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# CK-12 Earth Science For Middle School Quizzes and Tests



# CK-12 Earth Science For Middle School Quizzes and Tests (With Answers)

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Dana Desonie, Ph.D.  
Dana Desonie

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CHAPTER

**1**

# MS What is Earth Science? Assessments

## Chapter Outline

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- 1.1 THE NATURE OF SCIENCE
  - 1.2 EARTH SCIENCE AND ITS BRANCHES
  - 1.3 WHAT IS EARTH SCIENCE?
-



# 1.1 The Nature of Science

## Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

1. Why do scientists call the “Big Bang” a theory?
  - a. It is probably unlikely and therefore not a fact.
  - b. A very well respected scientist proved it to be true.
  - c. Many scientists have agreed upon this explanation after repeated experiments and models have shown it to be accurate.
  - d. All possible answers to a scientific idea are called theories.
2. Which of the following is not a scientific model?
  - a. A cross section of an apple that mimics the layers of the Earth.
  - b. A chart with nutritional information about food we eat.
  - c. A computer simulation that can show what will happen to algae in a pond over 10 years given conditions such as rain, sunlight, animal populations and temperature.
  - d. An explanation for the extinction of the dinosaurs that takes into account volcanic activity, climate, space activity and rock samples.
3. Which of the following are good measures to follow when working in the field?
  - a. Bring sun protection and sufficient water.
  - b. Do not travel without someone who knows the area.
  - c. Bring first aid supplies.
  - d. More than one answer is correct.
4. A scientist is conducting an experiment to determine which of three building structure types will best withstand the force of an earthquake. Which of the following is most likely to be the “dependent variable”?
  - a. The amount of damage each building receives.
  - b. The magnitude of the earthquake.
  - c. The structure of the building.
  - d. The type of soil each building is sitting on
5. Conclusions in an experiment
  - a. Improve with greater and more accurate data..
  - b. Often lead a researcher to new scientific questions
  - c. Can agree or disagree with the hypothesis.
  - d. All of the above.

### True or False

*Write true if the statement is true or false if the statement is false.*

\_\_\_\_\_ 6. The scientific method is used to answer any question that one can think of.

- \_\_\_\_\_ 7. Scientific models are an organized step-by-step process to answer a question in science.
- \_\_\_\_\_ 8. The dependent variable in an experiment is directly influenced by the independent variable.
- \_\_\_\_\_ 9. Even if there is information we don't know, a model can be used to explain an event.
- \_\_\_\_\_ 10. A theory will still remain even if conflicting data is discovered.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. A chart or a graph can be used to show the \_\_\_\_\_ of an experiment.
12. After creating a hypothesis, the next step in the process is the \_\_\_\_\_.
13. A \_\_\_\_\_ model shows a representation of something using objects.
14. An important part of the scientific process wherein scientists examine each other's research to see if there are mistakes is called \_\_\_\_\_.
15. It is very important to have only one \_\_\_\_\_ in an experiment, and also to have many \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. Describe the 3 types of scientific models explained and give an example of each.

17. Write up a mock experiment for testing a question science can answer. Include the terms control, independent variable and dependent variable correctly in your explanation.

---

**Answer Key**

1. c 2. b 3. d 4. a 5. d

6. false 7. false 8. true 9. true 10. false

11. data 12. experiment 13. physical 14. peer review 15. independent variable; controls

16. A physical model is a representation of something using an object. An example is the globe. An idea as a model is an idea that explains the known facts of something. An example is the model of how the Earth got its Moon. A model that uses numbers is one that uses formulas or equations to describe something. An example is a climate model.

17. Student will write an experiment. Controls (what needs to stay the same in the experiment) should be listed. They should be one changeable independent variable and the result will be the dependent variable.

## 1.2 Earth Science and its Branches

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which of the following is not an area of geology
  - Cartography
  - Paleontology
  - Volcanology
  - Seismology
- Which is true about Oceanography
  - It is the most established of the Earth Sciences
  - It began as a study of tides
  - Most of the ocean has already been explored
  - None of the above.
- Geology is the study of
  - The solid matter of Earth
  - Space rocks like meteors or comets
  - Climate
  - Environmental Factors
- An oceanographer might study all of the following except for
  - Chemistry of seawater
  - Underwater ocean features such as volcanoes or vents
  - Rainfall patterns during a hurricane
  - Water movement
- Which of the following statements is true about Climatology and Meteorology
  - Climatologists might work on tomorrow's weather forecast for the local news.
  - Meteorologists might create a computer model to predict global warming patterns
  - Both areas focus on the Earth's atmosphere and its patterns
  - Climatologists are interested in tornadoes

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Geologists only study rocks on Earth.
- \_\_\_\_\_ 7. Over 70% of Earth is covered with water.
- \_\_\_\_\_ 8. Two things that a geologist might use to do her work are radars and satellites.

\_\_\_\_\_ 9. Environmental Scientists work closely with Earth Scientists to help preserve Earth.

\_\_\_\_\_ 10. Astronomers have few scientific questions left unanswered.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Geology is the study of the \_\_\_\_\_ Earth.

12. A scientist who studies molten lava is called a \_\_\_\_\_.

13. \_\_\_\_\_ use both optical and radio telescopes to view faraway objects.

14. Meteorologists use tools to forecast the \_\_\_\_\_.

15. The “last frontier” on planet Earth according to many is the \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What are five important functions of Earth Scientists?

17. A scientist discovers new marine life on the bottom of the ocean near a volcanic vent. What different types of Earth Scientists specialists might be brought in to help research this area? Explain what each might do.

---

## Answer Key

1. a 2. d 3. a 4. c 5. c

6. false 7. true 8. false 9. true 10. false

11. solid 12. volcanologist 13. Astronomers 14. weather 15. oceans

16. Earth Scientists have many functions in the scientific world. Examples of these functions are looking at Earth’s history and fossils and studying how earthquakes and volcanoes work to better be able to protect humans and

property. Earth Scientists study water flow and water supply, global warming, and weather patterns. Earth scientists study other planets to see which may be inhabitable and also learn about the Sun to better predict its effects on the Earth.

17. A number of geologists might come to study the ocean floor and then to study the volcano and vents. A chemical oceanographer might study the water chemicals to see how life is able to survive. Marine geologist would study the rocks at the ocean bottom. Environmental scientists would look at the ecosystem in the underwater vents.

## 1.3 What is Earth Science?

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which step of the scientific method comes after asking the question?
  - Hypothesis
  - Formulate a theory
  - Research
  - Conclusion
- Which of the following is NOT a safety measure to take when working outside the laboratory?
  - Bring sufficient food and water
  - Know how to use the eye wash station
  - Let others know what you are doing, where you will be, and when you will be returning
  - Wear long pants and use sun protection
- Which of the following would a physical model be used to show
  - Global warming predictions
  - The chemical reaction between sodium and water
  - How our Moon was created from Earth
  - Where the tectonic plates on Earth are located
- A scientific theory is a
  - Hypothesis that is repeatedly shown to be true.
  - The same as a hypothesis
  - Is disproved if conflicting data is discovered
  - 2 answers are correct
- Meteorology is the study of
  - Atmosphere, weather and storms
  - Climate, atmosphere and long-term climate events like global warming
  - Planets, galaxies, and stars
  - None of the above
- In an experiment, which of the following can be changed or manipulated
  - control
  - independent variable
  - dependent variable
  - dependent control
- What does a conceptual or ideas model provide
  - a physical representation of what is being studied

- b. a drawing of the different parts of a system
  - c. a mental explanation that ties together data
  - d. an equation that ties together data
8. A scientific investigation begins with
- a. the asking of a question
  - b. the formation of a hypothesis
  - c. the gathering of data
  - d. the investigation of current research or ideas already known about the subject
9. An important feature of a hypothesis is that it is
- a. In the form of a question
  - b. testable
  - c. right the first time
  - d. the only possible solution
10. Tornadoes might be studied by
- a. geologists
  - b. astronomers
  - c. physical oceanographers
  - d. meteorologists

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. The scientific method is a set of logical steps used to help create scientific theories.
- \_\_\_\_\_ 12. Earth Scientists do not often work with scientists in other fields.
- \_\_\_\_\_ 13. Scientific models offer perfect explanations for ideas for which we have all the information.
- \_\_\_\_\_ 14. Earth Scientists only study things that occur on our planet.
- \_\_\_\_\_ 15. Seismology and Volcanology are all fields within the study of geology.
- \_\_\_\_\_ 16. One of the things that a meteorologist studies are meteors.
- \_\_\_\_\_ 17. Of all the branches in Earth Science, oceanography is the most understood.
- \_\_\_\_\_ 18. A Model that uses numbers will often use equations or computers to show the science.
- \_\_\_\_\_ 19. The safety symbol that warns of high voltage is a lightning bolt in a triangle.
- \_\_\_\_\_ 20. Oceanographers study the impact that humans have had on fish, water pollution and the melting of ice caps.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. \_\_\_\_\_ is the study of water movement, like waves and ocean currents.
22. “\_\_\_\_\_” means “the study of.”
23. Both \_\_\_\_\_ and \_\_\_\_\_ study the atmosphere.
24. For something to be science, it must be \_\_\_\_\_.
25. The result to an experiment is known as the \_\_\_\_\_ variable.
26. When a scientist looks up information in books and the internet, or interviews experts for information this process is known as \_\_\_\_\_.





---

## Answer Key

1. c 2. b 3. d 4. d 5. a 6. b 7. c 8. a 9. b 10. d

11. true 12. false 13. false 14. false 15. true 16. false 17. false 18. true 19. true 20. true

21. physical oceanography 22. -ology 23. climatology, meteorology (either order) 24. testable 25. dependent 26. research 27. safety 28. computers 29. symbols 30. oceans

31. Three possible branches of Earth Science are meteorology, oceanography and geology. Specialties in meteorologist would be someone forecasting weather and someone studying global warming. In oceanography, one could study physical oceanography or marine geology. In geology there are scientists in seismology and mineralogy.

32. Answers will vary.

33. *Sample hypotheses:* Limestone erodes more quickly than other rocks because it dissolves in mild acid. Pumice erodes the fastest because water can enter the holes and dissolve the rock.

---

CHAPTER **2**

# MS Studying Earth's Surface Assessments

## Chapter Outline

---

- 2.1 INTRODUCTION TO EARTH'S SURFACE
  - 2.2 MODELING EARTH'S SURFACE
  - 2.3 TOPOGRAPHIC MAPS
  - 2.4 USING SATELLITES AND COMPUTERS
  - 2.5 STUDYING EARTH'S SURFACE
-

## 2.1 Introduction to Earth's Surface

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Continents
  - a. are above sea level
  - b. are older than ocean basins
  - c. both a and b
  - d. none of the above
2. Which of the following is NOT an example of a destructive force?
  - a. A volcano blowing its top off
  - b. Rivers cutting away at rocks
  - c. Rivers bringing sand to the shore to form beaches
  - d. Wind wearing down mountains to become plateaus
3. A double compass rose
  - a. shows both direction and location
  - b. is used by sailors
  - c. shows the difference between true north and magnetic north
  - d. both b and c are correct
4. The terrain of an area, or the difference between high and low points in an area, is known as
  - a. elevation
  - b. relief
  - c. height
  - d. landform differential
5. Constructive forces
  - a. create new land and features
  - b. build land outward
  - c. are responsible for creating mountains
  - d. all of the above

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Latitude and longitude can describe direction.
- \_\_\_\_\_ 7. Elevation describes how far above sea level an object is.
- \_\_\_\_\_ 8. Continents can be billions of years old.

\_\_\_\_\_ 9. Mid-ocean ridges are the deepest places in the ocean.

\_\_\_\_\_ 10. The ocean basin begins where the ocean meets the land.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Wind erosion is an example of a(n) \_\_\_\_\_ force

12. A compass's needle always points to \_\_\_\_\_ north.

13. The deepest place in the world is the \_\_\_\_\_.

14. Huge, connected underwater mountain ranges are called \_\_\_\_\_.

15. Location on earth is often found by using a grid system known as \_\_\_\_\_ and \_\_\_\_\_ - \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. How can a river act as both a constructive and destructive force?

17. What is the difference between magnetic north and geographic north?

---

## Answer Key

1. c 2. c 3. c 4. b 5. d

6. false 7. true 8. true 9. false 10. true

11. destructive 13. magnetic 13. Mariana Trench 14. mid-ocean ridges 15. longitude, latitude

16. Rivers can be constructive by picking up sediments to create beaches, deltas, and barrier islands. The force of the water in a river is also destructive, wearing away land and causing erosion.

17. A compass needle lines up with the magnetic north of the Earth. The magnetic north shifts locations over time throughout Earth's history. The geographic north is a fixed point at the top of the imaginary axis around which the Earth rotates.

## 2.2 Modeling Earth's Surface

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Lines of latitude give the distance north and south of the
  - Prime Meridian
  - Equator
  - North Pole
  - South Pole
- A Mercator projection
  - is a perfect likeness of Earth
  - uses a cone to create the map
  - distorts the size of continents near the poles the most
  - distorts Mexico more than Greenland
- Which is NOT true on a map legend?
  - Blue is used to show water features
  - Purple lines show major roads
  - Black dots represent cities
  - The size of a city dots helps to show its population
- Which is NOT true of a Robinson projection?
  - It is a completely accurate map with no distortions
  - It is more oval than rectangular
  - It is more accurate in size than the Mercator
  - It was created using mathematical formulas
- Which is NOT true of the Prime Meridian?
  - It is a line of longitude
  - It runs through Greenwich, England
  - It is known as 0 degrees
  - It runs from east to west

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. All map projections have some disadvantage.
- \_\_\_\_\_ 7. Both Robinson and Mercator Projections have distortion at the poles more than at the equator.
- \_\_\_\_\_ 8. Gnomonic projections are most accurate when used for small geographic areas.

- \_\_\_\_\_ 9. The Mercator Projection, unlike most other maps, represents the world with South at the top of the map.
- \_\_\_\_\_ 10. A globe is the most detailed map we have of Earth.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. A small scale \_\_\_\_\_ map, showing hills and streams, might be used hiking or orienteering.
12. A \_\_\_\_\_ is the most accurate way to represent Earth's curved surface.
13. The \_\_\_\_\_ projection has a great deal of size distortion past 15 degrees north and south of the equator.
14. A \_\_\_\_\_ projection places a flat piece of paper on the globe and projects an image from that point.
15. A \_\_\_\_\_ map shows types and locations of rocks in an area.

**Short Answer**

*Answer each question in the space provided.*

16. Given the advantages and disadvantages of the different map projections, tell what projection you believe would be best to show the north pole accurately. Explain why you think this is true.

17. Name three different types of maps (not projections) and tell what each shows.

---

**Answer Key**

1. b 2. c 3. b 4. a 5. d
6. true 7. true 8. true 9. false 10. false
11. topographic 12. globe 13. Mercator 14. gnomonic 15. geologic



16. *One possible answer:* A gnomonic projection would be best suited for the north pole. It is first good for small geographical areas, which is true of the north pole. Secondly most maps distort the poles more than any other area, so traditional maps like ones made with a cylinder or cone would make the north pole inaccurate in size. By placing the paper directly over the pole, the gnomonic map would be the most accurate.

17. *Possible answer:* Three types of maps are relief maps, weather maps, and geological maps. Relief maps show detailed elevations and features of an area. Weather maps show storms, fronts and pressure. Geological maps show what types of rocks are in a given location.

## 2.3 Topographic Maps

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. A cross section
  - a. can show the inside of something
  - b. is a type of topographic map
  - c. cannot used with bathymetric maps
  - d. uses concentric circles to show elevations
2. Which is NOT true of a bathymetric map?
  - a. it is a type of topographic map
  - b. larger numbers show great depths
  - c. negative numbers are used to show depths below sea level
  - d. it is often made using sonar
3. Contour lines that create a V shape indicate what?
  - a. a stream channel
  - b. a hilltop
  - c. a valley
  - d. a cliff
4. Which of the following is a topographic map NOT able to do?
  - a. show the slope of an area
  - b. show the horizontal scale
  - c. give details about the land use in an area
  - d. determine the direction of water flow
5. If elevation between 2 bold lines is 1000 feet, and there are 5 lines in between the bold lines, what is the contour interval?
  - a. 5
  - b. 200
  - c. 500
  - d. 2000

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The difference between two contour lines is the contour interval.
- \_\_\_\_\_ 7. Contour lines help us to see the three-dimensional shape of the land.
- \_\_\_\_\_ 8. Concentric lines that are very far apart show a high, steep hill.

\_\_\_\_\_ 9. The hatch marks on a topographic map are drawn on the side of the circle with the higher elevation.

\_\_\_\_\_ 10. While topographic maps can show vertical distances, they cannot show horizontal distances.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The spacing between contour lines shows the \_\_\_\_\_ of the land.

12. One important rule of a topographic map is that contour lines may never \_\_\_\_\_.

13. Water depths are shown on a \_\_\_\_\_ map.

14. Faults and complicated regions of exposed rocks can be shown using a \_\_\_\_\_ map.

15. A stream valley on a topographic map is shown with \_\_\_\_\_ portions of contour lines.

### Short Answer

*Answer each question in the space provided.*

16. Explain three benefits of topographic maps, including the people that would find them useful.

17. Describe the look of a topographic map that has a steep hill on the north side, a stream valley in the middle, and a gentle hill on the east side with a depression on the top. What features would it have?

---

## Answer Key

1. a 2. c 3. a 4. c 5. b

6. true 7. true 8. false 9. false 10. false

11. slope 12. cross 13. bathymetric 14. geologic 15. V-shaped

16. Topographic maps would be useful to hikers to determine the best route in terms of water, slope and elevation. The maps can also be used by city planners who might want to find a flat place to build a structure or the highest

place to keep some place from flooding. Finally, topographic maps can be used by civil engineers to find the best places for roads or bridges.

17. On the north side of the map would be numerous concentric circles very close together. At the middle of the map would be contour lines in the shape of a V. On the east side there would be concentric circles that are far apart. In the center of the series of circles, there will be hatch marks on the inside of the interior circle.

## 2.4 Using Satellites and Computers

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which best describes a geostationary orbit?
  - A satellite orbit that can “see” the entire Earth in about 24 hours
  - A satellite orbit that is used to accurately pinpoint a location using radio signals
  - A satellite that stays above one location
  - A satellite orbit that is very high above the Earth and collect data on a single geographic point on the Earth
- Scientific satellites can be used
  - by NOAA, NASA and USGS
  - to detect things such as the ocean levels
  - to carry instruments that allow for measurements such as temperatures or atmospheric gas levels
  - all of the above
- Which of the following is not true of GPS?
  - it stands for Global Positioning System
  - it was first used by the U.S. military, but is now available to the general public
  - it makes use of travel times of infrared waves in order to know distances
  - it relies on both a GPS receiver at the point of interest and satellites
- In which way can a satellite be used to help with safety?
  - satellites can better predict weather to warn people of severe storms or hurricanes
  - satellites keep people from getting lost when they use GPS
  - satellites can communicate important information to television stations to warn of a dangerous situation
  - all of the above
- Computer maps
  - are often able to display more information than traditional maps
  - cannot put multiple pieces of satellite data together
  - are not more accurate, but are often more visually pleasing
  - all of the above

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. A polar orbit is a shorter orbit than a geostationary orbit.
- \_\_\_\_\_ 7. GPS can only be done with a minimum of 4 satellites.
- \_\_\_\_\_ 8. GIS stands for Geostationary Information System.

\_\_\_\_\_ 9. Computers increase the accuracy of maps made from satellite images and satellite data.

\_\_\_\_\_ 10. The higher above Earth that a satellite orbits the smaller the view it is able to see.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The first group to use GPS was the \_\_\_\_\_.

12. In order to communicate with satellites using the Global Position System, the user on Earth must have a \_\_\_\_\_.

13. A type of mapping called \_\_\_\_\_ is able to link satellite data and locations to create useful information for many people.

14. A \_\_\_\_\_ orbit can be used to monitor local weather 24 hours a day.

15. \_\_\_\_\_ launched a fleet of satellites that are now used by many other organizations.

### Short Answer

*Answer each question in the space provided.*

16. Explain the differences and similarities of polar orbits and geostationary orbits.

17. Explain how GPS works.

---

## Answer Key

1. c 2. d 3. c 4. d 5. a

6. false 7. true 8. false 9. true 10. false

11. military 12. GPS receiver 13. GIS 14. geostationary 15. NASA

16. Both polar and geostationary orbits are used for satellites that orbit Earth collecting data and images. Both are used by numerous groups for a variety of uses. A polar orbit rotates from pole to pole using a longitudinal orbit. It orbits very quickly- about 90 minutes per orbit. In this way, it can see a large portion of Earth daily. The geostationary orbit also is an orbit used by satellites. In this case, the orbit is based on a latitude line at a specific latitude along Earth. It moves at the same speed as Earth orbits and therefore remains fixed in one location above Earth to collect local data or to be used for communications.

17. GPS detects radio signals via a GPS receiver from nearby satellites. Each radio signal is timed, thereby telling how far away the receiver is from the satellite. When the receiver gets signals from 4 different satellites, they can be used to pinpoint an exact location.

## 2.5 Studying Earth's Surface

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- TRUE north is
  - the magnetic north pole
  - the geographic north pole
  - where a compass needle always points
  - more than one is correct
- The deepest places in the ocean are
  - Ocean trenches
  - Seamounts
  - Mid-Ocean ridges
  - Formed by constructive lava flows
- The area on a map that explains features and symbols is called a(n)
  - compass
  - scale
  - legend
  - projection
- An often triangular shaped deposit of sediment at the mouth of the river is
  - a river valley
  - a continental slope
  - a plain
  - a delta
- Which statement describes a latitude line?
  - runs from north to south
  - begins at the Prime Meridian
  - runs parallel to the Equator
  - runs vertically
- Contour intervals are
  - the elevation difference between contour lines
  - differences in horizontal distances between 2 contour lines
  - indicators of areas with gentle slopes
  - only found on large scale topographic maps
- Which of the following is NOT the correct pairing of features with explanations?
  - hills: shown by concentric circles



- b. steep slope: shown by contour lines being very close together
- c. an area of depression: shown by hatch marks
- d. stream valleys: shown by two crossing contour lines

8. Which is NOT true of GPS?

- a. It stands for global positioning system
- b. it uses radio signals
- c. it detects locations using satellite imagery
- d. it was first used by the US military

9. Which is true of a satellite in a polar orbit?

- a. It is often used for local communications satellites
- b. it views Earth's entire surface in less than one day
- c. it moves in a longitudinal orbit
- d. it is used only by NASA

10. Geologic maps

- a. use color to show rock units
- b. can include a cross section
- c. are a type of topographic map
- d. all of the above

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Contour lines on a topographic map must never cross.
- \_\_\_\_\_ 12. Map projections are a way to represent Earth's curved surfaces on a two-dimensional surface.
- \_\_\_\_\_ 13. All map projections have distortions or inaccuracies.
- \_\_\_\_\_ 14. The Mercator map projection is more accurate in terms of country size than the Robinson project since the Mercator map is rounded on the edges.
- \_\_\_\_\_ 15. The Polar Coordinate System is the same thing as GPS.
- \_\_\_\_\_ 16. A topographic map is able to show elevations using contour lines.
- \_\_\_\_\_ 17. A bathymetric map uses contour lines to show air pressure on weather maps.
- \_\_\_\_\_ 18. The GIS, or Geographic Information System, is used to accurately pinpoint locations on Earth using radio signals.
- \_\_\_\_\_ 19. An example of a destructive force is lava flowing out of the ocean floor to form Hawaii.
- \_\_\_\_\_ 20. Much of the ocean floor is called the abyssal plain.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. For a sailor to know both geographic and true north, he uses a device called a \_\_\_\_\_.
22. \_\_\_\_\_ are much older than ocean basins. Some are billions of years old!
23. Weathering and erosion are types of \_\_\_\_\_ forces.
24. \_\_\_\_\_ are long, tall underwater mountain ranges.
25. Longitude and latitude is an example of a \_\_\_\_\_ system.
26. An imaginary line on Earth that runs north-south is called a line of \_\_\_\_\_.

27. A \_\_\_\_\_ is the only representation of Earth where distances and sizes are not distorted.
28. When contour lines are far apart it shows a \_\_\_\_\_ slope.
29. Concentric circles on a topographic map indicate a \_\_\_\_\_.
30. A \_\_\_\_\_ map shows the outlines and borders of states and countries.

**Short Answer**

*Answer each question in the space provided.*

31. Describe the difference between a destructive and constructive force on Earth. Then give two examples of each.

32. What does it mean if something is said to be at 30 degrees north, 50 degrees west?

33. How are a topographic map and a bathymetric map the same? How are they different?

---

**Answer Key**

1. b 2. a 3. c 4. d 5. c 6. a 7. d 8. c 9. b 10. d

11. true 12. true 13. true 14. false 15. false 16. true 17. false 18. false 19. false 20. true

21. double compass rose 22. Continents 23. destructive 24. Mid-ocean ridges 25. coordinate 26. longitude 27. globe 28. gentle 29. hill 30. political

31. Destructive forces blow apart or otherwise destroy landforms. Examples are erosion and volcanic eruptions. Constructive forces cause landforms to grow. Examples are eruptions at undersea volcanoes to create a hill and sand being deposited at a delta to create new land.

32. This means that the location is 30 degrees north of the Equator and 50 degrees west of the Prime Meridian, using latitude and longitude lines.

33. Both types of maps have contour lines that connect points of equal elevation. In both, the numbers get larger as they are further from sea level (or lake level). Lines that are closer together indicate steeper slopes and those that are farther apart indicate shallower slopes. In a topo map, the contour lines measure above sea level and in a bathymetric maps they measure below sea level so for one they are higher than sea level and for the other they are lower.

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CHAPTER **3**

# MS Earth's Minerals Assessments

## Chapter Outline

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- 3.1 MINERALS**
  - 3.2 IDENTIFICATION OF MINERALS**
  - 3.3 FORMATION OF MINERALS**
  - 3.4 MINING AND USING MINERALS**
  - 3.5 EARTH'S MINERALS**
-

## 3.1 Minerals

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which of the following is the basic unit of matter?
  - molecule
  - chemical compound
  - atom
  - nucleus
- Water is an example of a(n)
  - atom
  - molecule
  - ion
  - native element
- An atom is only an ion if it has more or less
  - neutrons than electrons
  - protons than neutrons
  - neutrons than protons
  - electrons than protons
- An example of a pure element is
  - table salt
  - silicon dioxide
  - sulfur
  - calcium carbonate
- The crystal shape of a mineral
  - shows how the atoms are arranged
  - will always be the same if it is made from the same atoms
  - can usually only be seen under a microscope
  - can help account for how hard or brittle a mineral is

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. A molecule is the smallest unit of an element.
- \_\_\_\_\_ 7. Protons and electrons are found in the nucleus of an atom.
- \_\_\_\_\_ 8. Halides (salts) make up the largest group of minerals on Earth.

\_\_\_\_\_ 9. Coal and diamonds are different minerals because they have different structure.

\_\_\_\_\_ 10. In a crystal, the atoms are arranged in a pattern.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. 90% of Earth's crust is made of minerals in the group called a(n) \_\_\_\_\_.

12. The \_\_\_\_\_ makeup of a material is the different atoms and molecules that it is composed of.

13. Even though calcium carbonate is made by marine animals, it is still \_\_\_\_\_.

14. \_\_\_\_\_ is the substance of which physical objects are made.

15. Electrically neutral particles are called \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. List and briefly describe the chemical composition of the eight groups of minerals.

17. What is a mineral?

---

## Answer Key

1. c 2. b 3. d 4. c 5. c

6. false 7. false 8. false 9. true 10. true

11. silicates 12. chemical 13. inorganic 14. matter 15. neutrons

16. Silicates, contain silicon and oxygen; native elements, contain only one type of element; carbonates, contain one carbon and three oxygen atoms; halides, contain fluorine, chlorine, bromine or iodine; oxides, contain one or

two metals and oxygen; phosphates, contain phosphorous, arsenic or vanadium bonded to oxygen; sulfates, sulfur bonded to oxygen; sulfides, metal elements combined with sulfur.

17. Minerals are formed from natural processes, are solid, are inorganic, have definite chemical compositions and are made of crystal structures.

## 3.2 Identification of Minerals

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. If the volume of a mineral is 6 and the mass is 3, what is its density?
  - a. 6
  - b. 3
  - c. 2
  - d. .5
2. The streak of a mineral is
  - a. the same as the color of the mineral
  - b. never the same color of the mineral
  - c. the same even when the same mineral is found in various colors
  - d. either black or white
3. Which of the following is NOT a property used to identify a mineral?
  - a. radioactivity
  - b. cleavage
  - c. reactivity
  - d. number of electrons
4. Mass is
  - a. how much space an object takes up
  - b. the amount of matter in an object
  - c. how much matter takes up a certain amount of space
  - d. the weight of an object
5. What mineral is number 1 on the Mohs Scale?
  - a. talc
  - b. diamond
  - c. topaz
  - d. calcite

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The color of a mineral is a more reliable test of its identity than its streak.
- \_\_\_\_\_ 7. An object with the density of 2 is denser than an object with the mass of 4 and the volume of 1.
- \_\_\_\_\_ 8. A crystal with six sides that are all the same size has a octahedral structure.



- \_\_\_\_\_ 9. Topaz is a harder mineral than calcite.  
\_\_\_\_\_ 10. The luster of a mineral its color under ultraviolet light.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. A mineral will break where the chemical bonds are the \_\_\_\_\_.  
12. When the break of a mineral is regular and has a pattern this is the mineral's \_\_\_\_\_.  
13. The hardest mineral on the Mohs Scale is \_\_\_\_\_.  
14. \_\_\_\_\_ is the amount of space that an object takes up.  
15. Gold and silver have a \_\_\_\_\_ luster.

**Short Answer**

*Answer each question in the space provided.*

16. Describe how to find the density of a mineral, including what information you would need to know and the formula to determine the density.

17. What is cleavage and what is fracture? What are their differences and what are their similarities?

---

**Answer Key**

1. d 2. c 3. d 4. b 5. a  
6. false 7. false 8. false 9. true 10. false  
11. weakest 12. Cleavage 13. diamond 14. volume 15. metallic  
16. You need to find its mass and its volume. Then use the formula Mass divided by volume to determine the density.

17. Cleavage is the tendency of a mineral to break along certain planes. It means that when the mineral breaks the lines will be smooth and often it will break into a distinct shape like a cube or an octahedron. Fracture on the other hand is when a mineral breaks without any pattern. When the mineral breaks the line is uneven. Both cleavage and fracture describe how a mineral breaks. Cleavage is when the mineral has a pattern and a fracture is when there is no pattern.

## 3.3 Formation of Minerals

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Water plus other substances is a(n)
  - precipitate
  - saline
  - solution
  - geode
- Hot fluids
  - flow through open spaces in rocks and deposit solid minerals
  - can hold more dissolved particles than cold fluids
  - can have chemical reactions with rocks
  - all of the above
- As the water in a solution evaporates,
  - all dissolved elements evaporate too
  - a chemical reaction occurs to help create minerals
  - it leaves behind a solid layer of minerals
  - nothing happens. Water in a solution cannot evaporate
- Underground water is heated by
  - lava
  - dissolved minerals
  - calcite
  - magma
- Melted rock that erupts on to Earth's surface is called
  - lava
  - magma
  - vein
  - melted minerals

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Seawater can hold more dissolved minerals than freshwater.
- \_\_\_\_\_ 7. Both geodes and veins are mineral deposits in rocks that form from hot solutions.
- \_\_\_\_\_ 8. As water evaporates in a solution, the minerals evaporate too.

\_\_\_\_\_ 9. Underground water that is heated creates magma.

\_\_\_\_\_ 10. Water has the ability to hold dissolved ions.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Minerals that are deposited in open spaces form crystals inside rocks called \_\_\_\_\_.

12. Magma is different from lava because magma is found \_\_\_\_\_.

13. \_\_\_\_\_ form when dissolved particles come together to form a solid in water.

14. \_\_\_\_\_ plus other substances is called a solution.

15. Salt and calcite can both easily \_\_\_\_\_ out of water.

### Short Answer

*Answer each question in the space provided.*

16. What is the difference between magma and lava?

17. How is mineral formed from a solution?

---

## Answer Key

1. c 2. d 3. c 4. d 5. a

6. true 7. true 8. false 9. false 10. true

11. geode 12. underground 13. Salts 14. Water 15. precipitate

16. Both are melted rock, but magma exists inside Earth and lava is magma that has erupted onto Earth's surface.

17. As water in a solution evaporates, the ions come together and form minerals. Minerals can precipitate from cool water or hot solutions, including magma.

## 3.4 Mining and Using Minerals

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Quartz can be found in
  - electrical wiring
  - soda cans
  - sheet rock
  - windows
- Which valuable element is found in bauxite ore?
  - aluminum
  - copper
  - corundum
  - iron
- What are techniques for finding and deciding whether to use ore?
  - examining chemical elements in the area to determine the presence of ores
  - creating a map of the geology and deposits
  - amounts of ores are calculated to determine profitability
  - all of the above
- Which is NOT true of diamonds?
  - more mined diamonds are used for gemstones than for cutting
  - diamonds are often mined underground
  - diamonds can be used to polish other gemstones
  - diamonds are cut to maximize reflecting light
- What is NOT true of placer minerals?
  - placer minerals collect in stream gravels
  - placer minerals were found in California in 1848
  - placer minerals are deposited along rivers
  - placer minerals are so small they often are not valuable

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Surface mining includes strip mining, open-pit mining, and quarrying.
- \_\_\_\_\_ 7. Waste rock is used to make aluminum cans.
- \_\_\_\_\_ 8. Rubies are opaque gemstones.

