Study Guide and Reinforcement

Student Edition

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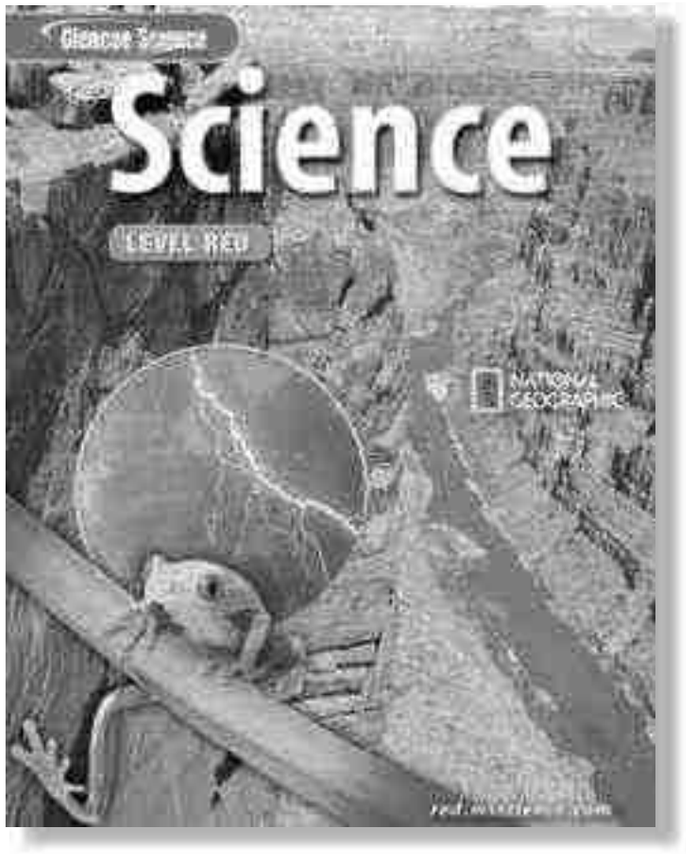

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SECTION 1 Study Guide

Minerals—Earth's Jewels

Chapter 1

Directions: *Match the terms from the word bank with the phrases below.*

Earth science	**health science**	**physical science**	**scientific theory**
chemistry	**life science**	**physics**	**technology**
climate	**mountain gorillas**	**science**	

_____ **1.** the study of matter and energy

_____ **2.** something a meteorologist might study

_____ **3.** an explanation of a pattern in nature that is supported by observations and results from many investigations

_____ **4.** an endangered species that was studied by Dian Fossey in Rwanda

_____ **5.** study of living systems and their interactions

_____ **6.** the study of energy and its ability to change matter

_____ **7.** a field that is part of life science and includes careers such as dietitians, nurses, and physiotherapists

_____ **8.** study of nonliving things and systems on Earth and in space

_____ **9.** a way of learning more about the world, that starts with making observations and asking questions

_____ **10.** applications of theoretical science. It's what engineers develop.

_____ **11.** the study of matter

Directions: *Use **Figure 2** to list four possible outcomes when new information is found about a scientific explanation.*

12. _____ **13.** _____

14. _____ **15.** _____

Directions: *Fill in the chart with the three interacting parts of a system, and <u>two</u> examples of each of these parts from your school.*

	Three Parts of a System	First Example	Second Example
16.			
17.			
18.			

Name Date Class

SECTION 2 Study Guide

Science in Action

Chapter 1

Directions: *Circle the term in the puzzle that fits each clue. Then write the term on the line. In the puzzle, terms read across or down.*

P E O B S E R V A T I O N
M Q R D Y B X K H E T P I
E K G X I E J N L S B Y H
P Y A F W Z S H A T R M Y
N R N C M J A H T L N J P
F Q I R R W O J I V A D O
U S Z D F V Z B L G C O T
P R E D I C T I O N F M H
L H G K D W C G U S X O E
V T C O N C L U S I O N S
Y Q W A O M U C T U P N I
P G I E Q V S X K Z B E S

1. Using your senses to gather information is called _____.
2. A reasonable and educated guess based on what you know and observe is called a(n) _____.
3. Making an educated guess on the results of an experiment based on observations and the hypothesis is called making a(n) _____.
4. In any good experiment, the scientist needs to _____ the hypothesis.
5. You can use a table or a graph to _____ your findings.
6. After your investigation, you can use the results of your experiments to draw _____.

Directions: *Answer the following question on the lines provided.*

7. What is a controlled experiment? Give an example.

_____

_____

_____

_____

_____

Name Date Class

SECTION 3 Study Guide

Models in Science

Chapter 1

Directions: *Complete the following sentences using the correct terms.*

1. A model built using software that you can see on a computer screen is a _____ model.
2. $E = mc^2$ is Einstein's _____ model of the theory of relativity.
3. A mobile that shows our solar system is a _____ model.
4. Some models are used to communicate _____ to other people.
5. Some models are used because testing with a model is _____ and less expensive than the real thing.

Directions: *Answer the following questions on the lines provided.*

6. List one example of a model used to test a prediction.

7. List one way a computer model could help a scientist studying plants.

8. What are the limitations of models?

9. Ancient scientists thought that Earth was the center of the universe, and imagined the sky as a blanket that covered the planet. Why did this early model change?

Name Date Class

SECTION 4 Study Guide

Evaluating Scientific Explanation

Chapter 1

Directions: *Fill in the blanks with the following terms.*

repeatable **explanations** **laboratory** **changing**
evaluate **inferences** **data** **critical thinking** **conclusions**

Scientists often have to evaluate scientific explanations in two parts. Scientists evaluate the observations that are made, and evaluate the **1.** _____ made from those observations. To make a decision, scientists use their **2.** _____ skills to evaluate the evidence. Scientists have to be careful whenever they are collecting any type of **3.** _____. Measurements must be accurate and instruments must be properly calibrated, as scientists cannot afford to be careless in their data collection.

Valid scientific explanations must be **4.** _____ by other scientists. If a scientist's experiment cannot be recreated accurately by other scientists, it might mean that the experiment is invalid. Once the experiments and evidence have been tested and examined, the scientist might draw **5.** _____ based on the observations. However, when drawing conclusions, scientists should ask themselves if they considered all of the possible **6.** _____. It is important to keep an open mind when drawing conclusions from scientific information. It is also important to remember that scientific information is constantly **7.** _____, and that all scientific models are subject to change.

It is important to know that scientific reasoning is used not only in the **8.** _____. Scientific reasoning and critical thinking skills are used every day. These skills will help you **9.** _____ claims and make good decisions about the world around you.

Directions: *Answer the following questions on the lines provided.*

10. Why is it important for a scientist to write down every observation, including unexpected observations? _____

_____

11. How is evaluating an advertising claim a use of the scientific process?

_____

12. Does an advertiser's claim that its results have been verified by an independent laboratory impress you?

_____

Name Date Class

SECTION 1 Study Guide

Description and Measurement

Chapter 2

Directions: *Use the word bank to fill in the blanks in the summary statements.*

accuracy	**far**	**much**	
decimal places	**long**	**measurement**	**precision**

(**1**)_____ is a way to describe the world with numbers. It can tell you how (**2**)_____, how (**3**)_____, or how (**4**)_____, by measuring time, distance, and mass.

(**5**)_____ is a description of how close measurements are to each other. It can also be used to describe the number of (**6**)_____ a number has.

(**7**)_____ is a description of how close a measurement is to the true value.

Directions: *Decide whether the number in column A or column B answers each question below and write the letter in the blank provided.*

		A	B	Answer
8.	the more accurate number, if the actual value is 10.21 g	10.201	10.19	
9.	the more precise number, if the actual value is 10.21 g	10.201	10.19	
10.	the more accurate number, if the actual value is 750 m	740.3	747	
11.	the more precise number, if the actual value is 750 m	740.3	747	
12.	the number 11.289, rounded to the tenths place	11.2	11.3	
13.	the number 12.4446, rounded to the hundredths place	12.45	12.44	
14.	the number 879,642 rounded to the hundreds place	879,600	879,000	
15.	the number of significant digits in 1280003	4	7	
16.	the number of significant digits in 454.00	5	3	
17.	the number of significant digits in 0.00002405	8	4	

Name Date Class

SECTION 2 Study Guide

SI Units

Chapter 2

Directions: *Complete the chart by filling in the SI unit and the tool you would use for each measurement.*

Measurement	Unit	Tool
1. mass of rock		
2. your body temperature		
3. volume of a plastic block		
4. length of your classroom		
5. how much water a tablespoon holds		
6. how long between blinks of your eyes		

Directions: *Convert each of the following SI measures.*

7. 64 km = _____ m

8. 373 g = _____ kg

9. 897 mm = _____ cm

10. 0.25 L = _____ mL

Directions: *Use the following information to answer the questions below.*
A train travels at the rate of 120 km per hour.

11. What is its speed in meters per second?

_____

12. What is its speed in meters per minute? Show your work in the space below.

_____

Name Date Class

SECTION 3 Study Guide

Drawings, Tables, and Graphs

Chapter 2

Directions: *Match the information in Column I with the best way to display it from Column II. Write the letter of the correct term in the blank at the left. A letter may be used more than once.*

Column I	Column II
_____ **1.** view of Earth from space	**a.** bar graph
_____ **2.** amount of rainfall in an area each month for a year	**b.** circle graph
_____ **3.** how the constellations change position over several hours	**c.** drawing
_____ **4.** percents of the most abundant metals in Earth's crust	**d.** line graph
_____ **5.** percents of the different gases in the atmosphere on Mars	**e.** movie
_____ **6.** how far a hurricane moves each hour	**f.** photograph
_____ **7.** structure of the human ear	**g.** table
_____ **8.** daily high and low tide times for a week	
_____ **9.** how a sound wave travels through the air	

Directions: *Use the paragraph below to complete question 10.*

Some animals can live much longer than others. For example, both the golden eagle and the blue whale have a maximum life span of more than 80 years, while a guppy's maximum life span is only 5 years. A giant spider may live 20 years, a lobster 50 years, and a crocodile may live 60 years.

10. Make a chart and draw a graph to display the data given in the paragraph.

Name Date Class

SECTION 1 Study Guide

Physical Properties and Changes

Chapter 3

Directions: *List nine physical properties of matter, give an example of each one, and explain how each is measured or calculated. Include units if they apply.*

	Property	Example with Units	How It Is Measured or Calculated
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

Directions: *List three physical properties of metals. Give the definition of each property and explain a use of a metal with each property.*

	Property	Definition	Use
10.			
11.			
12.			

