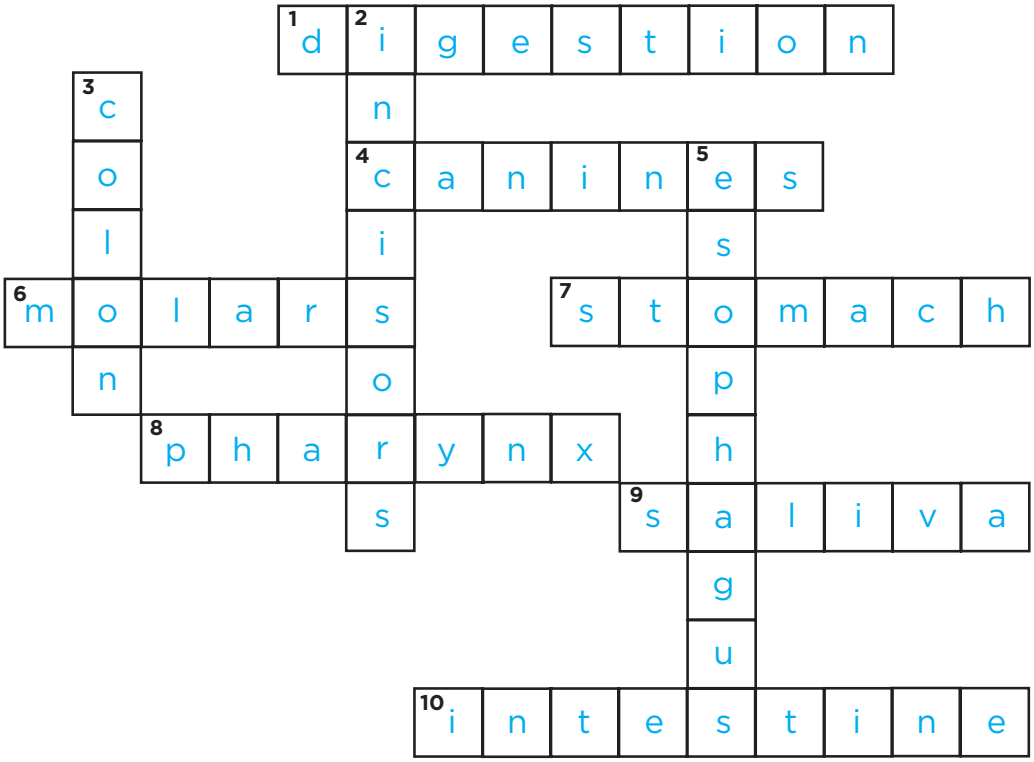
Digestion begins in the mouth where teeth cut and grind food, and saliva begins to break it down chemically. Most of the chemical breakdown of food takes place in the stomach and the small intestine. Absorption of nutrients occurs in the small intestine. Solid waste, or undigested food, is passed along to the large intestine.

Name _____ Date _____

Vocabulary

The Digestive System

Use the following hints to fill in the crossword puzzle.



Across

1. the process that breaks down food into simple substances
4. pointy teeth used for cutting and tearing food
6. flat back teeth used for crushing and grinding food
7. has muscles that squeeze and mix food, as well as acids that break it down
8. another name for throat
9. found in the mouth, it starts softening food, breaking it down chemically
10. an organ that has villi to absorb the nutrients

Down

2. front teeth used for biting food
3. the widest part of the large intestine
5. a muscular tube that connects your mouth to your stomach

Cloze Test Name _____ Date _____

The Digestive System

bile	colon	large intestine	small intestine
bolus	energy	molars	stomach
canines	esophagus	rectum	villi
chemically	incisors	saliva	

Fill in the blanks.

The function of the digestive system is to break food down so that the cells can use it. Food supplies energy to the cells. Digestion begins in the mouth with the teeth where incisors bite the food, and canines cut and tear it. Molars grind and crush the food into a small ball called bolus . Saliva , a liquid found in the mouth, softens the bolus and starts breaking it down chemically . Swallowed food moves down the esophagus to the stomach . In the stomach the liver adds bile and the pancreas adds other digestive juices that break food down into a soupy liquid. Then the food moves to the small intestine where it can be absorbed into the body through villi . The leftover food that could not be digested moves to the large intestine , which has the colon as its widest part. The last part of the large intestine is the rectum .

Name _____ Date _____

Reading

Meet George Barrowclough

When most people think of predators, they picture long, sharp teeth that can rip into flesh. But did you know that some predators, like owls, have no teeth at all? An owl is a predator, an animal that hunts other animals, that eat and digest their food in an interesting way.

George Barrowclough is an ornithologist at the American Museum of Natural History. An ornithologist is a scientist who studies birds. He investigates a bird called the Northern spotted owl, found only in California, Oregon, Washington, and parts of Canada. Northern spotted owls are excellent hunters. They catch mostly rodents, including flying squirrels, woodrats, and mice.

Owl Pellets

When you eat, you chew first to break the food apart before swallowing it down to your stomach. Most of the time, when an owl eats a mouse, it swallows it whole. Then it relies on a part of its stomach called the gizzard to break the food down. The gizzard has digestive fluids that dissolve all of the soft tissue of the mouse.

The skeleton, teeth, fur, and claws don't have a lot of nutrients and are very hard for the owls to digest. So instead they are squeezed into a tight ball in the gizzard. Several hours later, the owl closes its eyes, coughs it up, and spits it out. This mass of mixed-up fur and bones is called a pellet.

Owl pellets may look gross to some people, but scientists like George find them fascinating. That's because scientists get a lot of information from owl pellets. They can find out what kinds of animals the owls prey on and how they hunt. This information is especially important because the Northern Spotted Owl is an endangered species of bird. The more we learn about these owls and what they need to survive, the better we are able to protect them.

Name _____ Date _____

Main Idea and Details

- Look for the central point of a selection to find the main idea.
- Details are important parts of the selection that support the main idea.

Write About It

Main Idea **Think about the article you just read. Look for the main topic or central idea of the article. Write the main idea of the article and give one detail from the article that supports the main idea.**

Owls are predators that spit out any undigested food in the form of a pellet. A detail that supports this main idea is when an owl eats a mouse, it swallows it whole.

Name _____ Date _____ **Outline**

The Respiratory System

Use your textbook to help you fill in the blanks.

What does the respiratory system do?

1. Your respiratory system is made up of tubes and passages to transport the air you breathe.
2. When you inhale, air enters through your mouth and nose and fills your lungs .
3. In your lungs, air is drawn down through a series of tubes surrounded by capillaries , or tiny blood vessels.
4. Oxygen enters the capillaries and carbon dioxide from the capillaries passes into the lungs.
5. When you exhale , the lungs empty of air, which contains the carbon dioxide.
6. The diaphragm , a large flat sheet of muscle, controls movement of air in and out of the lungs.
7. Air flows in through your nose and enters your mouth. It passes through your pharynx , or throat, and over your larynx , or voice box.
8. A flap of tissue that closes when you swallow to prevent food from entering the airway is called the epiglottis .

Name _____ Date _____

Where does gas exchange take place?

10. After passing the larynx, air enters the trachea, or windpipe, a strong tube that divides into two branches.

11. In the lungs, the branches of the trachea continue to divide into smaller and smaller branches called bronchi.

12. At the end of the smallest bronchi are tiny, thin sacs called alveoli, where the gas exchange takes place.

13. The walls of the alveoli are so thin that gases like oxygen and carbon dioxide can pass through them by a process called diffusion.

How does cellular respiration happen in animal cells?

14. Oxygen in the bloodstream flows into the cell's mitochondria.

15. In the mitochondria, glucose and oxygen react to produce carbon dioxide, water and energy.

16. Energy is stored within a cell in a substance called ATP.

17. Carbon dioxide is carried back to the lungs to be released.

Summarize the Main Idea

18. What does the respiratory system do?

The respiratory system is an organ system that takes air, containing oxygen, into the lungs, where it is exchanged for carbon dioxide. Cell respiration takes place when the blood carries glucose and oxygen into a cell's mitochondria. Here, the two chemicals react to produce carbon dioxide and water. This reaction releases energy for the cell.

Name _____ Date _____ **Vocabulary**

The Respiratory System

GIPDAAHRM

D	I	A	P	H	R	A	G	M
1								6

TITGIPSEOL

E	P	I	G	L	O	T	T	I	S
					2	4			5

IFNIOSUDF

D	I	F	F	U	S	I	O	N
								3

KABRE

B	R	E	A	K
				8

ESLUCGO

G	L	U	C	O	S	E
				7		9

Unscramble the words using the hints, then solve the puzzle.

1. The large flat muscle that controls your breathing is called the _____diaphragm_____ .
2. The flap of tissue that closes when you swallow to protect you from choking is the _____epiglottis_____ .
3. The passage of oxygen or carbon dioxide through a cell membrane is a process called _____diffusion_____ .
4. Cellular respiration occurs when cells _____break_____ down nutrients to get energy.
5. _____Glucose_____ and oxygen react inside a cell's mitochondria to produce carbon dioxide, water, and energy.

The best advice for keeping a healthy respiratory system is:

D	O	N	T
1	2	3	4

S	M	O	K	E
5	6	7	8	9

!

Cloze Test

Name _____ Date _____

The Respiratory System

alveoli	diaphragm	glucose	mitochondria
bronchi	diffusion	inhale	respiratory system
carbon dioxide	exhale	lungs	trachea

Fill in the blanks.

Your cells need oxygen to break down food for energy. Oxygen enters the body through your respiratory system . When you inhale , air passes through your nose and mouth and enters your trachea , or windpipe. The trachea lets air into your right and left lungs . The lungs expand as air flows into smaller branched tubes called bronchi . At the end of the bronchi are tiny sacs called alveoli . Here oxygen flows through the alveoli's walls into the blood cells in a process called diffusion . The blood carries a waste product called carbon dioxide from the blood to the tubes of the lungs. Carbon dioxide is pushed out of the body when the lungs exhale . The muscle that controls the movement of gases through the lungs is called the diaphragm . Oxygen in the blood can flow into a cell's mitochondria , where it reacts with a type of sugar called glucose . This reaction releases energy to the cell.

Name _____ Date _____ **Outline**

The Circulatory System

Use your textbook to help you fill in the blanks.

How are materials transported through your body?

1. The circulatory system is made up of the heart , blood vessels , and blood .
2. The circulatory system is a transport system that brings materials to and from your body's organs, tissues, and cells .
3. Blood from the heart is pumped into arteries , which carry the blood mixed with oxygen from the heart to the body.
4. Oxygen and nutrients pass from the blood to the body's tissues through the thin walls of the capillaries .
5. The veins take the blood that carries carbon dioxide back from the body to the heart.

What are the parts of the heart?

6. The heart, a fist-sized muscle, is located behind a bone called the sternum in the center of your chest.
7. Pericardium , a protective sac of tissue, surrounds the heart.
8. Each side has two chambers; the upper chamber, or atrium , and the lower chamber, or ventricle .

Name _____ Date _____

9. Blood leaves the heart through the aorta , an artery, and is pumped to the body.

10. The heart has valves that automatically close to stop blood from flowing in the wrong direction.

How do blood and blood vessels work?

11. Red blood cells carry oxygen and carbon dioxide to and from the lungs and the rest of the body.

12. White blood cells are large blood cells that fight germs entering the body; they also break down dead cells.

13. Platelets are cell fragments that prevent blood from leaking through capillaries.

How do the circulatory and respiratory systems work together?

14. Blood coming from the body is oxygen – poor and carbon dioxide – rich.

15. The heart pumps the blood to the lungs through the pulmonary artery .

16. Blood comes back from the lungs to the left side of the heart through the pulmonary veins .

Summarize the Main Idea

17. What does the circulatory system do?

The circulatory system is an organ system that transports needed materials to and from various parts of the body. The heart, blood vessels, and blood make up the circulatory system. Working together with the respiratory system, oxygen enters the blood and is transported to the body's cells, while carbon dioxide is picked up from the cells and transported out of the body.

Name _____ Date _____ **Vocabulary**

The Circulatory System

MIRTUA A T R I U M

NILRECTEV V E N T R I C L E

NOXYGE O X Y G E N

TASLELPTE P L A T E L E T S

RAIESRET A R T E R I E S

LILPIASACRE C A P I L L A R I E S

Unscramble the words using the hints, then solve the puzzle.

1. The upper chamber of the heart is called the _____atrium_____ .

2. The lower chamber of the heart is called the _____ventricle_____ .

3. Blood is _____oxygen_____ – poor coming into the right side of the heart from the body.

4. _____Platelets_____ are part of the blood formed of small cell fragments. They form clots to stop bleeding.

5. _____Arteries_____ are thick-walled blood vessels that carry blood away from the heart.

6. _____Capillaries_____ are tiny blood vessels that have walls thin enough for carbon dioxide and oxygen to be exchanged.

A strong cardiovascular system is developed through regular _____ .

E X E R C I S E

Cloze Test Name _____ Date _____

The Circulatory System

arteries	capillaries	platelets	white
atrium	carbon dioxide	red	
blood	heart	veins	
blood vessels	oxygen	ventricle	

Fill in the blanks.

The circulatory system carries needed supplies like food and oxygen to various organs and tissues, and it takes away wastes. The circulatory system consists of the heart , blood vessels and blood . The heart itself is divided into four chambers the upper left and right atrium and lower left and right ventricle . There are three types of blood vessels: the veins that carry blood to the heart from the body, the arteries that carry blood from the heart to the body and the capillaries that connect the two. An important station in the blood's trip through the body is the lung where red blood cells get oxygen and leave carbon dioxide . The blood's white cells fight germs and break down dead cells. Platelets keep blood from leaking through the thin walls of the capillaries. They also form scabs that stop cuts from bleeding.

Name _____ Date _____

Reading

Meet Adriana Aquino

Water covers about two-thirds of the Earth's surface, and fish live in almost every corner of it. In tropical seas where coral reefs are found, the water is warm. In oceans near the poles, the water is below freezing. How do fish survive in these different conditions?

Adriana Aquino is a scientist at the American Museum of Natural History. She's studied several fish species from around the world. The fish she studies are from many different environments. Adriana specializes in their body structure and form. Some of the fish she is interested in have developed amazing adaptations to their circulatory systems that allow them to live in these different environments.

One of these adaptations allows fish to live in some of the coldest places on Earth, like the icy cold waters of the Arctic and Antarctic oceans. You might think that the fish swimming in water below 0˚C would freeze solid, but they do not. What stops them from freezing?

These fish have a special protein in their blood. This "antifreeze" protein in the circulatory systems of these fish stops the blood from freezing. Even a single ice crystal can be deadly to a fish. Once one crystal grows, others can cluster around it, eventually freezing the blood. If the blood freezes, the circulatory system fails. The frozen blood stops circulating and no longer carries oxygen and nutrients to cells. The antifreeze proteins stop this from happening by surrounding any ice crystals and binding to their sides. This stops the crystals from clustering. And that's how these fish can survive in the coldest waters of the world.

Name _____ Date _____

Main Idea and Details

- Look for the central point of a selection to find the main idea.
- Details are important parts of the selection that support the main idea.

Write About It

Main Idea **Tell how the fish that live in the Arctic and Antarctic oceans are able to keep from freezing. Explain what would happen if a fish did not have this adaptation to the cold water. Research and explain other adaptations fish in cold environments use to survive.**

Response should state that fish in the Arctic and Antarctic regions have special proteins in their blood that act as antifreeze. This prevents the fish from freezing to death. Student may include other adaptations that allow the fish to survive, move, and find food in such a cold environment.

Name _____ Date _____ **Outline**

The Excretory System

Use your textbook to help you fill in the blanks.

What does the excretory system do?

1. The excretory system removes _waste products_ from your body.

2. Solid waste leaves the body through the _digestive_ system. Carbon dioxide leaves the body through the _respiratory_ system. Urine leaves through the _urinary_ system, and sweat leaves through the _integumentary_ system.

3. The urinary system includes the _kidneys_, the _bladder_, and the _urinary tract_.

How does your body filter blood?

4. The liver breaks down toxins, or _poisonous_ substances in the blood.

5. Toxins broken down by the liver need to be _filtered_ or separated out of the blood by the kidneys.

6. The kidneys are organs that _remove_ substances from the blood that the body does not need, and they also _return_ substances to the blood that the body does need.

Name _____ Date _____

7. Nephrons are individual, tiny filters in the kidneys that separate waste from the useful materials in the blood.

8. Each nephron consists of a cup-like capsule that is connected to a long coiled tube.

9. The nephron tube gathers all of the unusable waste and excess water in a collecting duct .

How does your body eliminate waste?

10. The collected wastes are turned into urine and stored in the bladder .

11. The urethra is the tube that carries urine from the bladder to the outside of the body.

12. Sweat helps the body get rid of wastes and excess heat by pushing sweat collected in sweat glands up into the pores and then onto the surface of the skin.