\_\_\_\_\_ 9. Land reclamation is used to restore an area damaged by mining.

\_\_\_\_\_ 10. Minerals must be removed from ore to be useful.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Ores have high concentrations of \_\_\_\_\_.

12. A \_\_\_\_\_ is a type of mine that produces rocks and minerals used for buildings and roads.

13. In underground mining, \_\_\_\_\_ are dug to allow miners and materials to be moved in and out of the mines.

14. \_\_\_\_\_ is a mineral used in electrical wiring.

15. Ores will only be mined for minerals if they will be \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What are the steps geologists use to determine if they can mine in a certain area of not.

17. Name 4 common products made from minerals.

---

## Answer Key

1. d 2. a 3. d 4. a 5. d

6. true 7. false 8. false 9. true 10. true

11. minerals 12. quarry 13. tunnels 14. Copper 15. profitable

16. Certain places are more likely to have mineral than others. Geologists go to these likely places. Then they test the physical and chemical properties of the soil and rocks of the area and surrounding areas. Once a mineral deposit

is found they determine its size and map it. From here miners will work to see if mining it would be profitable.

17. Electrical wires are made from metals, especially copper. Baby powder is often made from the mineral talc. The aluminum from bauxite is used to make aluminum foil and cans. Windows contain quartz.

## 3.5 Earth's Minerals

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which of the following is a characteristic of a mineral?
  - solid
  - inorganic
  - naturally created
  - all of the above
- Which following pairing is incorrect?
  - a proton is positive
  - a neutron is neutral
  - an electron is negative
  - an ion is neutral
- The smallest unit of matter is a(n)
  - molecule
  - atom
  - nucleus
  - compound
- The color of a mineral's powder is its
  - luster
  - shine
  - streak
  - cleavage
- The hardness of a mineral is determined by
  - measuring both its mass and volume
  - looking at a sample of the mineral under the microscope
  - scratching it by and on a series of other minerals with known hardnesses
  - breaking the mineral and seeing the type of fracture or cleavage
- Water plus other substances is known as a(n)
  - precipitate
  - solution
  - salt
  - element
- Hot water can
  - hold more dissolved particles than cold water



- b. hold less dissolved particles than cold water
  - c. help create lava
  - d. make a lake less salty
8. What is NOT true of mining?
- a. minerals cannot be directly mined
  - b. mining can be both dangerous and polluting
  - c. mining is done primarily for metals like gold, silver and copper
  - d. mining is needed for the creation of many everyday objects
9. Restoring land mined to its natural state is called
- a. reclamation
  - b. restoration
  - c. decontamination
  - d. quarrying
10. Rocks that contain valuable minerals are called
- a. placers
  - b. gemstones
  - c. metals
  - d. ores

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Earth's crust is made mainly of silicates.
- \_\_\_\_\_ 12. All minerals are organic.
- \_\_\_\_\_ 13. A mineral has fracture if it breaks unevenly or in a non-patterned way.
- \_\_\_\_\_ 14. Color is most often the least useful tool in mineral identification.
- \_\_\_\_\_ 15. The luster of a mineral is described as either metallic or non-metallic.
- \_\_\_\_\_ 16. Magma is melted rock that erupts onto Earth.
- \_\_\_\_\_ 17. Salt and calcite can easily precipitate out of water.
- \_\_\_\_\_ 18. A vein is a mineral deposit formed only from salt water.
- \_\_\_\_\_ 19. Surface mining can include blasting rocks apart and tunnels.
- \_\_\_\_\_ 20. Gemstones are useful for things other than for their beauty and for jewelry.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. A \_\_\_\_\_ is the smallest unit of a chemical compound.
22. A \_\_\_\_\_ structure is one that has a regular, repeated arrangement of atoms.
23. A \_\_\_\_\_ is an inorganic, solid substance made naturally and having a definite composition.
24. The \_\_\_\_\_ of an object shows the relationship between its mass and volume.
25. If halide forms cubes as it breaks, it has a definite \_\_\_\_\_.
26. Geodes are formed as \_\_\_\_\_ form in large open spaces.
27. Elements in water can form solid \_\_\_\_\_.
28. Most ores mined are \_\_\_\_\_ resources.

29. In order to help with pollution from mining, the U.S. government has created standards to protect \_\_\_\_\_-  
\_\_ quality.
30. When ore is mined \_\_\_\_\_ must be separated out of it to be useful.

**Short Answer**

*Answer each question in the space provided.*

31. Name four characteristics of minerals, four physical properties of minerals, and four examples of minerals.

32. Describe how a mineral can be formed from a solution.

33. Why would a company choose surface mining? Why would it choose underground mining? If both were equally viable, which would be the best choice and why?

---

**Answer Key**

1. d 2. d 3. b 4. c 5. c 6. b 7. a 8. c 9. a 10. d  
11. true 12. false 13. true 14. true 15. true 16. false 17. true 18. false 19. false 20. true

21. molecule 22. crystal 23. mineral 24. density 25. cleavage 26. crystals 27. mineral deposits 28. nonrenewable 29. water 30. minerals

31 Answers will vary. Minerals are inorganic, solid, naturally created and made of a crystal structure. Four properties are its luster, cleavage, color and specific gravity. Four specific minerals are gold, gypsum, table salt, and turquoise.

32. Solutions are water mixed with other substances. As the water evaporates, the remaining dissolved material can combine to create a solid mineral. This mineral precipitates out of the solution.

33. Miners would choose surface mining if the mineral are close to the surface and easy to get to. Underground mining is used when minerals are more cheaply obtained by creating a tunnel underground than by removing the top layer of rock. This is especially true when the mineral deposits are very far below the surface. Because underground mining is more expensive and dangerous, companies would prefer surface mining.

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CHAPTER

**4**

# MS Rocks Assessments

## Chapter Outline

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- 4.1 TYPES OF ROCKS
  - 4.2 IGNEOUS ROCKS
  - 4.3 SEDIMENTARY ROCKS
  - 4.4 METAMORPHIC ROCKS
  - 4.5 STUDYING ROCKS
-

## 4.1 Types of Rocks

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

- How many major rock types are in the rock cycle?
  - 3
  - 4
  - 5
  - 7
- Each type of rock has a particular
  - color
  - size
  - set of minerals
  - shape
- The texture of a rock is describes what feature of the mineral grains?
  - size
  - shape
  - arrangement
  - all of the above
- Two rocks have the same minerals, but of very different sizes. Which statement is true?
  - One rock has more eroded fragments than the other.
  - The minerals cooled at different rates from a magma.
  - The rocks have different compositions.
  - One rock is igneous and one rock is metamorphic.
- A rock that was once a different rock with a different mineral composition and/or texture is a(n)
  - igneous rock
  - sedimentary rock
  - metamorphic rock
  - hard rock

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. As magma cools, all of the mineral grains form at the same temperature.
- \_\_\_\_\_ 7. Metamorphism may change the chemical composition of a rock.
- \_\_\_\_\_ 8. Only one type of mineral can be present in a metamorphic rock.

\_\_\_\_\_ 9. Rocks can be studied through a microscope

\_\_\_\_\_ 10. A metamorphic rock must have a different mineral composition than its parent rock

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The natural transitions that change one rock type to another rock type are part of the \_\_\_\_\_.

12. Igneous rocks form by the cooling of a \_\_\_\_\_.

13. The two features that are used to identify rocks are \_\_\_\_\_ and \_\_\_\_\_.

14. An exposed rock formation is called a(n) \_\_\_\_\_.

15. The solids that are left behind after a liquid evaporates are called \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Describe the importance of the rock cycle.

17. Draw a picture of the rock cycle with the three rock types and the processes that connect them. This will be useful as a reference in the rest of this chapter.

---

## Answer Key

1. a 2. c 3. d 4. b 5. c

6. false 7. false 8. false 9. true 10. false

11. rock cycle 12. magma 13. minerals, texture 14. outcrop 15. precipitate

16. The rock cycle shows that any rock can become any other type of rock. It shows the processes that cause that to happen.

17. See the diagram in the chapter.

## 4.2 Igneous Rocks

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

1. Which term describes igneous rocks that crystallize above the crust
  - a. extrusive
  - b. intrusive
  - c. magma
  - d. lava
2. Which mineral is the most common in a dark-colored, mafic igneous rock?
  - a. diamond
  - b. quartz
  - c. pyroxene
  - d. olivine
3. The color of minerals in an igneous rock is determined by
  - a. the composition of the magma
  - b. the length of time it took the magma to cool
  - c. whether it cooled from a lava or a magma
  - d. none of the above.
4. An igneous rock with large crystals cooled
  - a. rapidly from a lava.
  - b. rapidly beneath the surface.
  - c. slowly from a magma.
  - d. unknown. It is not possible to tell the rate of cooling from the crystal size.
5. Extrusive igneous rocks
  - a. are common because large mountain ranges are made entirely of basalt
  - b. are common because the seafloor is made up of basalt
  - c. are rare because not much rock melts to produce lava.
  - d. are rare because much more magma cools intrusively.

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. A basalt looks light colored partly because its crystals are too small to see.
- \_\_\_\_\_ 7. Volcanic rock may have so many gas bubbles that it can float on water.
- \_\_\_\_\_ 8. Granite and rhyolite are high silica rocks.



\_\_\_\_\_ 9. Mountain ranges can be made mainly of igneous rocks.

\_\_\_\_\_ 10. Igneous rock is too hard to be used for art works.

### Fill in the Blanks

11. Pumice has its distinctive texture because \_\_\_\_\_.

12. Mountain ranges can be made mainly of the intrusive igneous rock type \_\_\_\_\_.

13. \_\_\_\_\_ igneous rocks form underground and cool more slowly, causing large crystals to form.

14. A light-colored extrusive igneous rock is \_\_\_\_\_.

15. Lighter colored igneous minerals are higher in \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Describe three uses of igneous rocks.

17. What are the differences between intrusive and extrusive igneous rocks in how they appear and how they form?

---

## Answer Key

1. a 2. d 3. a 4. c 5. b

6. false 7. true 8. true 9. true 10. false

11. it is full of gas bubbles 12. granite 13. intrusive 14. rhyolite 15. silica

16. Igneous rocks are used for art work like vases, for countertops, buildings, monuments and statues. Pumice is used to smooth skin or can be put into washing machines to create stone-washed jeans.

17. An intrusive igneous rock cools and crystallizes underneath the surface and an extrusive igneous rock cools and crystallizes above the surface. Intrusive rocks cool slower and have larger crystals than extrusive rocks.

## 4.3 Sedimentary Rocks

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What are solid particles that have been deposited on the Earth's surface called?
  - a. lava
  - b. sediments
  - c. quartz
  - d. soils
2. Which of the following has the smallest grains?
  - a. breccia
  - b. conglomerate
  - c. siltstone
  - d. sandstone
3. The processes by which sediments harden into rock include
  - a. compaction
  - b. sedimentation
  - c. dissolution
  - d. precipitation
4. Clastic sedimentary rocks are classified by
  - a. the presence or absence of fossils
  - b. how hard they are
  - c. the size of the sediments they are made of
  - d. the location where they precipitated
5. Which of the following is NOT a fossil?
  - a. dinosaur footprints
  - b. mammoth bones
  - c. ancient human hair preserved in cave sediments
  - d. a modern shell on the beach

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Like minerals, rocks cannot include organic materials.
- \_\_\_\_\_ 7. Breccia and conglomerate have large sediments that have different shapes.
- \_\_\_\_\_ 8. Coal is not a sedimentary rock.

\_\_\_\_\_ 9. Cementation occurs when the fluids in the free spaces of the sediments crystallize.

\_\_\_\_\_ 10. A rock that includes fossil fragments is a bioclastic rock.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. \_\_\_\_\_ sedimentary rocks are rocks that form when chemical precipitates harden.

12. As sediments are buried underneath newer sediments, weight causes \_\_\_\_\_ to occur

13. Loose sediments harden by process of \_\_\_\_\_ where fluids deposit ions.

14. A material that is a mineral and a rock is \_\_\_\_\_.

15. The sedimentary rock made of the smallest sediments is called \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Describe how sedimentary rocks are classified.

17. What are some uses of sedimentary rocks?

---

## Answer Key

1. b 2. c 3. a 4. c 5. d

6. false 7. true 8. false 9. true 10. true

11. chemical 12. compaction 13. cementation 14. halite or rock salt 15. siltstone or shale

16. First sedimentary rocks are separated into clastic and chemical. Clastic rocks are classified based on the size of their sediments. Conglomerates and breccias have large fragments that are rounded or angular, respectively. Chemical sedimentary rocks include biochemical rocks that were created by a living creature.

17. Sedimentary rocks are used construction as building stones. They are broken into sand and gravel to make rock piles (like beneath railroad tracks) or to make concrete or asphalt.

## 4.4 Metamorphic Rocks

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

1. Metamorphism occurs when there is
  - a. heat only
  - b. pressure only
  - c. heat and pressure together
  - d. all of the above
2. Metamorphic rocks change
  - a. physically only
  - b. chemically only
  - c. physically and chemically together
  - d. any of the above
3. Contact metamorphism is caused by
  - a. heat from magma
  - b. water pressure
  - c. the weight of overlying rock
  - d. atmospheric pressure
4. Metamorphism changes rocks because
  - a. the minerals need to be stable under new conditions
  - b. the rocks melt
  - c. atoms break apart to form new atoms
  - d. the pressure causes foliation in each mineral
5. Regional metamorphism can be the result of
  - a. extreme heat
  - b. fluid infiltration
  - c. intense pressure from all directions
  - d. melting

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. Foliation occurs when pressure is exerted from all directions equally.
- \_\_\_\_\_ 7. Regional metamorphism may expose rocks to high pressure and low temperature.
- \_\_\_\_\_ 8. A metamorphic rock can be metamorphosed.

\_\_\_\_\_ 9. A metamorphic rock nearly always resembles its original parent rock.

\_\_\_\_\_ 10. Metamorphic rocks can always be distinguished from igneous and sedimentary rocks because they are foliated.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. During metamorphism, \_\_\_\_\_ move between minerals.

12. A metamorphic rock with alternating bands of light and dark minerals is \_\_\_\_\_.

13. \_\_\_\_\_ metamorphism occurs when existing rock is altered by heat from a nearby magma.

14. A rock that is exposed to so much heat and pressure that it melts will cool to become a(n) \_\_\_\_\_ rock.

15. Banded layers found in metamorphic rock are known as \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What is hornfels? What processes lead to its creation?

17. What are metamorphic rocks used for?

---

## Answer Key

1. d 2. d 3. a 4. a 5. c

6. false 7. true 8. true 9. false 10. false

11. ions 12. hornfels 13. Contact 14. igneous 15. foliation

16. Hornfels is a metamorphic rock made of alternating bands of light and dark minerals. When a rock is heated the minerals rearrange themselves by density.

17. Hard metamorphic rocks, like quartzite and marble, can be used for building materials and artwork. Marble is used for statues and decorative items. It can be the facades of buildings. Quartzite may be used for small stones like to hold up railroad tracks.

## 4.5 Studying Rocks

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which type of rock forms from cooling magma?
  - igneous
  - sedimentary
  - metamorphic
  - all of these.
- Gravel, sand, silt, or clay are types of
  - minerals
  - rocklets
  - sediments
  - none of these
- How are igneous rocks classified?
  - size and shape
  - composition and grain size
  - texture and grain size
  - none of these
- What is the primary process by which rocks break down into sediments?
  - transport
  - weathering
  - erosion
  - pressure
- By raising their pressure temperature enough, rocks may form
  - new minerals
  - minerals bands
  - layers
  - all of these
- What are the flat layers that form as rocks are squeezed called?
  - foliation
  - layers
  - hornfels
  - bedding planes
- Sediments come together by these processes to create sedimentary rocks.
  - compaction and cementation



- b. precipitation and cementation
  - c. compaction and precipitation
  - d. compaction, cementation and precipitation
8. Regional metamorphism is due to extreme pressure caused by
- a. heat from magma
  - b. water pressure
  - c. the weight of overlying rock
  - d. atmospheric pressure
9. When sediments are buried the weight above them can make them into \_\_\_\_\_ rocks. When they are buried by more weight they can become \_\_\_\_\_ rocks.
- a. regional metamorphic; intrusive igneous
  - b. cemented sedimentary; intrusive igneous
  - c. clastic sedimentary; contact metamorphic
  - d. clastic sedimentary; regional metamorphic
10. For an igneous rock to become a metamorphic rock it must
- a. melt and then cool
  - b. be broken into fragments and then cemented together
  - c. change composition or mineral shape by heat or pressure
  - d. An igneous rock cannot become a metamorphic rock.

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Rocks are naturally formed, non-living material.
- \_\_\_\_\_ 12. Most rocks are made up of only one type of mineral.
- \_\_\_\_\_ 13. Rocks are classified by their texture only.
- \_\_\_\_\_ 14. Precipitates are the solid materials left behind after a liquid evaporates.
- \_\_\_\_\_ 15. As magma cools, different crystals form in the process known as metamorphism.
- \_\_\_\_\_ 16. When a rock melts completely it can become the metamorphic rock migmatite.
- \_\_\_\_\_ 17. The rock cycle describes the transformation of one type of rock to another.
- \_\_\_\_\_ 18. When sediments become sedimentary rock they often have changes in composition.
- \_\_\_\_\_ 19. The White House is made of pink sandstone that was painted white.
- \_\_\_\_\_ 20. Fossils are the remains of once-living organisms.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. \_\_\_\_\_ igneous rocks solidify beneath the surface.
22. \_\_\_\_\_ cooling allows time for large crystals to form.
23. Sediments are laid down, or \_\_\_\_\_, before they can be formed into sedimentary rocks.
24. Fluids that crystallize in the spaces between the loose particles of sediments create rock by \_\_\_\_\_.
25. \_\_\_\_\_ metamorphism changes enormous quantities of rock over a wide area.
26. \_\_\_\_\_ metamorphism changes a rock that is in contact with magma because of the extreme heat.
27. In a metamorphic, minerals separate by \_\_\_\_\_ into lighter and darker bands.

28. The rocks that form from an erupting volcano are \_\_\_\_\_ rocks.
29. Cemented sediments become \_\_\_\_\_ sedimentary rocks.
30. \_\_\_\_\_ occurs when sediments are squeezed together by the weight of overlying sediments on top of them.

**Short Answer**

*Answer each question in the space provided.*

31. Briefly describe how igneous rocks form. How do both of the two main subcategories form?
32. Briefly describe how sedimentary rocks form. How do both of the two main subcategories form?
33. Briefly describe how metamorphic rocks form. How do both of the two main subcategories form?

---

**Answer Key**

1. a 2. c 3. b 4. b 5. d 6. a 7. a 8. c 9. d 10. c

11. true 12. false 13. false 14. true 15. false 16. false 17. true 18. false 19. false 20. true

21. Intrusive 22. Slow 23. deposited 24. cementation 25. Regional 26. Contact 27. density 28. extrusive igneous  
29. clastic 30. Compaction

31. Igneous rocks form as magma crystallizes. This can take place rapidly above ground to create extrusive igneous rocks or slowly below ground to create intrusive igneous rocks.

32. Sedimentary rocks are made of particles that are compacted and/or cemented together, called clastic sedimentary rocks, or they are made of chemical precipitates, called chemical sedimentary rocks.

33. Metamorphic rocks are altered by extreme heat and/or pressure. They can be caused by being close to a magma body (contact metamorphism) or by being deeply buried or exposed to pressure (regional metamorphism).

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CHAPTER **5**

# MS Earth's Energy Assessments

## Chapter Outline

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- 5.1 ENERGY RESOURCES
  - 5.2 NON-RENEWABLE ENERGY RESOURCES
  - 5.3 RENEWABLE ENERGY RESOURCES
  - 5.4 EARTH'S ENERGY
-

## 5.1 Energy Resources

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

- Kinetic energy is the energy that
  - is stored in food
  - comes from the sun to our planet
  - is contained by a body in motion
  - is stored by a body that is about to do work.
- Energy
  - can be created or destroyed
  - cannot be created or destroyed
  - can be created but not destroyed
  - can be destroyed but not created
- Fuel
  - can help you to kick a soccer ball
  - stores energy
  - releases energy
  - all of the above
- Fossil fuels
  - take millions of years to form
  - are plentiful all over the planet
  - are made of renewable resources
  - have few environmental consequences
- Possible problems with renewable energy sources include
  - they are limited in their availability
  - they may be expensive
  - they cause a lot of pollution
  - all of the above

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. A fuel is any material that can release energy in a chemical change.
- \_\_\_\_\_ 7. All energy sources are renewable.
- \_\_\_\_\_ 8. Breathing does not require energy because it happens without our noticing.

- \_\_\_\_\_ 9. Energy cannot be created or destroyed.  
\_\_\_\_\_ 10. Stored energy is called potential energy.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. Energy is stored and released by \_\_\_\_\_.  
12. When a fuel is burned, most of the energy is released as \_\_\_\_\_.  
13. \_\_\_\_\_ is the ability to do work.  
14. The partially decomposed remains of plants and animals make up \_\_\_\_\_.  
15. Solar, tidal, and wind energy are examples of \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. What does the law of conservation of energy say? Give an example of how it works.

17. What characteristics does a material need to have if it is going to be useful as an energy resource?

---

**Answer Key**

1. c 2. b 3. d 4. a 5. b  
6. true 7. false 8. false 9. true 10. true  
11. fuel 12. heat 13. Energy 14. fossil fuels 15. renewable energy  
16. The law of conservation of energy states that energy cannot be created or destroyed. Energy can only change form. The energy that you use to hit a nail with a hammer comes indirectly from the sun. A plant takes solar energy

and creates food energy. You eat the food energy and store it in your body as chemical energy. As you hit the nail with your hammer, that chemical energy does work.

17. The resource must be able to be turned into a useful form of energy in a practical way. The resource must produce significantly more energy than it takes to produce it. The resource must not produce large amounts of pollutants

## 5.2 Non-renewable Energy Resources

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

- To be useful, oil must be located in a(n) \_\_\_\_\_ rock layer and trapped by a(n) \_\_\_\_\_ rock layer.
  - impermeable, permeable
  - permeable, impermeable
  - impermeable, impermeable
  - permeable, permeable
- Which of the following fuels produces the least amount of carbon dioxide per unit of energy?
  - coal
  - oil
  - natural gas
  - all of these produce the same amount of carbon dioxide.
- Fuel made primarily of methane is called
  - coal
  - petroleum
  - natural gas
  - liquid gas
- The main gases that are a by-product of burning gasoline are
  - water vapor and carbon dioxide
  - carbon dioxide and sulfur compounds
  - sulfur compounds and nitrogen compounds
  - nitrogen compounds and carbon dioxide
- Nuclear power that is currently in use comes from.
  - combustion of uranium atoms
  - splitting uranium atoms
  - fusing uranium atoms
  - breaking electrons away from a uranium atom

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. Fossil fuels come from the remains of ancient organisms.
- \_\_\_\_\_ 7. Hydrocarbons are all liquids, like gasoline.
- \_\_\_\_\_ 8. Oil and gas will fill our needs for a time period on the order of thousands of years.



\_\_\_\_\_ 9. Nuclear power plants produce so much energy because the process is not controlled.

\_\_\_\_\_ 10. Natural gas is useful as a fuel more-or-less as it comes out of the ground.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Chemicals made of one carbon atom and four hydrogen atoms are called \_\_\_\_\_.

12. A solid fossil fuel that is burned primarily for electricity is \_\_\_\_\_.

13. A major pollutant in coal is the element \_\_\_\_\_.

14. Ancient organisms that have been preserved in some form over time are \_\_\_\_\_.

15. The biggest contributor to global warming is the fossil fuel \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Describe how fossil fuels form.

17. Describe the process that turns coal into electricity.

---

## Answer Key

1. b 2. c 3. c 4. a 5. b

6. true 7. false 8. false 9. false 10. true

11. hydrocarbons 12. coal 13. sulfur 14. fossil fuels 15. coal

16. Plants and animals in a swamp, lake or shallow sea die and settle to the bottom. Sediment accumulates over the top and the remains are buried. The weight compresses the organic material and it becomes hot. After millions of years, the organic material turns into chemicals called hydrocarbons.

17. Coal is first mined and then crushed into powder. The powder is burned in a furnace. The furnace heats water in a boiler, which creates steam. The steam spins turbines, which turn generators, which creates electricity.

## 5.3 Renewable Energy Resources

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

- The primary barrier to solar energy use is that it
  - is not technically feasible
  - causes major pollution problems
  - is too expensive compared to other energy sources
  - all of these
- Hydroelectric plants
  - produce a lot of greenhouse gases
  - create a reservoir that may bury natural or cultural resources
  - release sediment that can bury a landscape
  - produce nitric acid that falls as acid rain
- Wind power
  - comes indirectly from solar energy
  - is cheap to harness on a large scale
  - is welcomed by people everywhere
  - produces a lot of greenhouse gases
- Geothermal energy
  - has extreme safety issues because it is so hot
  - is best where hot water comes to the surface
  - requires cool water be pumped into the ground
  - produces a lot of greenhouse gases
- When energy moves through material, but the material itself does not move, this is
  - radiation
  - convection
  - electromagnetism
  - conduction

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. Wind power has only been harnessed in recent years.
- \_\_\_\_\_ 7. The largest geothermal power plant in the United States is in Iceland.
- \_\_\_\_\_ 8. To produce electricity, a resource must somehow turn a turbine.

\_\_\_\_\_ 9. The land upstream of a dam may be flooded.

\_\_\_\_\_ 10. Most of Earth's energy comes directly or indirectly from the Sun.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. In principle, \_\_\_\_\_ resources will never run out.

12. \_\_\_\_\_ energy comes from plants and animals that were recently living.

13. Solar energy is carried between the Sun and Earth as \_\_\_\_\_.

14. Where cool Pacific Ocean air is pulled into warmer inland valleys, \_\_\_\_\_ power may be harnessed.

15. Energy moving from a higher temperature object to an adjacent lower temperature object it is called \_\_\_\_\_ - \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. How do solar power plants turn sunlight into electricity?

17. Describe how a hydroelectric dam harnesses the energy of stored water.

---

## Answer Key

1. c 2. b 3. a 4. b 5. d

6. false 7. false 8. true 9. true 10. true

11. renewable 12. Biomass 13. radiation 14. wind 15. conduction

16. Mirrors focus sunlight onto a receiver. A liquid is heated and transfers heat by conduction. That energy is used to make electricity.

17. A dam holds the water from a stream behind it to create a reservoir. The water in the reservoir has a lot of potential energy. The water flows downhill through a turbine. The moving water has kinetic energy, which it transfers to the turbine, which is collected to a generator, which makes electricity.

## 5.4 Earth's Energy

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Most of Earth's energy comes from the Sun. Where does the rest come from?
  - a. nuclear fusion
  - b. biomass
  - c. fossil fuels
  - d. internal heat
2. What type of energy is used when your body breaks down the food you eat?
  - a. kinetic
  - b. chemical
  - c. potential
  - d. nuclear
3. Which of the following does not produce carbon dioxide?
  - a. oil
  - b. nuclear
  - c. coal
  - d. natural gas
4. Nuclear fusion powers \_\_\_\_\_.
  - a. the Sun
  - b. Earth's internal heat
  - c. nuclear power plants
  - d. none of these
5. Resources that will not run out are called
  - a. non-infinite
  - b. infinite
  - c. renewable
  - d. non-renewable
6. Before fossil fuel use became widespread, which of the following did people use for energy?
  - a. wind
  - b. water
  - c. animals
  - d. all of these
7. What is the single largest source of energy for electricity?
  - a. coal

- b. oil
- c. natural gas
- d. wind

## 8. The United States

- a. is a net oil exporter
- b. produces just as much oil as it uses
- c. produces far less oil than it uses
- d. has no oil resources

## 9. The transfer of light energy from the sun to the earth is known as...

- a. reflection
- b. radiation
- c. fusion
- d. fission

## 10. What is the world's most widely used form of renewable energy?

- a. solar
- b. wind
- c. hydropower
- d. geothermal

**True or False**

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. The law of conservation of energy states that energy cannot be created or destroyed.
- \_\_\_\_\_ 12. Potential energy is the energy of anything in motion.
- \_\_\_\_\_ 13. The energy to make electricity comes from heat.
- \_\_\_\_\_ 14. Wind, geothermal, solar and nuclear energy are all examples of renewable energy resources.
- \_\_\_\_\_ 15. Fossil fuels come from organisms that died many millions of years ago.
- \_\_\_\_\_ 16. Hydrocarbons can be solid, liquid or gaseous.
- \_\_\_\_\_ 17. All fossil fuels can be made into liquids.
- \_\_\_\_\_ 18. Crude oil is so pure it needs no refining.
- \_\_\_\_\_ 19. Wind farms are sometimes not developed because they are considered to be unsightly.
- \_\_\_\_\_ 20. Oil is used to produce waxes, plastics, fertilizers, and other products.

**Fill in the Blanks**

Fill in the blank with the term that best completes the sentence.

21. \_\_\_\_\_ is the ability to do work and produce change.
22. When you hold a ball above the ground the ball has \_\_\_\_\_ energy.
23. \_\_\_\_\_ is any material that can release energy in a chemical change.
24. \_\_\_\_\_ resources will not run out because they are extremely abundant or rapidly replaced.
25. Coal may contain impurities such as \_\_\_\_\_.
26. \_\_\_\_\_ is a liquid fossil fuel that can be used in vehicles.
27. Nuclear power plants use the element \_\_\_\_\_ that has been concentrated into fuel rods.
28. Natural gas is mostly the hydrocarbon \_\_\_\_\_.

29. The movement of hot material to a cooler location is \_\_\_\_\_.
30. \_\_\_\_\_ power is the fastest growing renewable energy source in the world.

**Short Answer**

*Answer each question in the space provided.*

31. What are the upsides of nuclear power? What are the downsides of nuclear power?

32. What are the advantages and disadvantages of wind power?

33. Explain the problems with non-renewable energy sources.

---

**Answer Key**

1. d 2. b 3. b 4. a 5. c 6. d 7. a 8. c 9. b 10. c

11. true 12. false 13. false 14. false 15. true 16. true 17. false 18. false 19. true 20. true

21. Energy 22. potential 23. Fuel 24. Renewable 25. sulfur 26. Petroleum 27. uranium 28. methane 29. conduction

30. Wind



31. Nuclear power is clean. It does not release pollutants including greenhouse gases. However, radioactive waste is dangerous for thousands of hundreds of thousands of years and there is no plan yet for long-term storage. Also, uranium mining is potentially harmful to the environment.

32. Advantages - Wind power is clean. It doesn't release pollution or carbon dioxide. It is available in many places. Disadvantages – Wind doesn't blow all the time. People in scenic locations don't like to mar their view with windmills.

33. Non-renewable resources are found on Earth in a limited amount. They will run out eventually. Obtaining and using these resources often produces pollution or has other serious environmental impacts. Greenhouse gases are released, which can cause climate change.

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CHAPTER **6**

# MS Plate Tectonics Assessments

## Chapter Outline

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- 6.1 INSIDE EARTH
  - 6.2 CONTINENTAL DRIFT
  - 6.3 SEAFLOOR SPREADING
  - 6.4 THEORY OF PLATE TECTONICS
  - 6.5 PLATE TECTONICS
-

## 6.1 Inside Earth

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

1. Seismic waves travel
  - a. at the same speed
  - b. through all materials
  - c. outwards in all directions
  - d. in a straight line
2. The lithosphere is
  - a. the brittle crust and uppermost mantle
  - b. another name for the crust
  - c. where convection is strongest
  - d. the upper part of the mantle
3. Scientists know that Earth's core is metal because of
  - a. the planet's high overall density
  - b. the magnetic field
  - c. metallic meteorites
  - d. all of these
4. Compared to continental crust, oceanic crust
  - a. is thicker
  - b. is denser
  - c. more varied in its rock types
  - d. more magnetic
5. Heat in the mantle moves by
  - a. radiation
  - b. conduction
  - c. convection
  - d. heat flow

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. Some seismic waves (S-waves) cannot travel through the outer core so we know it is molten.
- \_\_\_\_\_ 7. The lithosphere is solid but it can flow.
- \_\_\_\_\_ 8. The mantle and the asthenosphere are different names for the same thing.

\_\_\_\_\_ 9. We can hold something like the core in our hands: a metallic meteorite.

\_\_\_\_\_ 10. Meteorites may represent material from the early solar system.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Earthquake energy travels through rocks as \_\_\_\_\_.

12. The outer brittle layer of the Earth is called the \_\_\_\_\_.

13. When heat moves from warmer to cooler objects without material moving it is called \_\_\_\_\_.

14. \_\_\_\_\_ crust is made of igneous, sedimentary and metamorphic rocks.

15. Warm mantle rises and sinks in a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided*

16. How do seismic waves give information to scientists about Earth's interior layers?

17. What are the three layers of Earth that differ in chemical composition? Give a brief description.

---

## Answer Key

1. c 2. a 3. d 4. b 5. c

6. true 7. false 8. false 9. true 10. true

11. seismic waves 12. lithosphere 13. conduction 14. Continental 15. convection cell

16. Seismic waves change speed as they move through different materials, causing them to bend. Some seismic waves cannot travel through all materials. The movements of seismic waves indicates the makeup of Earth's interior.

17. The innermost layer is the dense, iron core. The inner core is solid but the outer core is liquid. The next layer out is the mantle. It is composed of hot, solid rock. There is convection in the mantle. The outermost layer is the crust, which is thin and brittle. There are two types: thicker, less dense continental crust, and the thinner denser oceanic crust.