Directions: *Explain what a physical change is, and give an example.*

13. _____

_____

_____

Name Date Class

SECTION 2 Study Guide

Chemical Properties and Changes

Chapter 3

Directions: *Answer the following question on the lines provided.*

1. What are the differences between physical and chemical changes? Explain them, giving two examples of each.

Directions: *Label the following changes as* **C** *for chemical or* **P** *for physical.*

_____ **2.** forming a bar of copper into a wire

_____ **3.** frying an egg

_____ **4.** breaking a glass

_____ **5.** bleaching your hair

_____ **6.** transferring graphite from a pencil to paper when writing

_____ **7.** dissolving a drink mix in water

_____ **8.** shooting off fireworks

_____ **9.** a puddle drying up after a rain

Directions: *In number 10 below, a code letter has been substituted for each letter in the alphabet. To find out what the sentence says, use the following key to decode it. In the key, the code letters are shown directly below the alphabet letters they stand for. Write the correct letter above each code letter, then read the sentence.*

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
S W Q G L V A X C R Y E F B K I J U N V Z P O H D M

10.

F S N N C N B K V Q U L S V L G K U G L N V U K D L G

G Z U C B A S B D Q X L F C Q S E Q X S B A L

Name Date Class

SECTION 1 Study Guide

Structure of Matter

Chapter 4

Directions: *List five things that are matter and five things that are not matter.*

Matter	Not Matter
1.	
2.	
3.	
4.	
5.	

Directions: *List the five main points of Democritus' atom theory.*

6. _____

7. _____

8. _____

9. _____

10. _____

Directions: *Use the word bank to fill in the blanks to match the phrases below.*

atom	Chadwick	electron cloud	orbits	Rutherford
atomic model	electron	neutron	proton	Thomson

_____ **11.** a neutral particle that is located in the nucleus

_____ **12.** a negative particle that orbits the nucleus

_____ **13.** a positive particle that is located in the nucleus

_____ **14.** the area where modern scientists think electrons are likely to be found

_____ **15.** scientist who discovered that atoms contained electric charge

_____ **16.** a student of Niels Bohr who discovered neutrons in the nucleus

_____ **17.** the place where Bohr thought electrons would be found

_____ **18.** the smallest piece of matter that keeps the properties of the element to which it belongs

_____ **19.** scientist who proposed the idea of a nucleus

_____ **20.** a way of thinking about the structure of the atom

Name Date Class

SECTION 2 Study Guide

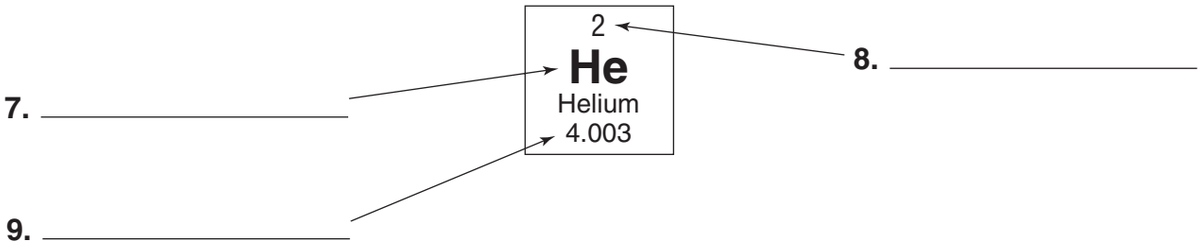
The Simplest Matter

Chapter 4

Directions: *Complete the table by writing in the appropriate characteristics for metals, metalloids, and nonmetals.*

Characteristics	Metals	Metalloids	Nonmetals
1. State of matter at room temperature			
2. Shininess			
3. Conductor of heat or electricity			
4. Malleability			
5. Ductility			
6. Location on periodic table			

Directions: *The square below represents one element from the periodic table. Identify and describe the numbered items. Then answer the questions below.*



10. What is the atom's mass number?

_____

11. What are isotopes?

_____

_____

Name Date Class

SECTION 3 Study Guide

Compounds and Mixtures

Chapter 4

Directions: *Select the term below that best describes each food listed.*

homogeneous mixture **compound** **heterogeneous mixture**

1. milk _____ **6.** popsicle _____

2. salt _____ **7.** chili _____

3. sugar _____ **8.** taco _____

4. soda pop _____ **9.** pizza _____

5. ice cream _____ **10.** water _____

Directions: *Answer the following questions on the lines provided.*

11. Describe what a compound's formula tells us about the compound.

_____

_____

_____

12. Both compounds and mixtures contain more than one kind of atom. Explain how a compound is different from a mixture.

_____

_____

_____

Directions: *Draw a line from the term on the right to its definition or description on the left.*

13. a sample of matter that has the same composition and properties throughout

14. a pure substance whose smallest unit is made up of atoms of more than one element

15. two or more substances that are together but do not combine to form a new, pure substance

16. a mixture that is the same throughout

17. a mixture with visible components

heterogeneous mixture

homogeneous mixture

compound

substance

mixture

Name Date Class

SECTION 1 Study Guide

Motion

Chapter 5

Directions: *Fill in the chart with information from the chapter.*

		Definition	Does it depend on direction?
1.	distance		
2.	average speed		
3.	insantaneous speed		
4.	velocity		
5.	acceleration		

Directions: *A snowboarder is moving down a half-pipe. Describe what the acceleration would be in the following situations, and how this would affect the snowboarder's velocity.*

6. The snowboarder does a turn in midair while keeping a constant speed. (note: the acceleration is directed toward the center of the turn)

_____

7. The snowboarder goes down a steep slope.

_____

8. The snowboarder moves up the half-pipe.

_____

9. The snowboarder moves down the half-pipe.

_____

Directions: *Explain how the velocity of an object could change while its speed stayed the same.*

10. _____

_____

Directions: *Use* ***Figure 5*** *to help you fill in the chart.*

	Description of the Moving Figure	Description of Acceleration	What Happens to Speed	Description of Line on a Speed-Time Graph
11.	coasts down a hill			
12.	skates on a flat surface		speed stays the same	
13.	skates up a hill	acceleration is opposite to motion		

Name Date Class

SECTION 2 Study Guide

Newton's Laws of Motion

Chapter 5

Directions: *A yo-yo with a mass 0.25 kg is suspended from a hook on a ceiling. Use the diagram at the bottom of the page to answer the questions.*

1. Identify which of Newton's laws explains what happens in each of the following steps.

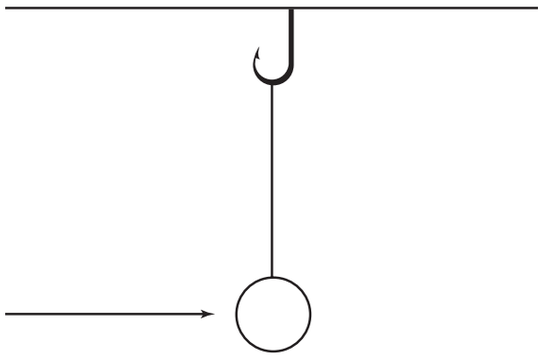
a. Earth pulls the yo-yo downward and the yo-yo pulls Earth upward.	
b. The yo-yo doesn't move.	
c. Someone pushes on the yo-yo in the direction shown by the arrow, and the yo-yo moves.	
d. The yo-yo keeps swinging back and forth.	
e. The yo-yo slows down and eventually stops.	
f. The yo-yo pulls on the hook and the hook pulls on the yo-yo.	

2. What is the net force acting on the yo-yo in step b?

3. In step e, what force causes the yo-yo to slow down and stop?

4. If a net force of 0.2 N is applied in step c, use the space below to calculate how fast the yo-yo accelerates.

5. If the same net force is applied to a yo-yo with a mass of 0.5 kg, how will the rate of acceleration be affected? Why?



6. If the hook exerts a force of 0.001 N on the ceiling, how much force does the ceiling exert on the hook?

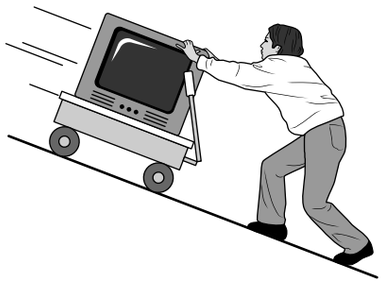
Name Date Class

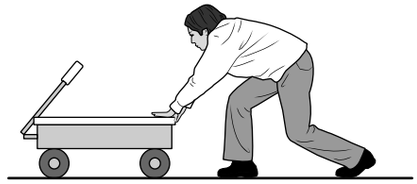
SECTION 3 Study Guide

Work and Simple Machines

Chapter 5

Directions: *Describe what is happening in each situation as* **work** *or* **no work**.





1. _____ **2.** _____ **3.** _____

Directions: *Name two situations in which no work is done to an object.*

4. _____

5. _____

Directions: *Answer the following questions on the lines provided.*

6. What two things must occur for effort to count as work?

_____

_____

7. How is work measured?

_____

8. What is mechanical advantage?

_____

_____

9. How do the three classes of levers differ?

_____

_____

_____

10. How does a pulley make work easier if it doesn't multiply force?

_____

Name Date Class

SECTION 1 Study Guide

Energy Changes

Chapter 6

Directions: *State the law of conservation of energy.*

1. _____

_____

Directions: *Label each situation with the type of energy it describes. Some situations may have more than one answer.*

chemical **heat** **kinetic** **nuclear** **potential**

_____ **2.** a rolling ball gains more of this kind of energy when it moves faster

_____ **3.** skiers gain this type of energy when they travel up the hill on a lift

_____ **4.** energy stored in the nuclei of atoms

_____ **5.** energy stored in chemical bonds

_____ **6.** the energy of moving water

_____ **7.** energy of position

_____ **8.** as objects become hotter, they have more of this type of energy

_____ **9.** two kinds of energy produced by burning firewood

_____ **10.** energy of a moving soccer ball

_____ **11.** energy stored in gasoline

Directions: *List two factors that cause a large meteor crashing into Earth to have more kinetic energy than a batted baseball.*

12. _____

13. _____

Directions: *List three situations where energy is transformed from one form to another.*

14. _____

_____

15. _____

_____

16. _____

_____

Name Date Class

SECTION 2 Study Guide

Temperature

Chapter 6

Directions: *Complete the following sentences using the correct terms.*

1. The words _____ and _____ are commonly used to indicate temperature, but they are not scientific terms because they mean different things to different people.

2. Temperature really is a measure of the _____ of the particles in any material.

3. _____ is an energy transfer due to a difference in temperature.

Directions: *Complete the chart.*

Two Scales for Measuring temperature

Name of Scale	Abbreviation	Temperature at which water freezes (degrees)	Temperature at which water boils (degrees)
Fahrenheit	**4.**	**5.**	**6.**
Celsius	**7.**	**8.**	**9.**

Directions: *Read the following description. Then answer the questions.*

Assume that you have just taken a pan of cookies out of the oven and set them on the counter to cool. In the space below, draw a picture of the cookies in the pan sitting on the counter. Add wavy lines to show the heat from the cooling cookies.

10. What term refers to the average kinetic energy of the particles of one of the cookies?

_____

11. Imagine you put your hand next to one cookie without touching it. Your hand feels warm. By what method(s) has the thermal energy of the cookies transferred to your hand?

_____

12. Imagine you move the pan and touch the spot where it had been sitting. The counter feels warm. How did the thermal energy of the cookies transfer to the counter?