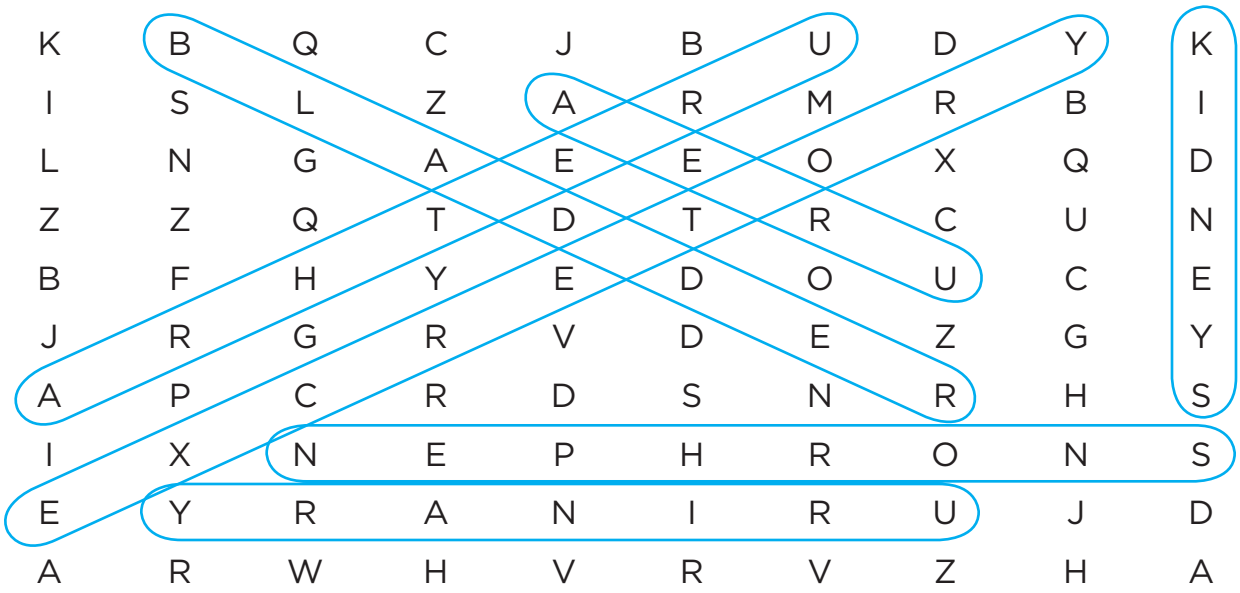
Summarize the Main Idea

13. Briefly explain the basic jobs of the kidneys, the nephrons, the bladder, and the urethra.

The bean-shaped kidneys produce urine and control the level of water and salts in the body. Nephrons act as tiny filters that remove wastes from the blood. The bladder stores urine, and the urine leaves the body through the urethra.

Name _____ Date _____ **Vocabulary**

The Excretory System



Use the clues below to help you find the words hidden in the puzzle.

1. An organ that temporarily stores urine and stretches from the size of a plum to the size of a grapefruit depending on how full it is. bladder

2. The system that removes waste products from the body. excretory

3. Bean-shaped organs that filter wastes out of the blood, send useful particles back to the blood, and produce urine. kidneys

4. Individual, tiny filters that separate wastes from useful materials in the blood, and number more than 1 million in each kidney. nephrons

5. What the parts of food that the liver cannot break down are converted into. urea

6. The tube that carries urine from the bladder to the outside of the body. urethra

7. The system that includes the kidneys, bladder, and urinary tract. urinary

Cloze Test

Name _____ Date _____

The Excretory System

artery	kidneys	returned	ureters
bile	nephrons	sweat	useful
ducts	pores	tubes	

Fill in the blanks.

The job of the excretory system is to get rid of wastes. In the integumentary system, sweat glands push ___sweat___ that contains wastes to the surface of the skin through ___pores___ . In the urinary system, waste products are filtered, and useful products are ___returned___ to the blood. The process of the urinary system starts when the liver produces ___bile___ to break down food. Whatever broken-down food the body cannot use leaves the liver as urea. Next, the blood containing urea flows into the bean-shaped ___kidneys___ through a(n) ___artery___ and then to capillaries. Once the blood reaches the ___nephrons___ , or individual, tiny filters, it will be separated so that ___useful___ materials are sent back to the blood. Wastes will get caught up in ___tubes___ with semipermeable membranes and then will be held in collecting ___ducts___ . The urea and other wastes reach the bladder through tubes called ___ureters___ . A signal goes to the brain to indicate that the bladder needs to be emptied.

Name _____ Date _____ Writing

Dr. Kolff Great Inventor

Read the Writing in Science feature in your textbook.

Write About It

Persuasive Writing Suppose your school wants to give someone an award. Write a letter that persuades your principal to give the award to Dr. Kolff. Use convincing facts and details to back up your arguments.

Planning and Organizing

Gloria plans to include her opinions or arguments about Dr. Kolff, and then back them up with facts. Here are five sentences that she wrote. Write O by each sentence that gives her opinion. Write F by each statement that gives a fact.

1. O Dr. Kolff is a dedicated humanitarian whose life demonstrates his concern for human welfare.
2. F In the midst of the horrors of World War II, Dr. Kolff started the first blood bank on the continent of Europe.
3. F After the war, he sent free dialysis machines to England, Canada, and the United States.
4. O Dr. Kolff's two life-saving machines are among the most important inventions ever.
5. F Working with Dr. Robert Jarvik and Dr. Don Olsen, he developed the mechanical heart.

Now write an opinion you could use in your editorial. Then, write two facts that back it up.

1. Opinion: _____
2. Fact: _____
3. Fact: _____

Name _____ Date _____

Now write the first draft of your editorial on a separate sheet of paper. Begin by clearly stating your position. Present the facts and evidence in a logical order. End with your strongest reason.

Revising and Proofreading

Read this passage from Gloria's report. There are eleven errors. Proofread this passage and correct the errors.

When willem kolff was a young boy growing up in the netherlands he decided he didn't want to be a doctor because doctors have to see people dye every day. However, he did become a doctor, studing at the university of leiden. As a result of his invention of the artificial kidney machine and the artificial heart many people now live longer lifes.

Now revise and proofread your editorial. Ask yourself:

- Have I clearly stated why Dr. Kolff should receive a lifetime achievement award?
- Have I supported my arguments or opinions with convincing facts and reasons?
- Have I included evidence from research on the subject?
- Have I presented evidence in logical order?
- Have I shown that I understand the purpose and format of an editorial?
- Have I corrected all grammar errors?
- Have I corrected all errors in spelling, punctuation, and capitalization?

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Human Body Systems

Choose the letter of the best answer.

1. Your skin and hair are parts of your

a. endocrine system.
b. excretory system.
c. immune system.
d. integumentary system.

2. What organ(s) filter waste from the blood?

a. bladder
b. kidneys
c. small intestine
d. urethra

3. The body system you use for movement is the

a. muscular system.
b. nervous system.
c. respiratory system.
d. urinary system.

4. The system that removes waste from your body is the

a. digestive system.
b. endocrine system.
c. excretory system.
d. integumentary system.

5. The system that controls your body's growth and responses is the

a. endocrine system.
b. excretory system.
c. immune system.
d. integumentary system.

6. The body system that helps you heal is the

a. circulatory system.
b. immune system.
c. integumentary system.
d. respiratory system.

7. Blood cells carrying carbon dioxide return to the heart through

a. arteries. **b.** capillaries. **c.** veins. **d.** lungs.

Name _____ Date _____

Choose the letter of the best answer.

8. What is another name for the throat?

a. esophagus **b.** larynx **c.** pharynx **d.** trachea

9. What body system includes the kidneys and bladder?

a. circulatory system
b. digestive system
c. reproductive system
d. urinary system

10. Oxygen and carbon dioxide move in and out of blood through the walls of the

a. arteries. **b.** capillaries. **c.** veins. **d.** vessels.

11. Food is broken down to supply energy for your body in the

a. digestive system.
b. endocrine system.
c. excretory system.
d. reproductive system.

12. Flat teeth in the back of your mouth that crush and grind food are

a. canines. **b.** fangs. **c.** incisors. **d.** molars.

13. The muscular organ that pumps blood throughout your body is your

a. diaphragm. **b.** heart. **c.** larynx. **d.** pharynx.

14. Digested food is absorbed in the

a. colon.
b. large intestine.
c. small intestine.
d. stomach.

15. What system brings in oxygen for your cells to use?

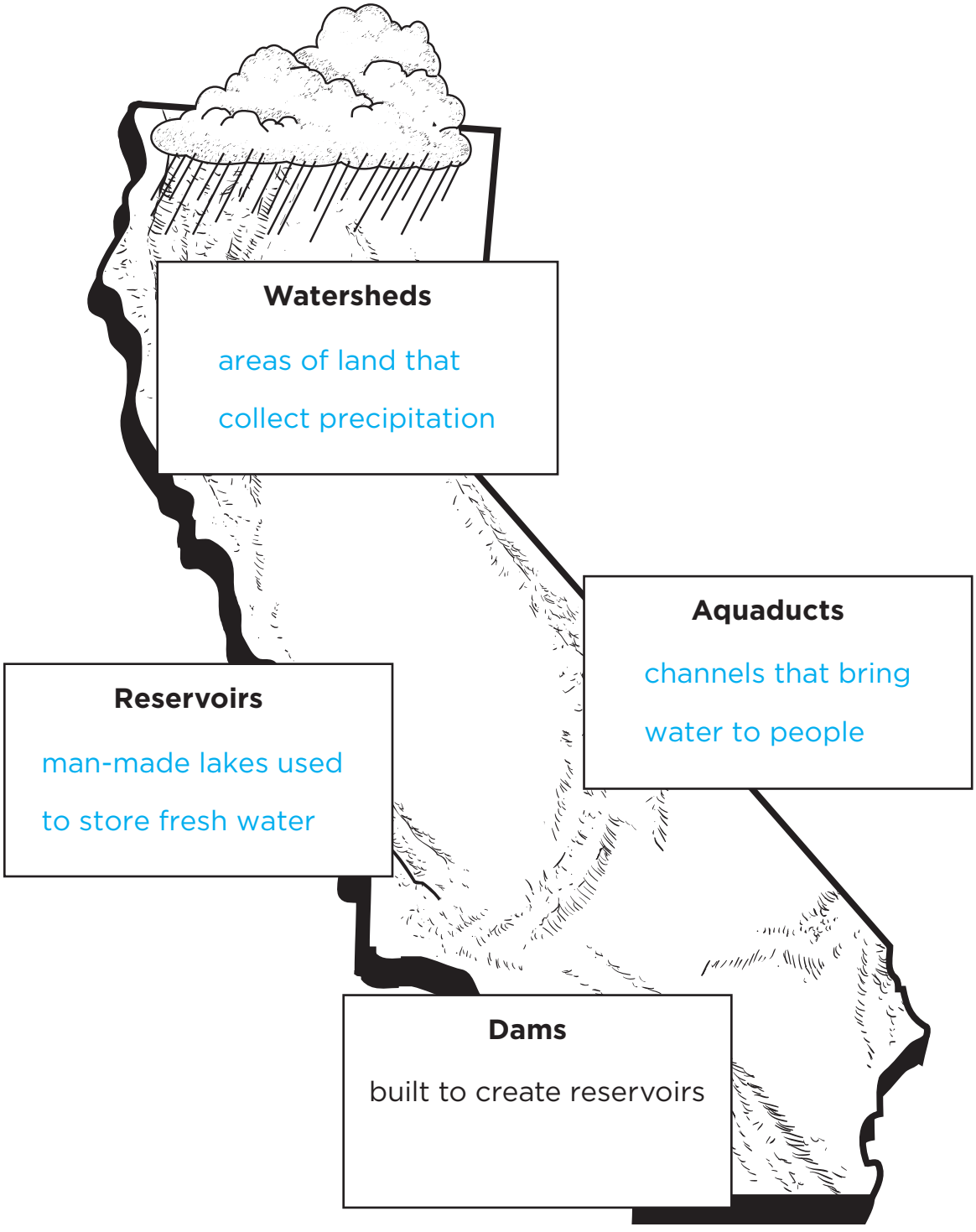
a. reproductive system
b. digestive system
c. endocrine system
d. respiratory system

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Earth's Water

Complete the concept map with the information you learned about Earth's water.



Watersheds

areas of land that collect precipitation

Aquaducts

channels that bring water to people

Reservoirs

man-made lakes used to store fresh water

Dams

built to create reservoirs

Name _____ Date _____

Mono Lake

Read the Literature feature in your textbook.

Write About It

Response to Literature The Mono Basin Aqueduct was built to help solve the water crisis in Los Angeles in 1939. Write a personal narrative. Tell about an experience that showed you how important water is to our everyday lives.

The narrative should include details about how water is essential to the student's life.

Name _____ Date _____ **Outline**

Earth: The Blue Planet

Use your textbook to help you fill in the blanks.

How much of Earth's surface is covered by water?

1. A large body of salt water is called a(n) ocean .
2. About 70 percent of the surface of Earth is covered by oceans.
3. People use different natural resources from the ocean for food, energy, and recreation.

What makes the ocean salty?

4. As rain runs downhill, it picks up salt from dirt and rocks.
5. Rivers carry this salt into the ocean.
6. Sunlight provides heat that evaporates fresh water from the ocean.
7. Waves pound on rocks and sand, and undersea volcanoes erupt, adding salt to the ocean.
8. The concentration of salt in the ocean is about 3.5 percent , which causes ocean water to taste salty.

Outline Name _____ Date _____

Where is Earth's fresh water found on Earth's surface?

9. Frozen ice sheets contain most of the fresh water on Earth.

10. Greenland and Antarctica have the only ice sheets in the world.

11. Some fresh water is frozen in glaciers, which are large bodies of ice that move slowly over land.

12. Fresh water flows across Earth's surface in rivers.

13. Most lakes are small to medium-sized bodies of water that are surrounded by land and hold fresh water.

Summarize the Main Idea

14. Describe the two kinds of water that cover three-fourths of Earth's surface.

Most of Earth's water is salt water. The salt enters the ocean from rivers, pounding waves, and volcanoes. A small fraction of the water on Earth is fresh water. Most fresh water is frozen in ice sheets.

Name _____ Date _____

Vocabulary

Earth: The Blue Planet

a. ocean	**c.** evaporation	**e.** ice sheet
b. fresh water	**d.** water vapor	**f.** glacier

Match the correct letter with the description.

1. **1.** d Tiny droplets of water.
2. **2.** a A large body of salt water.
3. **3.** f A slowly moving ice sheet.
4. **4.** c The process of a liquid turning into a gas.
5. **5.** e A huge slab of ice and snow covering a large area of land.
6. **6.** b Water that contains little or no dissolved salts.

Cloze Test

Name _____ Date _____

Earth: The Blue Planet

concentration	fresh water	ocean	volcanoes
evaporates	natural resources	salt	

Fill in the blanks.

Oceans cover most of Earth's surface. A(n) ocean is a large body of salty water. People use different natural resources from the ocean for food, energy, and recreation. Fresh water contains little or no dissolved salts and covers only a small fraction of Earth's surface. Rain dissolves salt from soil and rocks, then streams and rivers carry it to the ocean. Heat from sunlight evaporates ocean water, leaving salt behind. Undersea volcanoes erupt and also add salt to the ocean. Over millions of years, the concentration of salt in the ocean has increased to about 3.5 percent. Water with this amount of salt is called salt water.

Name _____ Date _____ **Outline**

The Water Cycle

Use your textbook to help you fill in the blanks.

What makes water change form?

1. The three forms of water are solid , liquid , and gas .

2. When heat is taken away from liquid water, it changes into a(n) solid .

3. Evaporation happens when liquid water turns into a(n) gas .

What happens to water after it evaporates?

4. Moving air is called a(n) wind or breeze .

5. Cold air is more dense than warm air.

How do clouds form?

6. Cirrus clouds form high in the sky, usually from ice crystals.

Outline Name _____ Date _____

Will it rain?

7. Drops of liquid water in clouds are pulled down by their weight.

8. If the temperature is below freezing, drops of water become solid, forming sleet, hail, or snow.

9. Snowflakes are formed when water vapor turns directly into solid crystals .

How is water recycled?

10. The water cycle is the continuous movement of water between Earth's surface and the air.

Summarize the Main Idea

11. Describe the three steps that cause water to change during the water cycle.

Condensation occurs when water vapor changes to a liquid.

Evaporation occurs when water changes from a liquid to a gas.

Precipitation occurs when water falls as a liquid in the form of rain, sleet, hail, or snow.

Name _____ Date _____

Vocabulary

The Water Cycle

a. sea breeze	**c.** land breeze	**e.** precipitation
b. condensation	**d.** fog	**f.** water cycle

Match the correct letter with the description.

1. f The continuous movement of water between Earth's surface and the air.
2. a The movement of air from the water to the land.
3. c The movement of air from the land to the water.
4. e Water that falls from the air to the ground as rain, sleet, hail, or snow.
5. b When water changes from vapor to liquid form.
6. d A cloud that forms near the ground.

Cloze Test Name _____ Date _____

The Water Cycle

condensation	evaporation	precipitation	rises
droplets	hail	rain	temperature

Fill in the blanks.

Water on Earth is never lost. Water changes from a liquid to a gas during evaporation . Then the water vapor rises in the air. As water vapor moves higher, it turns into tiny water droplets . This change from gas to liquid is called condensation . When water droplets get heavy enough, they fall to the ground in the form of precipitation . This can be in liquid form as rain , or frozen as snow or hail . The type of precipitation depends on the temperature . When water returns to Earth's surface, the water cycle begins again.

Name _____ Date _____ **Outline**

Freshwater Resources

Use your textbook to help you fill in the blanks.

Where is Earth's usable fresh water found?

1. Much of Earth's usable freshwater resources are obtained from running water , standing water , and groundwater .

2. People build dams across rivers to form reservoirs.

3. Layers of rock and soil that allow water to flow through are called aquifers .

4. Some of the fresh water used by people comes from reservoirs , or man-made lakes.

5. If people live far away from streams, rivers, and lakes, they can get their water from groundwater .

What is a watershed?

6. A(n) watershed is the name for an area of land from which water drains into a specific river.

7. As water flows through a watershed, it replaces water that rivers, lakes, and oceans lose through evaporation.

8. Plants help control the flow of water through a watershed.

9. A(n) flood occurs when water pours over the banks of a body of water.

Outline Name _____ Date _____

What causes polluted water?

10. Contaminated or polluted water contains substances that can be harmful.

11. Governments have passed laws to control water pollution.

How are freshwater resources cleaned?

12. Chlorine is added to water to kill harmful bacteria.

Summarize the Main Idea

13. Why is usable fresh water considered a limited resource?

Usable fresh water is only found in running water, surface water, and groundwater. It can be easily contaminated by human activities. Laws have been passed to protect freshwater resources. Fresh water is treated before it reaches your community.