## 6.2 Continental Drift

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

- Mountain ranges located on both side of the Atlantic Ocean
  - are the same height and width
  - have the same rock types, structures and ages
  - have ancient fossils and coal seams
  - are just separate mountain ranges
- Scientists didn't accept the continental drift idea because
  - there was almost no evidence for it
  - Wegener was not liked and no one listened to him
  - there were many other ways to explain the evidence
  - none of these
- Magnetic minerals in volcanic rock point to
  - the current north magnetic pole
  - the north magnetic pole at the time they crystallized
  - the north magnetic pole on the adjacent continent.
  - none of these
- Wegener's idea is correctly referred to as
  - the continental drift hypothesis
  - the continental drift theory
  - the plate tectonics hypothesis
  - the plate tectonics theory
- What was Wegener's continental drift idea?
  - The continents have always been located at their current locations.
  - The continents are moving slowly together from their current locations.
  - The continents have moved slowly apart to their current locations.
  - None of these

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. Similar fossil records across continents was evidence for continental drift.
- \_\_\_\_\_ 7. The magnetic north pole and geographic north pole are in the same location.
- \_\_\_\_\_ 8. If an ancient coral reef is found in the arctic it means that the continent it is on has drifted.

- \_\_\_\_\_ 9. The continents have never all been together as a single whole continent.
- \_\_\_\_\_ 10. The locations of ancient climate zones provide evidence for continental drift.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. Alfred Wegener named his single supercontinent \_\_\_\_\_, which means "all Earth" in ancient Greek.
12. Coal is mined in many cold regions, but it is thought to form in \_\_\_\_\_ climates.
13. The most common type of magnetic minerals called \_\_\_\_\_.
14. Rocks and structures on both sides of the \_\_\_\_\_ Ocean are very similar.
15. When all the continents are together, it is called a(n) \_\_\_\_\_ continent.

**Short Answer**

*Answer each question in the space provided*

16. How and why does the seed fern, Glossopteris, provide evidence that the continents were once all joined together?

17. Why did scientists reject Wegener's continental drift idea?

---

**Answer Key**

1. b 2. d 3. b 4. a 5. c
6. true 7. false 8. true 9. false 10. true
11. Pangaea 12. tropical or subtropical 13. magnetite 14. Atlantic 15. supercontinent
16. Glossopteris seed fossils are found across all of the southern continents. The seeds are too heavy to be blown across oceans. So the most likely explanation is that the continents were together at the time Glossopteris was alive.

17. There was no mechanism to explain how a solid continent could move through the ocean basins.



## 6.3 Seafloor Spreading

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

1. Before echo sounders, scientists thought topography of the seafloor
  - a. was just like the topography of the continents
  - b. had many long linear mountain ranges, like Japan
  - c. had lots of small hills, but nothing else
  - d. was completely flat
2. In the Atlantic Ocean, the mid-ocean ridge is
  - a. a straight line between the Americas and Europe/Africa
  - b. a line that mimics the coastlines of the Americas and Europe/Africa
  - c. not visible
  - d. none of these
3. At a time of reversed magnetic polarity, the north and south poles are
  - a. aligned as they are now
  - b. in somewhat different locations from where they are now
  - c. in the opposite positions from where they are now
  - d. none of these
4. New oceanic crust is created
  - a. at mid-ocean ridges
  - b. at deep sea trenches
  - c. within abyssal plains
  - d. at long, linear chains of volcanoes
5. Since new oceanic crust is being created
  - a. Earth must be getting larger
  - b. mountains must be rising somewhere
  - c. old crust must be destroyed somewhere
  - d. none of these

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. Two different plates of lithosphere lie on each side of the mid-ocean ridge.
- \_\_\_\_\_ 7. The mid-ocean ridge is the longest mountain range on Earth.
- \_\_\_\_\_ 8. The mid-ocean ridge is only found in the Atlantic Ocean.

- \_\_\_\_\_ 9. The seafloor is oldest at the mid-ocean ridges  
\_\_\_\_\_ 10. Magnetic polarity stripes end at the edges of continents.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. The depth of the ocean floor can be recorded by using a(n) \_\_\_\_\_.  
12. Seafloor maps were first made using data gathered during the historical event called \_\_\_\_\_.  
13. The flat areas of the oceans are called the \_\_\_\_\_.  
14. When the magnetic poles switch positions, the \_\_\_\_\_ pole becomes the \_\_\_\_\_ pole.  
15. At mid-ocean ridges, hot \_\_\_\_\_ rises to the surface.

**Short Answer**

*Answer each question in the space provided*

16. Describe the patterns of the magnetic stripes around the mid-ocean ridge.

17. Describe the seafloor spreading hypothesis.

---

**Answer Key**

1. d 2. b 3. c 4. a 5. c

6. true 7. true 8. false 9. false 10. true

11. echo sounder 12. World War II 13. abyssal plains 14. north pole, south pole OR south pole, north pole 15. magma

16. Stripes are symmetrical on both sides of the mid-ocean ridge. On the ridge, the stripe has normal polarity. On both sides of it, the stripes have reversed polarity. This pattern of normal and reversed goes symmetrically away

from the ridge across the seafloor. It creates a mirror image.

17. Hot buoyant magma rises through through the crust and erupts at the mid-ocean ridge. The new crust takes on the magnetic polarity at the time it cools. More new magma rises into the space and pushes the new seafloor outward. This may push a continent along.

## 6.4 Theory of Plate Tectonics

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

Circle the letter of the correct choice.

1. Earth's plates are made of slabs of
  - a. crust
  - b. upper mantle
  - c. crust and upper mantle
  - d. asthenosphere
2. The outlines of the plates are located by mapping
  - a. earthquake epicenters
  - b. continental margins
  - c. the locations of earthquake faults
  - d. mid-ocean ridges
3. If a divergent plate boundary is found within a continent,
  - a. a line of volcanoes forms
  - b. a subduction zone forms
  - c. the continent rifts apart
  - d. none of these.
4. An island arc forms when
  - a. two oceanic plates diverge
  - b. a continental plate sub ducts beneath an oceanic plate
  - c. an oceanic plate sub ducts beneath a continental plate
  - d. an oceanic plate sub ducts beneath an oceanic plate
5. Plate tectonics theory says that
  - a. Earth's geography has been the same for all geologic time
  - b. Earth's geography is continually changing
  - c. all geological activity happens at plate boundaries
  - d. continents drift but scientists do not yet know why.

#### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 6. All volcanoes and earthquakes take place at plate boundaries.
- \_\_\_\_\_ 7. At transform plate boundaries, two plates move toward each other.
- \_\_\_\_\_ 8. All earthquakes at transform plate boundaries are fairly small.

\_\_\_\_\_ 9. Seafloor spreading is what makes the continents move.

\_\_\_\_\_ 10. The youngest volcano in Hawaii is below sea level.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. New land is created at a \_\_\_\_\_ plate boundary.

12. The Hawaiian Island chain was formed by a(n) \_\_\_\_\_.

13. Volcanoes are caused by the \_\_\_\_\_ of one plate under another.

14. The line of volcanoes of South America are a(n) \_\_\_\_\_ caused by subduction.

15. The continuous joining and separating of landmasses is known as the \_\_\_\_\_ cycle.

### Short Answer

*Answer each question in the space provided*

16. Describe the process that causes the plates to move.

17. What are the three types of plate boundaries? How do the plates move relative to each other? At which are there volcanoes? At which are there earthquakes?

---

## Answer Key

1. c 2. a 3. c 4. d 5. b

6. false 7. false 8. false 9. true 10. true

11. divergent 12. hotspot 13. subduction 14. continental arc 15. supercontinent

16. Hot mantle material rises up to near the surface and moves horizontally, cooling as it goes. It descends back into the mantle. This creates and moves plates of oceanic crust. If the plate has continental crust on it, it the continent

will move too.

17. Plates move apart at divergent plate boundaries. They have volcanic eruptions and shallow earthquakes. Plates move together at convergent plate boundaries. They have volcanic eruptions and shallow through deep earthquakes. Plates slide past each other at transform boundaries. They have earthquakes but no volcanoes.

## 6.5 Plate Tectonics

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Scientists learn about our planet's interior from
  - a. tracking seismic waves
  - b. probes in deep mines
  - c. diving into deep ocean trenches
  - d. satellite imagery
2. The lithosphere
  - a. is partially molten
  - b. is brittle
  - c. behaves plastically
  - d. can flow
3. How did Wegener explain the presence of Mesosaurus fossils on Africa and South America?
  - a. The continents were joined when Mesosaurus lived and then moved apart.
  - b. Mesosaurus swam across the Atlantic Ocean
  - c. a land bridge across the Atlantic Ocean connected the two continents
  - d. none of these
4. Which process moves heat from the warmer to cooler places until all are the same temperature?
  - a. radiation
  - b. convection
  - c. conduction
  - d. none of the above
5. During the time of Pangaea,
  - a. organisms lived side-by-side that are now fossils on distant continents.
  - b. there was no Atlantic Ocean.
  - c. there was one magnetic north pole.
  - d. all of these.
6. Everywhere across the seafloor, scientists find
  - a. flat, sediment covered bathymetry.
  - b. increasing crust thickness toward the mid-ocean ridges.
  - c. magnetic stripes with normal or reversed polarity.
  - d. none of the above
7. Volcanoes are found at \_\_\_\_\_ plate boundaries.
  - a. all three types of

- b. divergent and convergent
  - c. convergent and transform
  - d. transform and divergent
8. What type of plate boundary is found at the San Andreas Fault?
- a. convergent
  - b. divergent
  - c. transform
  - d. none of the above
9. With distance from the mid-ocean ridge
- a. the crust becomes thicker
  - b. the sediment becomes thinner
  - c. the rocks become younger
  - d. none of these
10. All deep sea trenches are located
- a. in the polar regions
  - b. in the middle of the oceans
  - c. at the edges of continents
  - d. near chains of active volcanoes

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Continental crust is thicker than oceanic crust.
- \_\_\_\_\_ 12. In a magnetic reversal, the north and south magnetic poles switch.
- \_\_\_\_\_ 13. A new supercontinent forms about every 500,000,000,000 years.
- \_\_\_\_\_ 14. Continental crust is too thick for hotspot volcanoes to break through.
- \_\_\_\_\_ 15. Metallic meteorites represent Earth's core.
- \_\_\_\_\_ 16. The Himalaya Mountains rise up at a transform plate boundary.
- \_\_\_\_\_ 17. The magnetic field is caused by convection in the mantle.
- \_\_\_\_\_ 18. Some rocks found on opposite sides of the Atlantic are extremely similar in type and age.
- \_\_\_\_\_ 19. The continents can fit together like pieces of a puzzle.
- \_\_\_\_\_ 20. Wegener used fossil evidence to support his continental drift hypothesis.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. \_\_\_\_\_ waves are released in all directions from an earthquake.
22. The \_\_\_\_\_ is composed of hot rock that can flow.
23. The core is composed of \_\_\_\_\_.
24. \_\_\_\_\_ are flat areas in ocean basins that are covered with sediment.
25. A \_\_\_\_\_ is a line of volcanoes caused by the subduction of an oceanic plate beneath a continental plate.
26. Subduction destroys older crust at deep sea \_\_\_\_\_.
27. Geological activity that occurs away from plate boundaries is called \_\_\_\_\_ activity.
28. The edges of continental plates can be drawn by connecting the dots that mark \_\_\_\_\_ epicenters.



29. Lithospheric plates move at the rate of a few \_\_\_\_\_ per year.

30. The Himalayan Mountains rise at a(n) \_\_\_\_\_ plate boundary.

### Short Answer

*Answer each question in the space provided.*

31. List the three types of plate boundaries and describe the motion of each.

32. List the evidence for continental drift.

33. Diagram and describe the internal structure of Earth.

---

## Answer Key

1. a 2. b 3. a 4. c 5. d 6. c 7. b 8. c 9. a 10. d

11. true 12. true 13. false 14. false 15. true 16. false 17. false 18. true 19. true 20. true

21. Seismic 22. asthenosphere or mantle 23. metal 24. Abyssal plain 25. continental arc 26. trenches 27. intraplate  
28. earthquake 29. centimeters 30. convergent

31. Divergent – two plate move away from each other. Convergent – the two plates move towards each other. Transform – the two plates slip past each other.

32. Identical rocks on both sides of the Atlantic Ocean. Mountain ranges with the same rock types and structures on opposite sides of the Atlantic Ocean. Ancient fossils of the same species of extinct plants and animals are found in rocks of the same age but are on continents that are now widely separated. The organisms could not have traveled across the ocean when alive. Grooves and rock deposits left by ancient glaciers are found on different continents. Ancient coral reefs and coal seams are found in locations where it is much too cold for them to develop today.

33. Crust – outermost and thinnest layer of the earth – made of rock. Two types: continental and oceanic. Lithosphere – is the outermost layer, brittle and can break, is about 100 km thick. Mantle – made of solid ultramafic rock and is hot – convection occurs here. Core – iron and nickel metal is composition; outer is liquid, inner is solid. Convection in the outer core produces the magnetic field.

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CHAPTER **7**

# MS Earthquakes Assessments

## Chapter Outline

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- 7.1 STRESS IN EARTH'S CRUST
  - 7.2 THE NATURE OF EARTHQUAKES
  - 7.3 MEASURING AND PREDICTING EARTHQUAKES
  - 7.4 STAYING SAFE IN EARTHQUAKES
  - 7.5 EARTHQUAKES
-

## 7.1 Stress in Earths Crust

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- As a rock experiences more stress it
  - deforms plastically, then elastically, then breaks
  - breaks, then deforms plastically, then elastically
  - deforms elastically, then plastically, then breaks
  - breaks, then deforms elastically, then plastically
- In the Grand Canyon, the Kaibab Limestone is above the Toroweap Formation. We can say that
  - the Kaibab is the oldest rock layer in the canyon
  - the Toroweap is the oldest rock layer in the canyon
  - the Kaibab is older than the Toroweap
  - the Toroweap is older than the Kaibab
- When rocks deform plastically, they tend to
  - return to their original state.
  - fold
  - break
  - fracture
- In a normal fault,
  - the fault plane is roughly vertical
  - the dip of the fault plane is nearly horizontal
  - the hanging wall pushes up relative to the footwall
  - the footwall pushes up relative to the hanging wall
- Large mountain ranges, like the Grand Tetons in Wyoming, are uplifted on
  - normal faults
  - reverse faults
  - dip-slip faults
  - strike-slip faults

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. If very old rocks are above much younger rocks there may be a thrust fault in between.
- \_\_\_\_\_ 7. A deeply buried rock is under compressive stresses.
- \_\_\_\_\_ 8. The terrain known as basin-and-range is caused by compressive forces.

\_\_\_\_\_ 9. The amount the ground moves in an earthquake is called slip.

\_\_\_\_\_ 10. In a strike-slip fault, the dip of the fault plane is vertical.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Forces that pull rocks apart are called \_\_\_\_\_ forces.

12. A break in rock along which there is no movement is a(n) \_\_\_\_\_.

13. A fold that bends down in the center is a(n) \_\_\_\_\_.

14. The displacement of rocks on either side of a \_\_\_\_\_ fault can be hundreds of miles.

15. An eroded \_\_\_\_\_ will have oldest rock layer found at the center.

### Short Answer

*Answer each question in the space provided.*

16. List and briefly describe the four different types of stress.

17. Describe the plate tectonics setting that is causing the rise of the Himalaya Mountains.

---

## Answer Key

1. c 2. d 3. b 4. d 5. a

6. true 7. true 8. false 9. true 10. true

11. tensional 12. joint 13. syncline 14. strike-slip 15. dome

16. Confining stress: The stress that comes from the weight of all the material above a rock. Compression: The stress of rocks being squeezed together. Tension: The stress of rocks being pulled apart. Shear: The stress from forces that are parallel but moving in opposite directions.

17. The Indian plate is moving northward and running into the Eurasian plate. This compressional stress is causing the continental crust to crumple upwards and create a mountain range.

## 7.2 The Nature of Earthquakes

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Earthquakes cause \_\_\_\_\_ faulting.
  - normal
  - reverse
  - thrust
  - all of these
- When a S wave travels from a solid to a liquid, its velocity
  - stays the same
  - increases
  - decreases
  - ends, because the wave can't travel through a liquid.
- Deep earthquakes, more than 300 km (200 miles) deep, are associated with \_\_\_\_\_.
  - convergent plate boundaries
  - divergent plate boundaries
  - transform plate boundaries
  - all of these
- The San Andreas Fault
  - is where the Pacific Plate sub ducts beneath the North American Plate.
  - is part of the ring of volcanoes and earthquakes around the Pacific Ocean basin.
  - is the fault where all major earthquakes occur in California.
  - is the site of shallow, intermediate and deep focus earthquakes.
- An earthquake in the New Madrid, Missouri seismic zone
  - would not kill many people; only 20 died in 1812.
  - would not kill many people; earthquakes on the fault are fairly small.
  - could kill many times more people than in 1812.
  - will not happen again; the 1812 quake relieved the stresses.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Earthquakes at divergent boundaries tend to be small.
- \_\_\_\_\_ 7. The height of a seismic wave is known as its wavelength.
- \_\_\_\_\_ 8. Sea waves from earthquakes can devastate coasts but be unnoticed at sea.

- \_\_\_\_\_ 9. The Seismic Wave Theory explains how earthquakes occur.
- \_\_\_\_\_ 10. About 95% of earthquakes occur along the three types of plate boundaries.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. Seismic waves that travel through the body of a planet are known as \_\_\_\_\_.
12. \_\_\_\_\_ are scientists that study earthquakes.
13. The distance between two adjacent wave crests or wave troughs is called \_\_\_\_\_.
14. After the Pacific basin, the region most likely to experience earthquakes is the \_\_\_\_\_.
15. The \_\_\_\_\_ of the earthquake was located 10 km below the surface.

**Short Answer**

*Answer each question in the space provided.*

16. Describe what causes a tsunami and why one is so destructive.

17. Explain elastic rebound theory.

---

**Answer Key**

1. d 2. d 3. a 4. b 5. c
6. true 7. false 8. true 9. false 10. true
11. body waves 12. Seismologists 13. wavelength 14. Mediterranean-Asiatic belt 15. focus
16. Tsunami mostly result from earthquakes at subduction zones. The crust moves and displaces the water, which moves rapidly in waves across the ocean. The waves have low amplitude so they are not noticed until they are pushed upward and they compress on a shoreline. Tsunami can grow to be enormous.



17. Stresses build on both sides of a fault. At first, the rocks deform plastically. When the stresses become too great, the rocks deform elastically; that is they break. This releases the built up stress causes the rocks to move to a different location.

## 7.3 Measuring and Predicting Earthquakes

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. If a seismograph records P-waves but not S-waves from an earthquake, it means
  - a. the quake wasn't very strong
  - b. the quake was very far away
  - c. the quake was on the opposite side of the planet
  - d. the seismograph was in the wrong spot
2. Where is the focus with respect to the epicenter?
  - a. directly below the epicenter
  - b. directly above the epicenter
  - c. in the P wave shadow zone
  - d. in the S wave shadow zone
3. Which of the following measures the observed effects on people and structures of an earthquake?
  - a. Richter scale
  - b. Modified Mercalli scale
  - c. the Centigrade scale
  - d. the moment magnitude scale
4. Which of the following statements best describes the state of earthquake prediction?
  - a. scientists can accurately predict the time and location of almost all earthquakes
  - b. scientists can accurately predict the time and location of about 50% of all earthquakes
  - c. scientists can accurately predict when an earthquake will occur, but not where
  - d. scientists can characterize the seismic risk of an area, but cannot yet accurately predict most earthquakes
5. If the arrival time of the first P-wave and the first S-wave is long, the epicenter is
  - a. far away
  - b. very close
  - c. very deep
  - d. near the surface

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Seismographs can help to determine the intensity of an earthquake.
- \_\_\_\_\_ 7. The intensity of an earthquake is directly related to its distance from the epicenter.
- \_\_\_\_\_ 8. An earthquake with magnitude between 8.0 and 8.9 happens about once per year.

\_\_\_\_\_ 9. Scientists can better predict when an earthquake will occur than where it will occur.

\_\_\_\_\_ 10. The time difference between the P & S wave shows the intensity of an earthquake.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The first seismic waves to arrive at a seismograph are the \_\_\_\_\_.

12. The \_\_\_\_\_ of a circle around a seismic station is the distance to an earthquake epicenter.

13. The \_\_\_\_\_ scale measures the largest jolt of energy of an earthquake.

14. To find an earthquake epicenter, you need data from a minimum of \_\_\_\_\_ seismographs.

15. Since 1900 there have been \_\_\_\_\_ earthquakes in the magnitude 9 range.

### Short Answer

*Answer each question in the space provided.*

16. How do scientists determine the distance of an earthquake epicenter from a seismograph?

17. Which is the best scale for giving earthquake magnitude and why?

---

## Answer Key

1. c 2. a 3. b 4. d 5. a

6. false 7. true 8. true 9. false 10. false

11. P-waves 12. radius 13. Richter 14. three 15. five

16. P-waves travel faster than S-waves. The further the waves need to travel the further ahead the P-waves can get. So the difference in the arrival time of the two wave types can be used to calculate the distance to the epicenter.

17. The moment magnitude scale measures the total energy released by an earthquake, but the Richter only measures the energy released by the largest jolt. If a quake is very long but doesn't have any very large jolts, the total amount of energy released (and the damage done) could be very high, but it would measure low on the Richter scale.

## 7.4 Staying Safe in Earthquakes

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which of the following hardly ever kills anyone in an earthquake?
  - structures falling
  - ground shaking
  - fire
  - tsunami
- Not too many people died in the Great Alaska Earthquake in 1964 because
  - few people lived in the area
  - it was not a large quake
  - the ground was so solid that the shock was absorbed.
  - none of these
- If you want to be safe in an earthquake, build your house on
  - soft sediments that absorb shock
  - sediments that will undergo liquefaction
  - solid bedrock
  - any type of ground is fine, just build a solid house
- To keep gas lines and water mains from breaking in an earthquake,
  - make them completely solid so that they don't break.
  - put them above ground so that they don't break.
  - zigzag the pipes so that they bend to absorb ground shaking.
  - b c
- Which of the following is something that you should NOT do during an earthquake.
  - Take an elevator to the ground floor so that you can run outside.
  - Stay away from things that can break or fall on you.
  - Dive underneath a sturdy piece of furniture.
  - Run to an open area if you are outside.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. In case of an earthquake, a one day supply of food and water is enough for a family.
- \_\_\_\_\_ 7. Large buildings can be placed on rollers so that they move as the ground moves.
- \_\_\_\_\_ 8. The largest recorded earthquake was 12.3 on the Richter Scale

\_\_\_\_\_ 9. The projected Mercalli Intensity scale for a future earthquake is used by city planners in earthquake prone areas.

\_\_\_\_\_ 10. Elevated freeways can be retrofitted for earthquakes.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. When sediments mix with water and become like quicksand, they have undergone \_\_\_\_\_.

12. A building undergoes \_\_\_\_\_ when it is altered to be more safe in an earthquake.

13. In the 1906 San Francisco earthquake, the most damage was done by \_\_\_\_\_.

14. \_\_\_\_\_ light bulbs are less of a fire risk than incandescent bulbs.

15. You should have flashlights available if the power goes out and don't forget the \_\_\_\_\_ to keep them working.

### Short Answer

*Answer each question in the space provided.*

16. List five things that a family in an earthquake zone should do to prepare for an earthquake.

17. Explain why all of the structures built in the United States are not built to meet earthquake standards.

---

## Answer Key

1. b 2. a 3. c 4. d 5. a

6. false 7. true 8. false 9. true 10. true

11. liquefaction 12. retrofitting 13. fire 14. Fluorescent 15. batteries

16. Choose any five from the list from the subsection *Protecting Yourself in an Earthquake*.

17. Building to meet earthquake codes is very expensive. Some regions just don't expect to have major earthquakes so that would be wasted money. Even in earthquake zones cost must be balanced with the possible hazard because it's just too expensive to build every building to the highest standards.

## 7.5 Earthquakes

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which forces squeeze rocks together, causing them to fold or fracture?
  - shear
  - tensional
  - compressional
  - strain
- When rocks deform plastically under compression stresses they
  - create folds
  - create faults
  - create shears
  - break
- At which type of plate boundary, do the world's largest mountains grow?
  - transform
  - divergent
  - convergent
  - none of the above
- The sudden release of energy stored in rocks creates
  - earthquakes
  - folds
  - volcanoes
  - none of these
- The main reason there are so many earthquakes around the Pacific ocean basins is
  - the large number of convergent plate boundaries
  - the large number of divergent plate boundaries
  - the large number of transform plate boundaries
  - the extreme solidity of the Pacific plate
- How do rock particles move during the passage of a S wave through the rock?
  - back and forth parallel to the direction of wave travel
  - back and forth perpendicular to the direction of wave travel
  - in a rolling elliptical motion
  - up and down perpendicular to the direction of wave travel
- As stresses build in a region, the rocks
  - break quickly



- b. deform plastically and then break
  - c. deform plastically but bounce back into shape
  - d. b c
8. Mountain ranges rise where there are
- a. shear stresses
  - b. compressive stresses
  - c. tensional stresses
  - d. b c
9. A useful earthquake prediction will include the quake's
- a. type
  - b. timing
  - c. magnitude
  - d. b c
10. One reason fewer people die in developed nations than developing ones in the same magnitude earthquake is
- a. there is a lower population density
  - b. in developed nations, people only build in safe places
  - c. the quality of construction is better
  - d. there is better earthquake prediction in developed nations

**True or False**

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Shear stress is the most common stress at transform plate boundaries.
- \_\_\_\_\_ 12. A fracture is when the rock breaks.
- \_\_\_\_\_ 13. Stress applied over time often leads to plastic deformation.
- \_\_\_\_\_ 14. Sedimentary rocks are formed with the youngest layers on the bottom and the oldest on top.
- \_\_\_\_\_ 15. Sedimentary rocks layers that are not horizontal are deformed.
- \_\_\_\_\_ 16. An anticline is a fold that bends downward.
- \_\_\_\_\_ 17. The movement of blocks of rocks on one or both sides of a fracture is called a joint.
- \_\_\_\_\_ 18. Slip is the distance rocks move along a fault.
- \_\_\_\_\_ 19. Two converging continental plates smash downwards and create mountain ranges.
- \_\_\_\_\_ 20. In an earthquake, the initial point where the rocks rupture in the crust is called the epicenter.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

21. Rocks that are pulled apart are under \_\_\_\_\_.
22. When stress causes a material to change, it has undergone \_\_\_\_\_.
23. In a \_\_\_\_\_ fault, the hanging wall moves upward relative to the footwall.
24. A \_\_\_\_\_ is a simple bend in the rock layers so that they are no longer horizontal.
25. A \_\_\_\_\_ is a circular structure in which the rocks bend downward.
26. A \_\_\_\_\_ fault is a type of reverse fault in which the fault plane angle is nearly horizontal.
27. The point where movement occurred which triggered the earthquake is the \_\_\_\_\_.
28. The waves that do the most damage in an earthquake are \_\_\_\_\_ waves.

29. The height of a wave from the center line to its crest is its \_\_\_\_\_.
30. An earthquake kit should have \_\_\_\_\_ days of supplies.

**Short Answer**

*Answer each question in the space provided.*

31. Explain why the 2004 Indian Ocean Earthquake and Tsunami was so deadly.

32. List the three methods for describing earthquake size. Explain each.

33. How do scientists predict where an earthquake will occur?

---

**Answer Key**

1. c 2. a 3. c 4. a 5. a 6. a 7. d 8. b 9. d 10. c

11. true 12. true 13. true 14. false 15. true 16. false 17. false 18. true 19. false 20. false

21. tension 22. Strain or deformation 23. reverse 24. monocline 25. basin 26. thrust 27. focus 28. surface 29. amplitude 30. three

31. The earthquake was large but didn't do that much damage. It created several tsunamis that went in all directions around the Indian Ocean. Many of these regions are low-lying so the waves traveled far inland. Early on people had little warning and could not escape the waves.

32.

- Mercalli Intensity Scale. Earthquakes are described in terms of what nearby residents felt and the damage that was done to nearby structures.
- Richter magnitude scale. Developed in 1935 by Charles Richter, this scale uses a seismometer to measure the magnitude of the largest jolt of energy released by an earthquake.
- Moment magnitude scale. Measures the total energy released by an earthquake. Moment magnitude is calculated from the area of the fault that is ruptured and the distance the ground moved along the fault.

33. Most earthquakes take place at plate boundaries so that's one indicator of where a quake will strike. Locations where earthquakes have taken place in the past are also prone.

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# CHAPTER **8** MS Volcanoes Assessments

## Chapter Outline

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- 8.1** WHERE VOLCANOES ARE LOCATED
  - 8.2** VOLCANIC ERUPTIONS
  - 8.3** TYPES OF VOLCANOES
  - 8.4** VOLCANIC LANDFORMS AND GEOTHERMAL ACTIVITY
  - 8.5** VOLCANOES
-

## 8.1 Where Volcanoes Are Located

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- For a volcano to form, there must be
  - earthquakes
  - magma
  - a convergent plate boundary
  - a transform plate boundary
- Why are there volcanoes in Central America?
  - the area is an extension of the San Andreas Fault
  - subduction of the Middle American Plate
  - subduction of the Juan de Fuca plate
  - none of the above
- How many hot spots are located on Earth
  - about 50
  - about 100
  - over 1000
  - 1
- A volcanic arc forms
  - at a divergent plate boundary
  - away from plate boundaries
  - at a convergent plate boundary
  - none of these
- The oldest volcanoes in a hotspot chain
  - are furthest from the hotspot.
  - may be below sea level.
  - may be surrounded by coral reefs.
  - all of these.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Most volcanoes are found in the Himalayan-Asiatic belt.
- \_\_\_\_\_ 7. All volcanoes are located on continental crust.
- \_\_\_\_\_ 8. Yellowstone is one of the few hotspots at a convergent plate boundary.

\_\_\_\_\_ 9. All volcanoes are the result of plate tectonics processes.

\_\_\_\_\_ 10. Many volcanoes occur at convergent plate boundaries.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The Ring of Fire is located around the \_\_\_\_\_ ocean basin.

12. The Ring of Fire is lined with \_\_\_\_\_ plate boundaries.

13. Large cracks in the ground through which lava erupts are called \_\_\_\_\_.

14. Volcanoes erupt at mid-ocean ridges along \_\_\_\_\_ plate boundaries.

15. Above a mantle plume is the volcano that is \_\_\_\_\_ in age in a hotspot chain.

### Short Answer

*Answer each question in the space provided.*

16. At what three geologic settings are volcanoes found? In one sentence each, describe why volcanoes are found there.

17. What are the relative ages of volcanoes in a chain with a hotspot at one end?

---

## Answer Key

1. b 2. d 3. a 4. c 5. d

6. false 7. false 8. false 9. false 10. true

11. Pacific 12. convergent 13. fissures 14. divergent 15. youngest

16. At divergent plate boundaries, the plates pull apart and create fissures that lava can erupt through. At convergent plate boundaries, subduction causes melting that allows volcanoes to form. Hotspots form volcanoes above a column

of hot mantle that melts.

17. The youngest volcano is found just above the hotspot and the ages of volcanoes get older with distance from the hotspot.

## 8.2 Volcanic Eruptions

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Non-explosive eruptions
  - a. cause little damage
  - b. rarely kill anyone
  - c. have lavas that contain a lot of gas
  - d. all of these
2. A volcano that has had no activity for quite a long time is said to be
  - a. active
  - b. sleeping
  - c. dormant
  - d. extinct
3. An ash plume from a volcano in Iceland
  - a. disrupted air travel across Europe for six days in 2010
  - b. mixed with pollutants in the atmosphere to cause excess acid rain
  - c. created pillow lavas offshore
  - d. created A'a and pāhoehoe lavas offshore
4. To see if a volcano will soon erupt, satellites can sense
  - a. earthquakes
  - b. rock fall
  - c. temperature, deformation and gases
  - d. nothing; satellites are too high up
5. The ability of scientists to predict volcanic eruptions is
  - a. excellent in most locations
  - b. about 50-50
  - c. an area of science that needs improvement
  - d. never going to improve; it's just too hard.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. At least one of the Cascades volcanoes has been actively erupting for at least a century.
- \_\_\_\_\_ 7. Gases from volcanoes can be poisonous.
- \_\_\_\_\_ 8. Volcanic eruptions in Hawaii are usually explosive.



\_\_\_\_\_ 9. Eruptions that are non-explosive have little or no gas.

\_\_\_\_\_ 10. An increase in earthquake activity is a sign that a volcano may be about to erupt.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Magma and gases collect beneath a volcano in a(n) \_\_\_\_\_.

12. A volcano that is not currently erupting, but has erupted recently is said to be \_\_\_\_\_.

13. A'a and pāhoehoe lavas are from \_\_\_\_\_ eruptions.

14. Hot fragments of rock that fly high and fast into the air are called \_\_\_\_\_.

15. Fluid lava in the water cools quickly, forming a shape called \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What causes some volcanic eruptions to be explosive?

17. Why might a volcano change shape before an eruption?

---

## Answer Key

1. b 2. d 3. a 4. c 5. c

6. false 7. true 8. false 9. true 10. true

11. magma chamber 12. dormant 13. non-explosive 14. pyroclasts 15. pillows

16. Hot magma may mix with water in the magma chamber. This forms gases. The gas pressure grows and it must be released so there is an enormous explosion.