_____

13. The lines you drew above the cookies show that the air above the cookies is rising in a current.

a. By what method is the thermal energy causing the air to move? _____

b. What kind of current is this? _____

Name Date Class

SECTION 3 Study Guide

Chemical Energy

Chapter 6

Directions: *Complete the following sentences using the correct terms and phrases.*

1. Chemical _____ stored in oil, gas, and coal is used everyday.
2. Scientists refer to the potential energy within chemical bonds as _____.
3. Energy is stored in the _____ between the atoms in a compound.
4. Muscles in your body transform chemical energy into _____ and heat when they move.
5. In chemical reactions, chemical bonds _____ between some particles and _____ between other particles.
6. Chemical reactions that absorb energy are called _____.
7. A photosynthetic reaction in a plant cell transforming energy from sunlight into chemical energy is a(n) _____ chemical reaction.
8. Living things depend on _____ for food and oxygen.
9. Exothermic reactions are chemical reactions that _____ energy.
10. Rates of chemical reactions can be changed by a substance called a(n) _____, whose own structure is not changed by the reaction.
11. Greater amounts of sugar will dissolve in water if the water is _____.
12. Your body relies on biological catalysts called _____ to control cell processes.

Directions: *For each of the following statements, write* **True** *or* **False** *on the line provided.*

_____ **13.** In a chemical reaction, the state of a substance changes, but the substance itself is not changed.

_____ **14.** Rusting is a chemical reaction that occurs when a metal combines with oxygen.

_____ **15.** All chemical reactions occur at the same rate.

_____ **16.** Every chemical reaction includes some energy transformation.

_____ **17.** Not every chemical reaction gives off energy.

Name Date Class

SECTION 1 Study Guide

Electric Charge and Forces

Chapter 7

Directions: *Match the terms from the list with the correct phrase below.*

air currents	**charging by induction**	**grounding**	**neutral**
attract	**conductors**	**insulators**	**positively charged**
charging by contact	**electric force**	**negatively charged**	**repel**

_____ **1.** cause the bottom of a storm cloud to become negatively charged

_____ **2.** how the ground beneath a storm cloud becomes positively charged

_____ **3.** how a lightning rod protects a building

_____ **4.** what a positive and a negative charge will do

_____ **5.** what two positive charges will do

_____ **6.** describes an atom with equal numbers of protons and electrons

_____ **7.** depends on the amount of charge on two objects and the distance between them

_____ **8.** describes an atom when the number of electrons is greater than the number of protons

_____ **9.** gold, silver, and copper

_____ **10.** materials with electrons that can not move easily through the material

_____ **11.** describes an atom when the number of electrons is less than the number of protons

_____ **12.** how a balloon becomes charged when you rub it on a cat

Directions: *Order the following steps in the production of lightning. The first step has been numbered for you.*

13. _____ The electric field surrounding the excess electrons in the bottom of the storm cloud repels electrons in the ground.

_____ Charges move quickly from the cloud to the ground, causing a flash of lightning.

1 During a storm, air currents in storm clouds cause electrons to be transferred from the top of the cloud to the bottom.

_____ The ground beneath the storm cloud becomes positively charged.

Directions: *Explain how a lightning flash can occur within a storm cloud.*

14. _____

_____

Name Date Class

SECTION 2 Study Guide

Electric Current

Chapter 7

Directions: *Circle the answer that correctly completes the sentence.*

1. The closed path in which electric charges can flow is an electric *circuit* / *current*.
2. Electrons flow from the *positive* / *negative* terminal of a battery.
3. Collisions of electrons with other particles in a circuit convert electrical *energy* / *charge* into heat or light.
4. V = IR is the equation that expresses the relationship known as *Ohm's* / *Ampere's* Law.
5. In the formula, $V = IR$, current is represented by the letter *I* / *R*.
6. The light switch in your classroom is part of a *series* / *parallel* circuit if it controls all of the lights at once.
7. A simple electric circuit includes a *switch* / *crank* battery, lightbulb, and wires.
8. One source of *energy* / *heat* for a circuit is a battery.
9. The unit for voltage is the *volt* / *hertz*.

Directions: *Answer the following questions.*

10. What happens to the total charge on a wire when a current flows through the wire?

11. In a light circuit with a constant voltage, what is the effect on current if the number of lightbulbs is doubled?

12. How can a broken wire affect a series circuit differently than a parallel circuit?

Name Date Class

SECTION 3 Study Guide

Magnetism

Chapter 7

Directions: *Complete this paragraph using the terms on the list.*

electric current	**generators**	**magnetic**
magnetic domain	**magnetic field**	**magnetic materials**
permanent magnets	**poles**	**power plants**

The atoms of **1.** _____, such as iron and nickel are **2.** _____. Many of these atoms can line up in a group, called a **3.** _____ with their **4.** _____ all pointed in the same direction. When all of the domains in a piece of iron are oriented in the same direction, they form a **5.** _____. The movement of a wire loop in the **6.** _____ that surrounds the magnet creates an **7.** _____. **8.** _____ use this interaction in **9.** _____ to produce the electrical energy that you use in your home.

Directions: *Place a check mark next to each statement that is true. If the statement is false, write the true statement on the line provided.*

____ **10.** Every magnet has a north pole and a south pole.

_____

____ **11.** If the north pole of a magnet is brought toward the north pole of another magnet, the magnets attract each other.

_____

____ **12.** In a permanent magnet the magnetic domains are oriented in random directions.

_____

____ **13.** A current-carrying wire wrapped around an iron core is an electromagnet.

_____

____ **14.** The production of an electric current by moving a magnet and a loop relative to each other is called a magnetic domain.

_____

Name Date Class

SECTION 1 Study Guide

What are waves?

Chapter 8

Directions: *Use the words from the word bank to fill in the blanks in front of the correct phrases below.*

compression	**mechanical**	**sound**	**water**
compressional	**medium**	**transverse**	**waves**
crest	**radiant**	**trough**	**X-ray**
electromagnetic	**rarefactions**	**vibrating**	

_____ **1.** a type of wave that requires matter to transmit energy

_____ **2.** part of a compressional wave where molecules are farthest apart

_____ **3.** all waves are produced by something that is doing this

_____ **4.** a type of wave that can carry energy without matter

_____ **5.** rhythmic disturbances that carry energy without carrying matter

_____ **6.** a type of compressional wave made by a guitar

_____ **7.** a material in which a mechanical wave is traveling

_____ **8.** a type of transverse wave

_____ **9.** a type of wave in which matter moves at right angles to the direction the wave travels

_____ **10.** high point of a transverse wave

_____ **11.** the type of energy emitted by the Sun

_____ **12.** part of a compressional wave where molecules are closest together

_____ **13.** a type of wave where the matter moves back and forth along the same direction that the wave travels

_____ **14.** low point of a transverse wave

_____ **15.** a type of electromagnetic wave

Directions: *Explain how ocean water moves within a wave, and how a wave can carry energy without moving matter.*

16. _____

_____

_____

Name Date Class

SECTION 2 Study Guide

Wave Properties

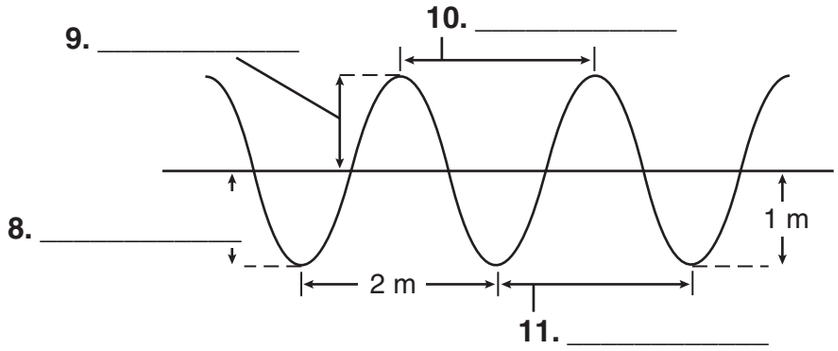
Chapter 8

Directions: *Circle the term that correctly completes each sentence.*

1. The wavelength of a transverse wave is often measured from (crest to crest, crest to trough).
2. Waves with greater amplitudes carry (more, less) energy than waves with smaller amplitudes.
3. The amplitude of a wave can be measured from the (medium, crest) or the (trough, wavelength) to the rest position of the wave's medium.
4. The number of waves that pass a point in one (second, minute) is the wave's (amplitude, frequency).
5. Waves with longer wavelengths have a (lower, higher) frequency and waves with shorter wavelengths have a (lower, higher) frequency.
6. A group of molecules that are squeezed together is called a (rarefaction, compression).
7. Electromagnetic waves travel faster in (gases, solids).

Directions: *Use the words below to label the diagram. You will use each term more than once. Then answer the questions.*

amplitude **wavelength**



12. What is the wavelength of the wave shown in the diagram?

_____

13. What is the amplitude of the wave shown in the diagram?

_____

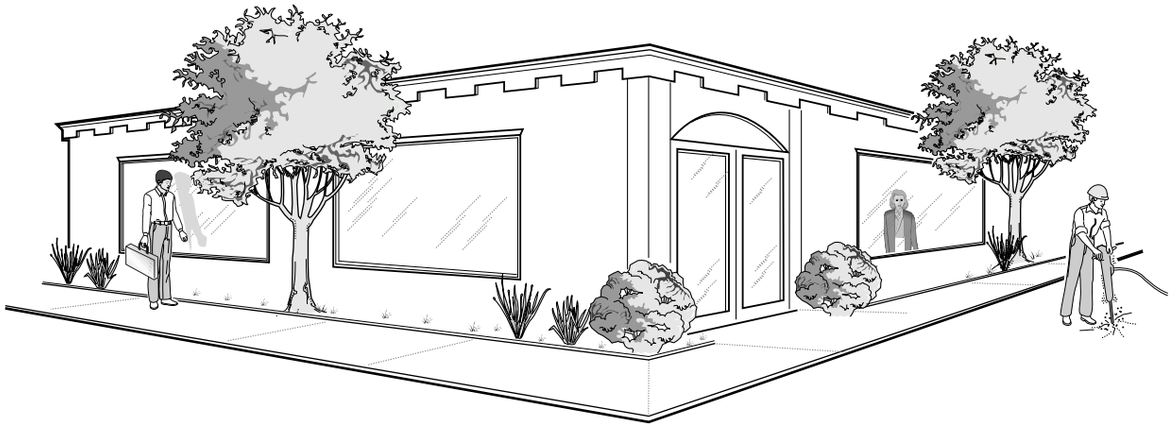
Name Date Class

SECTION 3 Study Guide

Wave Behavior

Chapter 8

Directions: *Study the following picture. Think about light waves and sound waves. Then answer each question.*



1. The woman in the building watches the worker through a window. What happens to the light waves as they pass though the window? _____

_____

2. Why is the worker wearing ear protectors? How do ear protectors work to block harmful sound waves?

_____

_____

_____

3. The man down the street hears the jackhammer around the corner, although he cannot see it. What behavior of waves is responsible for this? _____

4. The man down the street can see an image of himself in the window. What behavior of waves is responsible for this? _____