Name _____ Date _____

Vocabulary

Freshwater Resources

a. aquifer	**d.** flood	**g.** watershed
b. contaminate	**e.** pollute	**h.** groundwater
c. dam	**f.** reservoir	

Fill in the blanks.

1. **1.** d When water runs over the banks of a body of water.
2. **2.** g An area of land where water drains into a specific body of water.
3. **3.** b To dirty, or pollute, a material such as fresh water.
4. **4.** c A barrier built across a stream or a river.
5. **5.** f A man-made lake that is used to store water.
6. **6.** a Underground layers of rock and soil that absorb water.
7. **7.** e To dirty, or contaminate, a material such as fresh water.
8. **8.** h Source of water reached by drilling or digging wells.

Cloze Test Name _____ Date _____

Freshwater Resources

aquifers	dams	precipitation
chlorine	flood	reservoirs
contaminated	pollution	watersheds

Fill in the blanks.

Fresh water is a precious resource. People build dams across rivers to create reservoirs of fresh water. Forms of precipitation such a rain and snow fall onto areas of land that drain into rivers. These areas are called watersheds. Water also flows through underground aquifers. If too much rain comes too fast, water overflows, causing a(n) flood.

Fresh water can become contaminated. This makes the water unsafe to use. Water treatment facilities use chlorine to kill bacteria in drinking water, making it safe. Governments also pass laws to prevent water pollution. These actions help keep fresh water safe for everyone.

Name _____ Date _____

Writing

Water Resources in California

Read the Writing in Science feature in your textbook.

Write About It

Persuasive Write a letter to the mayor of your town. Explain a need that the students in your community have and why people should help. State your position clearly and support it with relevant facts and evidence organized in a logical way.

Planning and Organizing

Write three sentences you could use in your letter. The sentences should explain the students' need and persuade people to help.

1. _____

_____

2. _____

_____

3. _____

_____

Name _____ Date _____

Drafting

Now use the guidelines below to write your persuasive letter. Use the business-letter format.

1. Write your complete address and the date.
2. Write the name of the person to whom you are writing, the organization, and the address.
3. Write the salutation, or greeting. Put a colon at the end of it.
4. Write the body of the letter. First explain why you are writing and state your position. Then provide facts and evidence that back up your opinion. Finally tell what you want to happen.
5. Write the closing. Use words such as "Sincerely" or "Yours truly." Put a comma after these words and sign your name.

(1) _____ _____

_____

(2) _____

_____

_____

(3) _____

(4) _____

_____

_____

_____

_____

_____

_____

(5) _____

Name _____ Date _____ **Outline**

California's Water Supply

Use your textbook to help you fill in the blanks.

Where does California's fresh water come from?

1. Most of California's people live in the ___southern___ part of the state.
2. However, most of California's ___precipitation___ falls in the northern part of the state.
3. A(n) ___drought___ is a long period of dry weather.
4. Some of the fresh water Californians use comes from water ___reclamation___ , or recycled water.
5. ___Aquifers___ supply about 30 percent of California's fresh water.

How is fresh water supplied to Californians?

6. For more than a hundred years, local, state, and federal governments have built different ways to ___transport___ and store fresh water in California.
7. People build water channels called ___aqueducts___ to move water from place to place.
8. Los Angeles gets water from ___Mono Lake___ and ___the Colorado River___ .
9. Californians have to make ___agreements___ about the best uses of their water.

Name _____ Date _____

How can California save water?

10. Since their water supply is limited, Californians have focused on water conservation .

11. Think of water conservation as a way to keep from wasting water.

12. Watering lawns uses 50 to 70% of a household's water.

Summarize the Main Idea

13. Where does California's water supply come from?

Most of the precipitation in California falls in the northern part of the state. Most of the people live in the southern part of the state. Aquifers, reclaimed water, aqueducts, and conservation of water help Californians get the water they need.

Name _____ Date _____

Vocabulary

California's Water Supply

a. aqueduct	**c.** drought
b. conservation	**d.** reclamation

Match the correct letter with the description.

1. ___a___ A channel where water travels from place to place.
2. ___c___ A long period of dry weather.
3. ___b___ Preventing the wasting of water.
4. ___d___ Recycling used water.

Cloze Test Name _____ Date _____

California's Water Supply

reclamation	recycle	southern
aqueducts	drought	
northern	reservoirs	

Fill in the blanks.

Californians get most of their fresh water from running water., standing water, and underground water. Most of California's rain falls in the northern part of the state, while most people live in the southern part of the state. Dams on rivers form reservoirs of water for people to use. Then water is transported through aqueducts to where people live.

However, the water supply may not be enough, especially during a(n) drought. Californians also use water from reclamation projects. These projects recycle water so it can be used again. Californians have learned to conserve water because they cannot afford to waste it.

Name _____ Date _____

Reading

Getting the Salt Out

Why does California have water shortages when it is right next to the Pacific Ocean? People cannot drink ocean water because of the salts that are dissolved in it.

The island of Santa Catalina lies off the coast of Southern California. It is completely surrounded by the Pacific Ocean. However, people on the island use water from the ocean all the time — to water crops, to take showers, and even to drink. How can they drink and use the salty ocean water? The water is transformed from salty to fresh at the Santa Catalina desalination plant. Desalination means to take the salt out.

At the desalination plant, ocean water is taken from an ocean water well. Once it is moved into the plant, salt and other impurities are removed from the water. The fresh water that is produced can now be used by people.

The Santa Catalina plant is one of the few desalination plants in the United States that produces water for public use. Desalination is an expensive process that uses a lot of energy. Despite its costs, there are desalination plant projects all over the world, including places like Saudi Arabia and Japan. Desalination is generally used when a community has so little access to fresh water that they are willing to pay a high price to get it. Scientists continue to research cheaper and more efficient ways to produce fresh water from ocean water.

Name _____ Date _____

Problem and Solution

- Identify the problem by looking for a conflict or an issue that needs to be resolved.
- Think about how the conflict or issue is resolved.

Write About It

Problem and Solution

1. Why can't the people of Santa Catalina island drink and use water directly from the ocean?

Ocean water has minerals, such as salt, dissolved in it.

2. How do the people of Santa Catalina get fresh water?

They take water from the ocean and remove the salt and other impurities at a desalination plant.

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Earth's Water

Choose the letter of the best answer.

1. Layers of rock or soil that allow water to flow through are called

   a. aquifers. **b.** lakes. **c.** reservoirs. **d.** watersheds.

2. Water that travels across land may pick up substances and become

   a. filtered. **b.** fresh. **c.** polluted. **d.** precipitated.

3. A sheet of ice that moves slowly over land is a(n)

   a. glacier. **b.** iceberg. **c.** ice cap. **d.** ice sheet.

4. The continuous movement of water from the Earth's surface to the air and back again is called the

   a. water evaporation.
   b. water cycle.
   c. water sequence.
   d. water rotation.

5. When water turns into a gas, the water is called

   a. condensation.
   b. fresh water.
   c. steam.
   d. water vapor.

6. A large body of salty water is called a(n)

   a. estuary. **b.** lake. **c.** ocean. **d.** pond.

7. A huge slab of ice and snow that covers a very large area of land is called a(n)

   a. glacier. **b.** iceberg. **c.** watershed. **d.** blizzard.

8. What do we call the area of land that drains into a specific river?

   a. rain drain
   b. island
   c. water drain
   d. watershed

Name _____ Date _____

Choose the letter of the best answer.

9. A medium-sized body of fresh water surround by land is a(n)

a. bay. **b.** lake. **c.** pond. **d.** stream.

10. When water vapor changes to liquid water, it

a. condenses. **b.** evaporates. **c.** freezes. **d.** precipitates.

11. Water that contains little or no dissolved salt is

a. filtered water. **c.** pure water.
b. fresh water. **d.** salt water.

12. Water from a flowing river may build up behind a dam to form a(n)

a. ocean. **b.** pond. **c.** reservoir. **d.** stream.

13. A large, flowing body of water is called a

a. lake. **b.** stream. **c.** rill. **d.** river.

14. A barrier built across a river is a

a. berm. **b.** dam. **c.** dike. **d.** wall.

15. Water that falls from the air to the ground as rain, snow, or sleet is

a. condensation. **c.** evaporation.
b. consternation. **d.** precipitation.

16. To dirty or pollute is to

a. contaminate. **b.** evaporate. **c.** precipitate. **d.** soil.

17. What kind of water has a salt concentration of about 3.5%?

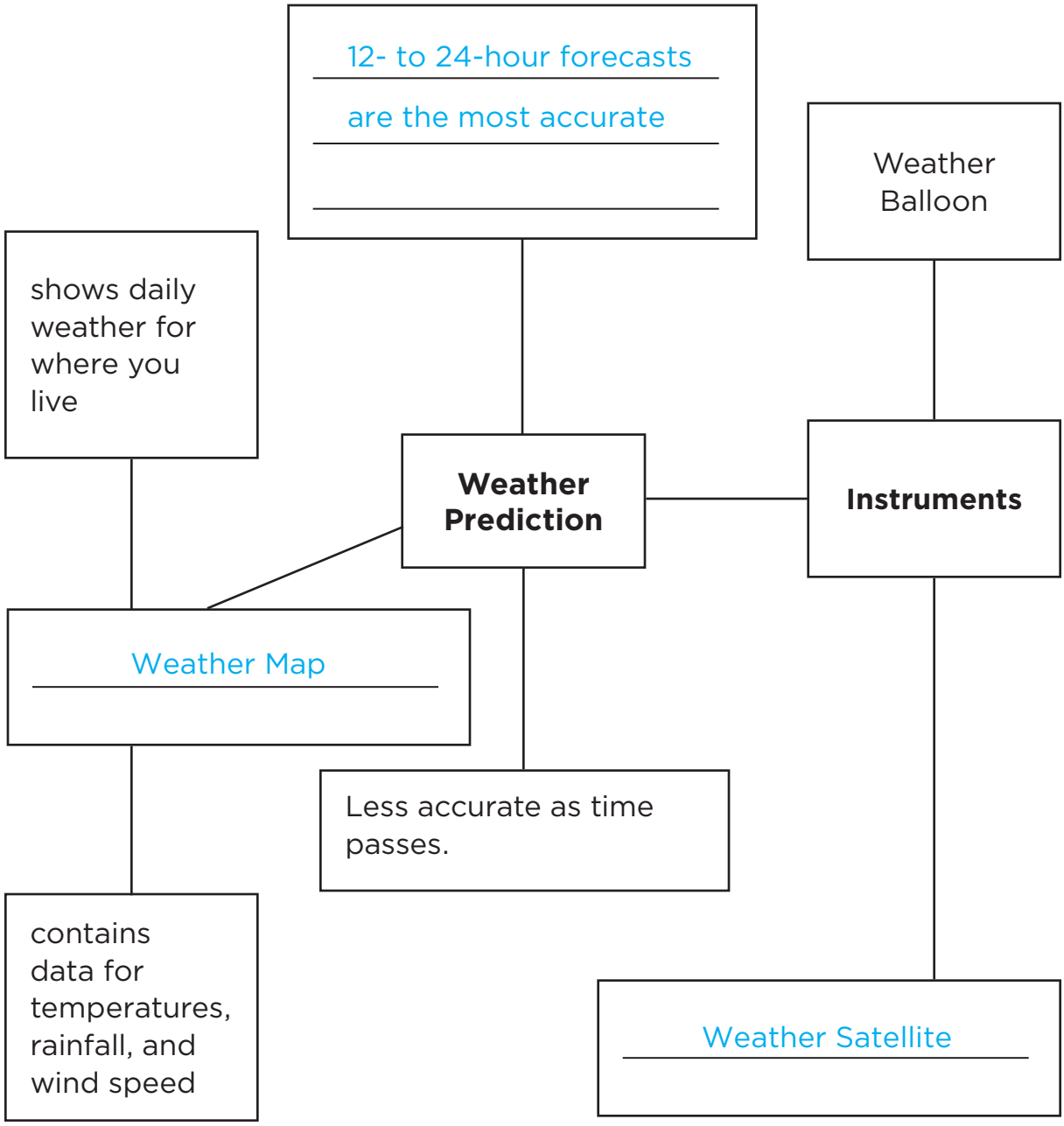
a. filtered water **c.** pure water
b. fresh water **d.** salt water

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Earth's Weather

Complete the concept map with the information you learned about Earth's weather.



Name _____ Date _____

Strong Storms

Read the Literature feature in your textbook.

Write About It

Response to Literature This article describes the damage caused by severe rainstorms in Los Angeles. Research additional information about damage caused by severe rainstorms. Write a report about the effects of severe rainstorms. Include facts and details from this article and from your research.

Report should present a main idea or topic about damage caused by severe rainstorms. It should include simple facts, examples, and explanations that expand on the main idea. Good research will also point to conditions caused by heavy rains such as threats to people, property, and infrastructure from erosion.

Name _____ Date _____ **Outline**

Earth's Atmosphere

Use your textbook to help you fill in the blanks.

What is air pressure?

1. Air is made of a mixture of gases such as nitrogen and oxygen .
2. The layers of gases that form around Earth are called the atmosphere .
3. The layer of gas closest to Earth's surface is called the troposphere .
4. All of life on Earth exists in the troposphere .
5. Weather occurs in the troposphere because of water vapor.
6. The force put on a given area by the weight of the air above it is called air pressure .

What variables can change air pressure?

7. Factors that affect air pressure are height, amount of water vapor , volume , and temperature .
8. Air pressure is lower at the top of a mountain than at sea level because the column of air above a mountain is shorter than the column of air above sea level.
9. A measure of height above Earth's surface is called altitude .

Name _____ Date _____

10. How much space something takes up is called volume .

11. When a sealed bag is compressed, less space is available in the bag, and the air pressure increases .

12. When air is heated, the gases speed up and spread out into a larger space .

13. When air is heated, the density decreases, the air weighs less , and the pressure decreases .

14. Dry air exerts more pressure than air that has water vapor .

15. Water vapor weighs less than most of the gases in air.

What is a barometer?

16. An instrument used to measure atmospheric pressure is called a(n) barometer .

17. Scientists use two different kinds of barometers: mercury barometers and aneroid barometers .

18. Pilots use barometers to tell the altitude of their plane.

Summarize the Main Idea

19. How does air affect Earth's atmosphere?

Earth's atmosphere exerts a pressure that decreases with distance above Earth's surface caused by changes in volume, temperature, and humidity of air.

Name _____ Date _____ **Vocabulary**

Earth's Atmosphere

a. air pressure	**d.** barometer	**g.** troposphere
b. altitude	**e.** gravity	**h.** volume
c. atmosphere	**f.** temperature	**i.** water vapor

Match the correct letter with the description.

1. d An instrument used to measure air pressure.

2. c Layers of gases that form around Earth.

3. e The force of attraction between an object and Earth.

4. b A measure of height above Earth's surface.

5. g The layer of gas closest to Earth.

6. a The force put on a given area by the weight of the air above it.

Choose three words from the word box above that complete the sentence.

7–9. Variables that can change air pressure are height, temperature, volume, and water vapor.

Cloze Test Name _____ Date _____

Earth's Atmosphere

air pressure	gases	troposphere	volume
altitude	mercury	temperature	water vapor
aneroid	nitrogen	all life on Earth	
Earth	oxygen		

Fill in the blanks.

Air has weight, takes up space, and exerts pressure. Air is made up of a mixture of gases that includes nitrogen and oxygen. Gravity attracts gases in the air and forms layers around Earth. The layer of gases closest to Earth's surface is called the troposphere. This layer is where all life on Earth exists and where water vapor is found. When the gravity of Earth gives these gases weight, it causes the gases to push against other objects. This weight of air is called air pressure or atmospheric pressure. Air pressure can change because of four variables: altitude, volume, temperature, and the amount of water vapor. Two instruments used to measure atmospheric pressure are the mercury and the aneroid barometers. These barometers are useful tools for weather forecasters to measure atmospheric pressure and for pilots to measure altitude.

Name _____ Date _____ **Outline**

Air Currents and Wind

Use your textbook to help you fill in the blanks.

Why are temperatures different around the world?

1. The Sun heats Earth's atmosphere and surface _____unevenly_____ .
2. That is because the shape of Earth looks like a _____sphere_____ or ball.
3. Sunlight strikes Earth in a circle at _____the equator_____ .
4. Sunlight strikes Earth above or below the equator in the shape of a(n) _____oval_____ .
5. Areas farther north or south of the equator receive _____less heat_____ from sunlight.
6. Areas closer to the equator receive _____more heat_____ and _____more sunlight_____ .

How do land and water temperatures affect air pressure?

7. Air moves from where the pressure is _____higher_____ to where the pressure is _____lower_____ .
8. During the day, _____land_____ heats up faster than _____water_____ .
9. When air moves from land to water, it is called a(n) _____land breeze_____ .
10. When air moves from water toward land, it is called a(n) _____sea breeze_____ .

Name _____ Date _____

11. Land and water temperature changes cause differences in air pressure .

12. When convection happens in air, it forms winds.

What are global winds?

13. When ships sailed from Europe to the Americas, they took advantage of winds that blew from northeast to southwest .

14. Captains learned that these winds were found in bands between the equator and 30°N latitude .

15. Latitude is a measure of how far north or south a place is from the equator.

16. Winds between 30°N latitude and 30°S latitude became known as trade winds .

17. Trade winds are part of a system of winds called global winds .

Summarize the Main Idea

18. How do the shape and rotation of Earth cause uneven heating?

Earth's shape is a sphere. It rotates on its axis causing air to move in curved paths. So, heat and sunlight are warmer and stronger around the equator than near Earth's poles.

Name _____ Date _____

Vocabulary

Air Currents and Wind

a. air pressure	**d.** global winds	**g.** sea breeze
b. convection current	**e.** land breeze	**h.** sphere
c. equator	**f.** latitude	**i.** trade winds

Match the correct letter with the description.