17. Magma and gas fill a magma chamber and push the sides of the volcano outward. This changes the shape of the volcano.

## 8.3 Types of Volcanoes

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Lava that is fluid and flows easily creates
  - cinder cones
  - pyroclastic flows
  - composite cones
  - shield volcanoes
- The opening in the top of a composite volcano is a
  - hole
  - crater
  - fissure
  - vent
- Cinder cones usually grow
  - from large numbers of fluid lava flows
  - from periodic eruptions of lava and ash
  - rapidly, usually in a single eruption
  - in large, explosive eruptions
- A composite volcano has layers of
  - thick lava and ash
  - fluid lava and viscous lava
  - ash and fluid lava
  - fluid lava, thick lava, and ash
- A caldera is created by
  - a set of fluid lava flows evacuating a magma chamber.
  - the earthquakes that accompany a large volcanic eruption.
  - a set of ash flows and lava flows building up a flat topped volcano.
  - the collapse of a volcano into its magma chamber.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Composite volcanoes are made of fluid magma.
- \_\_\_\_\_ 7. The composition of lava in a shield volcano changes over time.
- \_\_\_\_\_ 8. Magma travels through the volcano to the surface through a pipe.

\_\_\_\_\_ 9. Supervolcanoes only erupted early in Earth history when the planet was hotter.

\_\_\_\_\_ 10. A volcanic mountain is a mountain that forms when magma is forced upward and flows onto Earth's surface.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. \_\_\_\_\_ volcanoes are found on continents near plate boundaries and are very explosive when they erupt.

12. Crater Lake in Oregon is a(n) \_\_\_\_\_ in old Mount Mazama.

13. The most common volcano type at spreading centers and intraplate hot spots is \_\_\_\_\_ volcanoes.

14. The U.S. state with the most shield volcanoes is \_\_\_\_\_

15. A volcano that erupts in enormous, catastrophic eruptions is called a(n) \_\_\_\_\_

### Short Answer

*Answer each question in the space provided.*

16. Which type of volcano has the classic volcano shape? What makes it have that shape?

17. What is Yellowstone volcanically? What might happen if Yellowstone erupts again?

---

## Answer Key

1. d 2. b 3. c 4. a 5. d

6. false 7. false 8. true 9. false 10. true

11. Composite 12. caldera 13. shield 14. Hawaii 15. supervolcano

16. Composite volcanoes form classic shapes with broad bases and steep sides. They make this shape because thick lava flows from the vent and cannot move far out. Ash also erupts and falls down near the vent. Both of these types

of eruptions create steep sides.

17. Yellowstone is the largest supervolcano in North America and it is still potentially active. The enormous eruption would be devastating to life and property.

## 8.4 Volcanic Landforms and Geothermal Activity

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Lava domes are created by
  - fluid lava that fills a crater
  - thick lava that does not move far from the vent
  - fluid lava that flows over a large area
  - alternating layers of silica-rich lava and ash
- Lava fluid that flows over a large area is called a
  - lava plateau
  - lava dome
  - volcano
  - cinder cone
- What is formed when water comes into contact with hot rock?
  - a geyser
  - a hot spring
  - an earthquake
  - a b
- When lava flows into or erupts into the ocean, it creates
  - geysers
  - new land
  - the most explosive eruptions
  - a b
- The volcanoes that are currently active on Earth are
  - cinder cones, composite volcanoes, shield volcanoes and supervolcanoes
  - composite volcanoes and shield volcanoes
  - cinder cones, composite volcanoes, shield volcanoes
  - supervolcanoes

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Magma that cools at the surface forms igneous intrusions.
- \_\_\_\_\_ 7. The youngest volcano of Hawaii does not rise above sea level.
- \_\_\_\_\_ 8. Shiprock in New Mexico is a lava dome.

\_\_\_\_\_ 9. There are many thousands of geysers in volcanic areas all around the world.

\_\_\_\_\_ 10. The eruptions of all of the geysers in Yellowstone are predictable, like Old Faithful.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The most common landforms created by lava are \_\_\_\_\_.

12. A plug of thick lava that cools in or near the vent of a volcano is called a(n) \_\_\_\_\_.

13. When underground water is heated by hot rock so that it flows to the surface it produces a(n) \_\_\_\_\_.

14. When hot water erupts at the surface it is as a(n) \_\_\_\_\_.

15. Igneous \_\_\_\_\_ beneath volcanoes create volcanic landforms.

### Short Answer

*Answer each question in the space provided.*

16. How can volcanic eruptions create an island, like Hawaii?

17. Describe how a geyser is created and why it erupts.

---

## Answer Key

1. b 2. a 3. d 4. b 5. c

6. false 7. true 8. false 9. false 10. false

11. volcanoes 12. lava dome 13. hot spring 14. geyser 15. intrusions

16. Lava flows go out from a volcano and solidify. On the coast, this can create new land. Over time enough land builds up that the volcano emerges from the water.

17. Water is heated below the surface, but it becomes trapped in a narrow passageway. Heat and pressure build and eventually the pressure grows so great that the water erupts at the surface.



## 8.5 Volcanoes

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The Hawaiian islands are found at a(n)
  - divergent boundary
  - hot spot
  - convergent boundary
  - transform boundary
- The most geologically active region in the world is the
  - Ring of Fire
  - Alps
  - Yellowstone Basin
  - Himalaya-Asiatic Belt
- When magma moves beneath a volcano it may cause
  - earthquakes
  - slope deformation
  - an eruption
  - all of these
- A sign that an eruption could soon occur is
  - less gases coming from the volcano
  - an decrease in the number and size of earthquakes
  - rocks falling down the volcano's slope
  - all of these
- Some volcanoes have steep slopes because
  - thick lava solidifies before it gets far down slope
  - fluid lava solidifies before it gets far down slope
  - ash does not fall far from the vent
  - earthquakes cause slopes to steepen
- A volcano that could erupt, but hasn't recently is
  - dead
  - active
  - dormant
  - extinct
- Which type of volcano is Kilauea in Hawaii?
  - shield

- b. composite
  - c. cinder cone
  - d. supervolcano
8. What is the most common type of volcano?
- a. shield
  - b. cinder cone
  - c. composite
  - d. supervolcano
9. Scientists think that supervolcano eruptions could have
- a. permanently altered the composition of the atmosphere
  - b. caused large land areas to fall into the sea
  - c. changed the directions of plate movement
  - d. caused mass extinctions
10. What is created when water is heated beneath the Earth's surface and erupts to the surface through a narrow passageway?
- a. lava plateau
  - b. lava dune
  - c. geyser
  - d. hot spring

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Subduction at the Middle American Trench creates volcanoes in Hawaii.
- \_\_\_\_\_ 12. A geyser is a hot spring that erupts because the hot water becomes trapped.
- \_\_\_\_\_ 13. Lava erupts through long cracks in the ground called fissures.
- \_\_\_\_\_ 14. Intraplate volcanoes are found at convergent plate boundaries.
- \_\_\_\_\_ 15. Volcanoes at divergent plate boundaries create oceanic crust.
- \_\_\_\_\_ 16. A supervolcano eruption occurs about once per century.
- \_\_\_\_\_ 17. A large explosive eruption has about the same power as an atomic bomb.
- \_\_\_\_\_ 18. Volcanic gases include sulfur dioxide, carbon dioxide, and water vapor.
- \_\_\_\_\_ 19. Non-explosive eruptions cause almost no deaths or property damage.
- \_\_\_\_\_ 20. Cinder cones are found with composite volcanoes, but not shield volcanoes.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. Some volcanic gases can be detected using \_\_\_\_\_ monitoring.
22. A \_\_\_\_\_ is a vent through which molten rock and gas escape from the magma chamber.
23. The shape of a volcano is related to the composition of its \_\_\_\_\_.
24. Cinder cone volcanoes usually have a \_\_\_\_\_ at their summit.
25. With distance from a hotspot, a chain of volcanoes becomes \_\_\_\_\_ in age.
26. When magma cools deeper in the crust it forms \_\_\_\_\_.
27. Most volcanoes are the result of the process of \_\_\_\_\_ at convergent plate boundaries.

28. An explosive eruption may create a \_\_\_\_\_, a large hole into which the mountain collapses.
29. The Andes Mountains that line South America are at a(n) \_\_\_\_\_ boundary.
30. \_\_\_\_\_ are found at divergent plate boundaries as continents break apart.

**Short Answer**

*Answer each question in the space provided.*

31. Look at the plate tectonics map of the world. In the western North and Central America, where are there volcanoes? Why are there volcanoes in those locations? Why are there no volcanoes through much of California?

32. Explain how volcanic eruptions are predicted.

33. How can volcanoes be considered constructive? How can volcanoes be considered destructive?

---

**Answer Key**

1. b 2. a 3. d 4. c 5. a 6. c 7. a 8. b 9. d 10. c

11. false 12. true 13. true 14. false 15. true 16. false 17. false 18. true 19. false 20. false

21. remote sensing 22. volcano 23. magma 24. crater 25. older 26. intrusions 27. subduction 28. caldera 29. convergent 30. Volcanoes

31. Along the west coast there are volcanoes where there is subduction. There are no volcanoes through much of California because there is a transform plate boundary at the San Andreas Fault and there is no subduction.

32. Scientists study the history of previous volcanic activities to see how often a volcano erupts. They look for an increase in the number of earthquakes. Before an eruption the slopes of the volcano may undergo deformation and gas emissions change in amount and composition.

33. Volcanic eruptions create large mountains - volcanoes. They create land, where the lava flows into the sea and they add to landscapes like lava domes. Sets of eruptions create lava plateaus. These are all constructive. Volcanic eruptions also are destructive. They can blow the top off a mountain or even a large area of land, like in a supervolcano eruption.

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CHAPTER

**9**

# MS Weathering and Formation of Soil Assessments

## Chapter Outline

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- 9.1 WEATHERING
  - 9.2 SOILS
  - 9.3 WEATHERING AND FORMATION OF SOIL
-

## 9.1 Weathering

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. If pieces of a rock flake off due to extreme temperature differences, it would be
  - a. erosion
  - b. mechanical weathering
  - c. chemical weathering
  - d. transportation
2. Chemical weathering
  - a. is unrelated to mechanical weathering
  - b. can go faster when there has been mechanical weathering
  - c. is slowed down after there has been mechanical weathering
  - d. none of these
3. If a mineral changes to a different type it has experienced
  - a. erosion
  - b. physical weathering
  - c. chemical weathering
  - d. transportation
4. Minerals undergo chemical weathering because
  - a. they formed at different pressure and temperature
  - b. they first undergo mechanical weathering
  - c. they break apart by mechanical weathering
  - d. water takes away some of their ions
5. Because carbon dioxide combines with water in the atmosphere
  - a. average global temperatures are rising
  - b. plants die off
  - c. the atmosphere is warmer
  - d. rainwater is a weak acid

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Important agents of chemical weathering include oxygen, carbon dioxide and sulfur.
- \_\_\_\_\_ 7. If temperature increases by 10°C, the rate of chemical reactions will double.
- \_\_\_\_\_ 8. All rocks weather at the same rate.

\_\_\_\_\_ 9. Abrasion is a type of chemical weathering.

\_\_\_\_\_ 10. Water can dissolve salt.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. \_\_\_\_\_ weathering creates new minerals that are stable at surface conditions.

12. When iron combines with oxygen, the result is reddish \_\_\_\_\_.

13. Weathering by the expansion and contraction of ice is known as \_\_\_\_\_.

14. The process that moves sediments is \_\_\_\_\_.

15. Chemical weathering increases as temperature \_\_\_\_\_ and precipitation \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Shiprock, in New Mexico, is the neck of an old volcano. Why does Shiprock stand above the surrounding desert?

17. Describe the climate type that causes the greatest rate of weathering. What factors cause the weathering rate to be high?

---

## Answer Key

1. b 2. b 3. c 4. a 5. d

6. true 7. true 8. false 9. false 10. true

11. Chemical 12. rust 13. ice wedging 14. erosion 15. increases, increases

16. The magma that cooled in the volcano is very hard and resistant to erosion. The surrounding rock was more easily eroded. This left Shiprock standing out in the desert.

17. A warm, wet climate has the highest rate of weathering. Warmer temperatures have faster chemical reactions: an increase in  $10^{\circ}\text{C}$  causes a doubling of the reaction rate. Water is a weathering agent, so a wet climate will have faster weathering. Warm, wet areas are conducive to plant growth and plants increase the rate of weathering.



## 9.2 Soils

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Topsoil is dark in color because it
  - a. undergoes a lot of chemical weathering
  - b. has a large amount of organic material
  - c. is full of dark rocks
  - d. contains a lot of worms
2. In the eastern U.S., high rainfall and deciduous forests have soils called
  - a. pedocal
  - b. laterite
  - c. pedalfers
  - d. weathered soil
3. Adding organic material to soil
  - a. allows it to contain water and nutrients
  - b. decreases its fertility
  - c. increases its A horizon
  - d. often kills existing vegetation
4. Farmers terrace hillsides to
  - a. eliminate the soil's C horizon
  - b. increase the types of crops they can grow
  - c. increase the creation of soil
  - d. reduce erosion
5. Soil made from the bedrock that lies beneath it is
  - a. transported soil
  - b. eroded soil
  - c. residual soil
  - d. weathered soil

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Flat lands develop thicker soils than steeper slopes.
- \_\_\_\_\_ 7. Rainforests are rich ecosystems and their soils are rich in nutrients.
- \_\_\_\_\_ 8. All soils contain organic material.

- \_\_\_\_\_ 9. Chemical erosion is most common in deserts.
- \_\_\_\_\_ 10. Pedocal soils form in regions covered with grasslands and brush.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. \_\_\_\_\_ is the organic portion of soil.
12. The organic portion of soil is important because it provides the \_\_\_\_\_ needed for plant growth.
13. A, B & C are complete soil layers or soil \_\_\_\_\_.
14. The \_\_\_\_\_ is where leached soluble minerals and clays accumulate.
15. \_\_\_\_\_ contains humus, plant roots and living organisms.

**Short Answer**

*Answer each question in the space provided.*

16. Describe the effect of climate on soil formation.

17. What is humus? Why is it a very important part of most soils?

---

**Answer Key**

1. b 2. c 3. a 4. d 5. c

6. true 7. false 8. false 9. false 10. true

11. Humus 12. nutrients 13. horizons 14. subsoil or B horizon 15. Topsoil

16. Climate is the most important factor determining soil formation. More rain leads to more chemical reactions for more chemical weathering. More rain also causes leaching. Warmer regions have more reactions and so soils are thicker.

17. Humus is the decayed remains of plants and animals. Humus coats mineral grains and binds sediments together to create a structure. This helps it to hold water. Humus helps the soil to hold nutrients, which increases its fertility and helps plants to grow.

## 9.3 Weathering and Formation of Soil

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Where is ice wedging an important form of mechanical weathering?
  - in frozen ground beneath glaciers
  - where salt enters cracks in rock
  - where the temperature is often near freezing
  - in deserts where nights can be extremely cold
- Abrasion describes when
  - sediments settle in water
  - angular fragments break off a parent rock
  - plant roots grow into a crack
  - rocks bump against each other
- What is the most important agent of chemical weathering?
  - water
  - carbon dioxide
  - oxygen
  - acid rain
- Chemical weathering is enhanced when
  - carbon dissolves rock
  - carbon dioxide creates acids in the atmosphere
  - water breaks into ions that dissolve rock
  - none of these
- The climate that produces the lowest rate of weathering is
  - hot and wet
  - hot and dry
  - cold and wet
  - cold and dry
- To classify types of soil, soil scientists measure the
  - amount of humus
  - proportions of particles of different sizes
  - depth of the three soil horizons
  - none of these.
- What is the darkest layer of soil?
  - A Horizon

- b. B Horizon
  - c. C Horizon
  - d. none of these
8. What type of soil is found in tropical rainforests?
- a. pedocal
  - b. pedalfer
  - c. laterite
  - d. none of these
9. For soil to be a renewable resource, it must be
- a. kept exposed to weather and other natural processes
  - b. exposed to oxygen so it can undergo oxidation
  - c. protected from erosion
  - d. all of these
10. Soil scientists study the layers of soil that together are called
- a. residual soil
  - b. transported soil
  - c. soil horizons
  - d. a soil profile

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Plants increase chemical weathering by emitting water into the ground.
- \_\_\_\_\_ 12. If the temperature rises, the rate of chemical reactions increases by 10.
- \_\_\_\_\_ 13. The steeper the slope, the thicker a soil will be.
- \_\_\_\_\_ 14. Soil is a renewable resource.
- \_\_\_\_\_ 15. Soil is a complex mixture of different materials.
- \_\_\_\_\_ 16. Residual soils form in one place but have been transported to somewhere else.
- \_\_\_\_\_ 17. Water runs off soil because soil is not permeable.
- \_\_\_\_\_ 18. In the eastern U.S., soils are thin and nutrient-poor.
- \_\_\_\_\_ 19. Plowing along the contours of a field reduces soil erosion.
- \_\_\_\_\_ 20. Adding compost to the soil improves its fertility and its ability to hold water and nutrients.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. \_\_\_\_\_ is the process that changes solid rock into sediments.
22. \_\_\_\_\_ moves broken pieces of rock, large or small downslope.
23. Some types of rock can completely dissolve in the chemical substance called \_\_\_\_\_.
24. A location's \_\_\_\_\_ is determined by the temperatures and the amount of precipitation.
25. Plant roots obtain nutrients from the layer known as \_\_\_\_\_.
26. The decayed remains of plant and animal life are called \_\_\_\_\_.
27. When soil contains a mixture of grain sizes, the soil is called \_\_\_\_\_.
28. \_\_\_\_\_ is a very fertile, dark brown soil common in many temperate areas of the eastern United States.

29. \_\_\_\_\_ soil is formed in drier temperate areas here grasslands and brush are the usual type of vegetation.
30. Adding organic material increases a soil's \_\_\_\_\_ .

**Short Answer**

*Answer each question in the space provided.*

31. List 3 factors that can lead to increased weathering and greater soil formation.

32. Explain how ice wedging works.

33. Why aren't laterite soils good for crops?

---

**Answer Key**

1. c 2. d 3. a 4. b 5. d 6. b 7. a 8. c 9. c 10. d

11. false 12. false 13. false 14. true 15. true 16. false 17. false 18. false 19. true 20. true

21. Weathering 22. Erosion 23. water 24. climate 25. topsoil 26. humus 27. loam 28. Pedalfer 29. Pedocal 30. fertility

31.

- More rain equals more chemical reactions to weather minerals and rocks. Those reactions are most efficient in the top layers of the soil where the water is fresh and has not yet reacted with other materials.
- Increased rainfall increases the amount of rock that is dissolved as well as the amount of material that is carried away by moving water. As materials are carried away, new surfaces are exposed, which also increases the rate of weathering.
- Increased temperature increases the rate of chemical reactions, which also increases soil formation.
- In warmer regions, plants and bacteria grow faster, which helps to weather material and produce soils. In tropical regions, where temperature and precipitation are consistently high, thick soils form. Arid regions have thin soils.

32. Water seeps into rocks and at night as temperatures drop, it freezes. When water freezes, it expands causing the rock to break apart as this process is repeated over and over again.

33. In the tropics, warm rain falls daily. By chemical weathering, the rain leaches the soluble nutrients from the soils. The insoluble materials are left behind, including aluminum and iron oxides. There is no humus. When the soils are exposed to the sun, they bake hard. Hard nutrient-poor soils do not make very good farmland.

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# CHAPTER **10** MS Erosion and Deposition Assessments

## Chapter Outline

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- 10.1 WATER EROSION AND DEPOSITION
  - 10.2 WAVE EROSION AND DEPOSITION
  - 10.3 WIND EROSION AND DEPOSITION
  - 10.4 GLACIAL EROSION AND DEPOSITION
  - 10.5 EROSION AND DEPOSITION BY GRAVITY
  - 10.6 EROSION AND DEPOSITION
-



# 10.1 Water Erosion and Deposition

## Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

- Stream water
  - deposits, but does not erode
  - does not deposit or erode
  - erodes, but does not deposit
  - erodes and deposits
- As a stream exit a canyon into open land, the sediments form a(n) \_\_\_\_\_.
  - alluvial fan
  - fluvial fan
  - sediment fan
  - fan
- In a meander, the stream
  - erodes at the inside of the bend, and deposits at the outside of the bend.
  - deposits at the inside of the bend, and erodes at the outside of the bend.
  - erodes all along the meander, inside and outside.
  - deposits all along the meander, inside and outside.
- A sinkhole forms
  - when the roof of a lava tube collapses and fills with water.
  - when glaciers gouge out a hole in the ground that fills with water.
  - when the roof of a limestone cave collapses and fills with water.
  - when ice trapped in glacial sediment melts and makes a pond.
- A stalagmite rises up from the floor of a cave because
  - water comes through the cave's floor and up.
  - water drips down from the ceiling.
  - a column breaks into two features, one down from the ceiling, one up from the floor.
  - none of these

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Streams always flow from higher to lower elevations
- \_\_\_\_\_ 7. Meanders are curves in the stream's path.
- \_\_\_\_\_ 8. Mountain streams erode narrow, U-shaped valleys.

\_\_\_\_\_ 9. The steeper the slope, the faster the stream moves.

\_\_\_\_\_ 10. Weathering and erosion can turn tall mountains into hills and even plains.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Moving water below the surface is called \_\_\_\_\_.

12. Sediment that is bumped and pushed along the stream bottom is said to move by \_\_\_\_\_.

13. As a stream traverses flat land, it tends to \_\_\_\_\_.

14. A(n) \_\_\_\_\_ forms where a stream meets a large body of standing water.

15. Streams build natural levees during \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Briefly describe the ways that streams carry sediments.

17. When does a stream erode? When does it deposit large sediments? When does it deposit small sediments?

---

## Answer Key

1. d 2. a 3. b 4. c 5. b

6. true 7. true 8. false 9. true 10. true

11. groundwater 12. saltation 13. meander 14. delta 15. floods

16. Dissolved load is ions in solution. Suspended load is solid particles that are small enough to stay up in the flowing water of the stream. Bed load is solid sediments that are too heavy to be carried up in the water flow and are bumped and pushed along the stream bed.

17. A stream erodes when it is flowing. It deposits as it slows down. If it's moving very rapidly and has a lot of energy then slows down, it will deposit its largest sediments. When it has little energy left, it will deposit its smallest sediments.

## 10.2 Wave Erosion and Deposition

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. A wave is \_\_\_\_\_ that passes through a material.
  - a. speed
  - b. energy
  - c. motion
  - d. water
2. Beaches are formed when
  - a. waves deposit sediments along the coast
  - b. waves carry sediments to sea
  - c. humans erect sea walls
  - d. tides rise
3. Where wave action is quiet,
  - a. sea stacks form
  - b. erosion and deposition of sediment are equal
  - c. erosion increases
  - d. sediment is deposited
4. If waves erode the base of a cliff
  - a. the cliff will collapse
  - b. they will erode a wave-cut platform
  - c. they will create a sea arch
  - d. they will create a delta
5. A structure built perpendicular to a beach that traps sand is a
  - a. breakwater
  - b. seawall
  - c. groin
  - d. spit

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Sandy beaches are a great place to develop property.
- \_\_\_\_\_ 7. Beaches made mostly of cobbles have higher energy waves than sandy beaches.
- \_\_\_\_\_ 8. Waves continually move sand along the shore.

\_\_\_\_\_ 9. A spit is a sand feature that is not connected to land.

\_\_\_\_\_ 10. Beach sediments can include mineral grains and shell fragments.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. A \_\_\_\_\_ protects the shoreline from incoming waves.

12. When a sea arch collapses, all that is left is a(n) \_\_\_\_\_.

13. A(n) \_\_\_\_\_ is a long, narrow sandbar that forms along the shore.

14. A long narrow island of sand that is parallel to a shoreline is a(n) \_\_\_\_\_.

15. A \_\_\_\_\_ protects a beach and is built offshore.

**Short Answer**

*Answer each question in the space provided.*

16. Under what conditions do the largest waves form?

17. Briefly describe the erosional features produced by ocean waves.

---

**Answer Key**

1. b 2. a 3. d 4. a 5. c

6. false 7. true 8. true 9. false 10. true

11. breakwater 12. sea stack 13. spit 14. barrier island 15. breakwater

16. The largest waves form when winds are strong and blow steadily over a large region of the ocean.

17. Waves erode land that sticks out into the water, which creates a wave-cut cliff. When a beach area is eroded flat

and uplifted, it creates a wave cut platform. When a cliff is eroded through, it crests an arch. if that arch collapses, it make sea stacks.

## 10.3 Wind Erosion and Deposition

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Sand dunes
  - a. move in the direction the wind is blowing
  - b. move in the direction the wind is coming from
  - c. move randomly
  - d. are stationary
2. In a sandstorm, most sand
  - a. rolls along on the ground.
  - b. blows up very high; as much as 100 feet.
  - c. blows within a meter of the ground.
  - d. blows in spirals, like in a tornado.
3. Sandstorms are more common in dry climates because
  - a. desert sands are a good size for wind to pick up
  - b. plants in humid areas hold the sediments down
  - c. winds are stronger in deserts
  - d. none of these
4. A sand dune's shape is
  - a. the same on both sides
  - b. steeply sloping on the downwind side and gently sloping on the upwind side
  - c. gently sloping on the downwind side and steeply sloping on the upwind side
  - d. random in most cases
5. Loess deposits form
  - a. where sand-sized sediments are common
  - b. in oceans
  - c. in deserts
  - d. where fine sediments are present

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Wind can carry small cobbles, sand, silt and clay.
- \_\_\_\_\_ 7. Wind-blown sand may polish rock faces.
- \_\_\_\_\_ 8. Wind is a stronger erosional force than water.

\_\_\_\_\_ 9. Loess deposits are wastelands for crops and other vegetation.

\_\_\_\_\_ 10. Wind may drop sand around an obstacle.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Extremely fine-grained, wind-borne deposit of silts and clays; forms nearly vertical cliffs is called a(n) \_\_\_\_\_-\_\_\_\_\_.

12. Wind lifts sand just above the surface and bounces it along by \_\_\_\_\_.

13. A rock or surface that has been sandblasted by blowing sand is a(n) \_\_\_\_\_.

14. Sand grains are pulled down a dune face by \_\_\_\_\_.

15. Sediment that is rolled along by wind is transported by \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. How do sand dunes form?

17. Briefly describe the three ways that wind moves sand.

---

## Answer Key

1. a 2. c 3. c 4. b 5. d

6. false 7. true 8. false 9. false 10. true

11. loess 12. saltation 13. abrasion 14. gravity 15. creep or bed load

16. An obstacle, such as a rock or a bush, causes the wind near the ground to slow and it drops its sand. This continues. When there is a pile of sand, the wind is slowed more and drops more sand. The sand slides down the



dune, creating the slip face.

17. Tiny particles move by suspension in the air. Larger particles hop along on the ground by saltation. still larger particles are rolled or pushed along the ground by creep or traction.

## 10.4 Glacial Erosion and Deposition

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Glaciers cover how much of the Earth's surface?
  - about 30%
  - less than 1%
  - over 40%
  - about 10%
- Glaciers make valleys in the shape of what letter?
  - V
  - U
  - C
  - W
- Long parallel grooves in the bedrock from glaciers indicate
  - the direction the glacier moved
  - the depth of the glacier
  - whether the glacier was continental or valley
  - that the glacier is advancing
- Three or more cirques carved into the top of a mountain create a(n)
  - horn
  - hanging valley
  - arête
  - moraine
- A lake that forms when a block of ice melts in glacial till is a(n)
  - kettle
  - varve
  - tarn
  - terminal lake

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. During the last ice age the entire continental United States was covered by ice.
- \_\_\_\_\_ 7. A continent that is covered by ice is said to be under an ice sheet.
- \_\_\_\_\_ 8. Glaciers erode the underlying rock by plucking.

- \_\_\_\_\_ 9. Drumlins point in the direction a glacier went.
- \_\_\_\_\_ 10. Antarctica is covered by an enormous number of valley glaciers.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. Thick layer of sediment deposited under a glacier is called a(n) \_\_\_\_\_.
12. Greenland is a large landmass that is covered by a(n) \_\_\_\_\_.
13. A round hollow carved high on a mountain is a(n) \_\_\_\_\_.
14. \_\_\_\_\_ occurs glacial melt water seeps into cracks, freezes, breaks off pieces of bedrock, and then transported by the glacier.
15. Rocks at the bottom of a glacier wear away bedrock by the process of \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. What is a valley glacier? List three features that indicate a valley glacier had been there.

17. What is a continental glacier? List three features that indicate a continental glacier had been there.

---

**Answer Key**

1. d 2. b 3. a 4. a 5. c
6. false 7. false 8. true 9. true 10. false
11. ground moraine 12. continental glacier or ice sheet 13. cirque 14. Plucking 15. abrasion
16. A valley glacier originates in the mountains and flows downhill through river valleys. Features left by valley glaciers include U-shaped valleys, cirques, aretes, horns and various types of moraines.

17. A continental glacier covers a large area that may or may not include mountains. These glaciers leave behind moraines, drumlins, eskers, kettle lakes and grooves in the rock, among other features.

## 10.5 Erosion and Deposition by Gravity

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The rate of erosion by gravity
  - is sudden and dramatic
  - is very slow over long periods of time
  - neither of these
  - both of these
- When a rock falls from a cliff face, the agent of erosion is usually
  - wind
  - water
  - gravity
  - glaciers
- Downhill creep
  - results in curved tree trunks
  - falls as a whole unit
  - leaves large scars in the hillside
  - cannot be noticed because it is so slow
- A slump is the sudden
  - fall of rock and soil down slope
  - flow of mud down slope
  - movement of a large block of rock and soil down slope
  - flow of volcanic ash and water down slope
- Mass movement may be caused when
  - droughts dry out the ground
  - a river undercuts a slope
  - the gravitational polarity reverses
  - none of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Curved tree trunks are a sign of land creep.
- \_\_\_\_\_ 7. Undercutting can cause the ground to become unstable.
- \_\_\_\_\_ 8. Heavy rainfall makes ground more susceptible to landslides.

\_\_\_\_\_ 9. Landslides can cause earthquakes.

\_\_\_\_\_ 10. Landslides rarely cause much damage.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A large block that moves along a curved surface is a(n) \_\_\_\_\_.

12. The slowest mass movement is \_\_\_\_\_.

13. Rock and soil are pulled downhill by \_\_\_\_\_.

14. A hillside that has slumped may display a crescent-shaped \_\_\_\_\_.

15. Wet \_\_\_\_\_ beneath a slope may cause slump.

### Short Answer

*Answer each question in the space provided.*

16. How might an earthquake cause a landslide and a landslide cause a tsunami?

17. How and where does creep happen?

---

## Answer Key

1. d 2. c 3. a 4. c 5. b

6. true 7. true 8. true 9. false 10. false

11. slump 12. creep 13. gravity 14. scar 15. clay

16. An earthquake shakes the ground and makes it unstable so that it slides. If a landslide falls into a body of water it can displace the water and cause a huge wave.

17. Creep takes place where the ground freezes and thaws frequently. During freezing soil and rock are lifted up and after thawing they settle down. Each time they settle they move a bit downhill.

## 10.6 Erosion and Deposition

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What is created when large sediments build a higher area around the edges of the stream channel?
  - a. meander
  - b. headwater
  - c. natural levees
  - d. none of the above
2. What is a curve in a stream channel called?
  - a. meander
  - b. headwater
  - c. natural levees
  - d. none of the above
3. A pointed icicle-like deposit that hangs from the ceiling of a cave is a(n)
  - a. icicle
  - b. calcite
  - c. stalagmite
  - d. stalactite
4. A lake formed from a cut-off meander is a(n)
  - a. meander lake
  - b. oxbow lake
  - c. flood lake
  - d. kettle lake
5. What is produced when waves erode through a cliff?
  - a. a wave-cut platform
  - b. a wave-cut cliff
  - c. an arch
  - d. a sea stack
6. What is a long, narrow pile of rocks built perpendicular to the shoreline in order to keep sand on the beach called?
  - a. breakwater
  - b. barrier island
  - c. sea wall
  - d. groin
7. Wind carries



- a. cobbles near the ground
  - b. sand in short hops
  - c. sand high in the air
  - d. all of these
8. Windblown silt and clay deposited layer upon layer over a large area is called
- a. sand
  - b. slipface
  - c. soil
  - d. loess
9. Glacial moraines are
- a. piles of glacial till left by a retreating glacier
  - b. ridges where cirques have carved on both sides
  - c. ridges of sand deposited by glacial meltwater
  - d. none of these
10. What are large ice sheets that cover relatively flat ground called?
- a. continental glaciers
  - b. alpine glaciers
  - c. valley glaciers
  - d. none of the above

**True or False**

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Flowing water does the work of both erosion and deposition.
- \_\_\_\_\_ 12. Faster streams can only carry smaller particles.
- \_\_\_\_\_ 13. A sinkhole forms if a cave's roof collapses.
- \_\_\_\_\_ 14. Barrier islands act as the first line of defense against storms if they are undeveloped.
- \_\_\_\_\_ 15. An ocean wave is energy traveling through water.
- \_\_\_\_\_ 16. Sand dunes form and remain in the same location over time.
- \_\_\_\_\_ 17. Loess deposits make very fertile soils in many regions.
- \_\_\_\_\_ 18. Plucking is the abrasion of rocks by glaciers.
- \_\_\_\_\_ 19. Geologists study moraines to determine when the next ice age will occur.
- \_\_\_\_\_ 20. Creep is most dramatic, sudden and dangerous example of earth materials moved by gravity.

**Fill in the Blanks**

Fill in the blank with the term that best completes the sentence.

21. A flat level area surrounding the stream channel is called a \_\_\_\_\_.
22. A stream deposits its sediments in a wide triangular-shaped deposit called a \_\_\_\_\_.
23. A \_\_\_\_\_ is a pillar of rock eroded by waves.
24. Waves spread the sediments along a coastline to create a \_\_\_\_\_.
25. A \_\_\_\_\_ is formed as wind passes over a dune and sand cascades down the crest.
26. \_\_\_\_\_ is the erosional agent that is responsible for the most erosion.
27. Rocks are picked up by glaciers due to the process of \_\_\_\_\_.