5. The man down the street can **NOT** see an image of himself in the wall of the building. What behavior of waves is responsible for this? _____

Name Date Class

SECTION 1 Study Guide

Minerals—Earth's Jewels

Chapter 9

Directions: *Use the words from the word bank to fill in the blanks in front of the correct phrases below.*

apatite	**graphite**	**precipitation**	**calcite**
kimberlite magma	**quartz**	**fracture**	**mica**
rocks	**gems**	**minerals**	**smelting**

_____ **1.** a mineral that is used to make glass

_____ **2.** something that must form and be brought to Earth's surface by through a special type of volcanic explosion for miners to be able to get diamonds

_____ **3.** solids made of two or more minerals

_____ **4.** a process to melt and separate unwanted materials from a metal

_____ **5.** minerals that break into jagged or rough pieces have this

_____ **6.** the mineral used in pencil lead

_____ **7.** one of the minerals found in bones

_____ **8.** rare minerals that can be cut and polished

_____ **9.** more than 4,000 of these solid inorganic materials with unique identifying characteristics have been identified

_____ **10.** the way that 25-cm manganese nodules form on the ocean floor

_____ **11.** a mineral that has cleavage lines that cause it to form thin flakes when broken

_____ **12.** a mineral that can form clear crystals that cause double images

Directions: *List four characteristics of gems.*

13. _____

_____

Directions: *List seven identifying properties of minerals.*

14. _____

_____

_____

Name Date Class

SECTION 2 Study Guide

Igneous and Sedimentary Rocks

Chapter 9

Directions: *Complete the following sentences using the correct terms.*

1. When melted rock cools or hardens on or under Earth's surface, it forms _____ rock.
2. Igneous rock that forms on Earth's surface is called _____.
3. Igneous rock that forms beneath Earth's surface is called _____.
4. Rocks that are formed of pieces of other rocks, plant and animal matter, or dissolved minerals are called _____ rocks.
5. Magma that flows onto Earth's surface is called _____.
6. Chalk and coal are examples of a kind of sedimentary rock called _____ rock.
7. Melted rock can ooze out from below Earth's surface through a crack in the crust called a(n) _____.
8. Rocks called _____ are made up of pebbles cemented together with other sediments.

Directions: *Classify the terms you used above so that the terms in each group are related.*

9. **Group 1**

_____

_____

_____

_____

_____

10. **Group 2**

_____

_____

_____

_____

_____

Name Date Class

SECTION 3 Study Guide

Metamorphic Rocks and the Rock Cycle

Chapter 9

Directions: *Match the term in the first column with its description in the second column by writing the correct letter in the space provided.*

_____	**1.** marble	**a.** nonfoliated metamorphic rock
_____	**2.** metamorphic	**b.** consisting of layers of different minerals
_____	**3.** foliated	**c.** a model of the way rocks change form
_____	**4.** nonfoliated	**d.** pieces of rock deposited by wind, ice, gravity, or water
_____	**5.** rock cycle	**e.** metamorphic rock having a uniform consistency
_____	**6.** sediment	**f.** having a changed or different form
_____	**7.** gneiss	**g.** foliated metamorphic rock

Directions: *Answer the following questions on the lines provided.*

8. What is the rock cycle?

9. What is the difference between foliated and nonfoliated metamorphic rocks?

10. How are metamorphic rocks formed?

11. What are three examples of foliated metamorphic rocks?

12. What are three examples of nonfoliated metamorphic rocks?

Name Date Class

Earth's Moving Plates

Chapter 10

Directions: *Match the terms from the word bank with the phrases below.*

Arabian plate	**erupting lava**	**mountain ranges**	**South American plate**
asthenosphere	**inner core**	**outer core**	**subduction**
colliding plates	**lithosphere**	**seismic waves**	**transform boundary**
convection	**mantle**	**separating plates**	**volcanoes**
crust			

_____ **1.** the part of Earth that makes up two thirds of its mass and flows slowly like putty

_____ **2.** a layer of Earth that is like plastic. It rests under the lithosphere and the plates move on it.

_____ **3.** the kind of plates that cause mountains to form

_____ **4.** these are formed when oceanic plates slide under continental plates

_____ **5.** what occurs when two plates of different densities are colliding

_____ **6.** the area where two plates slide past each other

_____ **7.** the plate that the Nazca plate is moving toward

_____ **8.** plates may move because of this type of movement in the mantle

_____ **9.** the highest-pressure, hottest part of Earth that is mostly solid iron

_____ **10.** these can form when plates of similar density are colliding

_____ **11.** the part of Earth that is made of the crust and upper mantle and rests on the asthenosphere.

_____ **12.** islands can be formed near ocean trenches by this

_____ **13.** the kind of plates that cause rift zones or high ridges to form under the sea

_____ **14.** the part of Earth that contains the mountains and the valleys. It is the least dense and thinnest layer and is thicker on the continents than under the oceans.

_____ **15.** the part of the Earth that stops or slows down seismic waves because it is made of liquid metal

_____ **16.** a plate that the African plate is moving toward

_____ **17.** energy disturbances that travel through rock, and can speed up, slow down, and be bent or stopped

Name Date Class

SECTION 2 Study Guide

Uplift of Earth's Crust

Chapter 10

Directions: *Complete the table by describing the type of mountain and giving an example of that type of mountain.*

Type of mountain	Description	Example
1. Fault–block		
2. Folded		
3. Upwarped		
4. Volcanic		

Directions: *Complete the following sentences using the correct terms.*

5. The principle of isostasy states that Earth's crust and _____ float on the upper part of the mantle.

6. Mountains grow _____ and sink farther down into the mantle.

7. Icebergs are largest when they break off of a _____.

8. The Hawaiian Islands are volcanic mountains that formed from lava eruptions on the _____.

Name Date Class

SECTION 1 Study Guide

Weathering and Soil Formation

Chapter 11

Directions: *Explain how each of the following factors cause weathering of rock.*

	Factor	Mechanical or Chemical	Explanation of Process
1.	ice		
2.	running water		
3.	plants	mechanical	
4.	plants	chemical	
5.	natural rock acids		
6.	animals		
7.	lichens		

Directions: *Unscramble the words to fill in the summary statements about soil formation.*

Sandy soil forms when **(8)**_____ (dastnesno) is weathered. Soil with clay in it forms from **(9)**_____ (milenotes). **(10)**_____ (shumu), or organic matter, is added to soil when plants and animals die. Thick soils are more likely to form in **(11)**_____ (tlaf) areas and in **(12)**_____ (mraw) climates where many plants grow. **(13)**_____ (streeds) do not have enough plants to form humus. **(14)**_____ (dloc) and dry climates may be slow to form soil because of the slow growth of plant life and the slow rate of **(15)**_____ (greatwheni).

Name Date Class

SECTION 2 Study Guide

Erosion of Earth's Surface

Chapter 11

Directions: *Answer the following questions on the lines provided.*

1. What is the difference between weathering and erosion?

2. Name four agents of erosion.

Directions: *Identify each statement as true or false. If the statement is true, write* **T** *in the blank at the left. If the statement is false, change the underlined term to make the statement true.*

3. Mass movement is caused by ice.

4. Creep is a flow of rock or sediment along a curved surface, often down an eroded cliff.

5. Continental glaciers are located near the north and south poles.

6. The most important agent of erosion is wind.

7. If you see long striations on the surface of a rock, you would suspect mass movement.

8. Water that flows over Earth's surface is called sheet flow.

Directions: *Circle the term in parentheses that correctly completes the sentence.*

9. Creep is caused by (glacial erosion, wind, gravity).

10. Sediment left behind when a glacier melts is called (till, loess, silt).

11. (Slump, Mudflow, Creep) is a mass of wet sediment that flows downhill as a result of heavy rain, melting snow and ice, or a volcano.

12. The wearing down of rocks by blowing sand is called (deflation, grinding, abrasion).

13. Where the Mississippi River enters the Gulf of Mexico, there is a large accumulation of sediment called a (cirque, gully, delta).

14. When wind lifts and carries off small particles of weathered rock, it is called (deflation, deposition, abrasion).

Name Date Class

SECTION 1 Study Guide

The Atmosphere

Chapter 12

Directions: *Use **Figure 6** and the chart below to make notes on the water cycle.*

1. Clouds	2. Precipitation
4. Evaporation	3. Runoff

Directions: *Fill in the chart with the names of the gases found in the atmosphere.*

5. 78%	6. 21%	7. 0–4%	8. 0.93%	9. 0.03%

Directions: *Name seven trace gases in the atmosphere.*

10. _____ _____

_____ _____

_____ _____

_____

Directions: *Name four aerosols in the atmosphere and explain how each gets into the air.*

11. _____

12. _____

13. _____

14. _____

Name Date Class

SECTION 2 Study Guide

Earth's Weather

Chapter 12

Directions: *Write the correct term in the spaces beside each definition. Unscramble the boxed letters to find the answer to question 11.*

1. current conditions of the atmosphere ___ ___ ___ □ ___ ___ ___
2. air has weight due to _____ ___ □ ___ ___ ___ ___ ___
3. the circular movement of warm air rising and cool air sinking ___ ___ ___ ___ ___ ___ □ ___ ___ ___
4. varying _____ causes wind ___ ___ ___ □ ___ ___ ___ ___ ___ ___ ___
5. measure of water vapor in the air compared to the amount that could be held at a specific temperature ___ ___ ___ □ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
6. low clouds form at less than 2,000 _____ □ ___ ___ ___ ___ ___
7. _____ form when air rises, cools to a dew point, and condenses into small particles ___ ___ ___ □ ___ ___
8. air deflection caused by Earth's rotation ___ ___ □ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
9. giant rivers of air that develop at high altitudes ___ □ ___ ___ ___ ___ □ ___ ___ ___
10. rain, sleet, snow, or hail ___ ___ □ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
11. a measure of how fast air molecules are moving ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Directions: *Circle the term in parentheses that makes each statement correct.*

12. When the Sun's rays strike Earth's surface, energy is (reflected/absorbed).
13. The process of warm rising and cool air sinking is called (pressure/convection).

Name Date Class

SECTION 3 Study Guide

Air Masses and Fronts

Chapter 12

Directions: *Select the term from Column II that matches the weather conditions described in Column I.*

Column I	Column II
_____ **1.** a warm air mass advancing under a cold air mass	**a.** cold front
_____ **2.** a cold air mass advancing under a warm air mass	**b.** warm front
_____ **3.** sinking air, dry weather, few clouds	**c.** stationary front
_____ **4.** sound produced due to rapid expansion and contraction of heated air	**d.** air mass
_____ **5.** a storm that can last weeks and has winds of at least 120 km/h	**e.** high pressure
_____ **6.** a large body of air that develops over a particular region	**f.** low pressure
_____ **7.** a fast-moving cold front overtakes a slower warmer front	**g.** thunderstorms
_____ **8.** air uplifts rapidly, causing electrical charges to form	**h.** tornadoes
_____ **9.** rising air that cools, forming clouds and precipitation	**i.** hurricane
_____ **10.** funnel clouds that last about 15 minutes	**j.** occluded front
_____ **11.** lightning and thunder	**k.** thunder
_____ **12.** a warm air mass and cold air mass meet but neither advances	**l.** lightning

Directions: *Answer the following questions on the lines provided.*

13. What instruments are used for monitoring weather?

14. In what types of weather should you be cautious?

15. How does the National Weather Service alert the public to dangerous weather?

Name Date Class

SECTION 1 Study Guide

Ocean Water

Chapter 13

Directions: *List three resources from the ocean and explain their uses.*

1. _____

2. _____

3. _____

Directions: *Use **Figure 3** to list the six most common dissolved solids in the ocean from greatest to least and write their percent.*

Greatest **Least**

4. 5. 6. 7. 8. 9.