1. **1.** d Winds that cover the world.
2. **2.** i Winds between 30°N latitude and 30°S latitude.
3. **3.** e Cool air that moves from land to water.
4. **4.** b Flow of air in a loop.
5. **5.** h A three-dimensional shape that looks like a ball.
6. **6.** a The force put on a given area by the weight of the air above it.
7. **7.** f A measure used north or south of the equator.
8. **8.** g Air that moves over water toward land.
9. **9.** c An imaginary line that runs around Earth's middle.

Cloze Test

Name _____ Date _____

Air Currents and Wind

at the equator	higher	lower
convection current	in curved paths	
differences in air pressure	less heat from sunlight	

Fill in the blanks.

The Sun warms the surface of Earth and the air above it. Sunlight strikes Earth most directly at the equator . Because Earth's surface is curved, the surface north or south of the equator receives less heat from sunlight . Throughout the day, land and water temperature change causing differences in air pressure . Air moves from where pressure is higher to where the pressure is lower . The flow of air in a loop caused by differences in temperature and pressure is called a(n) convection current . It takes the form of a wind or a breeze. Winds move around the world in curved paths , not straight north or south. These global winds are predictable, blow steadily, and blow over long distances.

Name _____ Date _____ **Outline**

Oceans and Air Temperature

Use your textbook to help you fill in the blanks.

How do oceans affect temperature on land?

1. In the summer, the air temperature over the _____ocean_____ does not change significantly, while the air temperature over _____land_____ warms very rapidly.

2. In the winter, the air temperature over the _____ocean_____ will be warmer than the air temperature over the _____land_____ .

3. The average weather conditions of a place or region throughout the year is called its _____climate_____ .

4. In addition to average temperatures and average rainfall, climate includes _____humidity_____ and _____wind conditions_____ .

What are ocean currents?

5. An ongoing movement of ocean water is called a(n) _____current_____ .

6. Two examples of ocean currents are the _____Gulf Stream_____ and the _____Labrador Current_____ .

7. Currents affect the _____weather_____ and the _____climate_____ of the land in their paths.

Name _____ Date _____

8. When water takes in heat, it evaporates .

9. The opposite of evaporation is condensation .

10. Because condensation releases heat, the land under the air gets warmer .

11. A cold ocean current means less water condensation in the air and less precipitation .

What causes El Niño?

12. Winds off the coast of South America near the equator normally blow east to west .

13. An abnormal, warmer current of water off the coast of Peru that happens every 2–7 years is called El Niño .

14. During an El Niño, winds drag ocean water causing high tides , heavy rains , and heavy storms along the west coasts of North and South America.

15. ENSO is an acronym for El Niño/Southern Oscillation .

16. Another word for a movement back and forth is called oscillation .

Summarize the Main Idea

17. What determines the weather conditions and climate of land?

The ocean water makes the air temperature above it warmer or cooler depending on the way the winds blow, changing weather conditions of nearby land.

Name _____ Date _____ Vocabulary

Oceans and Air Temperature

a. climate	**d.** Labrador Current	**g.** humidity
b. condensation	**e.** ENSO	**h.** oscillation
c. current	**f.** evaporation	**i.** precipitation

Match the correct letter with the description.

1. **1.** d Current of water moving from the North Pole toward the equator.
2. **2.** i Weather in the form of rain, snow, sleet, or hail.
3. **3.** e An acronym for El Niño/Southern Oscillation.
4. **4.** b The process of water releasing heat.
5. **5.** h A movement back and forth.
6. **6.** a The average weather conditions of a region throughout the year.
7. **7.** f The process of changing water into vapor or gas.
8. **8.** g Moisture in the air.
9. **9.** c An ongoing movement of ocean water.

Cloze Test Name _____ Date _____

Oceans and Air Temperature

currents	Labrador Current	oceans
El Niño	loses heat	precipitation
Gulf Stream	moderate	

Fill in the blanks.

The ocean water influences weather and weather patterns of nearby land. Water absorbs heat more slowly than land does; it also _____loses heat_____ more slowly than land does. Oceans keep temperatures _____moderate_____ . Differences between temperatures near the equator and temperatures near the poles would be much greater if Earth had no _____oceans_____ . Oceans move heat from one place to another by _____currents_____ . One ocean current that circulates warm water along the Atlantic coast is the _____Gulf Stream_____ . A cold ocean current along the eastern coast of Canada is the _____Labrador Current_____ . Ocean currents affect the amount of _____precipitation_____ , or rain and snow, in an area. _____El Niño_____ in the Pacific Ocean is a good example of the way that ocean temperature affects weather. As a result of El Niño, California experienced heavy rains and storms, and Australia and Southwest Asia experienced very dry weather conditions in 1997–1998.

Name _____ Date _____ **Outline**

Severe Weather

Use your textbook to help you fill in the blanks.

What causes severe weather?

1. A large region of air that has a similar temperature and amount of moisture is called a(n) air mass .
2. Changes in weather occur when one air mass meets a different air mass .
3. The boundary marking the edge of the oncoming air mass is called a(n) front .
4. A cold front brings cold and dry air, while a warm front usually brings warm air and rain .

What causes thunderstorms?

5. The spark caused when the electricity in a thunderhead discharges is called lightning .
6. The sound of thunder is caused by the heat of a lightning bolt making the air expand violently.

What are tornadoes?

7. When warm air moves upward in a thunderhead, it creates a zone of low pressure .
8. When an area of low pressure air is surrounded by high pressure air, it is called a(n) low pressure closure .
9. When the tip of the funnel cloud touches the ground, it becomes a(n) tornado .

Name _____ Date _____

10. The area with the worst and most frequent tornadoes is known as Tornado Alley .

11. Ideal weather conditions for tornadoes are in places where cold, dry air from Canada meets warm, moist air from the Gulf of Mexico .

What are hurricanes?

12. A large, swirling storm with low pressure at its center is called a(n) tropical storm .

13. In the northern hemisphere, the air in a hurricane spins counterclockwise .

14. The rotation of hurricanes is related to the rotation of Earth .

15. From space, a hurricane looks like a spiral of clouds with a hole in its middle, also known as the eye of the hurricane .

16. Hurricanes create huge waves and a bulge of water in the ocean called a(n) storm surge .

17. Both hurricanes and tornadoes are types of cyclones because they are storms with a low pressure closure that make circular wind patterns .

Summarize the Main Idea

18. What causes unsettled weather and storms to brew?

Unsettled weather and storms brew when warm and cold air form a front that causes the temperature and moisture in the air to change.

Name _____ Date _____ Vocabulary

Severe Weather

a. air mass	**d.** front	**g.** monsoon	**i.** thunderstorm
b. cyclone	**e.** hurricane	**h.** storm surge	**j.** tornado
c. drought	**f.** low pressure closure		

Match the correct letter with the description.

1. **1.** c A long period without rain, or very little rain.
2. **2.** j A funnel-shaped low pressure closure.
3. **3.** d The boundary that marks air masses with different temperatures and moisture.
4. **4.** b Any storm with a circular wind pattern and a low pressure closure.
5. **5.** i A rainstorm that produces lightning and thunder.
6. **6.** a A large region of air that has a similar temperature and amount of moisture.
7. **7.** e A large swirling storm with low pressure in its center and wind gusts of more than 75 miles per hour.
8. **8.** g A storm with heavy rains that may cause flooding, mudslides, or landslides.
9. **9.** h A bulge of water created by large waves in the ocean.
10. **10.** f An area of low pressure that is surrounded by higher air pressure.

Cloze Test

Name _____ Date _____

Severe Weather

cold	fronts	thunderstorms
drought	hurricanes	tornadoes
eye	monsoon	warm

Fill in the blanks.

Storms and severe weather occur when air masses collide. Air masses can be warm and moist, or cold and dry. Unsettled weather and storms form at the boundaries of air masses called fronts. Rainstorms with thunder and lightning are called thunderstorms. Given the right weather conditions, thunderstorms can turn into tornadoes. Thunderstorms with wind speeds over 75 miles per hour can turn into hurricanes over the Atlantic Ocean. The fastest winds and heaviest rains are near the center of the storm called the eye of the hurricane. Another type of severe weather that can bring heavy rains with flooding and mudslides is called a(n) monsoon. The opposite of too much rain is too little or no rain, which causes a(n) drought. Even fog can cause severe weather, especially when it interferes with safety at airports and on highways.

Name _____ Date _____ Writing

Severe Weather

Read the Writing in Science feature in your textbook.

Write About It

Narrative Writing Write a personal narrative about a storm, mudslide, or other severe weather condition that you have experienced. Use a clear sequence of events to tell what happened and what you did.

Planning and Organizing

Chronological order, or time order, is the order in which events occur from first to last. It's a good way to organize a personal narrative. Help Cody organize her narrative. Number her sentences to show time order. Write 1 by the sentence that should come first, 2 by the sentence that should come next, and so on. The last sentence should be numbered 4.

1. Next the clouds seemed to open and heavy snow began falling. 3
2. The blowing snow combined with the falling snow to create a ferocious storm. 4
3. Then, the sky began to darken as heavy clouds formed. 2
4. At first, it seemed a beautiful day on the mountain. 1

Now write five sentences you could use in your own personal narrative. Arrange them in chronological order.

1. _____
2. _____
3. _____
4. _____
5. _____

Name _____ Date _____

Now write your first draft on a separate sheet of paper. Tell the events in chronological order. Use the details to describe the setting and bring the events alive for the reader. End with a satisfying conclusion.

Revising and Proofreading

Here are sentences from Cody's personal narrative. She used too many short, choppy sentences. Combine them to make her writing stronger.

1. During a blizzard, there are high winds. There is also driving snow.

   During a blizzard, there are high winds and driving snow.

2. Often, you can't see anything for up to a quarter of a mile. This condition can last for over three hours.

   Often, you can't see anything for up to a quarter of a mile, and this condition can last for over three hours.

3. The sky began to darken. The winds began to blow. It all happened suddenly.

   Suddenly, the sky began to darken and the winds began to blow.

Now revise and proofread your own narrative. Ask yourself:

- Have I used the "I" point of view throughout?
- Have I used adjectives or verbs that make my description of the setting vivid?
- Have I organized my sentences in time order?
- Have I combined any short, choppy sentences?
- Have I corrected any grammar problems?
- Have I corrected any spelling, capitalization, and punctuation problems?

Name _____ Date _____ **Outline**

Predicting the Weather

Use your textbook to help you fill in the blanks.

Who needs to know what the weather will be?

1. To _forecast_ is to make your best prediction before the event happens.

2. Variables such as _wind speed_ and _air pressure_ help weather forecasters improve the accuracy of their predictions.

3. A meteorologist is a scientist who specializes in the study of Earth's _atmosphere_ and _weather_ .

4. A weather map shows the weather in a specific _area_ at a specific _point in time_ .

5. _Symbols_ on a weather map may show you wind speed, cloud cover, air temperature, and precipitation for a specific area.

What do weather fronts tell you?

6. Warm and cold fronts are the leading edges of _air masses_ and can tell you what the weather is going to be like in the _future_ .

7. Jet stream winds can reach speeds of _240_ kilometers, or _150_ miles per hour and higher.

8. Jet streams blow from _west_ to _east_ , so almost all weather fronts in North America move in the same direction.

Outline Name _____ Date _____

What do highs and lows tell you?

9. Winds in a low-pressure system turn in a counterclockwise direction in the northern hemisphere.

10. A high-pressure system is a large mass of air with the highest air pressure in the center, with winds blowing outward from the center.

11. High-pressure winds also turn to the right because of the rotation of Earth.

12. Wind in a high-pressure system turns in a clockwise direction.

13. Low-pressure systems usually bring warm and stormy weather.

14. Moisture held in a low pressure air mass condenses and cools as it rises bringing precipitation.

How do weather forecasters collect data?

15. Meteorologists use instruments on Earth's surface, in the sky, and in space to forecast the weather.

Summarize the Main Idea

16. Briefly explain why weather maps are important and what resources are used to forecast the weather.

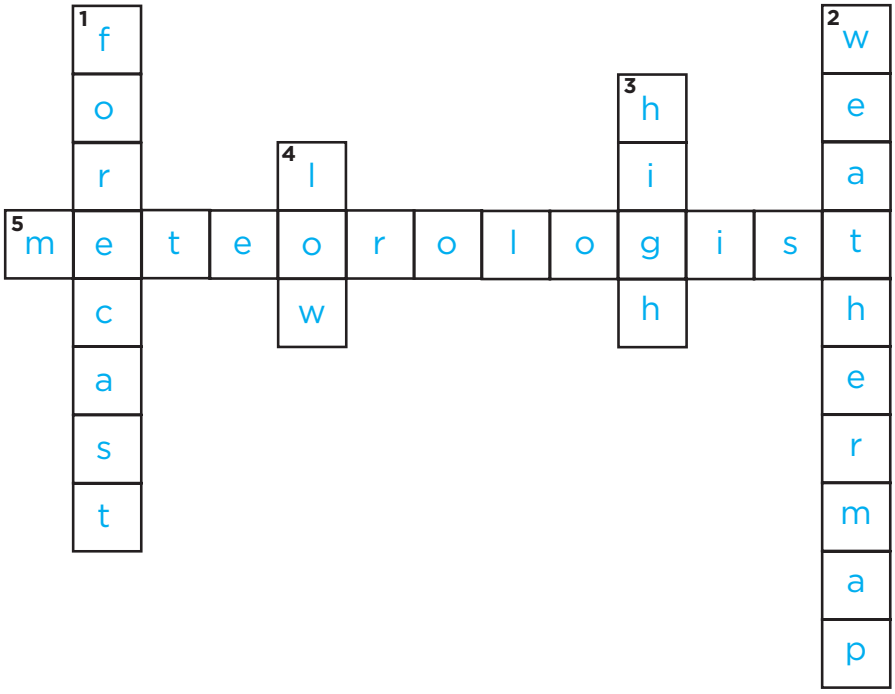
Weather maps contain data that is used to predict weather. Data from observations, instruments, and tools are used to forecast weather.

Name _____ Date _____

Vocabulary

Predicting the Weather

Use the clues below to help you fill in the crossword puzzle.



- forecast
- high
- low
- meteorologist
- weather map

Across

5. A scientist who specializes in the study of Earth's atmosphere and weather.

Down

1. To make your best prediction before the event happens.

2. This item shows the weather in a specific area at a specific point in time.

3. Air pressure where the air moves in a clockwise direction.

4. Air pressure where the air moves in a counterclockwise direction.

Cloze Test

Name _____ Date _____

Predicting the Weather

forecasts	reliable	space	weather maps
pilots	sky	surface	

Fill in the blanks.

Meteorologists do not use crystal balls to predict the weather's future. Instead, they make forecasts using instruments on Earth's surface, in the sky, and in space to gather data about changes in Earth's atmosphere. Weather forecasts help pilots take off and land their planes safely. Most 12- to 24-hour forecasts are more reliable than long-term forecasts. Weather maps show the weather in a specific area at a specific point in time. Weather fronts lead air masses such as high- and low-pressure systems and help meteorologists predict the weather.

Name _____ Date _____ **Reading**

Museum Mail Call

Scientists at the American Museum of Natural History study the natural world and the people who live in it. They collect stories and objects from people around the world. Read these letters to find out how weather affects children in different countries at the same time of the year.

June 13

Dear Museum Scientists,

Hola! (That's "hello" in Spanish.) It's the dry season here in Palmdale right now and it's muy caliente — very hot! We haven't had rain in weeks.

It's usually hot and dry here from May to November. We don't have a lot of water, so it has to be piped in from other areas. People have to watch how much water they use. Restaurants only serve water to people who ask for it.

Some people plant cacti and shrubs around their home. These plants need a lot less water than a thick, green lawn. I planted jalapeño peppers with mi hermana, my sister. We water the plants in the evening. That way the hot sun won't dry up all of the water.

Carlos

June 23

Dear Museum Scientists,

The gío múa, or monsoons, have brought wet weather to our land. Everything here is soaked! Our monsoon season lasts from May to October. Many inches of rain can fall during heavy storms. But the storms only last for about an hour each day. It's very hot, so we don't mind getting wet. It's actually a lot of fun, and we dry off right away.

Our farm is near the Mekong River. Water floods our rice fields and helps the rice grow. It's hard work walking through the swampy ground. We carry the rice with quang ganh. These are baskets that we balance on the end of a pole.

People here are used to a lot of water. We build our homes on stilts so the water won't get in. We ride boats down the river and sell our rice on a floating market. Some years, there is more water than we expect!

Vang

Name _____ Date _____

Compare and Contrast

- To compare, look for similarities, or things that are the same.
- To contrast, look for differences, or things that are not the same.

Write About It

Compare and Contrast

1. How is the weather in Palmdale compared to the weather near the MeKong River?

In Palmdale, the weather is dry and hot. Near the Mekong River, the weather is rainy and hot.

2. What activity do both Carlos and Vang do?

Both Carlos and Vang plant crops.

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Earth's Weather

Choose the letter of the best answer.

1. A rotating funnel-shaped cloud is a(n)

a. dust devil **b.** hurricane **c.** tornado **d.** water spout

2. A long period with little or no rain is a(n)

a. cyclone **b.** drought **c.** heat wave **d.** monsoon

3. What instrument is used to measure atmospheric pressure?

a. anemometer **b.** barometer **c.** psychrometer **d.** wind vane

4. A large region of air with a similar temperature and amount of moisture is a(n)

a. air mass **b.** air pressure **c.** atmosphere **d.** front

5. Winds which blow in bands between 30°N latitude and 30°S latitude are the

a. banded winds
b. east winds
c. trade winds
d. west winds

6. An ongoing movement of ocean water is a(n)

a. current **b.** swell **c.** tide **d.** wave

7. Intense seasonal winds that can bring a lot of rain are

a. cyclones
b. hurricanes
c. monsoons
d. thunderstorms

8. Layers of gases around Earth make up the

a. atmosphere
b. climate
c. stratosphere
d. troposphere

Name _____ Date _____

Choose the letter of the best answer.