28. Linear deposits of rock that were dumped by a glacier are called \_\_\_\_\_.
29. \_\_\_\_\_ are the very dramatic and sudden movement of earth downhill.
30. \_\_\_\_\_ is the extremely gradual movement of soil downhill.

**Short Answer**

*Answer each question in the space provided.*

31. What different features would you expect to find in a stream valley that once had a glacier and one that did not?

32. Briefly describe the depositional features produced by ocean waves.

33. How do sand dunes move?

34. Glacier National Park once had a lot of glaciers. What are a few features you would expect to see there? What kind of glaciers were there?

35. List the factors that cause a landslide to occur.

---

### Answer Key

1. c 2. a 3. d 4. b 5. c 6. d 7. b 8. d 9. a 10. a

11. true 12. false 13. true 14. true 15. true 16. false 17. true 18. false 19. false 20. false

21. floodplain 22. delta 23. sea stack 24. beach 25. slip face 26. Water 27. plucking 28. moraines 29. Landslide 30. Creep

31. A stream valley is V-shaped, but U-shaped if a glacier was there. Streams can meander and have levees and floodplains. Glacial valleys have erosional features such as cirques and horns, and also will have glacial moraines.

32. Waves spread sediments along a coastline to create beaches. Waves may move the sand so that it extends outward from the land, creating a spit. The sand may collect offshore parallel to the mainland to make a barrier island.

33. Once a sand dune exists, it is an obstacle for wind. As the wind goes over the top of the dune, it decreases speed and drops its sand. The sand slides down the slip face of the dune. This means that sand is being deposited in the direction the wind is moving.

34. Valley glaciers were found in the mountains of Glacier National Park. There are many cirques, aretes and horns. The valleys coming from the mountains are U-shaped.

35.

- Water – rapid snow melt and/or excessive precipitation can increase the weight of the soil and increase the lubrication between grains.
- Rock type – layers of weak rock allow for more landslides.
- Undercutting – human digging into the base of a slope to create a road or home site.
- Ground shaking – an earthquake, volcanic eruption, or traffic can shake unstable ground.

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# CHAPTER **11** MS Evidence About Earth's Past Assessments

## Chapter Outline

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- 11.1 FOSSILS
  - 11.2 RELATIVE AGES OF ROCKS
  - 11.3 ABSOLUTE AGES OF ROCKS
  - 11.4 EVIDENCE ABOUT EARTH'S PAST
-

# 11.1 Fossils

## Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

- Examples of imprint fossils made by compression are
  - drawings on rock made by prehistoric humans
  - frozen remains of elephant-like mammoths
  - footprints and animal tracks
  - fossil leaves
- Fossilized insects have been found preserved in amber which is hardened
  - flower nectar
  - tree sap
  - wood
  - None of the above
- Fossilized stomach contents may indicate
  - the diet of the animal
  - the vegetation type in its habitat
  - whether an animal walked, swam or flew
  - a b
- An animal is more likely to a fossil if it:
  - is buried deeply in the ground
  - is left on the surface of the ground
  - does not contain bones or other hard body parts
  - all of the above are about equally likely to result in fossilization
- Marine fossils on the top of Mt. Everest indicate
  - sea level was once higher than the top of Mt. Everest
  - the fossils are not actually marine fossils, but just look like them
  - the rock at the top of Mt. Everest was once under water
  - someone put them up there as a trick.

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. In the past, fossils inspired legends of monsters.
- \_\_\_\_\_ 7. Fossils in older rocks are more similar to animals that live today than fossils in younger rocks.
- \_\_\_\_\_ 8. Fossils form when remains are replaced by minerals.

\_\_\_\_\_ 9. Complete preservation is valuable because scientists can study the organism's DNA.

\_\_\_\_\_ 10. There are no plants in Antarctica so there are no plant fossils there.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Fossils that are left by an organisms but were not part of the organisms are \_\_\_\_\_ fossils.

12. If a shell dissolves and the hole is filled with sediment, the fossil that results is a \_\_\_\_\_.

13. Ancient insects can be preserved in \_\_\_\_\_.

14. Fossils are good at telling the story of the history of \_\_\_\_\_ on Earth.

15. A fossil that can pinpoint a specific period of time is a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Why are there more fossils of clams than there are of jellyfish?

17. List and briefly describe the types of fossilization.

---

## Answer Key

1. d 2. b 3. d 4. a 5. c

6. true 7. false 8. true 9. true 10. false

11. trace 12. cast 13. amber 14. life 15. index fossil

16. Jellyfish are soft bodied. Like other soft-bodied organisms, they fall apart or are ripped apart before they can be fossilized. Clams have hard shells, which are more easily fossilized.

17. An entire body can be preserved in a substance like amber or ice. A buried piece of bone, wood or shell can be replaced minerals into its empty spaces. A bone or shell can be held in sediment and leave a depression called a mold, which is later filled with other sediments to create a cast. An original bone or shell dissolves, but is replaced by a different mineral. Carbon can be squeezed from a leaf or some other organism and leaves a dark imprint.

## 11.2 Relative Ages of Rocks

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. A rock's age compared to the ages of other rocks is called its
  - a. absolute age
  - b. confirmed age
  - c. nominal age
  - d. none of the above
2. The Law of Superposition states that
  - a. younger rocks are found below older rocks
  - b. older rocks are found below younger rocks
  - c. a rock that cuts across other rocks must be younger than the rock it cuts across
  - d. none of the above
3. The rock layers at the Grand Canyon
  - a. are the same on opposite sides of the river.
  - b. were formed in different ways on each side of the river.
  - c. are younger than the Colorado River in that region.
  - d. none of these.
4. A good key bed must be
  - a. found over a large area
  - b. similar to the rock units it is found with
  - c. a volcanic ash
  - d. all of these
5. A good index fossil
  - a. is found in a local area
  - b. is distinctive
  - c. existed for a long period of time
  - d. all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Fossil B is younger than Fossil A, but the rock layer containing Fossil B is beneath the rock layer containing Fossil A. In this section, the rock layers are overturned
- \_\_\_\_\_ 7. To help decipher the geologic history of a region, create a geologic time scale using the rock units you see in that region.



- \_\_\_\_\_ 8. James Hutton thought Earth was old because he saw how slowly geological processes work now.
- \_\_\_\_\_ 9. Cross-cutting relationships help geologists to determine the older and younger of two rock units.
- \_\_\_\_\_ 10. In the process of relative dating, scientists determine the exact age of a fossil or rock.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. In the Grand Canyon rock layers stretch over wide areas, which illustrates the principle of \_\_\_\_\_.
12. Large time periods of erosion can cause a(n) \_\_\_\_\_ in the rock record.
13. The Cretaceous Period ended at the same time as the \_\_\_\_\_ Era.
14. A distinctive layer of rock that can be recognized across a large area is a(n) \_\_\_\_\_.
15. Organisms that cannot adapt to a changing environment often become \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. You see a sequence of rocks: A is on the bottom, B is in the center and C is on the top. Rock D cuts across layers A and B, but not C. What is the age sequence from oldest to youngest and why?

17. Describe three features of the geologic time scale.

---

**Answer Key**

1. d 2. b 3. a 4. a 5. b
6. true 7. false 8. true 9. true 10. false
11. original horizontality 12. unconformity 13. Mesozoic 14. key bed 15. extinct

16. By the law of superposition A was laid down first, then B, then C. By the law of cross-cutting relationships, D is younger than the rocks it cuts across, A & B, but is older than the rock it does not cut across, C. This means that the age order is A, B, D, C.

17. Possibilities include: The oldest ages are on the bottom and the youngest ages are on the top. The youngest ages are the most finely divided. The names of time units come from local places where the representative rock layers are found

## 11.3 Absolute Ages of Rocks

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- How much percent of the parent isotope remains after 2 half-lives?
  - 100%
  - 50%
  - 25%
  - 75%
- The half-life of a radioactive element is
  - half the estimated age of Earth's crust
  - the time it takes for half a parent isotope to decay into the daughter isotope
  - half the weight of the original radioactive element
  - the time it takes for half of a daughter isotope to decay into a parent isotope
- Carbon dating is useful for
  - igneous rocks
  - sedimentary rocks
  - organic materials
  - none of the above
- Potassium-argon is better for dating igneous rocks than carbon-14 because
  - the argon-39 half life is short
  - the potassium-40 half-life is long
  - igneous rocks do not contain carbon
  - all of these
- For radiometric dating of Earth's oldest rocks, it is best to use
  - uranium-238 to lead-206
  - potassium-argon
  - radiocarbon
  - none of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Using radioactivity scientists are able to measure the relative age of some rocks.
- \_\_\_\_\_ 7. Radioactive isotopes gain or lose particles to become different elements.
- \_\_\_\_\_ 8. No one knows Earth's age because no isotopes are good for substances that old.

\_\_\_\_\_ 9. Carbon-14 loses an alpha particle, which is two protons and two electrons.

\_\_\_\_\_ 10. Plants take in carbon-14 during photosynthesis.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Rock A is older than Rock B is a(n) relative age. Rock A is 1.2 million years old is a(n) \_\_\_\_\_ age.

12. \_\_\_\_\_ is the emission of high-energy particles by unstable isotopes.

13. A(n) \_\_\_\_\_ is formed from the radioactive decay of a parent isotope.

14. Radioactive dating is used to determine the \_\_\_\_\_ of objects.

15. A crystal has 100 ions of uranium-235 when it forms; at the same time it has \_\_\_\_\_ ions of lead-207.

### Short Answer

*Answer each question in the space provided.*

16. The half-life of carbon-14 is 5730 years. Describe what happens to the carbon-14 to carbon-12 ratio over eight half lives. Why is radiocarbon dating not useful for materials that are older than 50,000 years?

17. If you find a zircon crystal that has an age of 1 billion years in a sedimentary rock, what is the age of the sedimentary rock?

---

## Answer Key

1. c 2. b 3. c 4. b 5. a

6. false 7. true 8. false 9. false 10. true

11. absolute 12. Radioactivity 13. daughter isotope 14. absolute age 15. 0

16. At the time of formation there is 100% parent and 0% daughter. In eight half lives it goes like this:

C-14: 100, 50, 25, 12.5, 6.25, 3.125, 1.565, 0.7825, 0.39125; C-12: 0, 50, 75, 87.5, 93.75, 86.875, 98.44, 99.2225, 99.61375

The reason there is a limit to the number of half lives that radiometric dating can be used is that there is not enough parent isotope left to measure.

17. You can't know the age of the sedimentary rock, you only know that it's younger than 1 billion years because it has to be younger than the oldest material in it.

## 11.4 Evidence about Earth's Past

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which of the following are body fossils?
  - footprints
  - coprolites (fossil poo)
  - burrows
  - bones
- Which of the following can be used to identify a specific period of time?
  - body fossil
  - trace fossil
  - index fossil
  - amber
- (Hint: draw this out) Imagine Rock A and Rock B above it. A dike cuts across Rock A and Rock B. A fault cuts across Rock A, but not Rock B. From this we know that the
  - dike is older than Rock A but not Rock B
  - fault is the youngest geologic feature
  - dike is older than the fault
  - fault is older than the dike
- Scientists first suspected that a giant asteroid impact wiped out the dinosaurs
  - from a widespread key bed
  - when scientists located the giant crater
  - from large chunks of the asteroid discovered in Mexico
  - none of these
- Fossils are most useful in
  - igneous rocks
  - metamorphic rocks
  - sedimentary rocks
  - all three types of rocks
- Two rock layers that are far apart but have the same index fossil
  - are about the same age
  - formed in the same environment
  - are unrelated
  - none of these
- Fossils are useful because they can indicate the

- a. absolute age of the rock they are in
  - b. environment in which the rock was deposited
  - c. both of these
  - d. none of these
8. Which era do we live in?
- a. Holocene
  - b. Cenozoic
  - c. Quaternary
  - d. Phanerozoic
9. After seven half-lives
- a. an isotope pair is no longer useful
  - b. there is very little parent isotope left
  - c. there is very little measurable daughter isotope
  - d. none of these
10. A fossil human preserved for thousands of years in a glacier could indicate the \_\_\_\_\_ of earlier humans.
- a. DNA
  - b. diet
  - c. culture
  - d. all of these

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Fossilization is very common.
- \_\_\_\_\_ 12. A cast is rock that fills in a fossil mold.
- \_\_\_\_\_ 13. The law of lateral continuity states that identical rock layers were once connected.
- \_\_\_\_\_ 14. Radioactivity allowed absolute ages to be put onto the events of the geological time scale.
- \_\_\_\_\_ 15. An unconformity can be thought of as a loss of time.
- \_\_\_\_\_ 16. Radioactivity was discovered in the middle of the 20th century.
- \_\_\_\_\_ 17. If a zircon crystal is 4.4 billion years old that means that the rock it is in is 4.4 billion years old.
- \_\_\_\_\_ 18. Radioactive isotopes are ideal for dating rocks because they are stable and unchanging.
- \_\_\_\_\_ 19. Different isotopes are used to date materials of different ages.
- \_\_\_\_\_ 20. Potassium-40 decays to argon-40.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. A \_\_\_\_\_ is any remains or traces of an ancient organism.
22. \_\_\_\_\_ is ancient tree sap.
23. The law of \_\_\_\_\_ states that the younger layers are at the top and the oldest are at the bottom.
24. The study of rock strata is called \_\_\_\_\_.
25. An intrusion is \_\_\_\_\_ in age than the rocks it cuts across.
26. We live in the \_\_\_\_\_ epoch.
27. Radiocarbon dating looks at the \_\_\_\_\_ of a parent isotope to a daughter isotope.

28. A rock is analyzed and found to have an equal number of parent and daughter isotopes so we know that \_\_\_\_\_ half-lives have passed.
29. Footprints and burrows are examples of \_\_\_\_\_ fossils.
30. \_\_\_\_\_ allows scientists to assign numbers to the breaks in the geologic time scale.

**Short Answer**

*Answer each question in the space provided.*

31. What are the limits on radiometric dating?

32. Why is fossilization rare?

33. Why is the geological time scale valuable?

---

**Answer Key**

1. d 2. c 3. d 4. a 5. c 6. a 7. b 8. b 9. b 10. d



11. false 12. true 13. true 14. true 15. true 16. false 17. false 18. false 19. true 20. true

21. fossil 22. Amber 23. superposition 24. stratigraphy 25. younger 26. Holocene 27. ratio 28. one 29. trace 30. Absolute dating

31. The material being dated must have measurable amounts of the parent and daughter isotopes. It is best done on igneous rocks.

32. Many organisms do not have hard parts and so they break apart. Even organisms with hard parts get eaten or broken up or dissolve or do not get deposited in a favorable environment.

33. Scientists can refer to periods of time so that they know what they mean. This gives them an organizing principle for Earth history.

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CHAPTER **12**

# MS Earth's History Assessments

## Chapter Outline

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- 12.1 THE ORIGIN OF EARTH
  - 12.2 EARLY EARTH
  - 12.3 HISTORY OF EARTH'S LIFE FORMS
  - 12.4 EARTH'S HISTORY
-

## 12.1 The Origin of Earth

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Before the Sun formed
  - a. temperature and pressure was extreme
  - b. radioactivity began
  - c. the planets formed
  - d. all of the above
2. The densest part of planet Earth is the
  - a. continental crust
  - b. oceanic crust
  - c. core
  - d. mantle
3. The Sun formed from
  - a. a spinning cloud of gas and dust
  - b. large dense planets pulled to the center by gravity
  - c. radioactive dust that ignited
  - d. a collision by two stars
4. When the solar system first formed
  - a. life forms were primitive
  - b. asteroid impacts were common
  - c. each planets was surrounded by a thick atmosphere
  - d. all of these
5. Gases in the first atmosphere came from
  - a. comet impact
  - b. volcanic outgassing
  - c. none of these
  - d. both of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The first atmosphere contained nitrogen, carbon dioxide, oxygen, and hydrogen.
- \_\_\_\_\_ 7. All of the stars in the Universe formed at around the same time as our Sun.
- \_\_\_\_\_ 8. The Sun, planets and other solar system objects formed at about the same time.

\_\_\_\_\_ 9. Early Earth was much like Earth today.

\_\_\_\_\_ 10. Before there was an ocean, there was water vapor in the atmosphere.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Earth's earliest atmosphere was missing the important gas \_\_\_\_\_.

12. The Sun became a star when the process of \_\_\_\_\_ began.

13. New stars form in a(n) \_\_\_\_\_.

14. \_\_\_\_\_ pulled rocks together to create planets.

15. Earth accreted from the solar nebula nearly \_\_\_\_\_ billion years ago.

### Short Answer

*Answer each question in the space provided.*

16. Describe how Earth developed its internal structure.

17. How did the Moon form?

---

## Answer Key

1. a 2. c 3. a 4. b 5. d

6. false 7. false 8. true 9. false 10. true

11. oxygen 12. nuclear fusion 13. solar nebula 14. Gravity 15. 4.5

16. The collisions of rocks together caused the material to become very hot and melt. Gravity separated the molten material into layers with the densest at the center. The core is mostly iron, the mantle is dense rock and the crust is the least dense rock.

17. About 4.5 billion years ago, a Mars-sized asteroid struck the new Earth. The energy from the impact melted both bodies. Some molten material flung up into an orbit around Earth. The material came together to form the Moon.

## 12.2 Early Earth

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Earth's first crust was probably made of
  - a. anorthosite
  - b. granite
  - c. basalt
  - d. peridotite
2. The earliest life on Earth
  - a. may have been wiped out more than once
  - b. got its nutrients from photosynthesis
  - c. passed genetic information using amino acids
  - d. all of these
3. How do cells make copies of themselves?
  - a. Nucleic acids pass on genetic information
  - b. Using their metabolism
  - c. By combining cells to become multi-cellular
  - d. None of these
4. Which of the following is true?
  - a. Prokaryotes and eukaryotes are both only single celled.
  - b. Prokaryotes are only single-celled; eukaryotes are only multicellular.
  - c. Prokaryotes are single-celled or multicellular; eukaryotes are only multicellular.
  - d. Prokaryotes and eukaryotes both are single-celled or multicellular.
5. Continents form when
  - a. seafloor spreading creates them
  - b. Earth melts and then re-solidifies
  - c. microcontinents or island arcs collide
  - d. none of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Prokaryotes are more common than eukaryotes.
- \_\_\_\_\_ 7. DNA is short for deoxyribonucleic acid
- \_\_\_\_\_ 8. Rodinia was the first supercontinent.

\_\_\_\_\_ 9. Early in Earth history mantle convection was super fast.

\_\_\_\_\_ 10. The evolution from prokaryotes to eukaryotes to multi-cellular organisms took a few million years.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The important waste product of photosynthesis is \_\_\_\_\_.

12. When all the continents are together, the planet has a(n) \_\_\_\_\_.

13. \_\_\_\_\_ are molecules that pass genetic information to the next generation.

14. The first photosynthesizers were \_\_\_\_\_.

15. A eukaryote is different from a prokaryote because it has a \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What is the history of oxygen in the early atmosphere?

17. Why did the development of photosynthesis make Earth more hospitable for life to evolve?

---

## Answer Key

1. b 2. a 3. a 4. d 5. c

6. false 7. true 8. false 9. true 10. false

11. oxygen 12. supercontinent 13. Nucleic acids 14. cyanobacteria or blue-green algae 15. nucleus

16. The atmosphere had very little oxygen until photosynthesis evolved. The first photosynthesizers were cyanobacteria and when they appeared there was a lot of oxygen all of a sudden. There was a lot of iron oxide at this time.

17. Photosynthesis allowed organisms to create a reliable source of food. Photosynthesizing organisms could become food for other organisms. Oxygen is a by-product of photosynthesis. Oxygen could become ozone, which protected the planet from ultraviolet radiation.



## 12.3 History of Earth's Life Forms

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- When large numbers of organisms die out completely at the same time, it is a(n) \_\_\_\_\_.
  - mass evolution
  - mass extinction
  - punctuated equilibrium
  - punctuated evolution
- A species changes over time if
  - its environment changes
  - its members contain genetic variations
  - it survives
  - all of these
- The Cambrian is best known for
  - a huge mass extinction
  - the swamps that produced massive coal deposits
  - an incredible increase in the number of species
  - the origin of life
- Compared with their ancestors, horses today are
  - very similar
  - smaller than those ice age giants
  - adapted to a different environment
  - none of these
- At the end of the Paleozoic,
  - more than 95% of all species went extinct
  - a giant asteroid certainly struck Earth
  - dinosaurs and other land animals went extinct
  - none of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Organisms alive today evolved from earlier life forms.
- \_\_\_\_\_ 7. Adaptations are inheritable characteristics that help an organism to survive.
- \_\_\_\_\_ 8. Mass extinctions often separate the time periods on the geologic time scale.

- \_\_\_\_\_ 9. A mutation is almost always favorable.
- \_\_\_\_\_ 10. Any animal can adapt to any environmental conditions.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. \_\_\_\_\_ are the special characteristics that help an organism to survive in its environment.
12. The change in the genetic makeup of species over time is known as \_\_\_\_\_.
13. A(n) \_\_\_\_\_ is a change an organism's genes that can be passed through generations.
14. The most common and diverse category of organisms during the Mesozoic was \_\_\_\_\_.
15. Human eyes can be blue, brown, green, hazel, and grey. This means that there are \_\_\_\_\_ in the trait of eye color.

**Short Answer**

*Answer each question in the space provided.*

16. How could an asteroid impact have caused the mass extinction at the end of the Cretaceous?

17. Why does Earth have such an incredible amount of biodiversity?

---

**Answer Key**

1. b 2. d 3. c 4. c 5. a

6. true 7. true 8. true 9. false 10. false

11. adaptations 12. evolution 13. mutation 14. reptiles 15. variations

16. The impacted shot dust into the atmosphere, which rained back to earth and heated the atmosphere so hot that it roasted animals. The dust blocked the sun and halted photosynthesis and froze the planet. Sulfur mixed with water

in the atmosphere to form acid rain, which dissolved plankton shells. Animals starved.

17. Earth has an incredible number of environments for organisms to live in so there are an incredible number of types of organisms. There are lots of climates, lots of ways of getting food, and being or avoiding predators.

## 12.4 Earth's History

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The Sun, Earth and Moon formed
  - at roughly the same time
  - over about 1 billion years
  - shortly after the Big Bang formed the Universe
  - over about 15 billion years
- Earth's first atmosphere was missing the important gas
  - nitrogen
  - hydrogen
  - carbon dioxide
  - oxygen
- The Sun shines from energy released when
  - helium breaks apart to form hydrogen
  - burning carbon
  - hydrogen fuses into helium
  - carbon fuses into carbon dioxide
- Why is ozone important?
  - It is needed for photosynthesis in phytoplankton.
  - It is needed for cellular respiration in animals.
  - It stops high energy ultraviolet radiation from reaching the Earth's surface.
  - none of these.
- Early Earth had lots of volcanoes and earthquakes because
  - asteroid impacts made the crust unstable
  - mantle convection was very rapid
  - the formation of the Moon made the crust unstable
  - life had not yet formed
- What stores genetic information and passes it onto the next generation?
  - amino acids
  - prokaryotes
  - nucleic acids
  - eukaryotes
- Evolution could not proceed without mutations because
  - there would not be enough genetic variation

- b. too many organisms would stay alive
  - c. organisms could not reproduce
  - d. none of these
8. Eukaryotes differ from prokaryotes because they
- a. are multicellular
  - b. use RNA instead of DNA as their replicator
  - c. contain organs
  - d. have a nucleus
9. At the beginning of the Cambrian life could flourish because
- a. the climate changed from humid tropical to more moderate
  - b. shells evolved
  - c. an asteroid impact wiped earlier life out
  - d. all of these
10. The first fish
- a. were very similar to modern fish
  - b. had cartilaginous skeletons
  - c. had jaws for obtaining prey
  - d. all of these

**True or False**

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Asteroids and comets brought all the water to the early Earth.
- \_\_\_\_\_ 12. Earliest Earth had no atmosphere because it was so hot gases were not stable.
- \_\_\_\_\_ 13. The Moon is a captured asteroid.
- \_\_\_\_\_ 14. The earliest cells were prokaryotes.
- \_\_\_\_\_ 15. Most comets and asteroids reside in belts around the Sun.
- \_\_\_\_\_ 16. Mutations are rarely valuable; they usually lead to an organism's death.
- \_\_\_\_\_ 17. The first continents were very similar to modern continents.
- \_\_\_\_\_ 18. The largest known mass extinction occurred at the end of the Cretaceous period.
- \_\_\_\_\_ 19. The dinosaurs went extinct 65 million years ago.
- \_\_\_\_\_ 20. Evolution proceeds at the same rate and from simpler to more advanced organisms always.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

21. Earth's \_\_\_\_\_ is the most dense layer of the planet.
22. The early Earth was hit frequently by \_\_\_\_\_.
23. Cells with a nucleus and organized structures are \_\_\_\_\_.
24. Volcanic eruptions and \_\_\_\_\_ supplied the gases for the early atmosphere.
25. Pangaea was the most recent \_\_\_\_\_.
26. \_\_\_\_\_ allows organisms to use sunlight and inorganic material to create food energy.
27. \_\_\_\_\_ have a cell membrane and get their nutrients directly from the water.
28. Earth formed about \_\_\_\_\_ years ago.

29. Scientists understand horse evolution from \_\_\_\_\_.

30. \_\_\_\_\_ are differences in a population that helps some members survive better than others.

**Short Answer**

*Answer each question in the space provided.*

31. What adaptations do organisms need for life on land?

32. How did the sun and planets form?

33. Explain the importance of adaptation to organisms.

---

**Answer Key**

1. a 2. d 3. c 4. c 5. b 6. c 7. a 8. d 9. b 10. b

11. false 12. true 13. false 14. true 15. true 16. true 17. false 18. false 19. true 20. false

21. core 22. asteroids 23. eukaryotes 24. comets 25. supercontinent 26. photosynthesis 27. prokaryotes 28. 4.6 billion 29. fossils 30. variations

31. The adaptations for land included a skeleton for support since water was not there to hold the organisms up; a way to keep from drying out; and the ability to breathe air. So the organisms needed skeletons, lungs and a protection like skin.

32. The sun and planets formed from a giant cloud of gas and dust called the solar nebula. The cloud contracted and began to spin, which increased the temperature and pressure. The cloud spun faster and formed a disk. At the center it was so hot and dense that the material ignited to become a star. Further out, material collided to form the planets and other solar system bodies.

33. Adaptations allow organisms to be successful in the environment in which they live. Organisms must be adapted by having protection from the external environment, the ability to gather nourishment without being eaten, and the ability to mate and produce offspring.

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CHAPTER

**13**

# MS Earth's Fresh Water Assessments

## Chapter Outline

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- 13.1 WATER ON EARTH
  - 13.2 SURFACE WATER
  - 13.3 GROUNDWATER
  - 13.4 EARTH'S FRESH WATER
-



# 13.1 Water on Earth

## Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

1. Water is stored in
  - a. ice and snow
  - b. the atmosphere
  - c. lakes and streams
  - d. all of these
2. The largest amount of fresh water is contained in
  - a. ice caps, glaciers and inland seas
  - b. rivers and streams
  - c. the oceans
  - d. groundwater and soil moisture
3. The water cycle
  - a. begins and ends in the oceans.
  - b. has no beginning and has no end.
  - c. begins in the oceans and ends in groundwater aquifers.
  - d. begins in the atmosphere and ends in the oceans.
4. The energy for the water cycle comes from
  - a. radioactive decay
  - b. Earth's internal heat
  - c. the Sun
  - d. water when it changes state
5. In infiltration, water goes
  - a. through the ground
  - b. to the atmosphere by changing from liquid to gas
  - c. to the atmosphere through a plant
  - d. none of these.

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Soil moisture is important for plants to grow.
- \_\_\_\_\_ 7. Water exists on Earth in all three states of matter.
- \_\_\_\_\_ 8. Water turns to gas through condensation.

- \_\_\_\_\_ 9. The atoms that make up water molecules come together and break apart easily.
- \_\_\_\_\_ 10. Cold air can hold less water than warm air so when air cools water may condense.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. The movement of water between reservoirs is called the \_\_\_\_\_.
12. The gas phase of water is called \_\_\_\_\_.
13. Water is composed of one \_\_\_\_\_ and two \_\_\_\_\_ atoms.
14. Water changes from a liquid to a gas in the process of \_\_\_\_\_.
15. Precipitation that flows over the surface of the land is called \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. Draw the water cycle and label the parts.

17. Describe two ways that water goes from the ground to the atmosphere.

---

**Answer Key**

1. d 2. a 3. b 4. c 5. a

6. true 7. true 8. false 9. false 10. true

11. water cycle or hydrologic cycle 12. water vapor 13. oxygen; hydrogen 14. evaporation 15. runoff

16. See text.

17. Water can evaporate, turn from a liquid to a gas, when energy is added. Water can also undergo transpiration, by being absorbed by a plant as a liquid and then being released into the atmosphere as a gas.

## 13.2 Surface Water

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. The Great Lakes
  - a. contain 12% of the world's fresh surface water
  - b. are the world's largest freshwater lakes
  - c. are so cold, not much lives in them
  - d. formed when tectonic faults created basins
2. Lakes
  - a. are often the result of glaciation
  - b. are permanent features of a landscape
  - c. all become salty over time
  - d. none of these
3. A stream is
  - a. any water that flows downhill
  - b. a large amount of water that flows downhill
  - c. any water that flows downhill in a channel
  - d. any water in a channel or depression
4. A broad curve in a river is a
  - a. tributary
  - b. delta
  - c. floodplain
  - d. meander
5. Two water droplets fall on opposite sides of a divide. Those droplets will
  - a. eventually end up in the same ocean
  - b. eventually end up in two different oceans
  - c. rapidly end up in the same river
  - d. none of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Streams usually begin with water from snow melt and possibly springs.
- \_\_\_\_\_ 7. A single stream will have a single water source.
- \_\_\_\_\_ 8. The Great Lakes are in basins carved by glaciers.

- \_\_\_\_\_ 9. A stream is a small river.  
\_\_\_\_\_ 10. A floodplain may be very wide and flat.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. A body of freshwater smaller than a lake is a(n) \_\_\_\_\_.  
12. A high occurrence of rain can cause a(n) \_\_\_\_\_ in a low lying area.  
13. Two river basins are separated by a(n) \_\_\_\_\_.  
14. The area where a river drops sediment at an ocean or lake is a(n) \_\_\_\_\_.  
15. Land that becomes flooded is called a \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. Why are wetlands important?

17. Draw and then describe these features of a stream: the source, tributaries, main river, and mouth.

---

**Answer Key**

1. b 2. a 3. c 4. d 5. b  
6. true 7. false 8. true 9. false 10. true  
11. pond 12. flood 13. divide 14. delta 15. floodplain  
16. Wetlands are important because they have tremendous biodiversity and provide homes for many species. Wetlands filter sediments and toxins to purify water. They also slow down rushing water and reduce the risk of flooding in a storm.

17. See text.

## 13.3 Groundwater

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Groundwater usually
  - flows rapidly like an underground river
  - flows uphill or downhill depending on the topography
  - flows very slowly between grains of sediment
  - is stationary in an aquifer
- What are the two features of a good aquifer?
  - high porosity and high permeability
  - low porosity and high permeability
  - high porosity and low permeability
  - low porosity and low permeability
- During very wet times, the water table will
  - stay the same
  - rise
  - fall
  - hard to know; water tables are not affected by surface conditions.
- Water replenishes an aquifer from
  - glacial meltwater
  - rainfall
  - snow melt
  - all of these
- Geysers erupt because
  - pressure builds until the water breaks through
  - they have much more water than hot springs
  - the water needs to get downhill in a hurry
  - they are above a volcano that is about to erupt

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Water in hot springs is heated by hot magma.
- \_\_\_\_\_ 7. Aquifers are generally found at the same depths.
- \_\_\_\_\_ 8. Land use in an area can affect the amount of water that is available to enter groundwater.

\_\_\_\_\_ 9. A good aquifer has rock in it that is porous and permeable.

\_\_\_\_\_ 10. The bottom layer of an aquifer has impermeable rock.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Sediments or rock with a lot of holes has high \_\_\_\_\_.

12. If a lot of water is pumped from an aquifer the ground above it may \_\_\_\_\_.

13. Water that infiltrates through the ground enters an aquifer for the process of \_\_\_\_\_.

14. A(n) \_\_\_\_\_ is created where groundwater seeps or flows from rock or soil.

15. To reach groundwater, people must dig or drill a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What characteristics of an aquifer make it a good source of water for humans? What problems might there be with this aquifer?

17. What is the Ogallala Aquifer and why it is important?

---

## Answer Key

1. c 2. a 3. b 4. d 5. a

6. true 7. false 8. true 9. true 10. true

11. porosity 12. sink 13. recharge 14. spring 15. well

16. A large aquifer that is near the surface can be more easily drilled into. Being near the surface may make it more susceptible to being polluted. An aquifer that is used may be pumped down and the ground above it may sink or it

may get low on water.

17. The Ogallala Aquifer is found beneath eight states from South Dakota down through Texas. It is a region that is heavily farmed and there are also towns and cities that need water. The aquifer is 30 to 100 meters deep and supplies about one-third of the irrigation water in the United States. The aquifer is being pumped at about eight times the rate that it is being replenished.