Directions: *List three dissolved gases in the ocean and make notes about the interactions of these gases with the atmosphere and/or ocean organisms. Give at least two points for each gas.*

	Name of Gas	Notes on Gas Interaction
10.		
11.		
12.		

Directions: *Explain why water is cooler near Earth's poles.*

13. _____

Directions: *Explain why water temperature drops in the thermocline layer.*

14. _____

Directions: *Explain why pressure increases with depth.*

15. _____

Name Date Class

SECTION 2 Study Guide

Ocean Currents and Climate

Chapter 13

Directions: *Identify each statement as true or false. If the statement is true, write* **true** *on the line. If the statement is false, rewrite it to make it correct.*

1. Surface currents are caused by the wind.

_____

2. The Gulf Stream cools the climate of the states on the east coast of the United States.

_____

3. The California Current warms the climate of the west coast of the United States.

_____

4. Because of the rotation of Earth, surface currents in the northern hemisphere bend to the right.

_____

5. Sailors depended on surface currents to transport them.

_____

6. Surface currents usually move in a few thousand meters of ocean.

_____

7. If the Iceland density current stopped flowing, the east coast of the United States might be warmer.

_____

8. The density of warm water is less than that of cold water.

_____

9. Where cool dense water sinks, it becomes more dense.

_____

10. Density currents flow faster than surface currents.

_____

Directions: *Complete the following sentences using the correct terms.*

11. The curving of winds and currents caused by Earth's rotation is called the _____.

12. Evaporation of water at the ocean's surface makes the water _____ dense.

13. Currents deep in the ocean are caused by differences in water _____.

Directions: *Answer the following question on the lines provided.*

14. Describe the two steps of upwelling.

_____

_____

Name Date Class

SECTION 3 Study Guide

Waves

Chapter 13

Directions: *Complete the following sentences using the correct terms.*

1. The particles in a water wave move _____.
2. When a wave approaches the shore, its _____ moves ahead of its _____.
3. Surface waves are caused by _____.
4. When Earth, the Moon, and the Sun line up together, they create _____ tides with high tidal ranges.
5. When cliffs are pounded by wind and water, _____ takes place.

Directions: *Select the term from the following list that matches each description.*

_____ **6.** the highest part of a wave

_____ **7.** a large ocean wave caused by the gravitational pull of the Moon

_____ **8.** a collapsed wave on the beach

_____ **9.** the distance between two wave crests

_____ **10.** the distance between high and low tides

_____ **11.** the lowest point of a wave

_____ **12.** water that runs parallel to the shore

a. breaker

b. crest

c. longshore current

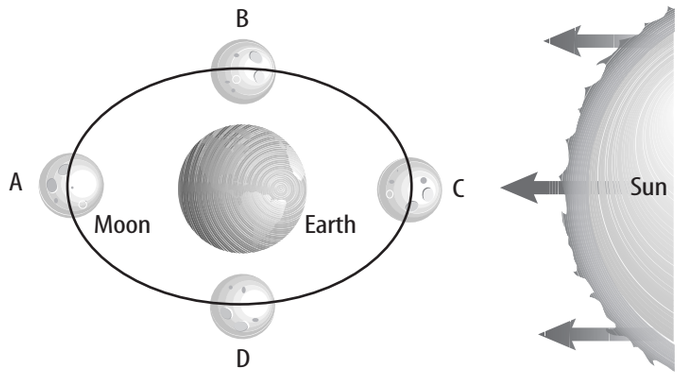
d. tidal range

e. tide

f. trough

g. wavelength

Directions: *Use the diagram to answer questions 13 and 14.*



13. In which position(s) of the Moon will the high tide be the highest? Why?

_____

14. In which position(s) of the Moon will the low tide be the highest? Why?

_____

Name Date Class

SECTION 4 Study Guide

Life in the Oceans

Chapter 13

Directions: *Answer the following questions on the lines provided.*

1. List three factors that could be considered part of an ecosystem.

2. Organisms in the ocean are divided loosely into three large groups. What are they?

3. Producers are usually the most plentiful organisms in an ecosystem. Describe how producers that live above the thermocline make food.

4. What is chemosynthesis?

5. What would happen if there were no decomposers?

6. Describe one path a nitrogen molecule might follow through the ocean ecosystem.

7. What is transferred from producers to consumers and decomposers through food chains?

8. Why isn't all the energy from one level of a food chain passed on to the next level?

9. Which kind of ocean life do humans most often use for food? Give three examples.

Name Date Class

SECTION 1 Study Guide

Radiation from Space

Chapter 14

Directions: *Write the correct term on the line in front of its definition.*

active and adaptive	**observatory**	**refracting telescope**
electromagnetic radiation	**optics**	**speed of light**
electromagnetic waves	**radio telescope**	
Hubble space telescope	**reflecting telescope**	

_____ **1.** an instrument with small mirrors pieced together to create a larger, clearer image

_____ **2.** carry energy through empty space and through matter

_____ **3.** 300,000 km/s

_____ **4.** a device placed outside Earth's atmosphere to minimize absorption and distortion of energy from space

_____ **5.** energy that is transmitted from one place to another by electromagnetic waves

_____ **6.** an instrument with a concave mirror that focuses an image on a second mirror for viewing through the eyepiece

_____ **7.** telescopes with computer enhanced and corrected images

_____ **8.** detects radio waves as they travel freely through Earth's atmosphere

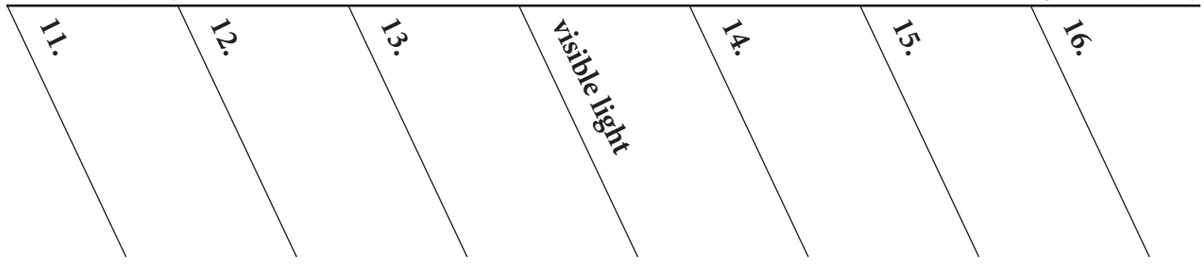
_____ **9.** an instrument for distance viewing through a convex lens that focuses the image to be viewed through an eyepiece

_____ **10.** a building with an open roof used to house a telescope

Directions: *Arrange the seven types of electromagnetic radiation from longest to shortest wavelength on the spectrum. (Hint: Refer to* ***Figure 1*** *in the text for additional help.)*

Longest wavelength
Lowest frequency

Shortest wavelength
Highest frequency



Name Date Class

SECTION 2 Study Guide

Early Space Missions

Chapter 14

Directions: *Circle the term in the puzzle that fits each clue. Then write the term on the line. The terms read across or down.*

S A T E L L I T E A R T H A
P R O J E C T G E M I N I T
A R M A R M S T R O N G I M
C T N E G E S A J L S G A O
E O T E L R D I U N T A E S
P R O J E C T A P O L L O P
R B S A N U Y S I J P I M H
O I A C N R O C K E T L A E
B T B V O Y A G E R D E R R
E S P U T N I K R R M O S E

1. The Moon is a natural _____ of Earth.
2. The first human to set foot on the Moon was Neil _____.
3. The path of one object circling another is an _____.
4. _____ was the program that first sent people to the Moon.
5. The _____ probes flew past Jupiter and other planets before heading outward toward deep space.
6. The first citizen of the United States to orbit Earth was John _____.
7. In _____, a team of American astronauts first met and connected with a spacecraft in orbit.
8. A _____ travels far into the solar system, collecting information and returning it to Earth.
9. *Galileo* dropped a smaller probe into Jupiter's _____.
10. Cooperative missions between countries are being planned to send spacecraft to _____ and elsewhere.
11. Launched in 1989, _____ provided information about Jupiter.
12. Space exploration began when the Soviets launched _____, the first artificial satellite.
13. The simplest _____ engine is made of a burning chamber and a nozzle.
14. Weather satellites provide information about the global weather systems on_____.
15. Project _____ began the United States' effort to reach the Moon.

Name Date Class

SECTION 3 Study Guide

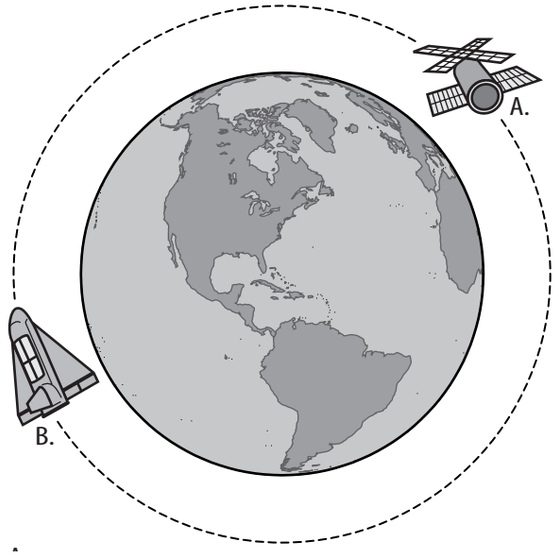
Current and Future Space Missions

Chapter 14

Directions: *Identify Figure A and Figure B as a* **space station** *or a* **space shuttle**. *Before each statement at the bottom of the page, write the name of the spacecraft that the item describes. If an item describes both types of spacecraft, write* **both**.