9. A storm with a low-pressure closure that forms a circular wind pattern is a(n)

a. current **b.** cyclone **c.** monsoon **d.** thunderstorm

10. What contains data that is used to predict weather?

a. barometer **b.** meteorologist **c.** front **d.** weather map

11. What is the force put on a given area by the air above?

a. air pressure **b.** atmosphere **c.** trade wind **d.** troposphere

12. The boundary between air masses with different temperatures and pressures is called a(n)

a. atmosphere
b. convection current
c. forecast
d. front

13. What do we call the average weather conditions of a place throughout the year?

a. average weather
b. climate
c. current
d. meteorology

14. A large, swirling storm that forms over the Atlantic Ocean is a(n)

a. convection current
b. thunderstorm
c. hurricane
d. tornado

15. A weather prediction before it happens is a(n)

a. forecast **b.** guess **c.** hypothesis **d.** meteorologist

16. What do we call a measure of height above Earth's surface?

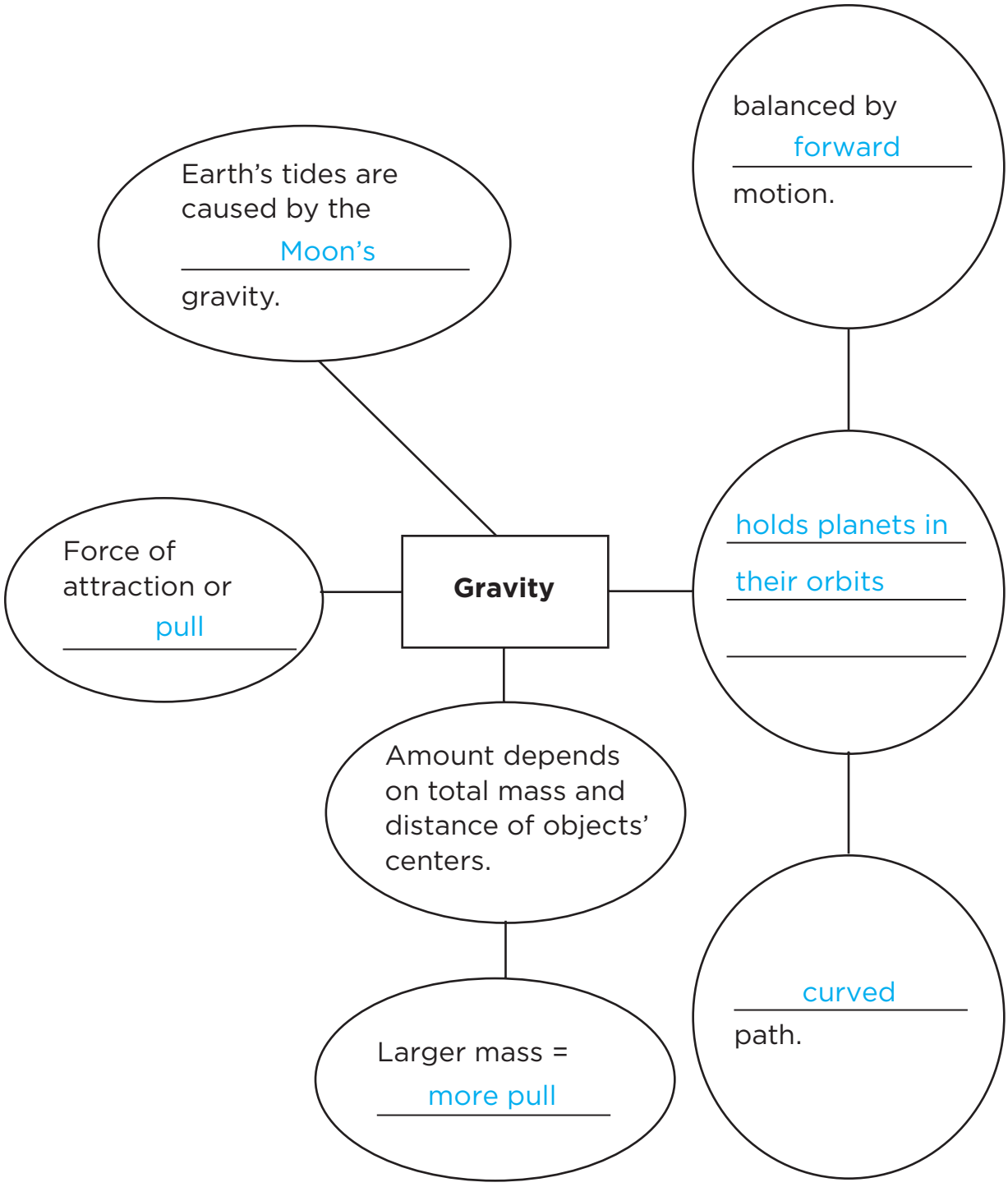
a. altitude **b.** attitude **c.** latitude **d.** longitude

Name _____ Date _____

CHAPTER LEVEL
Concept Map

The Solar System

Complete the concept map with the information you learned about the Solar System.



Name _____ Date _____

Stopping By a Planet on a Snowy Evening

Read the Literature feature in your textbook.

Write About It

Response to Literature **The space traveler in this poem cannot tell where he or she is. Write a fictional narrative as if you were the space traveler in this poem and were landing on this planet.**

Student narratives should include enough clues for the reader to be able to identify the planet. They should go a bit further than the example to which they are reacting. Narratives might mimic the writer's voice, which is lighthearted and ironic. Good narratives will establish a plot, point of view, setting, and conflict.

Name _____ Date _____ **Outline**

The Sun

Use your textbook to help you fill in the blanks.

What is the Sun?

1. A _____star_____ is an object that produces its own heat and light energy.

2. If the Sun were a hollow ball, more than a _____million_____ Earths could fit in it.

3. The mass of the Sun can be calculated if we know the _____length of time_____ it takes a planet to make one trip around the Sun and the _____distance_____ between the planet and the Sun.

4. The average distance from the Sun to Earth is known as one _____astronomical unit (AU)_____ , or roughly 149,591,000 km.

5. The Sun makes up 99.8% of all the _____mass_____ in the solar system.

What are the parts of the Sun?

6. The Sun is made up of two very light gases, _____hydrogen_____ and helium.

7. Most of the energy the Sun produces is formed in its _____core_____ .

8. In the _____convection layer_____ gases with different energies move in circles.

9. The _____photosphere_____ is the visible surface of the Sun.

Name _____ Date _____

10. A solar flare is a burst of heat and energy that stretches from the surface of the Sun into space.

11. Energy from solar flares causes displays of lights in the upper atmosphere called the aurora borealis .

12. Dark spots that appear on the surface of the Sun are called sunspots .

13. Sunspots are regions of the photosphere that have a lower energy than surrounding regions.

How does the Sun produce energy?

14. Einstein's equation for mass and energy is $E=mc^2$.

15. Einstein's equation tells us that a little bit of mass can be changed into a lot of energy .

16. The smashing together of atoms is called fusion .

Summarize the Main Idea

17. How does Einstein's theory, $E = mc^2$, explain the relationship between energy and mass?

The equation tells us that a little bit of mass can be changed into a lot of energy. We see this energy as light and heat as well as other kinds of energy that travel into space.

Name _____ Date _____

Vocabulary

The Sun

a. astronomical unit	**d.** fusion	**g.** aurora borealis	**j.** sunspots
b. photosphere	**e.** core	**h.** solar flare	
c. Einstein	**f.** corona	**i.** star	

Match the correct letter with the description

1. h Burst of heat and energy that stretches from the surface of the Sun into space.

2. a Measurement based on the average distance between the Sun and Earth.

3. c Scientist that discovered an equation between energy and mass.

4. g Multicolored lights in the upper atmosphere caused by energy from solar flares.

5. j Dark spots that appear occasionally on the surface of the Sun.

6. d The smashing together of atoms.

7. b The visible surface of the Sun.

8. f The outermost layer of the Sun's atmosphere.

9. i An object that produces its own heat and light energy.

10. e The center of the Sun, where most of its energy is produced.

Cloze Test

Name _____ Date _____

The Sun

aurora borealis	fusion	hydrogen
$E = mc^2$	heat	light
energy	helium	mass

Fill in the blanks.

The Sun is the largest object in the solar system. The Sun is a star, meaning that it produces its own heat and light energy. It is a large sphere made up of mostly two gases, hydrogen and helium . Solar flares release energy into space that produces lights in Earth's sky called aurora borealis . Einstein discovered the equation to show the relationship between energy and mass . The equation $E = mc^2$ tells us that a little bit of mass can be changed into a lot of energy . Inside the Sun, hydrogen atoms smash together causing fusion . This makes the larger atom, helium.

Name _____ Date _____ **Outline**

The Structure of the Solar System

Use your textbook to help you fill in the blanks.

How is the solar system organized?

1. The solar system is a system of objects around the Sun.
2. The first four planets nearest to the Sun, Mercury, Venus, Earth, and Mars have rocky surfaces.
3. The next four planets are called gas giants.
4. A telescope is a device that uses lenses to focus light in a certain way so distant objects can be seen.
5. Scientists on Earth build telescopes on top of mountains so the atmosphere doesn't interfere with what they can see.
6. Astronauts have walked on Earth's Moon.

What is a moon?

7. A moon is an object that circles a planet.
8. A moon is also called a satellite.
9. When objects in space collide, the impact forms a crater or hole.

Name _____ Date _____

10. The rock on the surface of the Moon is darker than the rock underneath.

11. Earth's atmosphere burns up most objects before they can land on Earth's surface.

12. There is no wind or water on the Moon to wear away the edges of the craters.

What are the smaller objects in the solar system?

13. A(n) asteroid is a rock that revolves around the Sun.

14. A(n) comet is a mixture of ice, dust, and rock that circles the Sun.

15. The glowing ball of gases and dust that form around a comet is called a coma .

16. The Sun's energy shapes the comet into a shimmering tail that can stretch out millions of kilometers.

17. The objects that enter Earth's atmosphere are called meteors .

18. When a meteor reaches Earth's surface, it is called a(n) meteorite .

Summarize the Main Idea

19. Why can we see the craters of the Moon so clearly from Earth?

One reason we can see the craters of the Moon is because the rock on the surface of the Moon is a darker color than the rock underneath the surface. The Moon also is the object closest to Earth.

Name _____ Date _____

Vocabulary

The Structure of the Solar System

a. artificial satellites	**e.** Galileo	**i.** telescope
b. astronauts	**f.** satellite	**j.** meteor
c. dwarf planet	**g.** solar	**k.** crater
d. Earth	**h.** solar system	**l.** comet

1. h the system of objects around the Sun

2. d the only planet that can support life

3. e the scientist who discovered moons circling around Jupiter

4. b people who travel in a spacecraft

5. k a hole formed when two objects collide

6. g means "of the Sun"

7. i a device that uses lenses to focus light so distant objects can be seen

8. a weather and communications objects circling Earth

9. f any object in space that circles another object

10. j an object that enters Earth's atmosphere

11. l a mixture of frozen gases, ice, dust, and rock that orbits the Sun

12. c Pluto, Eris, and Ceres

Cloze Test Name _____ Date _____

The Structure of the Solar System

9	hydrogen	solar
140	moon	telescope
Earth	revolve	rocky

Fill in the blanks.

The Sun is the center of our solar system. The word _____solar_____ means "of the Sun." Our solar system includes _____9_____ planets and _____140_____ moons. The first four planets have _____rocky_____ surfaces. The next four planets are called gas giants because they are mostly made up of _____hydrogen_____ and helium gases. _____Earth_____ is the only planet that can support life. In 1610, Galileo used a _____telescope_____ to discover moons circling around Jupiter. Galileo's theory showed that everything in the solar system did not _____revolve_____ around the Earth but the Sun instead. A _____moon_____ is an object that circles around a planet. Jupiter has at least sixty-three moons!

Name _____ Date _____ Outline

Gravity and Orbit

Use your textbook to help you fill in the blanks.

What is gravity?

1. Gravity is a _____force of attraction_____ , or pull, between any two objects due to their mass.
2. Mass is a measure of the _____amount of matter_____ in an object.
3. Gravity acts over _____distance_____.
4. The pull of gravity between Earth and the Sun acts across _____150 million_____ kilometers of space.
5. As the _____total mass_____ of an object increases, the force of gravity increases.
6. As the distance between two objects increases, the force of gravity between them _____decreases_____ .
7. A truck weighs more than a car because the truck's _____mass_____ is greater than the car's.

What keeps objects in orbit?

8. Planets are held in their orbits by the _____force of gravity_____ between them.
9. As a planet orbits the Sun, it tends to _____fall_____ toward the Sun, but at the same time, its _____inertia_____ tends to make it move away from the Sun.

Name _____ Date _____

10. The effect of these two motions makes the planets move in a curved path called an ellipse.

What causes the tides?

11. The pull of gravity from the Sun and the Moon cause a bulge or bump in the surface of the Earth.

12. Gravitational pull of the Sun and Moon causes the tides, or the rise and fall of the ocean's surface.

13. When the Sun and Moon line up and pull in the same direction, higher high tides and lower low tides, called spring tides result.

14. Smaller tides, or neap tides come when the Sun and Moon pull in different directions and their pulls partly cancel each other.

Summarize the Main Idea

15. What is gravity, and how does it affect planets and oceans?

Gravity is the force of attraction or pull, between any two objects due to their mass. Gravity keeps the planets in orbit and it causes the tides.

Name _____ Date _____ Vocabulary

Gravity and Orbit

a. ellipse	**d.** mass	**g.** spring tides
b. forward speed	**e.** neap tides	**h.** tide
c. gravity	**f.** orbit	

Fill in the blanks.

1. **1.** c The force of attraction, or pull, between any two objects due to their mass.
2. **2.** d A measure of the amount of matter in an object.
3. **3.** b Tends to make a planet move away from the Sun.
4. **4.** a A closed curve that is shaped something like a chicken egg.
5. **5.** f The path an object takes around another object, as planets do around the Sun and moons do around their planets.
6. **6.** h The rise and fall of the ocean's surface.
7. **7.** g Higher high tides and lower low tides.
8. **8.** e The tides with the smallest range, more moderate tides.

Cloze Test Name _____ Date _____

Gravity and Orbit

decreases	increases	orbit
distance	mass	tides
gravity	more	

Fill in the blanks.

The force that keeps people from floating off into space also helps keep planets in their orbits, and causes oceans to rise and fall. Gravity is the force of attraction, or pull, between any two objects that have mass. Two things determine the strength of gravity between two objects: their total mass and how far apart they are. A person weighs more on Earth than on the Moon because Earth has a greater mass than the Moon. As the total mass increases, the force of gravity increases. That same person would weigh more on Earth than in a spaceship 1000 miles above Earth because of the greater distance from Earth's center. As the distance between objects increases, the force of gravity between them decreases. The massive gravity of the Sun pulls planets toward it. However, the forward speed of planets tend to make them move away from the Sun. Those two effects make planets orbit in a curved path. The gravitational effect of the Sun and the Moon causes the tides to rise and fall.

Name _____ Date _____ Reading

Voyager Discoveries

In 1977, NASA launched the Voyager Interstellar Mission to explore Jupiter, Saturn, Uranus, Neptune, and their moons. The trip had to be very precisely planned. Speeds and distances had to be accurately calculated. The two *Voyager* spacecraft had to be close enough to each planet to collect data and to get a pull from that planet's gravity in order to be propelled toward their next destination. At the same time, the spacecraft had to be far enough away from the planets that they would not go into orbit around them. All of NASA's careful planning worked. The *Voyager* mission has provided scientists with new and closer looks at our farthest neighbors.

Voyager Spacecraft Travel

Jupiter – 1979:

Images show Jupiter's rings. Volcanic activity is observed on Io, one of Jupiter's moons.

Saturn – 1980-91:

Scientists get a close look at Saturn's rings. They contain structures that look like spokes or braids. Scientists observed that Titon, one of Saturn's moons, has a thin atmosphere and active geyser-like landforms.

Uranus – 1986:

Scientists discover the dark rings around Uranus. They also see 10 new moons, bringing Uranus's total to 15 moons. *Voyager* sends back detailed images and data on the planet, its moons, and dark rings.

Neptune – 1989:

Large storms are seen on the planet. One of these storms is Neptune's Great Dark Spot. Neptune was originally thought to be too cold to support this kind of weather.

After observing these planets, the *Voyager* spacecraft keep traveling. They are the first human-made objects to go beyond the heliosphere. The heliosphere is the region of space reached by the energy of our Sun. It extends far beyond the most distant planets in the Solar System.

Name _____ Date _____

Cause and Effect

- Look for the reason why something happens to find a cause.
- An effect is what happens as a result of a cause.

Write About It

Cause and Effect

1. What would cause the *Voyager* spacecraft to be propelled toward their next destination?

The pull from the planet's gravity they are visiting would propel them to their next destination.

2. What was an effect of the *Voyager* mission?

Answer may discuss that the *Voyager* mission provided scientists with new and closer looks at Jupiter, Saturn, Uranus, and Neptune.

Name _____ Date _____ Writing

What would happen if gravity went away?

Read the Writing in Science feature in your textbook.

Write About It

Explanatory Writing You know that the pull of gravity keeps everything on Earth from floating off into space. Look at the picture on page 326 of your textbook. Explain what would happen if gravity suddenly stopped working.

Planning and Organizing

Explanatory writing requires you to organize your ideas in chronological or time order. When Luis planned to make a mobile to represent the solar system, he needed to list the steps in sequence. Here are some steps that he wrote, number them from 1 to 5 with 1 being the first step.