## 13.4 Earth's Fresh Water

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What percent of the Earth's water is fresh water?
  - a. 4%
  - b. 3%
  - c. 2%
  - d. 1%
2. Clouds form when
  - a. liquid water condenses in the atmosphere
  - b. water evaporates to form water vapor
  - c. raindrops break apart in the atmosphere
  - d. none of these
3. With transpiration
  - a. plants take water from the soil and let water vapor out into the air
  - b. plants absorb water into their tissues
  - c. water vapor becomes liquid water in a tiny droplet
  - d. solid water becomes water vapor without first becoming a liquid
4. Freshwater contains
  - a. absolutely no salt
  - b. little or no salt
  - c. a noticeable amount of salt
  - d. an amount of salt up to the amount an ocean has
5. Humans get water from aquifers from
  - a. springs
  - b. drilling wells and waiting for the water to come up
  - c. drilling wells and pumping water
  - d. all of these
6. In a lake, water plants and algae live
  - a. at the bottom where they are rooted
  - b. throughout all water levels
  - c. near the top where sunlight penetrates
  - d. where animals cannot reach them
7. Which of the following is true about floods?
  - a. They only happen on the largest rivers.

- b. They only flood their floodplain.
  - c. They have only caused damage in the past few decades.
  - d. They are a natural event on many streams.
8. To get water, a well must
- a. reach the top of the water table
  - b. reach below the water table
  - c. reach below the impermeable layer
  - d. be drilled; the depth doesn't matter
9. The Ogallala aquifer
- a. is recharging faster than it is being pumped
  - b. has recharge equal to the amount being pumped
  - c. is being pumped must faster than it is being recharged
  - d. will have water to support the farm belt forever.
10. If a lot of water is pumped from aquifer but the water table stays at the same level,
- a. the aquifer is very full of water.
  - b. the extra recharge is equal to the increase in pumping
  - c. the water table will soon go down
  - d. none of these.

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. The water cycle is a one way process.
- \_\_\_\_\_ 12. Rivers are the largest type of streams.
- \_\_\_\_\_ 13. Lakes are small bodies of water that have no outlet.
- \_\_\_\_\_ 14. The mouth of a stream is where it originates.
- \_\_\_\_\_ 15. Lakes do not ever disappear.
- \_\_\_\_\_ 16. Wetlands are found inland and at the edges of seas.
- \_\_\_\_\_ 17. Geysers always erupt at regular intervals.
- \_\_\_\_\_ 18. Withdrawing too much water from an aquifer may cause the land surface to sink.
- \_\_\_\_\_ 19. Nothing can live in a hot springs for very long.
- \_\_\_\_\_ 20. Each water molecule on Earth has been around for billions of years.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. The movement of water around Earth's surface is the \_\_\_\_\_ cycle.
22. The top of water level in a layer of groundwater is called a(n) \_\_\_\_\_.
23. Water changes from a liquid to a gas by \_\_\_\_\_.
24. A stream that overflows its banks is in \_\_\_\_\_.
25. The smaller of two streams that come together is a \_\_\_\_\_ of the larger stream.
26. The highest point between two streams is called a(n) \_\_\_\_\_.
27. \_\_\_\_\_ are fragile systems that are sensitive to the amounts and quality of water.
28. A stream flows in a \_\_\_\_\_

29. A \_\_\_\_\_ is a wetland that is under water.
30. When precipitation soaks into the ground the process is called \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

31. Draw the water cycle. Label the reservoirs and processes.

32. Describe the features of a groundwater aquifer.

33. Crater Lake is found in the caldera of an old volcano. How might this lake have formed?

---

**Answer Key**

1. b 2. a 3. a 4. b 5. d 6. c 7. d 8. b 9. c 10. b
11. false 12. true 13. false 14. false 15. false 16. true 17. false 18. true 19. false 20. true
21. hydrologic (water) 22. water table 23. evaporation 24. flood 25. tributary 26. divide 27. Wetlands 28. channel
29. marsh 30. infiltration

31. Water in the ocean → evaporation into water vapor in the atmosphere → condenses into clouds and tiny droplets of water → precipitation occurs as rain, sleet, or snow and falls back to the earth → water runs into rivers or becomes groundwater which will eventually get to the oceans.
32. An aquifer is a porous and permeable layer that has an impermeable layer below it. Water trickles down into the aquifer and travels very slowly through it. The top of the zone that contains water is called the water table.
33. The volcano blew its top and the top collapsed and created a basin. Rain and snow melt have collected in the basin to create a lake.

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CHAPTER **14**

# MS Earth's Oceans Assessments

## Chapter Outline

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- 14.1 INTRODUCTION TO THE OCEANS
  - 14.2 OCEAN MOVEMENTS
  - 14.3 THE SEAFLOOR
  - 14.4 OCEAN LIFE
  - 14.5 EARTH'S OCEANS
-

## 14.1 Introduction to the Oceans

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What percent of the Earth is covered in salt water oceans?
  - a. 82%
  - b. 71%
  - c. 65%
  - d. 49%
2. Coastal areas have a milder climate than inland areas because
  - a. water does not change temperature as rapidly as land
  - b. currents move warm and cold water around
  - c. breezes blow between land and sea
  - d. all of these
3. Compared with shallow water, deeper water is
  - a. saltier and colder
  - b. saltier and warmer
  - c. less salty and colder
  - d. less salty and warmer
4. Salt in the oceans comes from
  - a. deep-sea hydrothermal vents
  - b. near shore salt deposits
  - c. river inflow
  - d. mid-ocean ridges
5. The ocean zone that is always covered by water, but is fairly shallow in depth is the
  - a. intertidal zone
  - b. oceanic zone
  - c. photic zone
  - d. neritic zone

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The Dead Sea is extremely saline due to high evaporation.
- \_\_\_\_\_ 7. Earth's oceans have always had the same configuration.
- \_\_\_\_\_ 8. Most nutrients in the ocean are washed in from the land.

\_\_\_\_\_ 9. About 250 million years ago, there was one world ocean known as Pansea.

\_\_\_\_\_ 10. The climate of inland areas is affected by oceans.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Between high and low tide is the \_\_\_\_\_ zone.

12. Photosynthesizing organisms must live in the \_\_\_\_\_ zone.

13. The most common salt in the ocean is the compound \_\_\_\_\_

14. The deepest trench is in the \_\_\_\_\_ Ocean.

15. For early oceans to form, there must have been the gas \_\_\_\_\_ in the atmosphere.

### Short Answer

*Answer each question in the space provided.*

16. Why is the sea salty?

17. Draw a diagram of the ocean and label the major horizontal and vertical divisions.

---

## Answer Key

1. b 2. d 3. a 4. c 5. a

6. true 7. false 8. true 9. false 10. true

11. intertidal or littoral 12. photic 13. sodium chloride 14. Pacific 15. water vapor

16. Ions come off rocks and into water that flows into the oceans in rivers. Ocean water evaporates and leaves the salts behind. So seawater is saltier than the rivers that enter it.

17. See text.

## 14.2 Ocean Movements

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What is the primary cause of the tides?
  - a. Earth's rotation
  - b. The moon's gravity
  - c. the Sun's gravity
  - d. wind
2. Surface currents
  - a. are caused by Coriolis effect
  - b. flow in a counterclockwise direction in the Northern Hemisphere
  - c. are caused by winds that may have blown far from the current
  - d. none of these
3. Where in the ocean is wave energy the greatest?
  - a. at the surface
  - b. at the ocean floor
  - c. half way between the surface and the ocean floor
  - d. None of the above
4. A wave breaks because
  - a. the base has friction with the bottom
  - b. it becomes too tall to be supported by its base
  - c. it reaches the shore
  - d. all of these
5. Upwelling brings
  - a. warm water to the surface so there are coral reefs
  - b. cold water east to west across the Pacific
  - c. nutrients to the surface so there is a lot of life
  - d. none of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The greatest cause of tides is the Sun.
- \_\_\_\_\_ 7. Tides are waves: high tide is the crest and low tide is the trough.
- \_\_\_\_\_ 8. A wave is a transfer of energy that initially began with wind.



\_\_\_\_\_ 9. The first sign of a tsunami is coming is high water moving fast across the ocean.

\_\_\_\_\_ 10. Coriolis effect is caused by Earth's rotation.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Surface currents deliver \_\_\_\_\_ around the planet.

12. Tides with the smallest tidal range are called \_\_\_\_\_ tides.

13. \_\_\_\_\_ currents are pushed along by surface winds.

14. The height difference between adjacent high and low tides is known as the \_\_\_\_\_.

15. The deepest water probably is coldest and saltiest so it has the highest \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What is the Gulf Stream? Why is it important?

17. Where are the Earth-Moon-Sun during spring tides? Where they during neap tides? What are spring and neap tides?

---

## Answer Key

1. b 2. d 3. a 4. d 5. c

6. false 7. true 8. true 9. false 10. true

11. heat 12. neap 13. Surface 14. tidal range 15. density

16. The Gulf Stream is a large ocean current that impacts the climate of nearby coasts. It carries warm water from the equator up the eastern coast of North America and so moderates the climate further north.

17. Spring tides are the highest high and lowest low tides, which occur when Sun, Moon and Earth are aligned. Neap tides are much more similar and occur when Sun and Moon are at 90-degrees to each other relative to Earth.

## 14.3 The Seafloor

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Which are not found in the ocean?
  - fish
  - oil gas
  - valuable minerals
  - all are found in the oceans
- The gently sloping seafloor just off the shoreline is called the
  - oceanic trench
  - mid-ocean ridge
  - continental shelf
  - coastal slope
- It is difficult to learn about the oceans because they
  - are salty and cold
  - are cold and dark
  - have intense currents that are hard to battle
  - none of these
- A volcano on the seafloor may
  - be fairly small
  - be active or extinct
  - rise above sea level
  - all of these
- Minerals form in the oceans at
  - hot water vents in the seafloor
  - igneous intrusions
  - clay settling sites
  - all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. To understand ocean chemistry, scientist need samples of seawater from different depths.
- \_\_\_\_\_ 7. It is possible for a submersible to take scientists to depths of up to one mile for observations.
- \_\_\_\_\_ 8. The seafloor is mined for many types of metals.

\_\_\_\_\_ 9. Advanced scuba divers can dive to the seafloor at a mid-ocean ridge.

\_\_\_\_\_ 10. Scientists look for medicines in some marine creatures.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A mountain on the seafloor that does not rise above sea level is a(n) \_\_\_\_\_

12. A vehicle that can visit the deepest ocean floor without humans aboard is called a(n) \_\_\_\_\_ vehicle.

13. The Gulf of Mexico in 2010 was damaged by the extraction of \_\_\_\_\_ .

14. The deep, flat part of the seafloor is called a(n) \_\_\_\_\_.

15. Nodules on the seafloor may contain valuable \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. How can sonar be used to create a map of the seafloor?

17. What problems face companies trying to get non-living resources from the oceans?

---

## Answer Key

1. d 2. c 3. b 4. d 5. a

6. true 7. false 8. false 9. false 10. true

11. seamount 12. remotely operated 13. oil and gas 14. abyssal plain 15. minerals

16. Sonar is sound waves. They are emitted from a ship and then collected back after they bounce off the seafloor. Since the waves travel at a known speed the travel time can be used to determine the distance to the seafloor from the sea surface. Enough of these points together can be used to create a seafloor map.

17. The ocean environment is harsh and many resources are located far from land. Oil and natural gas are being extracted from deeper waters but the large floating oil rigs needed to get it are risky for workers and for the ocean environment. Minerals are usually located far from shore and in very deep water so the cost of extracting them is too high.

## 14.4 Ocean Life

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What type of organism found in the ocean floats along with the current?
  - a. plankton
  - b. whales
  - c. jellyfish
  - d. squids
2. What part of a fish's body extracts oxygen from the water?
  - a. bladder
  - b. gills
  - c. spleen
  - d. lungs
3. Benthic organisms that live in the intertidal must do which of the following
  - a. have hard shells
  - b. have strong attachments
  - c. burrow into sediment
  - d. any of these
4. Coral reefs
  - a. are found off of nearly all shorelines
  - b. are rocky outcroppings with little other life
  - c. have a tremendous amount of biodiversity
  - d. none of these
5. Life in the deepest ocean is
  - a. non-existent
  - b. abundant
  - c. about the same as at the surface
  - d. scarce

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Nekton must live in the photic zone.
- \_\_\_\_\_ 7. Zooplankton may include larvae of large animals.
- \_\_\_\_\_ 8. Plankton are organisms that can swim against the current.

\_\_\_\_\_ 9. There is no photosynthesis at deep-sea vents because there is no light.

\_\_\_\_\_ 10. If an ocean plant can photosynthesize, light must be available to the plant.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. \_\_\_\_\_ must float in the photic zone to photosynthesize sunlight.

12. Organisms that break down chemicals to make food engage in \_\_\_\_\_.

13. A worm that burrows into ocean sediments is an example of an organism classified as \_\_\_\_\_.

14. Organisms that can swim are \_\_\_\_\_.

15. Dead organisms are broken down into nutrients by \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Draw and label a marine food web.

17. What are plankton? What are the two main types?

---

## Answer Key

1. a 2. b 3. d 4. c 5. d

6. false 7. true 8. false 9. true 10. true

11. phytoplankton 12. chemosynthesis 13. benthos 14. nekton 15. decomposers

16. See text

17. Plankton are floaters; they cannot move on their own, but must move with ocean currents. They are usually

tiny. Phytoplankton are plant-like; they can photosynthesize so they must live in the photic zone. Zooplankton are animal-like; they feed on phytoplankton and include tiny animals and larvae.



## 14.5 Earth's Oceans

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The ocean is salty where
  - evaporation is high; fresh water mixing is high
  - evaporation is high; fresh water mixing is low
  - evaporation is low; fresh water mixing is high
  - evaporation is low; fresh water mixing is low
- Organisms living between the high and low tide marks
  - are usually adapted to land environments
  - could easily move out to sea
  - must have adaptations to live on land and in the sea
  - none of these
- In the zone below where sunlight penetrates, there is
  - no chemosynthesis
  - no photosynthesis
  - no well-developed food web
  - all of these
- Which zone makes up the majority of the ocean?
  - deep sea
  - photic zone
  - aphotic zone
  - none of these
- Upwelling is important because
  - organisms depend on the nutrient-rich water from the deep
  - cold water goes down to the seafloor and warm water comes up to the surface
  - it drives surface ocean currents
  - it drives deep ocean currents
- Which tides have the smallest tidal range?
  - high tide
  - low tide
  - spring tide
  - neap tide
- To build a large ocean wave, wind must blow
  - at high speed

- b. over a large distance
  - c. for a long period of time
  - d. all of these
8. At the continental slope the
- a. continent slopes relatively gently toward the seafloor
  - b. continent drops off relatively steeply toward the seafloor
  - c. beach slopes toward the tidal zone
  - d. abyssal plain slopes toward a trench
9. At the new and full moon, the tides are
- a. at their highest and lowest
  - b. more even in height
  - c. higher in one of the high tides that day than in the other
  - d. random
10. Nekton are
- a. animals that float in the currents
  - b. plants and animals that float in the currents
  - c. plants and animals that live on the seafloor
  - d. animals that can swim in the currents

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. About 71% of the Earth's surface is covered in water.
- \_\_\_\_\_ 12. The average salinity of seawater is 3.5%.
- \_\_\_\_\_ 13. Tsunamis travel across the sea as giant waves, but do most of their damage when they hit shore.
- \_\_\_\_\_ 14. Spring tides occur only in the spring.
- \_\_\_\_\_ 15. Downwelling occurs where cold dense water sinks.
- \_\_\_\_\_ 16. Organisms at hot vents get energy from chemicals.
- \_\_\_\_\_ 17. There is one high tide and one low tide a day in most locations.
- \_\_\_\_\_ 18. Coral reefs have a tremendous diversity of organisms.
- \_\_\_\_\_ 19. Photosynthetic life has been found near hydrothermal vents.
- \_\_\_\_\_ 20. Nodules on the seafloor contain valuable minerals.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. \_\_\_\_\_ ocean currents move water of different temperature around the planet.
22. An ecosystem with high \_\_\_\_\_ has a large number of species inhabiting it.
23. Tides are produced the Sun and Moon's \_\_\_\_\_ pulls on Earth.
24. A volcano that is covered by seawater is a(n) \_\_\_\_\_
25. Earth's rotation affects the direction of winds and currents is a phenomenon called \_\_\_\_\_.
26. The mountain range that runs through the world's oceans is called a \_\_\_\_\_.
27. The \_\_\_\_\_ is a warm water current in the Atlantic ocean that warms the northern regions.
28. A \_\_\_\_\_ is a manned vehicle that can visit the bottom of the ocean.

29. For tubeworms, which live at/in \_\_\_\_\_, bacteria make food and the worm protects the bacteria in its tube.
30. To make a map of the seafloor, scientists use \_\_\_\_\_ waves.

**Short Answer**

*Answer each question in the space provided.*

31. What causes the two high tides that take place at the same time in different locations?

32. What happens in the North Atlantic that drives deep ocean circulation?

33. About photosynthesis and chemosynthesis: How are they the same? How are they different?

---

**Answer Key**

1. b 2. c 3. b 4. c 5. a 6. d 7. d 8. b 9. a 10. d  
11. true 12. true 13. false 14. false 15. true 16. true 17. false 18. true 19. false 20. true

21. Surface 22. biodiversity 23. gravity 24. seamount 25. Coriolis effect 26. mid-ocean ridge 27. Gulf Stream 28. submersible 29. vents 30. sound or sonar

31. One high tide is caused by the gravitational pull of the Moon. The other is on the opposite side of Earth from the Moon because Earth is being pulled by the Moon and leaves behind the water.

32. In the North Atlantic, sea ice grows, leaving behind cold water that is salty. This dense water sinks to the bottom of the sea. As it sinks, it pushes deep water along the bottom of the ocean so that it circulates through the ocean basins.

33. Both of these processes make food energy from something that is not food. The energy source is not the same: for photosynthesis it is light and for chemosynthesis it is chemicals. Photosynthesis must occur in the light. Chemosynthesis doesn't need light and it takes place in the deep sea where light cannot penetrate.

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CHAPTER

**15**

# MS Earth's Atmosphere Assessments

## Chapter Outline

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- 15.1 THE ATMOSPHERE
  - 15.2 ENERGY IN THE ATMOSPHERE
  - 15.3 ATMOSPHERIC LAYERS
  - 15.4 AIR MOVEMENT
  - 15.5 EARTH'S ATMOSPHERE
-

## 15.1 The Atmosphere

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What are the two most common gases in the atmosphere?
  - a. hydrogen and oxygen
  - b. nitrogen and water vapor
  - c. hydrogen and nitrogen
  - d. oxygen and nitrogen
2. The most important gas(es) for life are
  - a. nitrogen and oxygen
  - b. oxygen and carbon dioxide
  - c. oxygen
  - d. nitrogen, oxygen and carbon dioxide
3. Photosynthesis
  - a. uses carbon dioxide and creates oxygen
  - b. uses oxygen and creates carbon dioxide
  - c. uses carbon dioxide and oxygen and creates food energy
  - d. uses food energy and creates carbon dioxide and oxygen.
4. On the Moon
  - a. birds couldn't breathe
  - b. birds couldn't fly
  - c. if birds said "cheep" they wouldn't be heard
  - d. all of these
5. An increase in air pollutant particles
  - a. would have no effect on the number of raindrops
  - b. would have an unknown effect on the number of raindrops
  - c. could produce more raindrops
  - d. might produce fewer raindrops

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The atmosphere protects Earth from harmful solar rays.
- \_\_\_\_\_ 7. Sound waves travel rapidly through empty space.
- \_\_\_\_\_ 8. Carbon dioxide is abundant in the atmosphere.

- \_\_\_\_\_ 9. Ozone is a type of oxygen.  
\_\_\_\_\_ 10. Weather on the Moon is always stormy.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. As you increase in altitude, air pressure \_\_\_\_\_ .  
12. As oceans and lakes evaporate, \_\_\_\_\_ accumulates in the atmosphere.  
13. As air rises, water vapor forms \_\_\_\_\_ .  
14. Near the surface, as air pressure rises, air density \_\_\_\_\_ .  
15. Molecules are packed more tightly together in air with higher \_\_\_\_\_ .

**Short Answer**

*Answer each question in the space provided.*

16. On top of Old Smokey, you drink a bottle of water then close the lid. Back at sea level, you find that the bottle has collapsed. Explain what has happened.

17. Often when there is cloud cover, daytime temperatures are lower and nighttime temperatures are higher. Why?

---

**Answer Key**

1. d 2. b 3. a 4. d 5. c  
6. true 7. false 8. false 9. true 10. false  
11. decreases 12. water vapor 13. clouds 14. increases 15. density  
16. At higher altitudes, the air has less density. Back at sea level the denser air pushes against the sides of the bottle but the air inside the bottle is not dense enough to push back so the bottle collapses.

17. The clouds are like a blanket. They keep out some of the sun's heat so daytime temperatures are cooler. They trap some of the heat that radiates from the surface at night so nighttime temperatures are warmer.



## 15.2 Energy in the Atmosphere

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- When heat is transferred by the movement of electromagnetic waves it is called
  - convection
  - conduction
  - radiation
  - none of these
- Electromagnetic spectrum
  - is all visible to humans
  - has the highest energy at the short wavelengths.
  - has the highest energy in the infrared.
  - is only able to travel through material
- The vertical movement of air due to the uneven heating is called
  - convection
  - reflection
  - conduction
  - refraction
- Wavelengths that are short and very high energy are
  - infrared
  - radio waves
  - ultraviolet
  - visible light
- Incoming solar radiation may
  - reflect back into space
  - be absorbed by clouds
  - strike the ground
  - all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Energy cannot be created or destroyed.
- \_\_\_\_\_ 7. Two important greenhouse gases are carbon dioxide and water vapor.
- \_\_\_\_\_ 8. Sunlight hits Earth surface, then heat travels by conduction back into the atmosphere.

\_\_\_\_\_ 9. Deep purple is part of the ultraviolet spectrum.

\_\_\_\_\_ 10. Burning wood releases chemical energy.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Light, radio waves and gamma rays are examples of \_\_\_\_\_.

12. The Sun's rays strike Earth's surface most directly at \_\_\_\_\_.

13. Infrared energy is also known as \_\_\_\_\_.

14. The ability to do work is \_\_\_\_\_.

15. Energy from the sun travels in packets called \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Describe the three ways that energy can move.

17. What causes greenhouse effect and why is it important?

---

## Answer Key

1. c 2. b 3. a 4. c 5. d

6. true 7. true 8. true 9. false 10. true

11. electromagnetic waves 12. the equator 13. heat 14. energy 15. photons

16. By radiation, energy travels in waves across space. By conduction, energy moves between molecules that are in contact. By convection, energy moves in a current through a liquid or gas.

17. Greenhouse gases, such as carbon dioxide and water vapor, trap heat in the atmosphere.

## 15.3 Atmospheric Layers

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Days with inversions may have high pollution because
  - they are cold and people use more fossil fuels
  - the air is stable and more pollutants can get trapped
  - they are warm and the air conditioners are running
  - none of these
- In the stratosphere, temperature \_\_\_\_\_ with altitude because \_\_\_\_\_.
  - decreases; heat radiates from the ground
  - decreases; heat comes from the sun
  - increases; heat comes from the sun
  - increases; heat radiates from the ground
- The ozone layer protects life on Earth from
  - the Sun's high energy ultraviolet radiation
  - global warming
  - the Sun's intense heat
  - none of these
- An inversion
  - has warm air above cold air
  - has cold air above warm air
  - is unstable
  - none of these
- In the thermosphere, the air feels very \_\_\_\_\_ because \_\_\_\_\_.
  - cold; there are so few gas molecules
  - hot; it is close to the sun
  - hot; it is above most of the atmosphere
  - b c

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The International Space Station orbits Earth in the stratosphere.
- \_\_\_\_\_ 7. The temperature gradient of each layer within the atmosphere is the same.
- \_\_\_\_\_ 8. Gas molecules in the thermosphere are very energetic, but the air still feels cold.

- \_\_\_\_\_ 9. All weather takes place in the troposphere.
- \_\_\_\_\_ 10. Earth's atmosphere is divided into five major layers.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. The \_\_\_\_\_ occurs when ions in the thermosphere become energized.
12. Three-fourths of all gas molecules are found in the \_\_\_\_\_ .
13. There is so little gravity that gas molecules may float off into space from the \_\_\_\_\_.
14. Mixing between the troposphere and stratosphere is prevented by the \_\_\_\_\_ .
15. A rock that burns as it falls through the mesosphere is a(n) \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. What is the temperature gradient of the troposphere and why? Is air in the troposphere stable?

17. How does the ozone layer absorb high-energy UV radiation? Why is this important?

---

**Answer Key**

1. b 2. c 3. a 4. b 5. a
6. false 7. false 8. true 9. true 10. true
11. aurora 12. troposphere 13. exosphere 14. tropopause 15. meteor or shooting star
16. The troposphere is heated by heat coming from Earth's surface so it is warmer at its base. Warm air is below cooler air, but cold air is more dense and should sink. This situation is unstable.

17. The ozone layer absorbs high-energy UV. This splits the ozone molecules into an oxygen molecule and an oxygen atom. High energy UV is extremely harmful to living things so life on earth would be in peril without the ozone layer.

## 15.4 Air Movement

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- A low pressure zone forms where
  - warm air rises
  - cold air rises
  - water evaporates
  - cold and warm air rapidly mix
- Winds blow when
  - warm air rises.
  - cool air sinks.
  - air flows from high to low pressure.
  - air flows from low to high pressure.
- Rain is most likely to fall as an air mass
  - descends down a mountain range.
  - rises up a mountain range.
  - rises over the desert.
  - none of these
- The time for an airplane to fly between San Francisco and New York relative to NY to SF is
  - greater due to the westerly winds.
  - less due to the westerly winds.
  - greater due to the easterly winds.
  - less due to the easterly winds.
- Precipitation is high
  - in low pressure areas where air is sinking.
  - in high pressure areas where air is rising.
  - in high pressure areas where air is sinking.
  - in low pressure areas where air is rising.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The westerly winds travel toward the west.
- \_\_\_\_\_ 7. Cool air sinking creates a high pressure zone at the ground.
- \_\_\_\_\_ 8. Wind is created by air that moves vertically between high and low pressure zones.

\_\_\_\_\_ 9. Walking on the beach in San Diego in December, one would likely feel a strong sea breeze coming off the ocean.

\_\_\_\_\_ 10. Winds blow northeast to southwest or the reverse due to Coriolis Effect.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The basis for much of this chapter is that warm air \_\_\_\_\_ and cool air \_\_\_\_\_.

12. Wind blows from \_\_\_\_\_ pressure zones to \_\_\_\_\_ pressure zones.

13. Most air movement takes place in the layer called the \_\_\_\_\_.

14. Wind along the ground is the bottom of a \_\_\_\_\_.

15. Fast flowing air that circles the planet from west to east is called a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Draw a picture of the atmospheric circulation cells with arrows for the direction the air is moving. Label where the high and low pressure zones are located.

17. How do sea breezes form? How do land breezes form?

---

## Answer Key

1. a 2. c 3. b 4. b 5. d

6. false 7. true 8. false 9. false 10. true

11. rises; sinks 12. high; low 13. troposphere 14. convection cell 15. jet stream

16. See text.

17. In the summer, the land surface is warmer than the sea surface. The warm air rises and sucks cooler sea air in. This is a sea breeze. In the winter, the sea is warmer than the land. The warm air above the sea rises and sucks cooler air from the land out to sea. This is a land breeze.



## 15.5 Earth's Atmosphere

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Energy can
  - do work
  - change form
  - move from place to place
  - all of these
- What is the force of air weighing down over a unit of area called?
  - air pressure
  - air density
  - air temperature
  - none of these
- Which layer of the atmosphere contains the ozone layer?
  - thermosphere
  - mesosphere
  - stratosphere
  - troposphere
- Land breezes blow when
  - warmer ocean air flows over land
  - warmer land air flows over the ocean
  - cooler ocean air flows over land
  - cooler land air flows over the ocean
- The temperature gradient of the troposphere means that
  - the troposphere is very unstable
  - the troposphere is extremely stable
  - the troposphere is prone to inversions
  - the troposphere is prone to rising into the stratosphere
- The global winds are created by
  - convection cells in the troposphere
  - Coriolis effect
  - monsoons
  - the location of the jet stream
- Air circulates in the troposphere because
  - it is warmer at the top due to solar radiation

- b. surface features cause air to move in different directions
  - c. dense air from the stratosphere weighs down on it
  - d. Earth's surface is heated unevenly
8. In the ozone layer, ozone breaks apart into
- a. oxygen atoms
  - b. oxygen molecules and carbon dioxide molecules
  - c. an oxygen atom and an oxygen molecule
  - d. a carbon atom, an oxygen atom and an oxygen molecule
9. The stratosphere is
- a. the highest layer of the atmosphere
  - b. cooler closer to Earth
  - c. the layer with the most air mixing
  - d. all of these
10. The polar regions get \_\_\_\_\_ solar energy over a year because
- a. the most; they receive 24 hours of daylight during the summer
  - b. the least; sun comes in at an angle or not at all
  - c. a medium amount; they receive lots in summer and none in winter
  - d. none of these; the polar regions get the same as the rest of the planet

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Photosynthesis is the process through which CO<sub>2</sub> is created and energy is released.
- \_\_\_\_\_ 12. High temperature particles vibrate faster than low temperature particles.
- \_\_\_\_\_ 13. Air mixes freely between the troposphere and the stratosphere.
- \_\_\_\_\_ 14. Humans can live for months at a time in the thermosphere.
- \_\_\_\_\_ 15. In the outer atmosphere, gas molecules have a lot of energy, but there are hardly any of them.
- \_\_\_\_\_ 16. When ozone in the ozone layer breaks apart it cools the surrounding atmosphere.
- \_\_\_\_\_ 17. The trade winds are local winds found in tropical regions.
- \_\_\_\_\_ 18. Gas molecules in the exosphere may escape Earth's gravity.
- \_\_\_\_\_ 19. Heat is held in the atmosphere by greenhouse gases.
- \_\_\_\_\_ 20. During the aurora energized ions emit light.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. Air movement takes place in the \_\_\_\_\_.
22. Forms of energy include heat and \_\_\_\_\_.
23. In a \_\_\_\_\_ cell, dense air sinks causing cool temperatures.
24. \_\_\_\_\_ waves have the longest wavelengths in the electromagnetic spectrum.
25. We feel \_\_\_\_\_ energy as heat.
26. Human actions have increased the levels of \_\_\_\_\_ gases in the atmosphere.
27. A bright ball streaking across the sky is a(n) \_\_\_\_\_.
28. Excited ions in the mesosphere can create waves of brilliant colors called the \_\_\_\_\_.

29. \_\_\_\_\_ winds are large scale versions of land and sea breezes.

30. Winds that blow over a limited area and that are influenced by local geography are \_\_\_\_\_ .

### Short Answer

*Answer each question in the space provided.*

31. What is a temperature inversion? Why are they more common in winter?

32. What are monsoons and what causes the monsoons in India?

33. What are the westerly winds? Why do they move in the direction that they move?

---

## Answer Key

1. d 2. a 3. c 4. d 5. a 6. a 7. d 8. c 9. b 10. b

11. false 12. true 13. false 14. true 15. true 16. false 17. false 18. true 19. true 20. true

21. troposphere 22. light 23. high pressure 24. Radio 25. infrared 26. greenhouse 27. meteor or shooting star 28. aurora 29. Monsoon 30. local winds

31. An inversion is a stable situation in which cold dense air lies below warmer more buoyant air. An inversion may form in the winter when the ground is very cold and cools the air above it. Then cold air will be sitting below warmer air.
32. Monsoons are giant winds that bring heavy rains. In the summer, South Asia heats up and the air above it rises. This sucks less hot but humid air in from the Indian Ocean. Over land there is a lot of rain.
33. The westerly winds are one of the global wind belts. The winds are the base of a circulation cell. Due to Coriolis effect they bend to the right in the Northern Hemisphere so they travel from southwest to northeast.

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# CHAPTER **16** MS Weather Assessments

## Chapter Outline

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**16.1 WEATHER AND ATMOSPHERIC WATER**

**16.2 CHANGING WEATHER**

**16.3 STORMS**

**16.4 WEATHER FORECASTING**

**16.5 WEATHER**

---

## 16.1 Weather and Atmospheric Water

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Clouds have a big influence on weather by
  - preventing solar radiation from reaching the ground
  - absorbing warmth that is re-emitted from the ground
  - being a source of precipitation
  - all of the above
- Local weather depends on which of the following?
  - air temperature
  - humidity
  - wind speed and direction
  - all of the above
- When warm moist air rises it eventually
  - cools and reaches its dew point.
  - becomes hot and begins to rain.
  - cools and becomes able to hold more water vapor.
  - none of these.
- If the weather report says there is 90% humidity, it means that the air
  - has 10% as much water vapor as it could hold.
  - has 90% as much water vapor as it could hold.
  - is 90% water vapor.
  - is 10% water vapor.
- Clouds form when
  - humidity decreases, but air temperature stays the same.
  - air temperature increases, but humidity stays the same.
  - the air reaches its dew point.
  - all of these.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Clouds grow tall because of strong upward vertical air currents.
- \_\_\_\_\_ 7. A particular location's weather does not depend on wind direction.
- \_\_\_\_\_ 8. The recipe for a cloud is water vapor, particulates and the right temperature.

\_\_\_\_\_ 9. An 85-degree day may be pleasant in a dry location but hot in a humid location.

\_\_\_\_\_ 10. Weather is caused by the sun's even heating of Earth's surface.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The \_\_\_\_\_ occurs when the air has 100% relative humidity.

12. \_\_\_\_\_ clouds, like cirrus, are made of ice crystals.

13. Air that is \_\_\_\_\_ in temperature can hold more water vapor than air that is \_\_\_\_\_ in temperature.

14. Precipitation falls when humidity reaches \_\_\_\_\_.

15. If rain hits a layer of freezing air near the ground it becomes \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. How do clouds influence weather?