A. _____

B. _____



_____ **1.** This spacecraft orbits Earth.

_____ **2.** Astronauts were able to conduct experiments when working in this.

_____ **3.** This glides back to Earth and lands like an airplane.

_____ **4.** The Americans launched *Skylab* in 1973.

_____ **5.** This reusable spacecraft transports astronauts and other materials.

_____ **6.** A former Soviet cosmonaut spent a record 438 days aboard one of these.

_____ **7.** The *Hubble Space Telescope* was launched in 1990 by one of these.

_____ **8.** This spacecraft provides living quarters and working space for people living and working in space.

_____ **9.** Several countries may cooperatively build one of these in the future.

_____ **10.** Its astronauts move mechanical arms to launch and recover satellites.

_____ **11.** The Soviet craft is named *Mir.*

_____ **12.** Its solid-fuel booster rockets are reused.

_____ **13.** American astronauts spent up to 84 days working in this.

Name Date Class

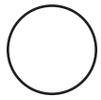
SECTION 1 Study Guide

Earth's Place in Space

Chapter 15

Directions: *Put the eight phases of the moon in order in the chart below, starting with the full moon. Then sketch each phase of the moon in its box.*

first quarter **new moon** **waning crescent** **waxing crescent**
full moon **third quarter** **waning gibbous** **waxing gibbous**

							
1. Full Moon	**2.** _____	**3.** _____	**4.** _____	**5.** _____	**6.** _____	**7.** _____	**8.** _____

Directions: *Use **Figure 8** to help you decide if each phase of the moon given happens at the same time as a neap tide or a spring tide.*

9. new moon happens at the same time as a _____ tide

10. first quarter happens at the same time as a _____ tide

11. full moon happens at the same time as a _____ tide

12. third quarter happens at the same time as a _____ tide

Directions: *Unscramble the words to fill in the blanks below.*

(13)_____ (antpaper) motion is the movement of the Sun, stars, Moon, and planets across the sky, caused by Earth's **(14)**_____ (rintatoo) on its **(15)**_____ (sixa). **(16)**_____ (aenosss) are caused by Earth's revolution and the **(17)**_____ (litt) of Earth's axis at an angle of **(18)**_____ (532.) degrees. The Earth **(19)**_____ (slervveo) around the Sun once each **(20)**_____ (raye). In June, North America gets more **(21)**_____ (nitseen) sunlight as the Earth tilts toward the Sun. **(22)**_____ (washsod) are longer in the winter months because North America is tilted **(23)**_____ (yaaw) from the Sun and **(24)**_____ (thilg) strikes the Earth at a lower angle. In **(25)**_____ (munuta) and **(26)**_____ (irnpsg) the Earth is neither tilted toward nor away from the **(27)**_____ (uns).

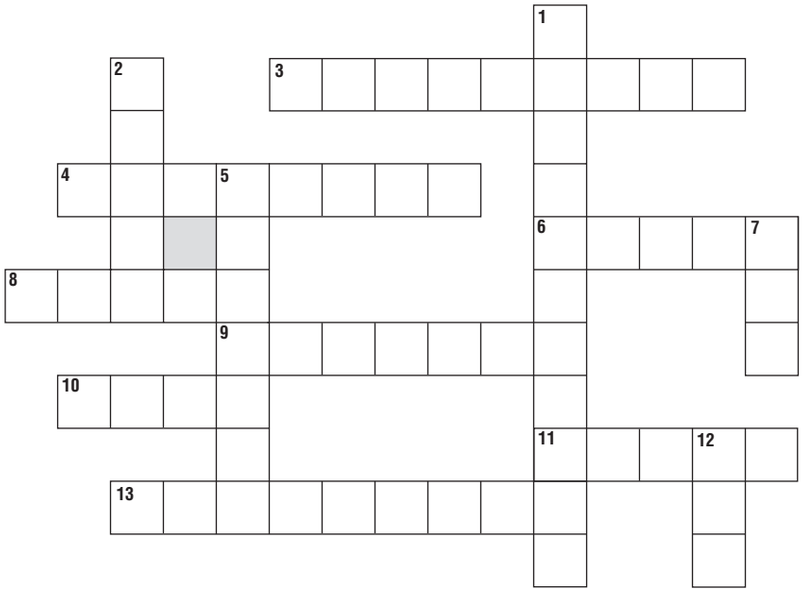
Name Date Class

SECTION 2 Study Guide

The Solar System

Chapter 15

Directions: *Use the clues below to complete the crossword puzzle.*



Across

3. These pieces of rock form a belt that separates the inner planets from the outer planets.

4. Pluto is the _____ planet in size.

6. Saturn is known for its dazzling _____.

8. Jupiter, Saturn, Uranus, Neptune, and Pluto make up the _____ planets.

9. This force holds the objects in the solar system in place.

10. This is the number of planets that are in our solar system.

11. Earth is the _____ planet from the Sun.

13. A piece of rock or metal that plunges through the atmosphere and falls to Earth is called a(n) _____.

Down

1. This is made up of the nine planets and numerous other objects that orbit the Sun.

2. This large body of frozen ice and rock sometimes forms what appears to be a bright, glowing tail when it gets near the Sun.

5. Jupiter is the _____ planet in size.

7. This is what we call the star in the center of our solar system.

12. Mars looks _____ because the rocks on its surface contain iron oxide.

Name Date Class

SECTION 3 Study Guide

Stars and Galaxies

Chapter 15

Directions: *Explain the relationship among the following groups of words. Use complete sentences.*

1. star's color, temperature, cool, medium, hot

2. supergiant, supernova, neutron star, black hole

3. giant, white dwarf, black dwarf

4. elliptical, spiral, irregular, Milky Way

5. astronomical units, light-years

6. huge clouds of gas and dust, gravity, fusion

7. Milky Way, galaxies, universe

Name Date Class

SECTION 1 Study Guide

The World of Cells

Chapter 16

Directions: *Write the correct term from the word bank on the line before each phrase below.*

bacteria	**chloroplast**	**microscope**	**organelle**
cell membrane	**chromosomes**	**mitochondrion**	**photosynthesis**
cell wall	**cytoplasm**	**nucleus**	**vacuole**

_____ **1.** device that Robert Hooke used in 1665 to see cork cells

_____ **2.** the part of the cell where food, water, minerals, and wastes may be stored

_____ **3.** the part of the nucleus that contains DNA

_____ **4.** the "manager" of cell operations

_____ **5.** a gelatinlike substance that fills the cell

_____ **6.** a green organelle that captures energy from sunlight

_____ **7.** the organelle that converts energy and produces carbon dioxide and water

_____ **8.** the smallest living things on Earth, which are made of just one cell

_____ **9.** controls what enters and exits the cell

_____ **10.** using light energy to make food and oxygen

_____ **11.** the part of a plant cell that provides support and protection

_____ **12.** the general name for the specialized parts of the cell

Directions: *List the three main ideas of the cell theory.*

13. _____

_____

_____

Directions: *List two things that plant cells have that animal cells do not, and explain the function of each part.*

14. _____

_____

Directions: *Explain how to find the magnification of the microscope.*

15. _____

_____

Name Date Class

SECTION 2 Study Guide

The Different Jobs of Cells

Chapter 16

Directions: *Match the description in the first column with the item in the second column by writing the correct letter in the space.*

_____	**1.** a group of organs working together	**a.** organ system
_____	**2.** what a cell's shape and size is related to	**b.** tissue
_____	**3.** group of similar cells that all do the same work	**c.** function
_____	**4.** two or more types of tissue working together	**d.** organ

Directions: *Complete the following sentences using the correct terms.*

5. Cells are _____ into systems that work together to keep an organism alive.

6. The tongue, stomach, and intestines make up part of an organ _____.

7. An organism that contains more than one cell is called a(n) _____ organism.

8. Plant cells help move _____, _____, and other materials throughout a plant.

Directions: *Unscramble the terms in italics to complete the sentences below. Write the terms on the lines provided.*

_____ **9.** Cells in a tissue or organ work *tergheto* to keep an organism alive.

_____ **10.** The *yiretporsra* system is one of several organ systems in your body.

_____ **11.** Your bones move from contracting *lecsmu* tissue.

_____ **12.** Groups of similar cells that do the same sort of work are *sesitus.*

_____ **13.** Different tissues working together form a(n) *rango.*

Directions: *Answer the following questions on the lines provided.*

14. Describe the various tissues in the stomach and what they do.

_____

_____

_____

15. How many muscles make up the muscular system, and what do they do?

_____

_____

_____

Name Date Class

SECTION 1 Study Guide

What is an animal?

Chapter 17

Directions: *Use the terms from the list below to fill in the summary of the five characteristics of animals.*

cells	**escape**	**move**	**reproduction**
digested	**eukaryotic**	**nucleus**	**shelter**
energy	**membrane**	**plants**	**wastes**

Most animals can (**1**)_____ to find food, (**2**)_____, and mates, and to (**3**)_____ from predators. Animals have many (**4**)_____ in their bodies, some of which digest food, get rid of (**5**)_____, and help in (**6**)_____. To get (**7**)_____, animals eat (**8**)_____ or other animals. Their food is (**9**)_____ into smaller substances that their cells can use. Animal cells have a (**10**)_____ and organelles. They are surrounded by a (**11**)_____ and are (**12**)_____.

Directions: *Classify each animal according to the headings in the chart.*

	Animal	Symmetry (Radial, Bilateral, or Asymmetrical)	Vertebrate/Invertebrate
13.	Grasshopper		
14.	Lobster		
15.	Human		
16.	Jellyfish		
17.	Sea urchin		
18.	Horse		
19.	Sponge		
20.	Sea anemone		
21.	Butterfly		
22.	Platypus		

Name Date Class

SECTION 2 Study Guide

Sponges, Cnidarians, Flatworms, and Roundworms

Chapter 17

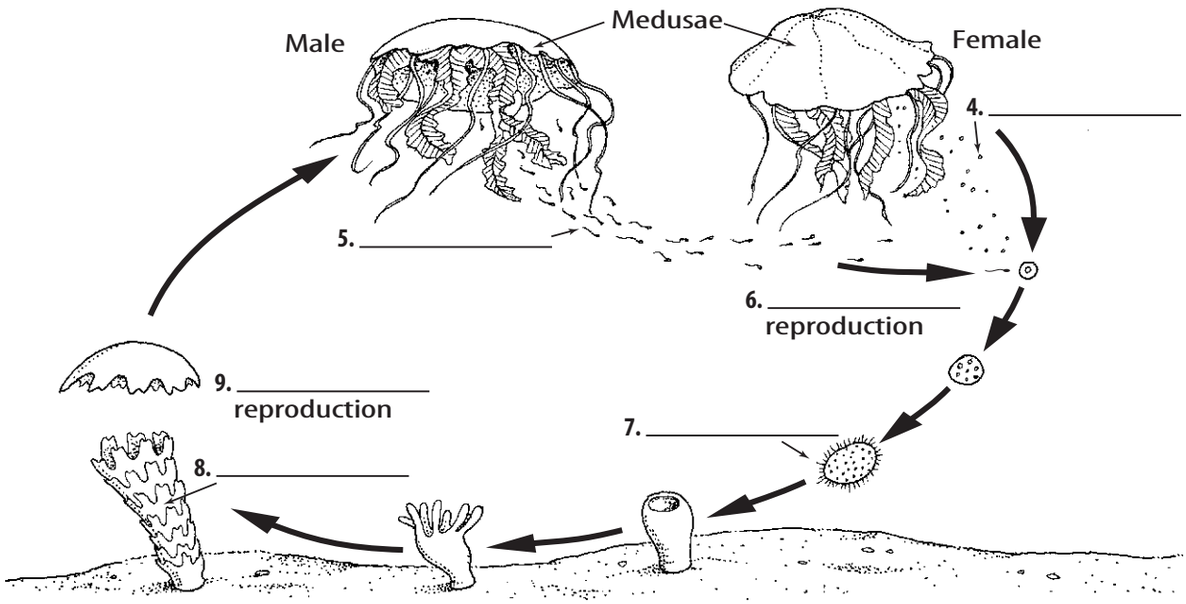
Directions: *Define the underlined term on the lines provided.*

1. Sponges are <u>sessile</u> animals. _____

2. Sponges are <u>filter feeders</u>. _____

3. <u>Spicules</u> support and protect a sponge's body. _____

Directions: *Study the following diagram. Fill in the blanks with the correct terms.*



Directions: *Answer the following questions on the lines provided.*

10. The word *cnidarian* means "stinging cells." Why is this a good name for this group?

_____

_____

11. Explain the difference between a free-living and a parasitic flatworm. _____

_____

12. Describe a roundworm. _____

_____

Name Date Class

SECTION 3 Study Guide

Mollusks and Segmented Worms

Chapter 17

Directions: *Answer the following questions on the lines provided.*

1. Define the following groups of animals and give an example of each.

a. mollusks _____

b. gastropods _____

c. bivalves _____

d. cephalopods _____

2. What is the difference between an open and a closed circulatory system?

a. open circulatory system _____

b. closed circulatory system _____

3. Many mollusks gather food with a radula, but bivalves are filter-feeders. Explain the difference between the two types of feeding.