1. Next, cut out the circles. Punch a hole at the top. 3
2. Then, thread the string through the hole in each circle. Attach it to a coat hanger. Finally, paste a cutout of the Sun onto the coathanger. 5
3. First, look at the sizes of the planets in comparison to each other. 1
4. After that, use string to represent how far each planet is from the Sun. 4
5. Then, use a compass to draw circles on cardboard to represent each planet. Make sure each circle represents the relative size of each planet. Color each planet and write its name. 2

Name _____ Date _____

Now write the first draft of your composition. Begin with a paragraph that establishes your topic and briefly describes the important ideas. Then describe the events that occur in chronological order. End with a short summary of the events and how they relate to your topic.

Now revise and proofread your instructions. Ask yourself:

- Have I explained the topic and described the important ideas?
- Have I described the events in time order?
- Have I provided clear descriptions of the events?
- Have I corrected all grammar errors?
- Have I corrected all errors in spelling, punctuation, and capitalization?

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

The Solar System

Choose the letter of the best answer.

1. Any object in space that circles another object is a(n)

a. asteroid. **b.** comet. **c.** planet. **d.** satellite.

2. The rise and fall of the ocean's surface is a(n)

a. ellipse. **b.** fusion. **c.** tide. **d.** trembler.

3. The system of objects around the Sun is the

a. galaxy. **c.** solar system.

b. planets. **d.** universe.

4. What are bursts of heat and light energy that extend from the surface of the Sun?

a. solar bursts. **c.** solar radiation.

b. solar flares. **d.** solar winds.

5. A device that uses lenses to focus light so that distant objects can be seen is a(n)

a. magnifying lens. **c.** telegraph.

b. microscope. **d.** telescope.

6. A closed, curved orbit shaped something like an egg is a(n)

a. ellipse.

b. circle.

c. revolution.

d. rotation.

Name _____ Date _____

Choose the letter of the best answer.

7. A mixture of ice, dust, and rock that circles the Sun is a(n)

a. asteroid. **b.** comet. **c.** meteorite. **d.** meteoroid.

8. What do we call an object that produces its own heat and light energy?

a. asteroid **b.** comet **c.** planet **d.** star

9. The force of attraction between two objects due to their mass is

a. fission. **b.** fusion. **c.** gravity. **d.** magnetism.

10. What do we call the smashing together of atoms in the Sun?

a. fission

b. fusion

c. solar flare

d. solar wind

11. A rock that orbits the Sun, and lies in a belt between Mars and Jupiter is a(n)

a. artificial satellite.

b. comet.

c. meteorite.

d. asteroid.

12. Meteoroids that are caught by Earth's gravity and fall through its atmosphere are called

a. meteors.

b. stars.

c. comets.

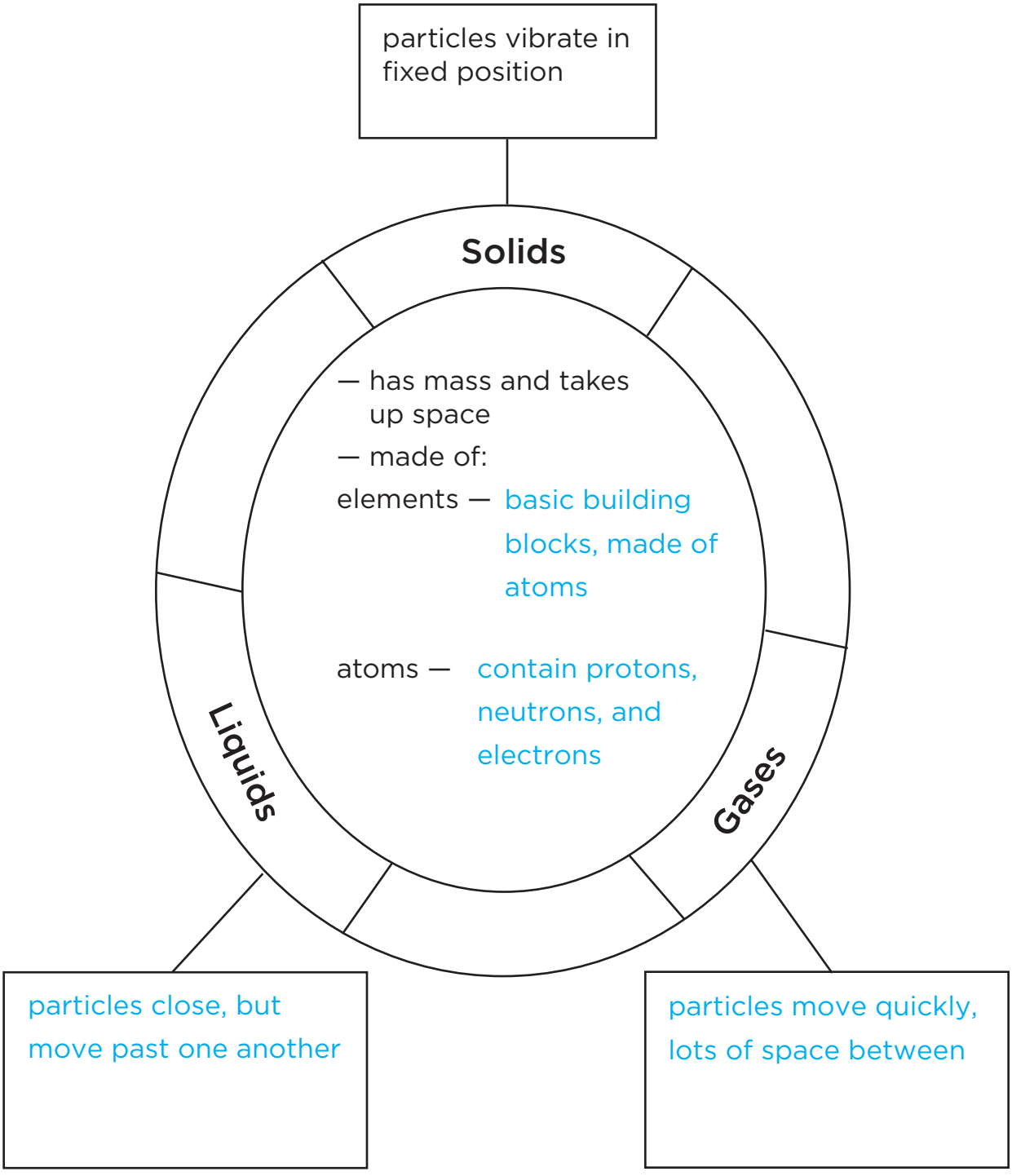
d. rocks.

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Types of Matter

Complete the concept map with the information you learned about the types of matter. Encourage students to include what the three forms of matter have in common in the middle circle.



Name _____ Date _____

Metamorphosis

Read the Literature feature in your textbook.

Write About It

Response to Literature **The famous poet Carl Sandburg is using water and ice to talk about changes in life and our ability to remember them. Why do you think he does this? Now it's your turn. What other changes in matter do you know about? Write about other changes in matter the poet could have used in his poem.**

The poem or prose should address changes between solid, liquid, and gas. Good writing will reflect understanding of "Metamorphosis" in the question asked by Sandburg, "Does it remember what it was?".

Name _____ Date _____ Outline

Properties of Matter

Use your textbook to help you fill in the blanks.

What is matter?

1. _____Volume_____ is the measure of how much space an object takes up.
2. An object sinking in water pushes an _____equal_____ volume out of the way.
3. _____Matter_____ is anything that has mass and takes up space.
4. The amount of matter in an object is called its _____mass_____ .
5. Weight is how strongly _____gravity_____ pulls on an object.
6. Weight and _____mass_____ are not the same thing.
7. Volume, mass, and weight can be measured with balances, scales, and _____graduated cylinders_____ .

What are the states of matter?

8. Solid, _____liquid_____ , and gas are the three states of matter.
9. Particles in a _____solid_____ vibrate back and forth but stay in a relatively fixed position.
10. Particles in a liquid move _____faster_____ than those in a solid, but they stay close together.
11. Particles in a gas are in _____rapid_____ motion and have lots of empty space between them.

Name _____ Date _____

Can the state of matter change?

12. When a substance changes from one state of matter to another, it is called a phase change .

13. The melting point is the temperature at which a substance changes from a solid to a liquid.

14. Substances also have a boiling point , which is the temperature at which a liquid changes to a gas.

15. A substance can also reach its freezing point , which is when a liquid changes to a solid.

16. Evaporation occurs when a substance changes from liquid to a gas.

17. Evaporation occurs at all temperatures, but boiling only occurs at one particular temperature.

18. Changes of state are physical changes since new substances are not created.

What is density?

19. An object that floats in a liquid must be less dense than the liquid.

Summarize the Main Idea

20. What are the differences in solid, liquid, and gaseous states of matter?

Solids have particles that vibrate but remain in a relatively fixed pattern. Liquid particles have more freedom than solids but typically remain close together. Gas particles are in rapid motion and have lots of empty space between them.

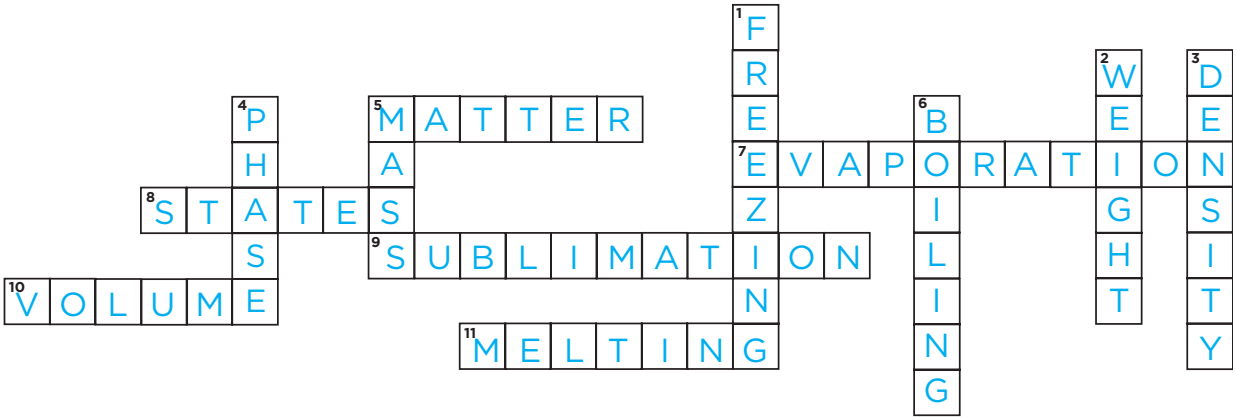
Name _____ Date _____

Vocabulary

Properties of Matter

boiling	freezing	melting	sublimation
density	mass	phase	volume
evaporation	matter	states	weight

Fill in the crossword puzzle using the clues below.



Down

1. The point at which a substance changes from a liquid to a solid
2. How strongly gravity pulls on an object
3. The amount of mass for each milliliter of a substance
4. A _____ change occurs when a substance changes forms.
5. The measure of how much matter is in an object
6. The point at which a substance changes from a liquid to a gas

Across

5. Anything that has mass and takes up space
7. A direct change from liquid to gas
8. Solid, liquid, and gas are the _____ of matter.
9. A direct change from a solid to a gas
10. The amount of space an object takes up
11. Process by which a substance changes from a solid to a liquid

Cloze Test

Name _____ Date _____

Properties of Matter

density	gravity	phase change	weight
freezing	mass	physical	volume
gases	motion	solid	

Fill in the blanks.

Matter is anything that has mass and takes up space. _Volume_ , _weight_ , and mass are examples of the physical properties of matter. The amount of matter in an object is called its _mass_ . Mass can be felt through an object's weight, which is the pull of _gravity_ on the object. The states of matter are _solid_ , liquid, and gas. The _motion_ of the particles within matter is different. For example, particles in solids stay in place, but particles in _gases_ move rapidly. When matter changes from one form to another, we call it a _phase change_ . Melting, boiling, _freezing_ , sublimation, and evaporation are methods by which matter changes into another form. Changes of state do not make new substances, so they are _physical_ changes. _Density_ shows how tightly packed solids, liquids, and gases are. The density of an object determines if it will sink or float in a liquid.

Name _____ Date _____ **Outline**

Elements

Use your textbook to help you fill in the blanks.

What is matter made of?

1. All matter is made of _____atoms_____ that combine to form molecules.
2. An atom is the _____smallest_____ part of an element, with the same chemical properties as the element.
3. Matter is composed of basic building blocks called _____elements_____ .
4. Elements are simple substances that _____combine_____ to form all other substances.
5. Each known element _____cannot_____ be broken down into any simpler substances.

What are the most common elements on Earth?

6. The most common elements on Earth are oxygen, silicon, aluminum, iron, calcium, sodium, _____potassium_____ , and magnesium.
7. These _____eight_____ elements make up 98% of Earth's crust.
8. The remaining _____2%_____ of the crust is made up of other elements, including hydrogen, titanium, and phosphorous.
9. However, Earth's atmosphere has a different _____composition_____ than its crust.

Name _____ Date _____

10. Only three elements make up nearly 100% of the air. They are nitrogen, oxygen, and argon.

11. Water is just a tiny part of our atmosphere.

What are the most common elements in living things?

12. Carbon , hydrogen, and oxygen are the most common elements in plants and animals.

13. Animal bodies contain a great deal of water .

14. 60% of human body weight is water.

15. Water is where much of the oxygen and hydrogen come from in our bodies.

Summarize the Main Idea

16. What are elements, and where can they be found?

Elements are the basic building blocks of life. Each element is made up of one kind of atom. Elements can be found everywhere such as in Earth's crust and its atmosphere and in plants and animals.

Name _____ Date _____

Vocabulary

Elements

Fill in the blank with the correct word.

atom
element
matter

1. _____Matter_____ is anything that has mass and takes up space.
2. An _____atom_____ is the smallest part of an element.
3. An _____element_____ is the basic building block of matter.

Fill in the chart with the correct elements.

The Earth's Crust	The Earth's Atmosphere	Plants and Animals
silicon aluminum iron calcium sodium potassium magnesium oxygen phosphorus chlorine titanium hydrogen carbon	nitrogen oxygen argon carbon	carbon hydrogen oxygen nitrogen phosphorus chlorine sulfur

Use the chart to answer the question.

4. What one common element do all three share?

oxygen or carbon is acceptable

Cloze Test Name _____ Date _____

Elements

animals	carbon	elements
atmosphere	common	oxygen
atom	eight	

Fill in the blanks.

All matter is made from atoms, which combine to form molecules. Matter is composed of basic building blocks called _____elements_____ . Each element is made of only one kind of _____atom_____ . Earth's crust is made up of _____eight_____ elements. However, the elements in Earth's _____atmosphere_____ are different than those in the crust. The atmosphere is mostly made up of three elements—nitrogen, argon, and _____oxygen_____ . Plants and _____animals_____ are also full of elements. Plants and animals have elements in _____common_____ . _____Carbon_____ , hydrogen, and oxygen are the three main elements shared by all living things. Elements can be found everywhere.

Name _____ Date _____ Outline

Classifying Elements

Use your textbook to help you fill in the blanks.

What are atoms and molecules?

1. _____Elements_____ are made up of atoms.
2. Protons, neutrons, and electrons are in an _____atom_____ .
3. _____Protons_____ and neutrons are in the nucleus of an atom.
4. _____Electrons_____ are outside the nucleus of an atom.
5. All atoms have the _____same_____ number of protons and electrons.
6. The identity of an atom is determined by its number of _____protons_____ , and this is called the atomic number.
7. The _____atomic weight_____ of an element is a measure of the mass of its atoms.

What are the properties of elements?

8. Most elements are _____metals_____ .
9. Metals are shiny when polished, can be shaped without breaking, and conduct heat and _____electricity_____ .
10. An example of a metal element is _____mercury_____ .
11. _____Nonmetals_____ are poor conductors of heat and electricity.
12. _____Metalloids_____ are elements with properties of both metals and nonmetals.

Outline Name _____ Date _____

What is the Periodic Table of Elements?

13. Dimitri Mendeleev created the periodic table in 1869.

14. Periodic means occurring in cycles.

15. The periodic table arranges the elements in a chart of rows and columns of increasing atomic numbers.

16. The columns in the periodic table are called groups or families.

17. The rows in the periodic table are called periods.

How can we see atoms?

18. Atoms are too small to see with your eye .

19. The one-angstrom microscope replaces the electron and field ion microscopes.

20. The one-angstrom microscope allows scientists to see the smallest atoms.

21. Scientists can place atoms in precise locations by grabbing them with the tip of a scanning tunneling microscope.

Summarize the Main Idea

22. Why is the periodic table such an important tool?

It has the name, symbol, and atomic weight and number of each element on it. It classifies the elements according to families/groups, periods, and as metals/nonmetals/metalloids/noble gases.

Name _____ Date _____ Vocabulary

Classifying Elements

a. atom	**e.** metalloids	**i.** noble gases
b. atomic number	**f.** metals	**j.** nonmetals
c. atomic weight	**g.** molecule	**k.** periodic table
d. field ion microscope	**h.** one-angstrom microscope	

Fill in the blanks with the correct letter.

1. f Elements that are shiny and conduct heat
2. h One of the most powerful new microscopes
3. a Elements are composed of these
4. b The number of protons in the nucleus of an atom
5. e Elements with properties of both metals and nonmetals
6. k A chart listing the different elements and their properties
7. j Elements that are poor conductors of heat, such as bromine
8. d A microscope used to create the first image of an atom
9. c The mass of an atom
10. i A special family of elements that rarely takes part in chemical reactions
11. g Two or more atoms combined create this

Cloze Test Name _____ Date _____

Classifying Elements

atomic number	increasing	neutrons
electrons	metalloids	nucleus
elements	microscopes	periodic table

Fill in the blanks.

All matter is made of atoms, which may combine to form molecules. Atoms contain small particles called protons, neutrons , and electrons. Protons and neutrons are in the nucleus , but electrons are not. All atoms have the same number of protons and electrons . The number of protons is the atomic number . Elements can be classified as metals, nonmetals, and metalloids . Dimitri Mendeleev created the periodic table in 1869. The elements are arranged in increasing atomic numbers. The periodic table also shows how elements are grouped. Atoms are too small to see with the eye, so special microscopes are used to study them. The one-angstrom microscope is one of the most powerful microscopes, and may lead to amazing discoveries in the future.