17. How does a hailstone form? When does it fall?

---

## Answer Key

1. d 2. d 3. a 4. b 5. c

6. true 7. false 8. true 9. true 10. false

11. dew point 12. High 13. warm; cold 14. 100% 15. sleet

16. Clouds absorb warmth that is emitted from the ground, which can warm temperatures. Clouds prevent sunlight from reaching the ground, which can cool temperatures. Clouds are also the source of precipitation.

17. An ice particle travels around in a cumulonimbus cloud with strong updrafts. Layers of ice form around the particle. When it finally becomes so heavy it can escape from the rising air currents, it falls.



## 16.2 Changing Weather

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. A warm front occurs when
  - a. a cold air mass slides over a warm air mass
  - b. a warm air mass slides over a cold air mass
  - c. two warm air masses meet
  - d. two cold air masses meet
2. A cold front in winter will produce
  - a. thunderstorms and tornadoes
  - b. strong rain
  - c. cold temperatures and heavy snow
  - d. cold temperatures but clear or slightly cloudy skies
3. Air masses do not form in temperate zones because
  - a. the air is too unstable
  - b. the area is not hot or cold enough to affect the air
  - c. there is too much rain in the mid-latitudes
  - d. none of these
4. After a cold front passes, the cold air mass is over you and you can expect
  - a. thunderstorms or snow showers
  - b. a squall line passing overhead
  - c. cold weather and clear or partly cloudy skies
  - d. tornadoes and thunderstorms
5. Thunderstorms tend to form
  - a. in summer and autumn
  - b. in autumn and winter
  - c. in winter and spring
  - d. in spring and summer

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Fronts are always moving.
- \_\_\_\_\_ 7. An air mass is a batch of air that has very similar temperature and humidity.
- \_\_\_\_\_ 8. Air masses generally form over a relatively small area.

\_\_\_\_\_ 9. A front is the meeting of two air masses that have different densities and do not easily mix.

\_\_\_\_\_ 10. An occluded front has three air masses: cold, warm, then cold.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A warm air mass will replace a cold air mass in a \_\_\_\_\_.

12. A front occurs that the meeting of one \_\_\_\_\_ with another.

13. The one air mass that forms within North America is cT, which stands for \_\_\_\_\_.

14. Most stormy weather occurs at \_\_\_\_\_.

15. Air masses do not move at a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. How and where do air masses form?

17. Imagine that it is a winter day and a warm front comes over you. What is the sequence of clouds and weather that you can observe?

---

## Answer Key

1. b 2. c 3. a 4. c 5. d

6. false 7. true 8. false 9. true 10. true

11. warm front 12. air mass 13. continental tropical 14. fronts 15. stationary front

16. Air masses form where the air is stable for long enough for it to take on the characteristics of the land or water beneath it, primarily in high pressure zones. Air masses mostly form in polar or tropical regions since the air there

is more stable.

17. You are in cold air but the warm air mass is above you. There are high cirrus clouds at the boundary. As the front moves toward you the clouds become thicker and cirrostratus clouds form. Right at the front there are altocumulus and altostratus clouds in the gray sky. Snow falls. When the air gets warmer, the snow turns to sleet and freezing rain. There are stratus clouds and fog due to the mixing of warm and cold air.

## 16.3 Storms

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The categories of the Saffir-Simpson Hurricane Scale are divided by
  - the amount of precipitation
  - the wind speed
  - the amount of precipitation and the wind speed
  - the amount of damage done
- Which of the following is true?
  - You hear thunder before you see lightning.
  - You hear thunder and see lightning at the same time.
  - You see lightning before you hear thunder.
  - The arrival time of sound and light waves is random.
- Tornadoes are common in the late spring when
  - warm wet air from the south meets cold dry air from the north.
  - hurricanes come off of the Atlantic and onto land.
  - nor-easters come off of the Atlantic and onto land.
  - none of these
- The eye of a hurricane is relatively calm because
  - it is located at the end of the storm
  - there is a lot of precipitation so air motion is downward
  - it is a high pressure
  - none of these
- Frigid air warms and collects moisture over the Great Lakes, so that downwind the air
  - warms the region and rain falls.
  - warms the region and skies clear.
  - cools and creates a nor'easter.
  - cools and drops lots of snow.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Lightning never strikes the same place twice.
- \_\_\_\_\_ 7. Cumulonimbus clouds are created by strong downdrafts.
- \_\_\_\_\_ 8. The states of Texas, Oklahoma, Kansas, Nebraska and South Dakota are the hotspots for tornadoes.

\_\_\_\_\_ 9. Lightning heats the air so that it expands explosively.

\_\_\_\_\_ 10. If there were no thunderstorms in Kansas, there would be no tornadoes there either.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. \_\_\_\_\_ are high-energy, narrow storms that lose energy as they move along the ground.

12. A \_\_\_\_\_ is a storm that rotates around a low pressure center.

13. High water that causes coastal flooding in a hurricane is called \_\_\_\_\_.

14. A snow storm with high winds is a(n) \_\_\_\_\_.

15. When the air temperature feels lower than it is due to moving air there is high \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What causes thunderheads?

17. What powers a hurricane and what causes it to die?

---

## Answer Key

1. b 2. c 3. a 4. d 5. d

6. false 7. false 8. true 9. true 10. true

11. Tornado 12. cyclone 13. storm surge 14. blizzard 15. windchill

16. Thunderstorms form when the air is warm and humid. The air rises rapidly to create strong updrafts. When it cools, water vapor condenses and creates clouds. The updrafts make tall cumulonimbus clouds called thunderheads.

17. Warm surface seawater starts a hurricane and keeps it growing stronger. When it is cut off from the energy of the hot water it loses strength. This can happen as it moves over cooler water or over land.

## 16.4 Weather Forecasting

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What instrument measures atmospheric pressure?
  - a. thermometer
  - b. barometer
  - c. scale
  - d. sundial
2. What will probably happen if barometric pressure rises?
  - a. a storm is on its way
  - b. conditions will remain the same as they are
  - c. the skies will clear
  - d. its not possible to say
3. To get a picture of a storm, meteorologists use
  - a. satellites
  - b. weather maps
  - c. radar
  - d. none of these
4. To create a weather model, scientists
  - a. compile weather data
  - b. put the data into a computer
  - c. analyze the data
  - d. all of these
5. Humidity is measured by a
  - a. anemometer
  - b. rain gauge
  - c. hydrometer
  - d. none of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. On a weather map, a curved red line with triangles indicates a warm front.
- \_\_\_\_\_ 7. Weather predictions are right more often than a guess would be.
- \_\_\_\_\_ 8. In a barometer, the atmosphere pressing down makes the mercury level go down.

\_\_\_\_\_ 9. All weather data is collected using computerized devices.

\_\_\_\_\_ 10. Weather stations collect data on land or at sea.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Scientists who forecast weather are \_\_\_\_\_.

12. On the warm side of the 0°C (32°F) isotherm, the precipitation would be \_\_\_\_\_.

13. To monitor large scale weather systems, it is best to use a(n) \_\_\_\_\_.

14. A(n) \_\_\_\_\_ measures wind speed.

15. \_\_\_\_\_ uses the reflection of radio waves to see precipitation falling.

### Short Answer

*Answer each question in the space provided.*

16. What is the link between atmospheric pressure and weather predictions?

17. Why are weather predictions so much more detailed and accurate than they were 50 years ago?

---

## Answer Key

1. b 2. a 3. b 4. d 5. d

6. false 7. true 8. false 9. false 10. true

11. meteorologists 12. rain 13. satellite 14. anemometer 15. Radar

16. Low pressure is found in the center of storms so falling atmospheric pressure on a barometer indicates an approaching storm.



17. The technology is better. Satellites can see storms visually but also can measure conditions from above. Computers can consume tremendous amounts of data and create a model of the future.

## 16.5 Weather

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- In the Northern Hemisphere, the general direction of the flow of the jet stream is toward the
  - north
  - south
  - east
  - west
- The layer of the atmosphere in which weather change occurs is the
  - mesosphere
  - troposphere
  - thermosphere
  - stratosphere
- Which type of front occurs when the air masses do NOT move?
  - cold
  - warm
  - stationary
  - occluded
- Which of the following is a product of thunderstorms?
  - tornadoes
  - hurricanes
  - typhoons
  - cyclones
- The Fujita Scale measures
  - tornado intensity
  - hurricane wind speed
  - hurricane wind damage
  - none of these
- Heat transfer that takes place when fluids (gases and liquids) are unevenly heated is called
  - reflection
  - conduction
  - radiation
  - convection
- A hurricane that is a 4 on the Saffir-Simpson scale is
  - stronger than a 3

- b. the strongest there is
  - c. more devastating than a tornado that is a 4 on the Fujita scale
  - d. none of these
8. Which of the following instruments measures air pressure?
- a. tachometer
  - b. radiosonde
  - c. thermometer
  - d. barometer
9. What clouds are towering clouds with anvil heads that bring thunderstorms?
- a. Nimbostratus
  - b. Cirrocumulus
  - c. Cumulonimbus
  - d. Cirrus
10. The eye of a hurricane is a
- a. high pressure cell
  - b. low pressure cell
  - c. tropical depression
  - d. tropical cyclone

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Radiation is the transfer of energy from one object to another through electromagnetic waves.
- \_\_\_\_\_ 12. Weather maps depict information only from computer models.
- \_\_\_\_\_ 13. Isotherms show temperature gradients.
- \_\_\_\_\_ 14. Isobars are lines of constant wind speed.
- \_\_\_\_\_ 15. Heat index takes into account air temperature and relative humidity.
- \_\_\_\_\_ 16. An F6 tornado would cause massive destruction wherever it touches the ground.
- \_\_\_\_\_ 17. Air masses forming in northern North America are cooler and drier than those forming in the North Pacific.
- \_\_\_\_\_ 18. Air masses form mainly in high pressure zones.
- \_\_\_\_\_ 19. Air masses are stationary and do not move.
- \_\_\_\_\_ 20. Because of the stability of temperature inversions, they often produce healthy air in cities.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. \_\_\_\_\_ is the percentage of water vapor a certain volume of air contains relative to the maximum amount it can contain.
22. The temperature at which air becomes saturated with water is called \_\_\_\_\_.
23. \_\_\_\_\_ is a cloud located at or near the ground.
24. An \_\_\_\_\_ is a batch of air that has nearly the same temperature and humidity.
25. Two air masses meet at a \_\_\_\_\_.
26. A \_\_\_\_\_ is a system of winds rotating counterclockwise around a low pressure system in the northern hemisphere.



11. false 12. false 13. false 14. false 15. true 16. true 17. true 18. true 19. false 20. false

21. Relative humidity 22. dew point 23. Fog 24. air mass 25. front 26. cyclone 27. Weather stations 28. gauge 29. cold front 30. low

31. Clouds prevent solar radiation from reaching the ground so they keep the ground cooler. On the other hand, they absorb warmth that is re-emitted from the ground, so they insulate the planet. Clouds are the source of precipitation.

32. Stationary front –rain, drizzle, and fog

Cold front –rain showers, snow showers, or thunderstorms with blustery winds –depends on the season

Warm front –snow will turn to sleet and freezing rain.

Occluded Front –precipitation and shifting wind.

33. Weather conditions are monitored at weather stations. Weather data is analyzed to identify the location of pressure cells and fronts. Satellites are used to get a bigger picture; e.g. where a hurricane might be heading. Weather is difficult to predict because it is a complex and chaotic system.

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# CHAPTER **17** MS Climate Assessments

## Chapter Outline

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- 17.1 CLIMATE AND ITS CAUSES
  - 17.2 WORLD CLIMATES
  - 17.3 CLIMATE CHANGE
  - 17.4 CLIMATE
-

# 17.1 Climate and Its Causes

## Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

- The most solar radiation over a year strikes
  - the north and south pole
  - the tropic of cancer and tropic of capricorn
  - the equator
  - the north pole
- At about 30°N and 30°S, the air is warm and dry because
  - it is a zone of evaporation.
  - it originated at the equator.
  - it is a low pressure zone.
  - all of these.
- The prevailing winds are
  - where air in the circulation cells ascends or descends.
  - affected by local climate.
  - the ground level portion of one of the circulation cells.
  - all of these.
- Compared with lower altitudes, at higher altitudes the air molecules are
  - less densely packed.
  - more densely packed.
  - the same density of packing.
  - packed with variable density.
- Rain falls
  - at the equatorial low
  - at 30-degrees north and south
  - at the polar front
  - a c

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Air temperature is lower at lower altitude.
- \_\_\_\_\_ 7. In the polar regions, a lot of sunlight reflects back into space.
- \_\_\_\_\_ 8. The most snowfall is at the poles.

\_\_\_\_\_ 9. Precipitation falls on mountains because air cools and can hold less moisture at higher elevations.

\_\_\_\_\_ 10. The latitude of a region affects how much solar radiation it receives.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The horizontal movement of air is called \_\_\_\_\_.

12. Weather averaged over the long term is called \_\_\_\_\_.

13. Coastal areas have a \_\_\_\_\_ climate.

14. Collisions between molecules give off \_\_\_\_\_, which warms the air.

15. The amount of solar radiation a spot receives depends on its \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Draw a picture of the globe with latitude marks (0, 30, 60, 90) and label the Intertropical Convergence Zone, Trade Winds, Westerlies and Poles.

17. San Francisco, California and Wichita, Kansas are at the same latitude, but SF is near the ocean and Wichita is inland. Describe what you think the climate is like for each in both summer and winter and why.

---

## Answer Key

1. c 2. b 3. c 4. a 5. d

6. false 7. true 8. false 9. true 10. true

11. wind 12. climate 13. mild 14. heat 15. latitude

16. See text



17. San Francisco has a milder climate; it is relatively warm in the winter and cool in the summer because of its proximity to the Pacific Ocean. Wichita has much more severe winters and summers because it has a continental climate.

## 17.2 World Climates

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- To figure out which climate zone you are in you should
  - look at the plants
  - monitor the temperature of the region
  - monitor the precipitation of the region
  - understand the seasons of the region
- Small areas with climates that differ from the surrounding area are known as?
  - small climates
  - micro areas
  - microclimates
  - abnormalities
- In what latitude zone are most of Earth's deserts between?
  - $0^{\circ}$  and  $15^{\circ}$
  - $15^{\circ}$  and  $30^{\circ}$
  - $30^{\circ}$  and  $45^{\circ}$
  - $45^{\circ}$  and  $60^{\circ}$
- Dry climate zones
  - receive no rainfall
  - experience more evaporation than precipitation
  - are all desert biomes
  - all of these
- Where it is dark and bitterly cold in winter,
  - it is a polar climate
  - the ground is permanently frozen
  - there may be so little precipitation, it is a desert
  - all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Right around the equator is the one latitude with no glaciers.
- \_\_\_\_\_ 7. A valley could have a different microclimate from a hillside because cold air sinks.
- \_\_\_\_\_ 8. The Southern Hemisphere has no lands with a continental climate.

\_\_\_\_\_ 9. Coastal California has a Mediterranean climate with woody plants to survive dry summers.

\_\_\_\_\_ 10. The Sonoran Desert has only a few sparse plants.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Greenland and Antarctica are covered by a(n) \_\_\_\_\_.

12. The \_\_\_\_\_ biome contains low bushes and bunch grasses.

13. A zone that is characterized by the living organisms with in it is a(n) \_\_\_\_\_.

14. Near the equator where part of the year is dry, the vegetation is typically \_\_\_\_\_.

15. Ground that is permanently frozen is called \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. In the map of world climates, why don't the different zones just follow latitude lines?

17. Why do the organisms in a certain climate type share characteristics wherever they are in the world?

---

## Answer Key

1. a 2. c 3. b 4. b 5. d

6. false 7. true 8. true 9. true 10. false

11. ice cap 12. steppe 13. biome 14. grasses 15. permafrost

16. Latitude is not the only factor that affects climate. Other factors include proximity to a large body of water, proximity to a mountain range, and elevation.

17. A climate zone has certain characteristics that organisms must be adapted to. So the organisms develop very similar traits to meet the challenges and exploit the advantages of the environment.

## 17.3 Climate Change

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- How much have temperatures risen since the end of the Pleistocene ice ages?
  - 4 °C
  - 0 °C
  - 4 °C
  - 40 °C
- Atmospheric greenhouse gas levels
  - are currently falling
  - are currently stable
  - are not being measured
  - are currently rising
- Sunspots
  - are storms on the Sun's surface
  - change in number over time
  - have not been found to be the cause of global warming
  - all of these
- Burning fossil fuels,
  - increases the ozone content of the atmosphere
  - releases carbon dioxide into the atmosphere
  - create an ozone hole that destroy the ozone layer
  - none of these
- An El Niño event
  - shuts down upwelling off of South America
  - changes water temperature
  - affects worldwide weather for as long as two years
  - all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Small changes in temperature can make big changes in climate.
- \_\_\_\_\_ 7. From 0 C.E. to 2010 C.E. average global temperature has gone straight up.
- \_\_\_\_\_ 8. Climate can change as continents shift position.

\_\_\_\_\_ 9. Global warming will cause weather to be more extreme.

\_\_\_\_\_ 10. All global warming projections show temperature rising during this century.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The time period of the ice ages between 2 million and 14,000 years ago is known as the \_\_\_\_\_ Epoch.

12. When glaciers advance, sea level \_\_\_\_\_.

13. Instruments on Mauna Loa volcano in Hawaii show that the greenhouse gas \_\_\_\_\_ is rising.

14. Throughout Earth history on average Earth's temperature has been \_\_\_\_\_ than today. .

15. The Trade Winds blow east to west but stronger than usual during a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What causes an El Niño event?

17. What are a few of the predicted effects of global warming?

---

## Answer Key

1. c 2. d 3. d 4. b 5. d

6. true 7. false 8. true 9. true 10. true

11. Pleistocene 12. falls 13. carbon dioxide 14. warmer/higher 15. La Niña

16. Warm water traveling across the equator from east to west gathers in the western Pacific, causing the Trade Winds to change direction. The warm water flows back across the equator to the eastern Pacific off of South America.

17. In response to global warming, sea ice will melt, sea level will rise and flood some coastal cities, temperatures will rise worldwide with the most in the Arctic and the Amazon, among many other things.

## 17.4 Climate

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Climate is
  - the long-term average of weather
  - stable over Earth history
  - dependent entirely on latitude
  - all of these
- What is the primary factor that influences the climate of a region?
  - wind
  - latitude
  - rainfall
  - sunlight
- Which type of climate has the greatest temperature differences between day and night and between summer and winter?
  - maritime
  - polar
  - equatorial
  - continental
- Over the past 130 years, average global temperature has
  - risen slightly
  - gone up and down so that it averages out
  - risen dramatically
  - none of these
- Which biome do you find where there is extreme cold, little light, little precipitation and small ground-hugging plants?
  - subpolar
  - ice cap
  - steppe
  - polar tundra
- Which of the following is an example of a microclimate?
  - a glacier on top of Mt. Kilimanjaro
  - San Francisco, which is moderated by the Pacific Ocean
  - coastal California, which has a long summer drought
  - the massive expanse of the Amazon Rainforest



7. The most recent ice age ended
  - a. 100 years ago
  - b. 1,000 years ago
  - c. 10,000 years ago
  - d. 100,000 years ago
8. Which of the following weather phenomena causes upwelling off of western South America to shut down?
  - a. El Niño
  - b. La Niña
  - c. normal conditions
  - d. none of these
9. Regarding El Niño and La Niña,
  - a. they are not caused by temperature variations
  - b. global warming may be speeding up the cycle
  - c. they are made worse by the ozone hole
  - d. all of these
10. Which greenhouse gas comes from fossil fuel burning?
  - a. ozone
  - b. methane
  - c. carbon dioxide
  - d. chlorofluorocarbons

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. The best way to identify a biome is to study the animals.
- \_\_\_\_\_ 12. Climate has changed throughout Earth history.
- \_\_\_\_\_ 13. Precipitation varies with latitude.
- \_\_\_\_\_ 14. Short woody plants in a Mediterranean climate are adapted to surviving wet winters.
- \_\_\_\_\_ 15. Dry climate zones cover about 50% of the world's land area.
- \_\_\_\_\_ 16. Rainforests survive a three month drought each dry season.
- \_\_\_\_\_ 17. The polar regions receive the least solar radiation.
- \_\_\_\_\_ 18. Atmospheric carbon dioxide levels are rising.
- \_\_\_\_\_ 19. Polar climates are found on some high mountains.
- \_\_\_\_\_ 20. Average global temperature is rising at an increasing rate.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. \_\_\_\_\_ is the average weather in a location over about 30 years.
22. Nearshore \_\_\_\_\_ can affect local climate by making it warmer or colder.
23. A \_\_\_\_\_ climate has no ocean influence.
24. The \_\_\_\_\_ biome is dominated by densely packed, broadleaf evergreen trees with tremendous diversity in lifeforms.
25. The westerly winds blow from \_\_\_\_\_ to \_\_\_\_\_.
26. In the Northern Hemisphere, the greatest rise in temperatures is being seen in the \_\_\_\_\_.

27. In the polar regions ice and snow \_\_\_\_\_ a large amount of the sun's light.
28. As air goes over the top of a mountain, the water content is \_\_\_\_\_.
29. A climate type and its plants and animals make up a \_\_\_\_\_.
30. As glaciers melt, sea level will \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

31. Why are the same types of organisms found at similar latitudes and in similar positions on nearly all continents in both the Northern and Southern Hemispheres (with one exception)?

32. How are climate zones classified?

33. What can cause long term climate change?

---

**Answer Key**

1. a 2. b 3. d 4. c 5. d 6. a 7. c 8. a 9. b 10. c

11. false 12. true 13. true 14. false 15. false 16. false 17. true 18. true 19. true 20. true

21. Climate 22. currents 23. continental 24. tropical rainforest 25. west to east 26. Arctic 27. reflect 28. lower 29. biome 30. rise

31. The conditions that create the climate zones are similar at similar positions on the continents. Organisms must adapt to those conditions. There are only so many ways that an organism can live under those circumstances. These are the adaptations.

32. Climate zones are based on the temperature, amount of precipitation, and the time of year when precipitation occurs.

33. Possible answers:

- The amount of energy the Sun produces over years.
- The positions of the continents over millions of years.
- The tilt of Earth's axis and orbit over thousands of years.
- Sudden and dramatic because of random catastrophic events, such as a large asteroid impact.
- Greenhouse gases in the atmosphere, caused naturally or by human activities.

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CHAPTER **18** MS Ecosystems and Human Populations Assessments

**Chapter Outline**

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- 18.1 ECOSYSTEMS
  - 18.2 CYCLES OF MATTER
  - 18.3 HUMAN POPULATIONS
  - 18.4 ECOSYSTEMS AND HUMAN POPULATIONS
-

# 18.1 Ecosystems

## Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

1. Herbivores are which type of consumer?
  - a. Producer
  - b. Primary consumer
  - c. Secondary consumer
  - d. Tertiary consumer
2. Which of the following is NOT a habitat?
  - a. A hole in a cactus
  - b. Under a leaf in a forest
  - c. Within the intestines of a shark
  - d. All of the above are habitats
3. Which of the following would be highest on the food pyramid?
  - a. Phytoplankton
  - b. Snakes
  - c. Falcons
  - d. Mice
4. Nutrients are useful for
  - a. growing an organism's body
  - b. building shells or bones
  - c. creating proteins, fats, carbohydrates and nucleic acids
  - d. all of these
5. When one organism eats another organism, it
  - a. receives all of its nutrients
  - b. receives all of its energy
  - c. receives all of its energy and nutrients
  - d. none of these

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. An organism that eats many types of animals only is an omnivore.
- \_\_\_\_\_ 7. Every ecosystem has the same general roles that living creatures fill.
- \_\_\_\_\_ 8. In an ecosystem, energy flows in many directions; matter flows in one direction.

- \_\_\_\_\_ 9. A community is all of the species and abiotic factors that coexist within a specific area.
- \_\_\_\_\_ 10. Mules, offspring of male donkeys and female horses, cannot have offspring and so are not members of a species.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. All living creatures and non living things that interact within an area make up a(n) \_\_\_\_\_.
12. Organisms that break dead tissue down into nutrients are \_\_\_\_\_.
13. Wind is a(n) \_\_\_\_\_ part of an ecosystem.
14. A(n) \_\_\_\_\_ is a combination of all the populations living in an ecosystem.
15. Feeding relationships of overlapping food chains are displayed on a(n) \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. What would happen to life on Earth if there were no decomposers?

17. How do nutrients move through ecosystems?

---

**Answer Key**

1. b 2. d 3. c 4. d 5. c

6. false 7. true 8. false 9. false 10. true

11. ecosystem 12. decomposer 13. abiotic 14. community 15. food web

16. Decomposers break down dead organisms and their waste materials into nutrients and carbon dioxide. The nutrients and gases can be used by new living things. Without decomposers, there would be no way for nutrients to

be recycled and life on Earth would have died out a long time ago.

17. Nutrients are ions that are in the soil and can be taken up by plants. A primary consumer eats the plant and takes up the nutrients. When one organism eats another, its nutrients pass up that food chain. When an organism dies and is decomposed, the nutrients go back into the soil.

## 18.2 Cycles of Matter

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What happens during respiration?
  - a. producers create food energy from solar energy
  - b. consumers use solar energy to create food energy
  - c. living things release energy from food
  - d. carbon dioxide is converted into oxygen
2. What is nitrogen fixing?
  - a. Soil bacteria make nitrogen useful for producers.
  - b. Producers make nitrogen useful for consumers.
  - c. Nitrogen gas in the atmosphere creates complex compounds.
  - d. Nitrogen combines with oxygen to make a useful gas.
3. Greenhouse gases
  - a. absorb incoming solar radiation in the atmosphere.
  - b. trap infrared radiation radiating from Earth's surface.
  - c. scatter sunlight from one molecule to another.
  - d. All of these.
4. Carbon is
  - a. stored in the mantle
  - b. released into the atmosphere at volcanoes
  - c. stored in the oceans
  - d. all of these
5. Destroying forests changes the carbon cycle because
  - a. plants take carbon out of the atmosphere
  - b. burning plants releases stored carbon into the atmosphere
  - c. more carbon is in the atmosphere
  - d. all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Carbon is an important part of organic material.
- \_\_\_\_\_ 7. When an organism decomposes, its carbon is released back into the environment.
- \_\_\_\_\_ 8. Carbon is only found in organic material.



\_\_\_\_\_ 9. Nitrogen is a nutrient so more is always better.

\_\_\_\_\_ 10. Algae create food energy from sunlight.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Carbon dioxide is a \_\_\_\_\_ gas in the atmosphere.

12. A low oxygen zone, as found in the Gulf of Mexico, creates a \_\_\_\_\_ .

13. Besides fossil fuels, burning \_\_\_\_\_ adds carbon dioxide to the atmosphere.

14. \_\_\_\_\_ contain carbon dioxide from the ancient atmosphere.

15. Living organisms release carbon dioxide into the atmosphere during the process of \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Describe how carbon cycles through living things.

17. What happens when excess nitrogen enters a pond or lake?

---

## Answer Key

1. c 2. a 3. b 4. d 5. d

6. true 7. true 8. false 9. false 10. true

11. greenhouse 12. dead zone 13. trees or forests 14. Fossil fuels 15. respiration

16. Producers use carbon dioxide to create sugar, which they store as carbohydrates. These carbohydrates are consumed by consumers and released as carbon dioxide back into the atmosphere during respiration.

17. The nitrogen fertilizes the pond and so bacteria grow. When the bacteria die, they decompose, which uses oxygen. Without oxygen, fish and other aquatic organisms can't live, which creates a dead zone.

## 18.3 Human Populations

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Carrying capacity is achieved when what occurs?
  - the number of births equal the number of deaths
  - the number of births exceeds the number of deaths
  - the number of deaths exceed the number of births
  - the number of deaths falls below 10,000
- The Green Revolution refers to what?
  - improved energy efficiency
  - improved agricultural productivity
  - improved oil production
  - improved color pigmentation
- What are the goals of sustainable development?
  - distribute resources fairly
  - conserve resources so they won't run out
  - use resources in ways that won't harm ecosystems
  - all of the above
- What is true about the beginning of the Industrial Revolution?
  - mass production
  - widespread use of fossil fuels
  - late 1700s
  - all of these
- To better develop sustainably, people can
  - use more pesticides to further the goals of the Green Revolution.
  - use more fossil fuels to improve transportation and manufacturing.
  - purchase products that are produced sustainably.
  - all of these.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The main reason for the human population explosion is a decline in the death rate.
- \_\_\_\_\_ 7. Vaccinations and antibiotics helped to increase human population.
- \_\_\_\_\_ 8. The wealthier countries are growing faster than the poorer countries.

\_\_\_\_\_ 9. The carrying capacity of Earth for humans is many times more than the population today.

\_\_\_\_\_ 10. A population grows rapidly when it is near its carrying capacity.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A species of organisms introduced into a new environment by humans either purposefully or by accident is a(n) \_\_\_\_\_.

12. The current human population is around \_\_\_\_\_.

13. The ability to produce automobiles mass during the \_\_\_\_\_ helped to cause fossil fuel use to grow rapidly.

14. \_\_\_\_\_ can kill pests that might harm crops.

15. A population grows when the death rate subtracted from the birth rate is a \_\_\_\_\_ number.

### Short Answer

*Answer each question in the space provided.*

16. Why has the death rate fallen in industrialized nations?

17. How did the Green Revolution change the carrying capacity of Earth for humans? Is there a reason this could be a problem?

---

## Answer Key

1. a 2. b 3. d 4. d 5. c

6. true 7. true 8. false 9. false 10. false

11. alien or invasive species 12. 7 billion 13. Industrial Revolution 14. Pesticide 15. positive

16. The death rate has declined because more food is being produced so people are healthier; sanitation has improved, which has reduced disease; vaccinations and medications have prevented

17. The Green Revolution increased agricultural productivity so more people could survive. To produce more food, water is being used in unsustainable ways. Also, chemicals are important and some of them may turn out to be dangerous to people or to other organisms.

## 18.4 Ecosystems and Human Populations

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- All members of a species that are found in the same place are part of a(n)
  - community
  - population
  - ecosystem
  - niche
- Which of the following is an abiotic factor?
  - bacteria
  - plants
  - light
  - fungi
- Which is an example of a food chain?
  - plant-carnivore-herbivore-decomposer
  - algae-fish-shark-decomposer
  - plant-herbivore-decomposer-carnivore
  - decomposer-plant-carnivore-decomposer
- Nutrients and carbon dioxide are the result of tissue breakdown by
  - herbivores
  - carnivores
  - omnivores
  - decomposers
- Forests are important to the carbon cycle because they
  - release carbon dioxide to the atmosphere
  - increase the global amount of carbon dioxide
  - increase carbon dioxide in the soil
  - store carbon dioxide
- What percent of energy is passed from organisms of one trophic level to the next?
  - 5%
  - 10%
  - 15%
  - 20%
- Respiration
  - releases carbon dioxide into the atmosphere

- b. is the opposite of photosynthesis in terms of gases
  - c. is done by living organisms
  - d. all of these
8. What is the largest source of excess carbon dioxide in the atmosphere?
- a. burning fossil fuel
  - b. deforestation
  - c. respiration
  - d. none of these
9. Top predators like lions are scarce because
- a. they are large and take up a lot of space
  - b. they are a favorite food of many organisms
  - c. only a small amount of energy makes it that far up the food web
  - d. none of these.
10. When greenhouse gases in the atmosphere increase, the
- a. atmosphere warms
  - b. atmosphere cools
  - c. temperature of the atmosphere stays the same
  - d. effect is not yet known

### True or False

Write true if the statement is true or false if the statement is false.

- \_\_\_\_\_ 11. Matter moves through an ecosystem in one direction.
- \_\_\_\_\_ 12. Energy moves through an ecosystem in many directions.
- \_\_\_\_\_ 13. Forests and oceans store carbon.
- \_\_\_\_\_ 14. Global warming is a consequence of increased carbon dioxide in the atmosphere.
- \_\_\_\_\_ 15. Scavengers eat animals that are already dead.
- \_\_\_\_\_ 16. Current world human population is less than 5 billion.
- \_\_\_\_\_ 17. Grazers kill prey for food.
- \_\_\_\_\_ 18. Dead zones are caused by excess nutrients.
- \_\_\_\_\_ 19. One of the most important steps to achieving a more sustainable future is to reduce human population.
- \_\_\_\_\_ 20. Overpopulation will occur so far in the future that we do not need to worry about it.

### Fill in the Blanks

Fill in the blank with the term that best completes the sentence.

21. An \_\_\_\_\_ is made up of living creatures and the nonliving things that those creatures need within an area.
22. A \_\_\_\_\_ is a single type of organism that can interbreed and produce fertile offspring.
23. The place a species lives is its \_\_\_\_\_ .
24. A producer that is eaten by a grazing herbivore fills the same \_\_\_\_\_ as an organism that does the same things in a different location.
25. Matter that is crucial to living things and passes between individuals is called \_\_\_\_\_.
26. \_\_\_\_\_ are organisms that are introduced into a habitat where they do not belong.