_____

_____

4. Describe the way in which squids and octopuses move through the water.

_____

_____

5. Why is the segmented structure of segmented worms important?

_____

_____

6. Describe the following structures in earthworms.

a. coelom _____

b. setae _____

7. What is unique about the earthworm's diet and skin?

_____

8. Leeches are parasites. How do they eat?

_____

9. How are marine worms different from earthworms?

_____

_____

Name Date Class

SECTION 4 Study Guide

Arthropods and Echinoderms

Chapter 17

Directions: *Answer the following questions on the lines provided.*

1. Arthropods have appendages instead of setae. What different kinds of appendages do they have?

2. What is the main difference between centipedes and millipedes?

3. What is attached to an insect's thorax?

4. In insects, what does the blood transport? What is not transported by the blood?

5. What are the four stages of complete metamorphosis?

6. If spiders cannot chew, how can they eat?

7. Why is a large heavy exoskeleton less limiting for arthropods that live in water?

8. Describe how a sea star feeds on a clam.

9. What happens if a sea star loses an arm?

10. Why are echinoderms important to the marine environment?

11. What functions do tube feet serve in an echinoderm such as a sea star?

Name Date Class

SECTION 1 Study Guide

Chordate Animals

Chapter 18

Directions: *Fill in the chart with the three characteristics of chordates and the definition of each part.*

	Three Characteristic Parts of Chordates	Definition
1.		
2.		
3.		

Directions: *Match the terms from the word bank with the phrases below.*

bony	**endo**	**gill slits**	**muscles**
cartilaginous	**endotherms**	**jawless**	**swim bladder**
ectotherms	**fish**	**mucus**	**vertebrates**

_____ **4.** structures that attach to the skeleton and make movement possible

_____ **5.** trout and goldfish are this type of fish

_____ **6.** structures in lancelets that developed from pharyngeal pouches

_____ **7.** this substance helps bony fish move through the water

_____ **8.** sharks are this type of fish

_____ **9.** warm-blooded animals such as humans

_____ **10.** a prefix that means "within"

_____ **11.** hagfish and lampreys are this type of fish

_____ **12.** cold-blooded animals such as fish

_____ **13.** the largest group of vertebrates

_____ **14.** an adaptation of bony fish to control their depth in the water

_____ **15.** the largest group of chordates

Directions: *Name three parts common to most fish and describe the structure and function of each part.*

	Name of Part	Description of Structure	Description of Function
16.			
17.			
18.			

Name Date Class

SECTION 2 Study Guide

Amphibians and Reptiles

Chapter 18

Directions: *Answer the following questions using complete sentences.*

1. What is the definition of a reptile?

2. How are reptiles related to amphibians?

3. Compare the skin of amphibians and reptiles.

4. What role does an amphibian's skin play in breathing?

5. Compare and contrast hibernation and estivation.

6. What is metamorphosis?

7. What amphibian activities occur on land? In water?

8. Explain the function of each of these structures in reptile eggs.

a. amniotic egg

b. a leathery shell

c. a yolk

Name Date Class

SECTION 3 Study Guide

Birds

Chapter 18

Directions: *Answer the following questions on the lines provided.*

1. Describe the four characteristics of birds.

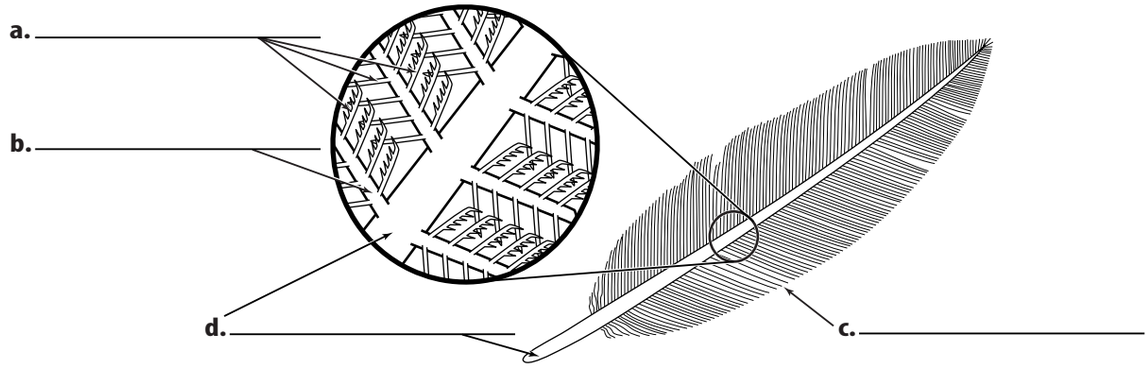
a. _____

b. _____

c. _____

d. _____

2. Label the drawing of a contour feather with the names of its parts.



3. How do the air sacs of birds help make the body lighter?

_____

_____

4. What is the purpose of preening?

_____

_____

5. Compare and contrast contour feathers and down feathers.

_____

_____

_____

Name Date Class

SECTION 4 Study Guide

Mammals

Chapter 18

Directions: *Answer the following questions on the lines provided.*

1. What are some characteristics of mammals?

_____

_____

2. What are some problems facing mammals today?

_____

3. What are the functions of these mammal characteristics?

a. hair or fur _____

b. mammary glands _____

c. complex nervous system _____

d. well-developed lungs _____

4. Define these types of mammals.

a. Carnivores _____

b. Herbivores _____

c. Omnivores _____

Directions: *Fill in the table by describing two characteristics of each group of mammals and giving an example.*

Group	Characteristic A	Characteristic B	Example
5. Monotremes			
6. Marsupials			
7. Placentals			

Name Date Class

SECTION 1 Study Guide

Body Systems

Chapter 19

Directions: *Match the terms from the word bank with the phrases below.*

bones	**involuntary**	**muscles**	**specific**
capillaries	**joints**	**proteins**	**sun**
fat-soluble	**kidneys**	**skin**	**water-soluble**

_____ **1.** the type of immunity where your body makes antibodies

_____ **2.** the smallest blood vessels

_____ **3.** place where two or more bones come together

_____ **4.** salt and other wastes can exit the body through this protective organ

_____ **5.** vitamins, like B and C, that you need to eat every day

_____ **6.** calcium and phosphorus make these cells hard

_____ **7.** organs that remove extra water, salts, and wastes from the blood

_____ **8.** muscle types in most organs

_____ **9.** these move your joints by relaxing and contracting

_____ **10.** vitamin D can be made by exposure to this

_____ **11.** vitamins E, A, K, and D are this type of vitamin

_____ **12.** vital nutrients for cell growth and repair

Directions: *Write the body system that corresponds with each function below.*

	Function	System
13.	absorption of nutrient molecules	
14.	movement of nutrients and gases to cells	
15.	movement of bones	
16.	a fluid system that requires skeletal and vessel muscle contractions for circulation	
17.	removes wastes from the blood that are produced by cells	
18.	shape, support, protection	
19.	senses and reflexes	
20.	entry and exit for most gases used and made by the body	
21.	body regulation and hormones	

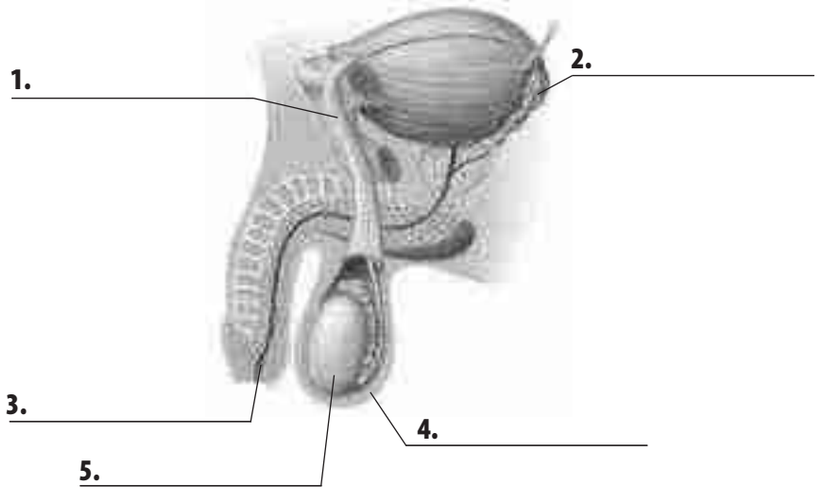
Name Date Class

SECTION 2 Study Guide

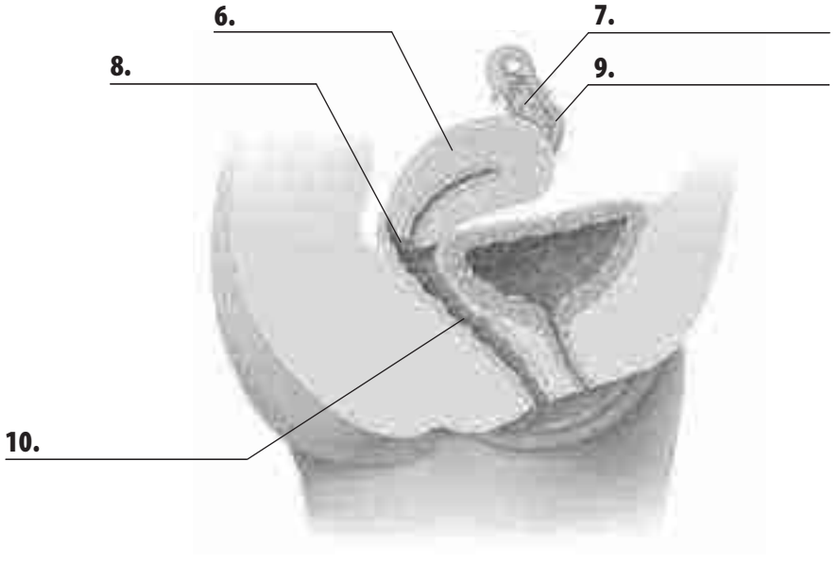
Human Reproduction

Chapter 19

Directions: *Label the diagrams of the male and female reproductive systems below. Write the function of each part in the space provided.*