Name _____ Date _____ Reading

Element Discovery

When Mendeleev shuffled his element cards to create the periodic table in 1869, he suspected he wasn't playing with a full deck. Many of the elements had already been discovered, but he believed others would come later.

1766 Hydrogen—The most abundant atom in nature is discovered by Henry Cavendish. In 1766, Cavendish is experimenting with materials in his lab when he isolates a gas that is flammable. He realizes that this gas might be a new element and calls it flammable air. The element later gets its name from the Greek words meaning "water forming," when another scientist discovers that water is made of hydrogen and oxygen.

1772–74 Oxygen—Scientists Joseph Priestley and Carl Wilhelm Scheele independently discover that when they heat certain compounds, a new kind of "air" or gas is given off. The new gas makes substances burn five times faster than ordinary air. The new gas is named oxygen from the Greek words meaning "acid former." That's because when oxygen combines with other elements, the compounds are usually acidic.

1868–1895 Helium—Joseph Lockyer discovers helium in 1868 by studying the Sun's spectrum with a spectroscope during a solar eclipse. He finds color lines that no element at the time was known to produce. He infers the lines must be due to a new element found only in the Sun. The element is named helium, after Helios, the Greek god of the Sun. In 1895, helium is finally found on Earth in uranium minerals.

1940 Plutonium—Scientists in Berkeley, California, create a new element by bombarding uranium with particles of deuterium, a special form of hydrogen. They name the element after the recently discovered planetary body Pluto.

1952 Einsteinium—A team of scientists find this element while studying the radioactive debris created when a hydrogen bomb explodes. They name it in honor of scientist Albert Einstein. Only a small amount of einsteinium has ever been produced, and it exists only for a fraction of a second before it transforms itself into other elements.

The periodic table isn't finished. Elements are still being added to it. In the past 75 years, 26 new elements have been added to the table. That's about one element every three years! If you found a new element, what would you name it?

Name _____ Date _____

Make Inferences

- Review the information to make inferences about information not stated explicitly.
- List the details that support the inferences you make.

Write About It

Make Inferences Look at the timeline. When was hydrogen discovered? When was oxygen discovered? What can you infer about the discovery of the composition of water? Read about the discoveries of hydrogen and oxygen to find the clues you need to make an inference.

1766—Hydrogen, 1772–1774—Oxygen. The composition of water must have been discovered after 1774 since its components, hydrogen and oxygen, were discovered in 1766 and 1774.

Name _____ Date _____ **Outline**

Mixtures

Use your textbook to help you fill in the blanks.

What is a mixture?

1. A _____mixture_____ is a physical combination of two or more substances blended together that do not form new substances.
2. Mixtures are _____physically_____ combined, not chemically combined.
3. In a mixture, the parts can be mixed using _____different_____ amounts.
4. For example, Trail Mix has the same parts, but each handful is a different _____mixture_____ of those parts.
5. The _____properties_____ of a mixture are a blend of the properties from its individual parts.
6. An example of this is _____muddy_____ water.
7. Mixtures are _____classified_____ by comparing the sizes of particles in them.
8. In _____heterogeneous_____ mixtures, particles are big enough for us to see with our eyes. Potting soil is an example.
9. A suspension mixture may look creamy or cloudy at first, but then its parts settle into _____layers_____ .
10. Salad oil and vinegar and dusty air are examples of _____suspension_____ mixtures.

Name _____ Date _____

11. A mixture is called a solution if the particles are the size of atoms, or when one substance dissolves in another.

12. All solutions are homogeneous , which means they have the same makeup throughout.

13. Solutions can be colored, but they are always transparent if they are a liquid or gas.

14. A solvent does the dissolving.

15. A solute gets dissolved.

16. Air is a solution of oxygen dissolved in nitrogen.

17. Solubility is the greatest amount of solute that a given solvent can dissolve.

How can you take mixtures apart?

18. Since mixtures are physical combinations of different substances, they can be separated .

Summarize the Main Idea

19. How can you tell the difference among types of mixtures?

You can see the parts of a heterogeneous mixture because of their size. A suspension mixture looks cloudy at first, but eventually settles into layers. A solution is a homogenous mixture where one part has dissolved into the other.

Name _____ Date _____ **Vocabulary**

Mixtures

heterogeneous	solubility	suspension
homogeneous	solute	solvent
mixture	solution	

Fill in the blanks with the correct word.

1. A mixture is a physical combination of two or more substances.
2. Heterogeneous means consisting of parts that are not the same.
3. Homogeneous means consisting of parts that are the same.
4. A solution is a mixture where one substance has dissolved into another substance.
5. Solubility is the greatest amount of a solute that a solvent can dissolve.
6. A solvent does the dissolving.
7. A solute gets dissolved.
8. The particles in a suspension mixture can easily be seen.

Cloze Test

Name _____ Date _____

Mixtures

amount	separated	solute
mixture	size	solutions
physical	solubility	solvent

Fill in the blanks.

Mixtures are just about everywhere you look. A mixture is a physical combination of two or more substances blended together to form a new substance. A mixture is a physical change, not a chemical change. The individual parts of a mixture vary in amount. Mixtures are classified by the size of the particles in them. Heterogeneous mixtures, suspensions, and solutions are types of mixtures. A solution has a solvent that does the dissolving and a solute that gets dissolved. A certain amount of solvent can only dissolve so much solute, and this amount is called the solubility. Mixtures can be separated since they are physical combinations of different substances.

Name _____ Date _____ Writing

What's in this mixture?

Read the Writing in Science feature in your textbook.

Write About It

Narrative Writing Do some research to write a report about how prospectors panned for gold during the California Gold Rush. What mixtures did prospectors have to separate? Give the steps of the process in order.

Planning and Organizing

Denise wrote the following sentences for her report. Read each group of sentences. Write MI by the sentence that states the main idea. Write SD by the sentence that contains facts, details, or examples that support the main idea.

1. Some miners came from as far away as the Sandwich Islands. SD
2. Every new gold strike drew hundreds of miners, coming from all over to stake their claim. MI
3. Others came from places up and down the West Coast. SD

Now write a main idea sentence for your report and four supporting detail sentences.

MI _____

SD _____

SD _____

SD _____

SD _____

Name _____ Date _____

Now write the first draft of your report on a separate sheet of paper. Introduce the main idea about your topic in your first paragraph. Provide facts and details to back it up. Explain the process of panning for gold in sequence. End with a concluding paragraph that summarizes your important points.

Revising and Proofreading

Here is a passage Denise wrote for her report about the California Gold Rush. Add a time-order word or phrase in each blank below to help her improve the transition.

_____ At first _____ , there was so much gold that miners could pick up nuggets by hand in streams and rivers. They also used the dry-digging method, scratching the gold out of ravines and gulches.

_____ Then _____ the situation changed. Miners had to turn to wet digging, or panning, to find gold. _____ When _____ miners "wet dug," or "panned," they used a pan to scoop up sand and gravel from the bottom of streams and rivers. _____ Then _____ they held the pan under a running stream for a few minutes or swirled water around in it.

Now revise and proofread your report. Ask yourself:

- Have I shown sufficient research on the topic of prospecting for gold in California?
- Have I presented a main idea?
- Have I supported my main idea with sufficient facts, details, and examples about panning for gold?
- Have I adequately described the process of panning for gold?
- Have I used time-order words effectively to connect ideas?
- Have I corrected all grammar errors?
- Have I corrected all errors in spelling, capitalization, and punctuation?

Name _____ Date _____ **Outline**

Compounds

Use your textbook to help you fill in the blanks.

What changes produce new and different substances?

1. A chemical change occurs when new compounds are formed.
2. The new compounds have different properties from the original substances forming them.
3. In a chemical change, the combination of atoms changes.
4. Compounds are formed by a combination of two or more elements.
5. Compounds are only formed and broken apart by chemical changes .

How are compounds named?

6. In addition to a common name like *water*, *sugar*, or *salt*, compounds have a chemical name .
7. Chemists name compounds and give them a chemical formula.
8. A chemical formula uses symbols to show what elements have combined to form a compound.
9. The formula contains numbers called subscripts .
10. The subscripts indicate the numbers of which atoms have combined.

Outline Name _____ Date _____

How can you identify compounds and elements?

11. Changes in the way atoms are ___linked___ together occur when compounds form.

12. Every compound has a unique set of properties that ___identify___ it.

13. Scientists use ___mass spectrometers___ and other instruments to identify compounds and their elements.

14. Elements in the compound are heated until they ___glow___ .

15. The ___color___ of the flame identifies the elements in the compound.

How can compounds be put to use?

16. ___Products___ that make our lives easier are produced from compounds.

17. Products from ___crude oil___ are examples of this.

18. Compounds made from hydrogen and carbon are called ___hydrocarbons___ .

19. ___Plastics___ are made from long strings of carbon, with oxygen, nitrogen, chlorine, or sulfur.

Summarize the Main Idea

20. Explain how a compound is different from a mixture.

A compound is created by a chemical change. It is a new substance.

A mixture is a physical change or blending of two substances that can be separated.

Name _____ Date _____

Vocabulary

Compounds

a. chemical change	**d.** hydrocarbons	**g.** subscripts
b. chemical formula	**e.** molecules	
c. compounds	**f.** polymers	

Match the correct letter with the description.

1. **1.** a This creates a new compound.
2. **2.** b The ratio of elements in a compound.
3. **3.** g The numbers in a chemical formula.
4. **4.** d The products of hydrogen and carbon.
5. **5.** f Familiar plastic and rubber materials composed of hydrocarbons.
6. **6.** e The combination of two or more atoms.
7. **7.** c These are formed by chemical changes.

Name _____ Date _____

Compounds

chemical formula	crude oil	molecules
compounds	heated	products
constant	mass spectrometers	subscripts

Fill in the blanks.

A chemical change creates a new substance through the combination of atoms. Compounds are formed by chemical changes. A compound has a constant composition unlike the varying composition of mixtures. Chemists name compounds, and give them a chemical formula. A chemical formula uses element symbols and subscripts to indicate the number and type of atoms combined in the substance. Scientists use mass spectrometers and other instruments to identify compounds. Elements in the compound can be heated until they glow a characteristic color. Many products come from compounds. For example, gasoline and kerosene come from crude oil. Chemists can now custom design molecules, which help create medicines. Compounds like hydrocarbons make our lives easier.

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Types of Matter

Choose the letter of the best answer.

1. What are elements made of?

a. atoms **b.** electrons **c.** molecules **d.** protons

2. The amount of matter in an object is called its

a. density **b.** mass **c.** volume **d.** weight

3. A physical combination blending two or more substances is called a(n)

a. element **b.** compound **c.** mixture **d.** suspension

4. Two or more elements combine chemically to form a(n)

a. solvent **b.** compound **c.** mixture **d.** solution

5. Solid, liquid, and gas are

a. boiling points **c.** particles

b. freezing points **d.** states of matter

6. The amount of space that an object takes up is its

a. density **b.** mass **c.** size **d.** volume

7. The greatest amount of solute that can dissolve in a solvent is its

a. density **b.** solution **c.** solubility **d.** suspension

8. A particle that contains more than one atom joined together is a(n)

a. compound **b.** matter **c.** molecule **d.** suspension

9. The amount of mass for a given volume of a substance is its

a. density **b.** mass **c.** volume **d.** weight

Name _____ Date _____

Choose the letter of the best answer.

10. What is anything that has mass and takes up space?

a. atom **b.** compound **c.** element **d.** matter

11. A compound is formed by a

a. chemical change **c.** mixture
b. suspension **d.** solution

12. What do we call the temperature that a liquid changes into a gas?

a. boiling point **c.** freezing point
b. evaporation point **d.** melting point

13. One substance dissolves into another substance to form a(n)

a. atom **b.** compound **c.** mixture **d.** solution

14. The strength with which gravity pulls on an object is its

a. density **b.** mass **c.** volume **d.** weight

15. Elements in what group are poor conductors of heat and electricity?

a. compounds **b.** metals **c.** metalloids **d.** nonmetals

16. Elements that rarely take part in chemical reactions are the

a. halogens **c.** nonmetals
b. metalloids **d.** noble gases

17. Direct change from solid to gas is called

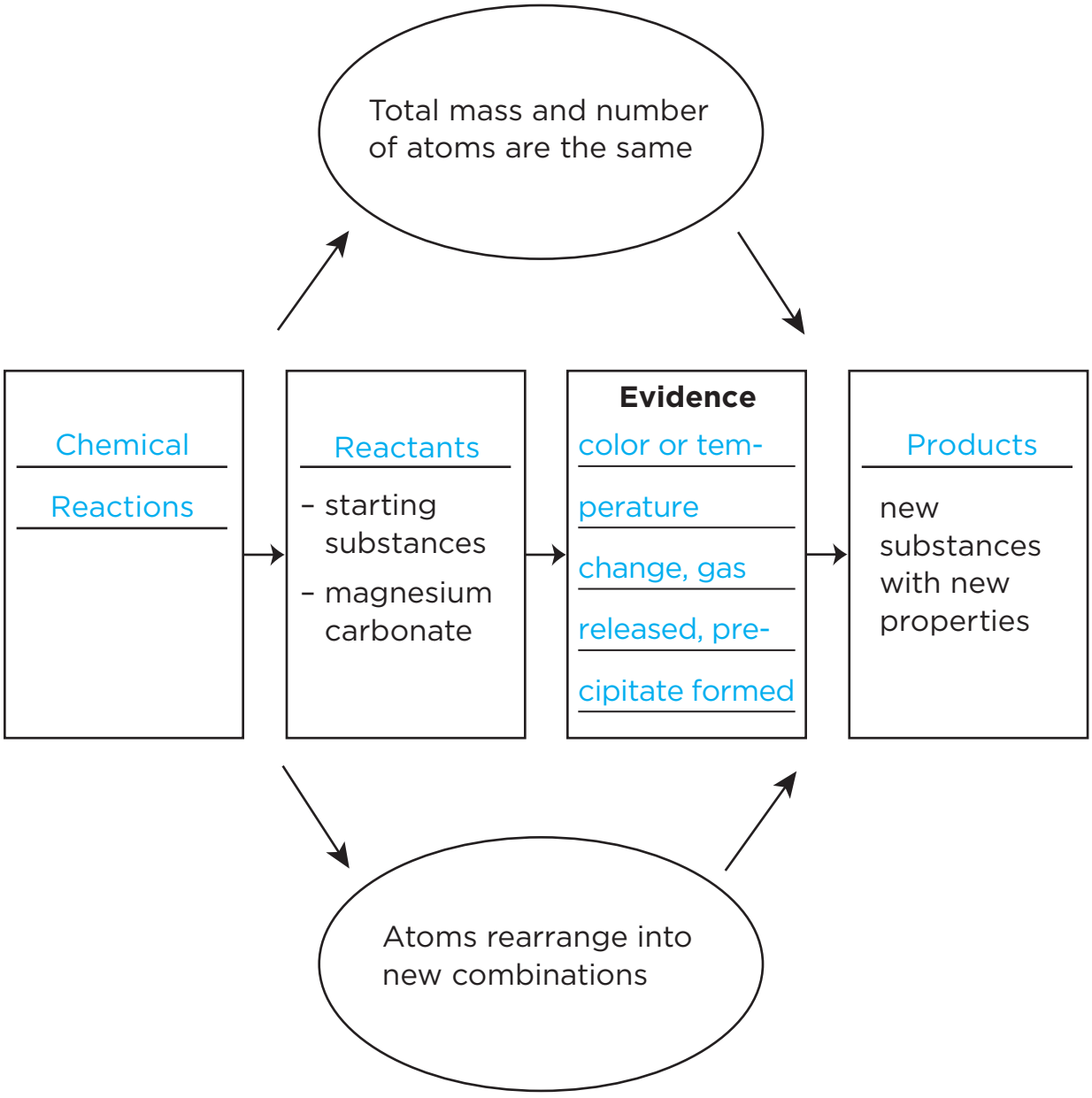
a. boiling **b.** evaporation **c.** freezing **d.** sublimation

Name _____ Date _____

CHAPTER LEVEL
Concept Map

Changes in Matter

Complete the concept map with the information you learned about matter.



Name _____ Date _____

The Grizzly Man

Read the Literature feature in your textbook.

Write About It

Response to Literature The article describes a suit designed to withstand bear attacks. If you were an inventor, what kind of suit would you invent? Write a fictional narrative describing your suit and its uses.

Name _____ Date _____ Outline

Chemical Reactions

Use your textbook to help you fill in the blanks.

What are chemical changes?

1. Another name for a chemical change is a chemical _____reaction_____ .
2. In this process, a starting substance chemically changes into a new _____substance_____ .
3. The starting substance is called the _____reactant_____ .
4. The new substance created is called the _____product_____ .
5. Chemists may say that reactants _____yield_____ products.
6. The total mass of the reactants always _____equals_____ the total mass of the products.
7. Since the numbers of atoms stay the same in a chemical reaction, it means that the atoms _____rearrange_____ into new combinations.
8. Baking soda reacts with _____vinegar_____ in a chemical reaction.

What are the most reactive elements?

9. _____Metallic_____ elements are much more likely to take part in chemical reactions because they have a high reactivity.
10. _____Reactivity_____ means that they react easily with other elements.
11. The most reactive family of metals are the _____alkali_____ metals like lithium and potassium.

Name _____ Date _____

12. The most reactive nonmetals are in the halogen family, like fluorine and chlorine.

13. When reactive elements combine, they give off heat and energy .

What are signs of a chemical change?

14. A precipitate is a solid formed after solutions are mixed.

15. One sign of a chemical change is a(n) gas being produced, indicated by the release of bubbles.

16. Temperature increase is another sign of a chemical change that releases energy.

17. A change in color can also indicate a chemical reaction, as when metal tarnishes.

What are photosynthesis and respiration?

18. Respiration and photosynthesis are examples of chemical reactions that enable people, plants, and animals to live.

19. The products of photosynthesis store the energy from the Sun in the form of glucose.

Summarize the Main Idea

20. What occurs in a chemical reaction and why are chemical reactions important?

A starting substance, reactant, yields a new substance, product. In chemical reactions the total numbers of atoms stay the same, but the atoms are rearranged into new combinations. Chemical reactions are important because they occur all around us.

Name _____ Date _____

Vocabulary

Chemical Reactions

a. alkali metals	**d.** photosynthesis	**g.** reactant
b. chemical reaction	**e.** precipitate	**h.** reactivity
c. halogens	**f.** product	

Match the correct term with the statement that best describes it.

1. e A solid that forms during a chemical reaction when solutions are mixed.
2. c The family of nonmetal elements with high reactivity, like fluorine.
3. h The ability of metals to react easily with one another.
4. b Another name for a chemical change.
5. a The most reactive family of metals.
6. f The new substance created in a chemical reaction.
7. g The starting substance in a chemical reaction.
8. d A common chemical reaction in plants.

Cloze Test Name _____ Date _____

Chemical Reactions

atoms	products	reactivity	respiration
bakes	halogens	rearrange	
plastics	chemical	chemically	

Fill in the blanks.

Chemical changes are called chemical reactions. In chemical reactions, substances _____chemically_____ change into new substances. Another way to say this is that reactants yield _____products_____ . The numbers of _____atoms_____ stays the same in a chemical reaction, they just _____rearrange_____ into new combinations. Photosynthesis and _____respiration_____ are examples of chemical reactions. Metallic elements are common in chemical reactions because they have a high _____reactivity_____ . Alkali metals are the most reactive metals and _____halogens_____ are the most reactive nonmetals. The release of a gas, formation of a precipitate, or a change in color are common indications of a _____chemical_____ reaction. Chemical reactions occur in the kitchen when one cooks or _____bakes_____ . Clothes, _____plastics_____ , and fuels are created by chemical reactions. These reactions are a part of everyday life.

Name _____ Date _____ **Outline**

Metals and Alloys

Use your textbook to help you fill in the blanks.

What are metals?

1. Metals such as gold, copper, and silver make up _____three-fourths_____ of the periodic table.
2. Metals are good _____conductors_____ of heat and electricity.
3. Mercury and bromine are two elements that are _____liquid_____ at room temperature.
4. The most abundant metal is _____iron_____ .
5. Because it was used thousands of years ago and is also used today to make pipes, _____copper_____ is the oldest metal in use.
6. Metals are useful for many purposes because of their wide range of _____melting_____ points.
7. Metals with _____high_____ melting points like titanium are useful because they can withstand high temperatures.
8. Since _____titanium_____ is both lightweight and has a high melting point, it is a good choice for use in airplanes.

What do metals have in common?

9. Metals have good electrical _____conductivity_____ because electricity flows through metals easily.
10. Nonmetals like wood are good _____insulators_____ because they resist the flow of electricity.
11. Electricity sent through wires must be covered by insulators or the energy would get lost into the surroundings as _____heat_____ .

Name _____ Date _____

12. Metals are also good _____thermal_____ conductors, which means heat flows readily through them.

How hard are metals?

13. Metals share the ability to be pressed or pulled into shape without _____shattering_____ or breaking.

14. Any metal that can be rolled or pounded into flat sheets is _____malleable_____ .

15. _____Ductile_____ is a property of metals that means it can be drawn into strands of wire.

16. As metals get harder, they get more brittle and are more likely to _____break_____ .

What are metal compounds and mixtures?

17. _____Corrosion_____ occurs when a metal reacts chemically to form a new compound.

18. _____Alloys_____ are formed when two metals, or a metal and nonmetal, are combined.

19. Alloys are used to harden metals, fight corrosion, improve sound quality and make tools _____sharp_____ .

Summarize the Main Idea

20. Why are metals and alloys used in so many materials?

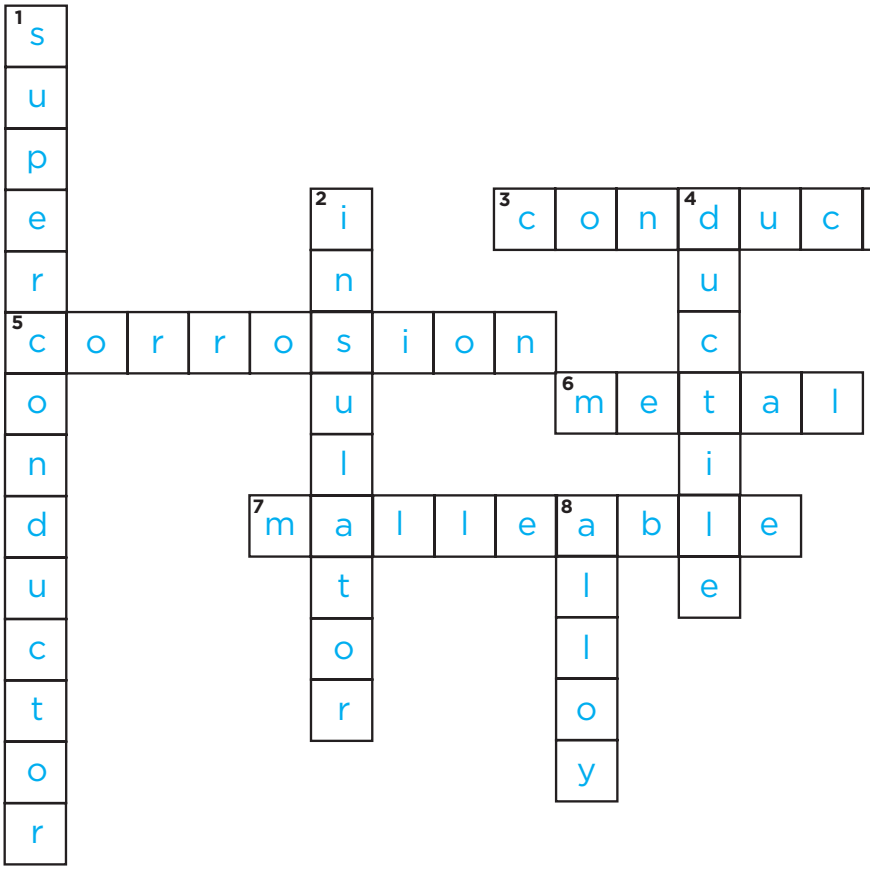
Metals are used because they are malleable and ductile and they have high thermal and electrical conductivity. Their wide range of melting points also allows them to be used for many purposes. Alloys are used to increase the hardness, strength and corrosion-resistance of metals.

Name _____ Date _____

Vocabulary

Metals and Alloys

Use the clues to fill in the crossword puzzle.



alloy
conductivity
corrosion
ductile
insulator
malleable
metal
superconductor

Down

1. A material that loses its resistance to electrical flow at very cold temperatures
2. Something that does not allow electricity to flow easily
4. Property of metal that can be drawn out into strands of wire
8. A mixture of metals, or metals and nonmetals

Across

3. The ability of metals to allow electricity to flow easily
5. The gradual eating away of a metal
6. Good conductors of heat and electricity
7. Property of a metal that can be rolled or pounded into flat sheets

Cloze Test Name _____ Date _____

Metals and Alloys

alloys	denting	insulators	shiny
conductors	electricity	melting	strengthen
corrode	high	pressed	thermal

Fill in the blanks.

Three-fourths of the elements in the periodic table are metals. Metals are good conductors of heat and electricity. Metals like gold and aluminum appear shiny when polished. Metals have a wide range of melting points, which makes them useful for many purposes. Metals with high melting points are useful in spacecrafts and aircrafts because they won't melt under intense heat. All metals let electricity flow through them easily. Nonmetals such as wood and glass serve as electrical insulators . The same properties that make metals good electrical conductors also make them good thermal conductors. Metals can be pressed or pulled into shape. The hardness of a metal is measured by denting it. Metals can corrode , which causes them to be eaten away. Alloys are made by mixing metals or metals and nonmetals together. Alloys strengthen metals and help prevent corrosion.

Name _____ Date _____ **Outline**

Salts

Use your textbook to help you fill in the blanks.

What is a salt?

1. A _____salt_____ is a compound made of a metal and a nonmetal.
2. Salts consist of atomic particles that have an _____electrical_____ charge.
3. The metallic atoms have a positive charge, while the nonmetallic atoms have a _____negative_____ charge.
4. The strong _____attraction_____ of positive and negative particles is what holds a salt together.
5. Salts have _____high_____ melting points.
6. Since salt is made of _____metal_____ and nonmetal elements, it also conducts electricity well.

What are acids and bases?

7. An _____acid_____ is a substance that tastes sour and turns blue litmus red.
8. Acid formulas usually start with _____H_____ because they have hydrogen atoms combined with other atoms in their molecules.
9. Acids can be used to form _____salts_____ .
10. A _____base_____ is a substance that tastes bitter and turns red litmus paper blue.
11. Bases feel _____slippery_____ like soap, but they can also burn your skin.

Name _____ Date _____

12. When bases react chemically with acids, they form salts and water .

13. When an acid and a base combine to form a salt and water, it is called neutralization .

Are all acids and bases equally strong?

14. The strength of an acidic solution is called its acidity .

15. The strength of a base solution is called its alkalinity .

16. The pH scale measures the strength of acids and bases by measuring the amount of charged hydrogen particles.

How do we use salts?

17. Salts have been considered precious since ancient times, and today are used to preserve and season foods.

18. Some salts are compounds of heavy metals, and contact with these salts is dangerous and should be avoided.

19. Table salt is sodium chloride mixed with other compounds.

Summarize the Main Idea

20. Why do salts have the ability to conduct electricity?

Salts are formed from metal and nonmetal elements. Salts consist of atomic particles that have an electric charge. When a salt dissolves, its electrically charged particles can conduct electricity.

Name _____ Date _____ Vocabulary

Salts

a. acid	**d.** base	**g.** pH scale
b. acidity	**e.** indicators	**h.** salt
c. alkalinity	**f.** neutralization reaction	

Match the correct term to its description.

1. ___d___ A substance that tastes bitter and has a pH between 7 and 14.
2. ___c___ The strength of a basic solution.
3. ___g___ This is used to measure the strength of an acid or base.
4. ___f___ The reaction that occurs when an acid and a base combine to form a salt and water.
5. ___a___ A substance that tastes sour and has a pH between 0 and 7.
6. ___b___ The strength of an acidic solution.
7. ___h___ A compound of metallic and nonmetallic elements.
8. ___e___ These change colors to identify substances.

Cloze Test

Name _____ Date _____

Salts

acids	conductors	neutralization
ancient	pH scale	salts
charges	nonmetallic	water

Fill in the blanks.

Salts are compounds made of metallic and nonmetallic elements. _____Salts_____ are composed of metallic elements that have positive charges, and _____nonmetallic_____ elements that have negative charges. These _____charges_____ hold a salt together. Because salts are made of charged particles, they are _____conductors_____ of electricity. _____Acids_____ and bases can also be used to form salts. Bases react chemically with acids to form salts and _____water_____ . This is called _____neutralization_____ because water is formed. The strength of acids and bases is measured on the _____pH scale_____ . Salts have been used since _____ancient_____ times. Salts are used today for purposes such as preserving and seasoning food and even de-icing a plane.

Name _____ Date _____

Reading

Meet Christina Elson

Christina Elson is a scientist at the American Museum of Natural History. She studies how salt was used by the ancient Aztec culture.

From the 12th to 16th centuries, the Aztecs lived in the area that is now Mexico. This area was very rich in salt, which is a natural mineral resource that is mined from the ground. Christina studies a region in Mexico where salt was obtained from deposits around a dried lake bed. The Aztecs turned these deposits into different kinds of salt. First, they collected the salty soils by scraping and digging them out of the ground. Then they filtered water through the soils to dissolve out the salts into big pots. The final step required boiling the salt solution so the water evaporated away. The salt remained behind in the form of crystals.

Aztecs used salt for much more than a cooking spice. In one Aztec town, Christina found thousands of ceramic fragments, pieces of clay pots that were used to transport salt for sale or trade. She also found that salt was used to dye cloth. Colorfully dyed cotton cloth was a valuable product because it was greatly desired by the Aztec nobles. Aztec women learned to spin cloth at an early age. The cloth was dyed with pigment in a hot watery dye-bath. When salt was added to the dye-bath, it helped the pigment "stick" to the cloth. The salt combined with the color pigment to make a compound that could not be dissolved in water.

Salt was important to many other ancient cultures, and continues to be important today. Salt can be used to preserve food so it can be stored for a long time without refrigeration; to prepare and preserve animal skins for clothing; and to make soap. Salt's value stems from its usefulness, durability, and portability.

Name _____ Date _____

Draw Conclusions

- Use information in the text and background knowledge.
- Support your conclusions with information found in the text.

Write About It

Draw Conclusions

1. How did the Aztecs change a mineral resource into a finished product?

They collected the salty soils and filtered water through them to dissolve the salts into the water. The water was collected in pots and then boiled so the water evaporated away. The salt crystals were left behind.

2. What would happen to the colors in Aztec cloth when washed if salt was not part of the dye-bath?

The colors would not stick to the cloth as well and would fade. If salt was not combined with the color pigment to make a compound, it could dissolve in water.

Name _____ Date _____ Writing

Clean Up

Read the Writing in Science feature in your textbook.

Write About It

Explanatory Writing Do research online to find other products that come from the reaction of an acid and a base. Choose one of those products and write out instructions to make it. Explain clearly what the finished product will look like and do.

Planning and Organizing

Alicia planned to write instructions for how to model an erupting volcano. Organize the steps she wrote from 1 to 4, with 4 being the last step.

A. Gather all your ingredients and equipment. 1

B. Finally, pour the vinegar mixture into the bottle of sodium carbonate. 4

C. Then prepare your base. Use the funnel to pour sodium carbonate into a small plastic bottle. Fill the bottle to the halfway point. 3

D. Pour the vinegar into a measuring cup. Add a few drops of the red food coloring to the vinegar and stir. 2

Write the purpose of your instructions, then write five steps in sequence.

I plan to write instructions to make _____

1. _____

2. _____

3. _____

4. _____

5. _____

Name _____ Date _____

Now write the first draft of your instructions on a separate sheet of paper. Begin with a paragraph that explains the purpose of the instructions and tells what the finished product will look like. Then write the list of materials needed. Arrange the steps in sequence. End with a paragraph that explains the chemical reaction.

Revising and Proofreading

Here are some sentences that Alicia wrote for her instructions. Each sentence contains a grammatical error. Find the error and correct it. Write the corrected sentence on the lines.

1. Pour the vinegar into the sodium carbonate and watch the liquid raise.

   Pour the vinegar into the sodium carbonate and watch the liquid rise.

2. A real volcano erupt when the pressure builds up.

   A real volcano erupts when the pressure builds up.

3. This demonstration will shown what an erupting volcano looks like.

   This demonstration will show what an erupting volcano looks like.

4. A chemical reaction occurs when a base was combined with an acid.

   A chemical reaction occurs when a base is combined with an acid.

5. Sit the bottle in the middle of the pile of gravel.

   Set the bottle in the middle of the pile of gravel.

Now revise and proofread your instructions. Ask yourself:

- Have I described what the finished product looks like and does?
- Have I listed the materials needed?
- Have I provided step-by-step instructions in time order?
- Have I given clear details that are easy to follow?
- Have I corrected all grammar errors?

Name _____ Date _____

CHAPTER LEVEL
Vocabulary

Changes in Matter

Choose the letter of the best answer.

1. At very cold temperatures, what loses all resistance to the flow of electricity?

a. conductors
b. insulators
c. superconductors
d. superinsulators

2. New compounds made during chemical reactions are

a. malleable. **b.** products. **c.** reactants. **d.** reactions.

3. About three-fourths of the elements on the Periodic Table are

a. alloys. **b.** compounds. **c.** metals. **d.** metalloids.

4. What occurs when bases react with acids to make salts and water?

a. double replacement reaction
b. exothermic reaction
c. neutralization reaction
d. single replacement reaction

5. A mixture of two or more metals is a(n)

a. alloy. **b.** ductile. **c.** malleable. **d.** reaction.

6. What may be used to identify an acid or a base?

a. alkaline **b.** indicator **c.** salt **d.** reactant

7. What property allows electricity to pass easily through metals?

a. conductivity **b.** corrosiveness **c.** ductility **d.** malleability

8. The strength of a basic solution is called its

a. acidity.
b. alkalinity.
c. conductivity.
d. concentration.

Name _____ Date _____

Choose the letter of the best answer.

9. Any metal that can be drawn into strands of wire is said to be

a. compliant. **b.** ductile. **c.** malleable. **d.** yielding.

10. A solid that forms in a solution during a chemical reaction is a(n)

a. acid. **b.** alkaline. **c.** base. **d.** precipitate.

11. Elements that easily take part in chemical reactions have a high

a. atomic mass.
b. atomic number.
c. productivity.
d. reactivity.

12. What process occurs when metals combine chemically with nonmetals?

a. adaptation **b.** corrosion **c.** ductility **d.** reactivity

13. Any metal that can be rolled or pounded into thin sheets is said to be

a. compliant. **b.** ductile. **c.** elastic. **d.** malleable.

14. A substance that tastes sour and turns litmus paper red is a(n)

a. acid. **b.** base. **c.** indicator. **d.** pH.

15. Starting substances in a chemical reaction are called

a. alkaline. **b.** basic. **c.** products. **d.** reactants.

16. Substances that resist the flow of electricity are

a. conductors. **b.** ductile. **c.** insulators. **d.** malleable.

17. A substance that tastes bitter and turns litmus paper blue is a(n)

a. acid. **b.** base. **c.** indicator. **d.** pH.