Male Reproductive System



Female Reproductive System

Name Date Class

SECTION 1 Study Guide

Continuing Life

Chapter 20

Directions: *Write the correct term from the word bank next to its definition.*

asexual reproduction	**DNA**	**mitosis**
cigarette smoking	**fertilization**	**sexual reproduction**
cloning	**meiosis**	**tadpole**

_____ **1.** division of the nucleus into two identical nuclei

_____ **2.** a new organism is produced from the DNA of two cells

_____ **3.** life stage will grow into an adult frog

_____ **4.** hereditary material that controls how offspring will look and function

_____ **5.** reproduction by one organism

_____ **6.** growing a plant from a cutting of a leaf to make an identical plant

_____ **7.** nucleus divides twice to form four sex cells

_____ **8.** a factor that may deform and decrease the number of sperm made by a male

_____ **9.** the joining of an egg and sperm to form a new organism

Directions: *Number the following steps of cell division in the order they happen. The first step in the sequence has been numbered for you.*

10. _____ duplicated chromosomes become visible through a microscope

_____ the cell divides into two new cells

_____ each duplicated chromosome pair separates

1 chromosomes in the nucleus are duplicated

_____ duplicated chromosome pairs line up along the middle of the cell

_____ individual chromosomes are pulled to opposite ends of the cell

Directions: *List two similarities and three differences between meiosis and mitosis in human cells. Use the information in Table 1 to help you.*

Similarities	Differences

Name Date Class

SECTION 2 Study Guide

Genetics—The Study of Inheritance

Chapter 20

Directions: *Answer the following questions on the lines provided.*

1. What is the passing of traits from parents to offspring?

2. Why is it likely that you look like your parents?

3. What is each gene of a gene pair called?

4. What are the differences between pure and hybrid genes?

5. Why are two recessive alleles needed for a recessive trait to be shown?

6. Give an example of a trait that is determined by multiple alleles.

7. To produce a beneficial version of a trait in an animal, what type of process is used?

8. What is the name of the science that studies which traits are passed from parents to offspring?

9. In human reproduction, at which point are traits passed from parent to offspring?

10. What functions of cells can be affected by a mutation?

Name Date Class

SECTION 1 Study Guide

What is an ecosystem?

Chapter 21

Directions: *Write a term from the word bank on each blank in front of the correct definition.*

abiotic factors	**burrowing**	**large leaves**	**soil**
biosphere	**ecology**	**organism**	**tree**
biotic factors	**ecosystem**	**short stature**	**water**

_____ **1.** nonliving parts of the ecosystem such as soil, sunlight, and water

_____ **2.** a way that desert creatures might get out of the heat

_____ **3.** an animal or plant

_____ **4.** an adaptation that gathers more light

_____ **5.** an abiotic factor that limits the number of organisms that can live in an ecosystem

_____ **6.** organisms interacting with each other and abiotic factors in an area

_____ **7.** a factor that determines what kind of plants can live in an ecosystem

_____ **8.** an adaptation that allows organisms to live where there are strong winds

_____ **9.** living parts of the ecosystem

_____ **10.** an organism that might provide food and shelter for birds

_____ **11.** the part of Earth that contains life

_____ **12.** the study of interactions in ecosystems

Directions: *List three examples of organisms interacting with other organisms in an ecosystem.*

13. _____

_____

_____

Directions: *List four abiotic factors and explain how they affect organisms' lives.*

14. _____

_____

_____

_____

Name Date Class

SECTION 2 Study Guide

Relationships Among Living Things

Chapter 21

Directions: *Determine whether the italicized term makes each statement true or false. If the statement is true, write true in the line provided. If the statement is false, write the term that makes the statement true.*

_____ **1.** Ecologists find it helpful to organize living things by how they interact with each other and their *environments*.

_____ **2.** A *biosphere* is a group of the same type of organisms living in the same place at the same time.

_____ **3.** Algae, sharks, and coral are all examples of *communities*.

_____ **4.** There are *100 trees* growing on a lot that is 10 square km in size. The population density is 100 trees per square km.

_____ **5.** The amount of rainfall an ecosystem receives is a *limiting factor*.

_____ **6.** A *predator* captures and eats other animals.

_____ **7.** The role of an organism in an ecosystem is called the organism's *habitat*.

Directions: *Answer the following questions on the lines provided. Use complete sentences.*

8. What is the relationship between a population and a community?

9. How do members of a community interact with each other?

10. What are two examples of limiting factors.

11. How might a falcon (predator) and a field mouse (prey) interact in a community?

12. In what type of habitat might you find birch trees, mushrooms, and deer?

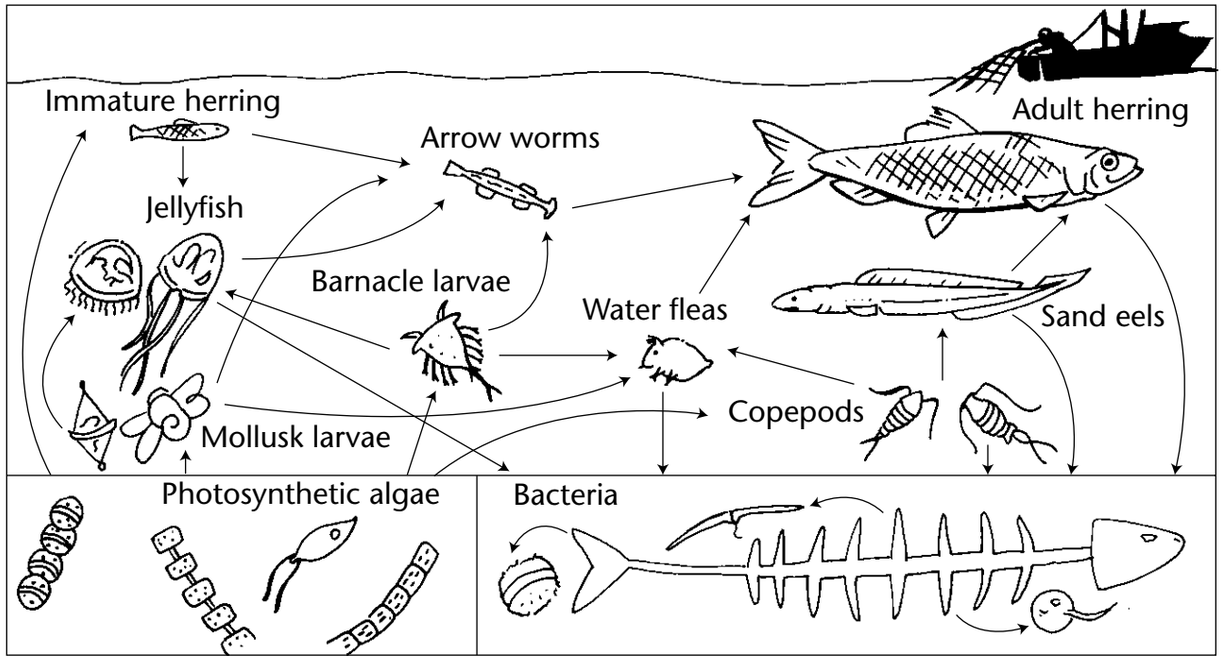
Name Date Class

SECTION 3 Study Guide

Energy Through the Ecosystem

Chapter 21

Directions: *Use the following diagram of the food web to answer the questions below.*



1. Which are the producers in this food web? Which are the decomposers?

2. List three consumers of barnacle larvae in this food web.

3. Provide the missing consumer in the food chain: algae → mollusk larvae → jellyfish →___?___→ adult herring

4. What "energy relationship" exists between the immature herring, arrow worms, and adult herring?

5. How might the energy of this ecosystem get passed on to an organism on land?

Name Date Class

SECTION 1 Study Guide

Natural Resource Use

Chapter 22

Directions: *Complete the right and left columns with the words from the word bank, and the middle column with renewable or not renewable.*

coal	**electricity**	**metal**
cotton	**gold**	**mud**
crude oil	**lumber**	**paper**

	Natural Resource	Renewable or Not?	Product Made from the Resource
1.	Rain forest trees		
2.	Other trees		
3.	Minerals		
4.			clothing
5.			jewelry
6.			plastic
7.		not renewable	electricity
8.			clay bricks
9.	Wind		
10.	Water		electricity

Directions: *List at least four steps in the production of screws for a CD player. Use* ***Figure 4*** *to help you.*

11. _____

_____

_____

_____

Directions: *Explain why some renewable resources should be conserved.*

12. _____

_____

_____

Name Date Class

SECTION 2 Study Guide

People and the Environment

Chapter 22

Directions: *Fill in the causes and effects in the following table. Some have been filled in for you.*

Human Actions	How does the action cause pollution?	What effect does the pollution have on the environment?
Using landfills		If the chemicals get into our food or water, they can interfere with life processes such as growth and development.
Running vehicles and factories	Vehicles release pollutants into the air when they burn gasoline or diesel fuel. Factories release pollutants when they burn coal or oil.	

Directions: *Use the information in the table above to answer the following questions.*

1. Which two types of pollution are caused by vehicles and factories?

_____

2. Which actions cause water pollution?

_____

3. Which actions cause land pollution?

_____

Directions: *Name two other human actions not included in the table that affect the environment. Describe the impact of each action.*

4. _____

_____

_____

Name Date Class

SECTION 3 Study Guide

Protecting the Environment

Chapter 22

Directions: *Circle the process in parentheses that is described in each situation.*

1. The checkout clerk at the bookstore asked Jorge if he wanted a bag for the book he had just bought. "No thanks," said Jorge. "I brought my own bag."

(reduce waste reuse things recycle things)

2. Claire outgrew her favorite sweater, so she gave it to her little sister.

(reduce waste reuse things recycle things)

Directions: *Read each of the following paragraphs. Then answer the question following each paragraph on the lines provided.*

Claudia and Jeff cleaned out the garage. They found lots of things that they did not want to keep. For example, they found three boxes of old clothes, a stack of newspapers, last year's telephone books, a bag full of old jars, and some old toys and games. How can Claudia and Jeff practice the three Rs to get rid of the items they found?

3. _____

_____

_____

Nick and his friends are going on a picnic. Their sandwiches are individually wrapped in aluminum foil. They brought macaroni salad in a disposable container, paper napkins, plastic forks, cans of soft drinks, and paper cups. How can Nick and his friends use the three Rs to reduce the amount of waste they produce on their next picnic?

4. _____

_____

_____

_____

Directions: *Answer the question on the line provided.*

5. What are three examples of solid waste?

_____