27. Soil, air and light are among the \_\_\_\_\_ factors needed in an ecosystem.
28. When the death rate exceeds the birth rate, a population will \_\_\_\_\_
29. If you eat a quiche made of spinach, mushrooms, eggs and chicken, you are a(n)\_\_\_\_\_.
30. For nitrogen in the atmosphere to be useful to organisms it must be \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

31. What does it mean to say that each ecosystem has the same niches, but the same species don't always fill them?

32. Why is the human population increasing so dramatically?

33. What is the purpose of sustainable development?

---

**Answer Key**

1. b 2. c 3. b 4. d 5. d 6. b 7. d 8. a 9. c 10. a



11. false 12. true 13. true 14. true 15. true 16. false 17. false 18. true 19. true 20. false

21. ecosystem 22. species 23. habitat 24. niche 25. nutrients 26. Invasive or alien species 27. abiotic 28. decrease  
29. omnivore 30. fixed

31. Each climate type creates a biome. Each biome has certain roles within it. If two organisms live in different locations but within the same biome and have the same role, they will have very similar adaptations. For example, if a plant lives in a desert, it will have adaptations that keep it from losing water and so it will resemble other desert plants in different locations. The species that fills a role evolved in that region.

32. Improved agricultural productivity has led to an increase in the availability of food. The death rate has declined due to the development of vaccines and medications.

33. The aim of sustainable development is to distribute resources fairly, conserve resources for the future and use resources in ways that do not harm ecosystems.

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# CHAPTER **19** MS Human Actions and the Land Assessments

## Chapter Outline

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- 19.1 LOSS OF SOILS
  - 19.2 POLLUTION OF THE LAND
  - 19.3 HUMAN ACTIONS AND THE LAND
-

# 19.1 Loss of Soils

## Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

1. How do trees prevent soil erosion?
  - a. Trees keep the wind from blowing hard through an area.
  - b. The leaves keep rain from striking the ground hard
  - c. Roots of the trees hold the soil together
  - d. All of the above
2. Soil erosion
  - a. is a natural process and as such should be left alone
  - b. has been accelerated by human activities
  - c. is an aesthetic problem but does little damage to human society
  - d. none of these
3. Farming causes soil erosion because
  - a. the land is uncovered by plants for part of the year
  - b. farm machines churn up the soil
  - c. crop plants are often less able to protect the land than native plants
  - d. all of these
4. To reduce soil erosion from agriculture
  - a. plant tall trees around the field to protect from wind.
  - b. use large sprinklers to be sure the soil is always moist.
  - c. plant one type of crop in a large region to keep conditions the same.
  - d. all of these.
5. To reduce soil erosion from logging
  - a. clear cut an entire area
  - b. log mostly on steep lands
  - c. cut a small area and replant the logged area with new seedlings
  - d. all of these

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Soil is an important natural resource.
- \_\_\_\_\_ 7. The Dust Bowl was caused entirely by bad farming practices.
- \_\_\_\_\_ 8. Off road vehicles cause soil erosion, but hiking, even off trail, does not.

\_\_\_\_\_ 9. Grazing animals are beneficial to soil as they compact the soil under their hooves.

\_\_\_\_\_ 10. The Dust Bowl took place in the 1930s in the Midwestern United States.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The soil that is most likely to erode is the nutrient-rich \_\_\_\_\_.

12. \_\_\_\_\_ animals cause soil erosion because they churn up ground with their hooves.

13. Besides removing trees, logging removes \_\_\_\_\_, the dead leaves that protect forest floors from erosion.

14. \_\_\_\_\_ runs off a paved surface and causes erosion nearby.

15. Plant \_\_\_\_\_ hold soil in place.

### Short Answer

*Answer each question in the space provided.*

16. Describe three farming methods that minimize soil erosion.

17. How do recreational activities cause soil erosion?

---

## Answer Key

1. d 2. b 3. d 4. a 5. c

6. true 7. false 8. false 9. false 10. true

11. topsoil 12. Grazing 13. leaf litter 14. Water 15. roots

16. Possibilities include strip cropping, windbreaks, contour cropping, cover crops, no-till planting, and terracing.

17. Any time ground becomes exposed it can be subject to soil erosion. Off-road vehicles churn up dirt. Even hiking trails can expose soil to erosion.

## 19.2 Pollution of the Land

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. At Love Canal
  - a. the hazardous wastes were safely buried
  - b. people became sick right after the town was built
  - c. the first sign that something was wrong was that children developed cancer
  - d. none of these
2. Where are Superfund sites located?
  - a. in densely populated areas
  - b. spread across the U.S.A.
  - c. East of the Mississippi River
  - d. all around the world
3. Which of the following is NOT considered a potentially hazardous material?
  - a. baking soda
  - b. batteries
  - c. fertilizers
  - d. paint
4. At Love Canal
  - a. the problem was uncovered by local residents
  - b. the local government detected the problem and dealt with it
  - c. the state government detected the problem and dealt with it
  - d. the federal government detected the problem and dealt with it
5. Nations that produce the most hazardous waste have the most
  - a. people
  - b. farmers
  - c. buildings
  - d. industry

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. To dispose of liquid waste, let it evaporate.
- \_\_\_\_\_ 7. Batteries contain toxic materials and should be disposed of properly.
- \_\_\_\_\_ 8. The Superfund Act requires companies to be responsible for hazardous chemicals that they put into the environment.

\_\_\_\_\_ 9. Pesticides in any amount are not toxic to humans.

\_\_\_\_\_ 10. Toxic wastes can be located because they are always visible.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The toxic metals lead and \_\_\_\_\_ damage the nervous system.

12. A substance that can cause serious harm, including death, or is poisonous is \_\_\_\_\_.

13. A good, non-toxic cleanser that just about everyone has in their kitchen is \_\_\_\_\_.

14. People use \_\_\_\_\_ to kill unwanted insects.

15. The people most likely to sicken first from exposure to hazardous wastes are \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What does the Superfund Act say?

17. What hazards are found in medical wastes?

---

## Answer Key

1. c 2. b 3. a 4. a 5. d

6. true 7. true 8. true 9. false 10. false

11. mercury 12. toxic 13. vinegar 14. pesticides 15. children

16. The Superfund Act requires that companies clean up contaminated Superfund sites. If the responsible party cannot be identified or cannot clean up a site, the federal government will pay for cleanup out of a trust fund.

17. Human body fluids may cause disease; old thermometers may contain mercury; pharmaceuticals may be toxic to humans and other animals.

## 19.3 Human Actions and the Land

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What occurred in the 1930s due in part to the poor farming practices?
  - a. World War I
  - b. World War II
  - c. the Dust Bowl
  - d. the Great Depression
2. What was Love Canal, New York?
  - a. a river
  - b. an abandoned waterway
  - c. a town
  - d. none of these
3. What did the Superfund Act of 1980 require businesses to do?
  - a. inform homeowners of risk from chemicals
  - b. sell polluted land to the government
  - c. pay to clean up the pollution they created
  - d. pay extra taxes if they polluted
4. Lead poisoning
  - a. causes cancer
  - b. causes neurological damage
  - c. is always reversible
  - d. all of these
5. Forests protect soil from erosion because
  - a. leaf litter protects the ground
  - b. plant roots hold soil together
  - c. trees break the wind
  - d. all of these
6. For strip cropping,
  - a. groundcover plants are planted between crop fields
  - b. step-like terraces are plowed onto a slope
  - c. crops rows follow hill contours
  - d. fields are planted all year round
7. How contaminated sites are usually identified?
  - a. the company notifies the Environmental Protection Agency (EPA)



- b. people start getting sick
  - c. the EPA randomly tests areas
  - d. animals show up with mutations
8. To avoid soil erosion
- a. contour hillsides that are to be farmed.
  - b. clear forests to make the landscape all the same.
  - c. introduce worms and other small creatures to the soil.
  - d. none of these.
9. Which of the following recreational activities can accelerate soil erosion?
- a. hiking
  - b. off road trails for ATVs
  - c. camping
  - d. all of the above
10. Hazardous wastes may include
- a. batteries
  - b. electronics
  - c. farm chemicals
  - d. all of these

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Logging results in the loss of leaf litter, which aids erosion.
- \_\_\_\_\_ 12. Farmland erodes a lot in winter when the land lies fallow.
- \_\_\_\_\_ 13. The Dust Bowl was caused entirely by bad farming practices.
- \_\_\_\_\_ 14. Many practices can be adopted to prevent soil erosion.
- \_\_\_\_\_ 15. Surface mining disturbs the land but doesn't contribute to soil erosion.
- \_\_\_\_\_ 16. Fine soil is blown away by wind.
- \_\_\_\_\_ 17. All household items can be safely disposed of in the trash.
- \_\_\_\_\_ 18. Construction protects soil from erosion because of all the concrete.
- \_\_\_\_\_ 19. A Love Canal resident was indirectly responsible for passage of the Superfund Act.
- \_\_\_\_\_ 20. If a company cannot pay to clean a Superfund Site, it will just be left alone.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. If too many sheep are living in the area, the land may become \_\_\_\_\_.
22. \_\_\_\_\_ is a natural process that has been accelerated by human activities.
23. \_\_\_\_\_, such as computers and cell phones, release toxic chemicals when they are put in landfills.
24. Topsoil blew in huge storms during the \_\_\_\_\_.
25. Love Canal became a \_\_\_\_\_ site in 1983.
26. A \_\_\_\_\_ material causes serious harm, death, or is poisonous.
27. A \_\_\_\_\_ material destroys other things with chemical reactions.
28. Toxic waste may cause cancer or birth defects so for humans it is \_\_\_\_\_.

29. Anything that catches fire easily and may send dangerous smoke into the air is called \_\_\_\_\_.
30. \_\_\_\_\_ farming does not disturb the soil as much before planting.

**Short Answer**

*Answer each question in the space provided.*

31. Briefly describe three human activities that can cause soil erosion.
32. What can you do to reduce soil erosion during your recreational activities?
33. Briefly describe the four types of hazardous waste.

---

**Answer Key**

1. c 2. b 3. c 4. b 5. d 6. a 7. b 8. a 9. d 10. d
11. true 12. true 13. false 14. true 15. false 16. true 17. false 18. false 19. false 20. false
21. overgrazed 22. Soil erosion 23. Electronics 24. Dust Bowl 25. Superfund 26. toxic 27. corrosive 28. poisonous
29. flammable 30. No-till

31. Farming (agriculture), grazing, logging and mining, construction, recreational activities. See text.
32. Avoid using off-road vehicles, especially on hills or stream banks. Stay on designated trails when hiking or mountain biking.
33. Toxic waste is poisonous and causes serious harm or death. Chemically active waste causes dangerous chemical reactions. Corrosive wastes destroys things by chemical reactions. Flammable waste catches fire easily.

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# CHAPTER **20** MS Human Actions and Earth's Resources Assessments

## Chapter Outline

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- 20.1 USE AND CONSERVATION OF RESOURCES
  - 20.2 USE AND CONSERVATION OF ENERGY
  - 20.3 HUMAN ACTIONS AND EARTH'S RESOURCES
-

## 20.1 Use and Conservation of Resources

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. The wealthiest 20% of people in the world use what percent of the resources?
  - a. 35%
  - b. 55%
  - c. 85%
  - d. 100%
2. Which of the following is a renewable resource?
  - a. oil
  - b. natural gas
  - c. forests
  - d. coal
3. Natural resources
  - a. can become unusable if they become polluted
  - b. are useful as long as they are not used up
  - c. are most valuable if they are renewable
  - d. none of these
4. If a forest is logged,
  - a. trees can be planted and so the forest is renewable
  - b. trees can be planted, but a forest takes time to be renewed
  - c. it can never be the same as it was
  - d. none of these
5. Fish can be a non-renewable resource if they
  - a. contain mercury
  - b. are overfished
  - c. are no longer desired as a food source
  - d. none of these.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Drinking bottled water is better for you and the environment.
- \_\_\_\_\_ 7. It is usually better to throw something away than to fix it.
- \_\_\_\_\_ 8. Pollution occurs when a product is produced and when it is tossed away.

\_\_\_\_\_ 9. Your community probably recycles plastics that have certain numbers on them.

\_\_\_\_\_ 10. Soil is considered a non-renewable resource.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. When you choose a product contained in something that is easily recycled you are \_\_\_\_\_ .

12. All natural resources are divided into renewable and \_\_\_\_\_.

13. To make natural resources last longer we must \_\_\_\_\_ them.

14. A resource that is renewed, but much more slowly than it is used, is a \_\_\_\_\_ resource.

15. A good way to conserve resources is to reduce, reuse and \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What determines the value of a resource?

17. Why should you conserve natural resources by buying less stuff?

---

## Answer Key

1. c 2. c 3. d 4. d 5. b

6. false 7. false 8. true 9. true 10. false

11. precycling 12. non-renewable 13. conserve 14. non-renewable 15. recycle

16. The value of a resource is determined by how much of it there is, where it is located relative to where it is used, how easy it is to locate and extract, and how much it costs to extract it and make it usable.

17. Material goods use natural resources and energy resources to produce. So if you buy an item, it represents the use of natural resources. Lots of items that we buy are used very little so it's important to try to conserve by buying less.

## 20.2 Use and Conservation of Energy

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Saving energy in industry is
  - possible if equipment is designed to be efficient
  - possible if new materials are used
  - not possible, since little energy is used
  - none of these.
- What are some ways residences can use less energy?
  - Turn off lights when not in use
  - Only run appliances when necessary
  - Use a fan instead of an air conditioner
  - All of the above
- What percent of the energy use in the United States is used for transportation?
  - 14%
  - 28%
  - 45%
  - 67%
- The cost of an energy source depends on
  - the cost of equipment needed to harness it
  - the cost of transporting it
  - its energy efficiency
  - all of these
- Conserving energy
  - is expensive because you have to buy special equipment
  - reduces costs because you create energy from less expensive sources
  - reduces costs because you use less energy
  - All of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. If the cost of oil goes up, sources that were too expensive to extract may become economical.
- \_\_\_\_\_ 7. To increase energy efficiency, be sure that equipment is running well.
- \_\_\_\_\_ 8. Conserving resources cuts down on trash.



\_\_\_\_\_ 9. The best energy source would be one that supplies a lot of energy and takes a lot of energy to make it useable.

\_\_\_\_\_ 10. Individuals can only do a little to increase energy efficiency because most energy is used by industry.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The more efficient an energy source is the more useful \_\_\_\_\_ it will produce.

12. If you must use 3 units of energy to get 18 units of energy, you have gained \_\_\_\_\_ units of energy.

13. Like homes, industries should \_\_\_\_\_, reuse and recycle materials.

14. You save resources when you buy \_\_\_\_\_, like when you buy your food at a farmers' market.

15. The country that uses the most resources in the world is \_\_\_\_\_ .

### Short Answer

*Answer each question in the space provided.*

16. List four ways that you can use energy more efficiently or use less energy.

17. What are reasons that solar is a good source of energy?

---

## Answer Key

1. a 2. d 3. b 4. d 5. c

6. true 7. true 8. true 9. false 10. false

11. work 12. 15 13. reduce 14. local 15. the United States

16. Ride a bike or walk instead of driving. Use public transportation instead of driving. Be efficient about the trips you make: go out once to do a few things rather than go out a few times. Turn off lights and unplug appliances.

17. There is way more sunlight available than we could possibly use. It is just there, we don't need to drill for it. The energy is clean and doesn't need to be transported.

## 20.3 Human Actions and Earth's Resources

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. A renewable resource
  - a. will always be a renewable resource
  - b. can be used so that it becomes non-renewable
  - c. will always become a non-renewable resource
  - d. none of these
2. How many countries have almost 80% of all the world's oil?
  - a. 10
  - b. 11
  - c. 12
  - d. 13
3. Which is NOT one of the biggest producers of oil?
  - a. United States
  - b. China
  - c. Venezuela
  - d. Saudi Arabia
4. Natural resources include
  - a. diamonds
  - b. computers
  - c. sunlight
  - d. trees
5. Where do we stand on fossil fuels?
  - a. Easy to get at reserves are dwindling so we go to more difficult locations.
  - b. They form just about as fast as we use them.
  - c. Massive new reserves are regularly being found.
  - d. none of these
6. In the United States, which sector uses the most energy?
  - a. industry
  - b. commercial
  - c. residential
  - d. transportation
7. To reduce energy use when driving,
  - a. buy a fuel efficient car

- b. drive as fast as possible
  - c. do not worry about car maintenance
  - d. all of these
8. The most energy efficient light bulbs to use in your home are
- a. incandescent
  - b. halogen
  - c. compact fluorescent
  - d. tungsten
9. To reduce resource use
- a. buy goods that will last longer
  - b. repair materials rather than replace them
  - c. buy only what you need
  - d. all of these
10. The highest net energy comes from
- a. coal
  - b. petroleum
  - c. natural gas
  - d. solar

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Natural resource use is generally lower in poorer countries.
- \_\_\_\_\_ 12. The nations that consume the most oil are the nations that produce the most oil.
- \_\_\_\_\_ 13. Pollution from discarded material degrades the land, air, and water.
- \_\_\_\_\_ 14. Consumerism leads to greater resource use, but it also leads to more waste.
- \_\_\_\_\_ 15. Water from a river might not be a renewable resource if it becomes polluted.
- \_\_\_\_\_ 16. Nuclear power is clean so it is a renewable resource.
- \_\_\_\_\_ 17. Recycling can help conserve natural resources.
- \_\_\_\_\_ 18. Energy Star appliances save a lot of energy over their lifetime.
- \_\_\_\_\_ 19. Turning off lights when not in a room is an easy way to conserve energy.
- \_\_\_\_\_ 20. Replacing old appliances with newer models doesn't save energy.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. We need to \_\_\_\_\_ natural resources so they will last longer.
22. Energy \_\_\_\_\_ describes how much useful work is extracted from one unit of energy.
23. A tremendous source of waste is the \_\_\_\_\_ that water comes in.
24. If you reduce your energy use, or \_\_\_\_\_ energy, your costs will be reduced.
25. Aluminum cans may be \_\_\_\_\_ into an aluminum cooking pan.
26. Efficient energy use gets more \_\_\_\_\_ out of the energy.
27. Gravel and sand are super abundant, but even so they are \_\_\_\_\_ resources.
28. Resources that regenerate faster than they are used are \_\_\_\_\_.

29. When we practice \_\_\_\_\_, we make sure resources will be available in the future.

30. \_\_\_\_\_ are resources that cannot be regenerated on a useful timescale.

**Short Answer**

*Answer each question in the space provided.*

31. What must be done before fossil fuels can be used?

32. Why is energy conservation beneficial?

33. List 5 ways that natural resources can be conserved.

---

**Answer Key**

1. b 2. c 3. b 4. b 5. a 6. a 7. a 8. c 9. d 10. d

11. true 12. false 13. true 14. true 15. true 16. false 17. true 18. true 19. true 20. false

21. conserve 22. efficiency 23. plastic bottles 24. conserve 25. recycled 26. work 27. non-renewable 28. renewable

29. conservation 30. Non-renewable resources

31. First, fossil fuels must be found and extracted. They are then refined and may need to be changed to a different form. They need to be transported to where they will be used.
32. Conserving energy means that less energy is needed, which reduces costs, ensures that non-renewable energy sources will last longer, and reduces political and environmental impacts.
33. Buy less stuff, reduce packaging, recycle, purchase products made with recycled materials, reduce pollution, prevent soil erosion, plant new trees, drive less, and conserve energy at home.

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CHAPTER

**21**

**MS Human Actions and  
Earth's Water Assessments**

**Chapter Outline**

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- 21.1 HUMANS AND THE WATER SUPPLY
  - 21.2 WATER POLLUTION
  - 21.3 PROTECTING THE WATER SUPPLY
  - 21.4 HUMAN ACTIONS AND EARTH'S WATERS
-

## 21.1 Humans and the Water Supply

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Regarding water use, developing nations use
  - a greater percentage for industry.
  - more for agriculture than for industry.
  - more for household uses than any other category.
  - a greater percentage for agriculture.
- Recreational uses of water include
  - irrigating golf courses
  - kayaking
  - scuba diving
  - all of these
- Agricultural chemicals
  - may enter groundwater
  - evaporate into the air
  - stay on the plants they target
  - all of these
- Water is lost for human use if it
  - infiltrates into the ground
  - enters a stream
  - becomes polluted
  - all of these
- The amount of water available to a population depends on
  - rainfall
  - the money available to develop water supplies
  - political agreements
  - all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Large irrigation systems may waste a lot of water.
- \_\_\_\_\_ 7. Water scarcity is not a problem since 70% of Earth is covered by water.
- \_\_\_\_\_ 8. Glaciers are a source of fresh water in some locations.



\_\_\_\_\_ 9. By the year 2025, only one-quarter of the world's people will have enough clean water.

\_\_\_\_\_ 10. In poorer countries, many young children die from waterborne diseases.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. People use water for swimming, fishing, boating and other activities. This is a(n) \_\_\_\_\_ use of water.

12. \_\_\_\_\_ and other organisms in water can cause disease.

13. A period of unusually low rainfall is a(n) \_\_\_\_\_.

14. From your house, water goes down the drain and into a(n) \_\_\_\_\_.

15. Most crops in the developed nations use water from \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What are the industrial uses of water?

17. What are the consequences of water shortages?

---

## Answer Key

1. b 2. d 3. a 4. c 5. d

6. true 7. false 8. true 9. false 10. true

11. recreational 12. Bacteria 13. drought 14. sewer 15. irrigation

16. Water is used in industry for chemical processes. It is used to generate electricity and cool power plants.

17. Crops and livestock may die yielding less food for people. Industry may slow or stop, reducing the jobs people can get and products they can buy. Nations may go to war over water and people may die from lack of water.

## 21.2 Water Pollution

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. The Gulf of Mexico oil spill began with
  - a. a ship running aground
  - b. a rig that cracked apart in a storm
  - c. a rig explosion
  - d. an onshore pipeline breaking apart
2. Industrial pollutants include
  - a. radioactive substances
  - b. chemicals
  - c. heat
  - d. all of these
3. Dead zones are found mostly
  - a. off of industrialized areas in developed nations
  - b. in the Gulf of Mexico
  - c. off of farming areas in developing nations
  - d. none of these
4. The temperature of a lake may rise if the water is
  - a. released from a reservoir
  - b. used to cool a power plant
  - c. exposed to oil drilling
  - d. all of these
5. An example of point source pollution is
  - a. a nuclear power plant
  - b. acid rain
  - c. a set of enormous animal farms
  - d. steel factories along a river

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Water pollution contributes to water shortages.
- \_\_\_\_\_ 7. Most ocean pollution comes from ships at sea.
- \_\_\_\_\_ 8. Animal waste and fertilizers bring nutrients to nearby water sources.

\_\_\_\_\_ 9. Water pollution includes any contaminant that gets into lakes, streams, and oceans.

\_\_\_\_\_ 10. Factory farms with thousands of animals pollute ocean water with animal wastes.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. When human activities heat up a natural water body it is called \_\_\_\_\_ pollution.

12. Excess fertilizers runoff into the Gulf of Mexico to create a region with little life called a(n) \_\_\_\_\_.

13. Pollutants that rain from the atmosphere are \_\_\_\_\_ source pollutants.

14. Toxic metals that are industrial pollutants include lead and \_\_\_\_\_.

15. Wastewater from septic tanks, sewers, and yards are part of \_\_\_\_\_ pollution.

### Short Answer

*Answer each question in the space provided.*

16. What two types of damage to the water supply can be done by huge animal farms?

17. What damage can an oil spill do?

---

## Answer Key

1. c 2. d 3. c 4. b 5. a

6. true 7. false 8. true 9. true 10. true

11. thermal 12. dead zone 13. non-point 14. mercury 15. municipal

16. Wastes can leak into the fresh water supply, such as streams or groundwater. Wastes can also go downstream into the oceans to create a dead zone.

17. Oil in the water may coat and kill ocean animals. Some oil washes ashore, which may ruin beaches and destroy coastal wetlands.

## 21.3 Protecting the Water Supply

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Passage of the Clean Water Act
  - a. established the Environmental Protection Agency
  - b. outlawed emitting all pollutants into water
  - c. made governments responsible for all pollution
  - d. all of these
2. Contaminants in water that need to be treated include
  - a. bacteria, algae, viruses, and fungi
  - b. some elements
  - c. chemical pollutants
  - d. all of these
3. Water purification
  - a. increases acidity
  - b. does not always produce water that is safe for drinking
  - c. removes all contaminants
  - d. none of these
4. What can governments and international agencies do to prevent pollution and clean up the oceans?
  - a. pass laws
  - b. provide funding
  - c. enforce laws
  - d. all of the above
5. To discard motor oil
  - a. put it in the storm sewers
  - b. put it down the drain
  - c. take it to an approved disposal facility
  - d. put it on the ground

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Cleaning the ocean of pollutants is difficult because the ocean is so vast.
- \_\_\_\_\_ 7. It is easier to clean water that has become polluted than to keep it from becoming polluted.
- \_\_\_\_\_ 8. Water for drinking, medicine, agriculture, and water parks is all purified to the same quality.

- \_\_\_\_\_ 9. Wastewater contains hundreds of contaminants.
- \_\_\_\_\_ 10. In a wastewater treatment plant, water is treated in one single process.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. The acronym for the Environmental Protection Agency is \_\_\_\_\_.
12. \_\_\_\_\_ nations have few or no water treatment facilities.
13. \_\_\_\_\_ produces drinking water by removing organisms, elements and chemical pollutants.
14. \_\_\_\_\_ removes contaminants, such as solids and particles from wastewater.
15. Since passage of the \_\_\_\_\_ Act many wastewater treatment plants have been constructed.

**Short Answer**

*Answer each question in the space provided.*

16. What are some ways that you can conserve water in and around your home?

17. Describe the four processes in a water treatment facility.

---

**Answer Key**

1. a 2. d 3. b 4. d 5. c

6. true 7. false 8. false 9. true 10. false

11. EPA 12. Poorer or developing 13. Water purification or treatment 14. Sewage treatment 15. Clean Water

16. To conserve water at home, use drip irrigation, turn off taps, take shorter showers, install water saving devices, water less, use human power rather than water; e.g. sweep rather than hose down areas.

17. There are four steps: 1) chemicals are added to cause solids to clump - coagulation, 2) water is moved to tanks and clumps sink to bottom- sedimentation, 3) water passes through filters that remove smaller particles - filtration, 4) chlorine is added to kill microbes - disinfection

## 21.4 Human Actions and Earth's Waters

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. People in some parts of the world cannot get enough clean water because
  - a. there is not enough water
  - b. they have no way to bring the water to the people
  - c. there is not enough money for treatment plants
  - d. all of these
2. Scientists estimate that half of the world's population will not have enough water by what year?
  - a. 2015
  - b. 2020
  - c. 2025
  - d. 2030
3. Droughts
  - a. make water shortages worse
  - b. are decreasing in frequency
  - c. only strike wet regions
  - d. none of these.
4. What is the most widespread source of water contamination in developing countries?
  - a. municipal pollution
  - b. agricultural pollution
  - c. raw sewage
  - d. industrial pollution
5. Thermal pollution is
  - a. not as harmful to life as chemical pollution
  - b. only a problem in developing nations
  - c. only seen around nuclear power plants
  - d. none of these
6. Coastal areas become polluted by
  - a. runoff from land
  - b. direct dumping of wastewater
  - c. power plants
  - d. all of these
7. Water is a \_\_\_\_\_ resource, and it is \_\_\_\_\_.
  - a. renewable; unlimited



- b. non-renewable; unlimited
  - c. renewable; limited
  - d. non-renewable; limited
8. People today use how much more water than they did 100 years ago?
- a. 2 times
  - b. 4 times
  - c. 6 times
  - d. 10 times
9. It is estimated that by 2025,
- a. all nations will provide clean water to all residents
  - b. a smaller percentage than today will not have clean water
  - c. about 40% of people will face water scarcity
  - d. nearly half of people won't have enough clean water
10. Waterborne diseases are the leading cause of death
- a. nowhere ever
  - b. in young children in many nations
  - c. in people of all ages worldwide
  - d. in people of all ages in many nations

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Getting rid of bacteria in contaminated water requires high-tech solutions.
- \_\_\_\_\_ 12. Aquatic organisms are extremely resistant to pollution.
- \_\_\_\_\_ 13. Nearly all of Earth's water is not usable by humans.
- \_\_\_\_\_ 14. The EPA has helped to improve water quality.
- \_\_\_\_\_ 15. Oil spills are easy to clean up.
- \_\_\_\_\_ 16. Many technologies are available to conserve water.
- \_\_\_\_\_ 17. Irrigation is only rarely used in agriculture today.
- \_\_\_\_\_ 18. Golf courses use very little water compared to other recreational activities.
- \_\_\_\_\_ 19. About one-quarter of all diseases are caused by drinking unsafe water.
- \_\_\_\_\_ 20. Water is unevenly distributed around the world.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. Most farms in the developed world get water from \_\_\_\_\_.
22. Your \_\_\_\_\_ uses water to cook, bathe, drink, flush toilets and wash the dog, among other things.
23. \_\_\_\_\_ delivers small amounts of water directly to the soil at the roots of each plant or tree.
24. \_\_\_\_\_ occur when a region experiences usually low precipitation for months or years.
25. Fresh water can be stored in icy \_\_\_\_\_.
26. A \_\_\_\_\_ is a large ocean area with no fish or plant life.
27. \_\_\_\_\_ is a rise in water temperature from a power plant.
28. \_\_\_\_\_ removes contaminants, such as solids and particles, from sewage.

29. Drinking water is produced through the process of \_\_\_\_\_.
30. The Clean Water Act gives the \_\_\_\_\_ the authority to set water quality standards.

**Short Answer**

*Answer each question in the space provided.*

31. What is the best way to have clean water (to keep it clean or to clean it once it's polluted)? How does society see to it that this happens?

32. What creates a dead zone?

33. What was the result of the passage of the Clean Water Act?

---

**Answer Key**

1. d 2. c 3. a 4. c 5. d 6. d 7. c 8. c 9. d 10. b  
11. true 12. false 13. true 14. true 15. false 16. true 17. false 18. false 19. true 20. true

21. irrigation 22. household 23. Drip irrigation 24. Drought 25. glaciers 26. dead zone 27. Thermal pollution 28. Sewage treatment 29. water purification 30. EPA (Environmental Protection Agency)

31. The best way to have clean water is to keep it clean. The only way to be sure this happens is to have laws that regulate the amount of pollution that is allowed to be emitted.

32. Runoff picks up fertilizers and other wastes that contain nutrients. When a stream runs into a lake or coastal region, the nutrients promote algae growth. When the algae die they decompose, which uses all of the dissolved oxygen in the water. Without oxygen, fish and other organisms cannot live and so it becomes a dead zone.

33. The Clean Water Act created the EPA, which is responsible for protecting the nation's water. Water is tested and the sources of pollutants are identified. Polluters are forced to fix the problem and clean the water and they are fined.

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CHAPTER **22** **MS Human Actions and the Atmosphere Assessments**

**Chapter Outline**

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- 22.1 AIR POLLUTION**
  - 22.2 EFFECTS OF AIR POLLUTION**
  - 22.3 REDUCING AIR POLLUTION**
  - 22.4 HUMAN ACTIONS AND THE ATMOSPHERE**
-

## 22.1 Air Pollution

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Many of the smoggiest cities are in which state?
  - a. California
  - b. New York
  - c. Texas
  - d. Florida
2. Slash-and-burn is done primarily
  - a. for energy
  - b. to clear land for agriculture
  - c. to clear land for construction
  - d. none of these
3. How many pollutants does the Clean Air Act of 1970 regulate?
  - a. 6
  - b. 89
  - c. 189
  - d. 289
4. Pollutants may collect
  - a. beside mountain ranges
  - b. in inversions
  - c. when there is little wind
  - d. all of these.
5. Smog that forms from a reaction with sunlight is known as
  - a. photographic smog
  - b. photochemical smog
  - c. photosynthesized smog
  - d. photogenic smog

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Before the Industrial Revolution there was very little air pollution that wasn't natural.
- \_\_\_\_\_ 7. Burning fossil fuels releases carbon dioxide into the atmosphere.
- \_\_\_\_\_ 8. About 150 million tons of pollutants enter into the atmosphere every year.

- \_\_\_\_\_ 9. The Clean Air Act regulates carbon dioxide.
- \_\_\_\_\_ 10. Ozone in the lower atmosphere protects life from UV radiation.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. The Clean Air Act was signed in the year \_\_\_\_\_.
12. The carbon-, nitrogen- and sulfur-oxides; particulates, lead and some organic compounds are \_\_\_\_\_-pollutants.
13. Once widely used in paint, gasoline and pipes, this pollutant causes brain damage and blood poisoning: \_\_\_\_\_-\_\_\_\_\_.
14. \_\_\_\_\_ enter the atmosphere from volcanic eruptions, windblown dust, industry and vehicles.
15. Besides burning fossil fuels, burning \_\_\_\_\_ releases pollutants into the atmosphere.

**Short Answer**

*Answer each question in the space provided.*

16. How does ozone pollution form? Where in the U.S. is it the most common?
17. If smoke from burning trees or dust blown in wind is natural, why is it considered a pollutant? What type of pollutant is it?

---

**Answer Key**

1. a 2. b 3. c 4. d 5. b
6. true 7. true 8. true 9. false 10. false
11. 1970 12. primary 13. lead 14. Particulates 15. forests
16. Ozone is created by a chemical reaction between exhaust and sunlight. Since sunlight is needed for it to form, it tends to form in the summer in warm dry cities like Los Angeles, Phoenix, and Denver.
17. Burning trees and windblown dust are particulates. They are pollutants when they are present in large amounts in the atmosphere and especially when they collect in places to make the air dangerous.

## 22.2 Effects of Air Pollution

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Particulates
  - a. increase asthma attacks
  - b. significantly reduce rates of skin cancer
  - c. are responsible for neurological diseases
  - d. have no effect on human health
2. Ozone is a pollutant in the \_\_\_\_\_, but is beneficial in the \_\_\_\_\_.
  - a. stratosphere; thermosphere
  - b. thermosphere; troposphere
  - c. ionosphere; thermosphere
  - d. troposphere; stratosphere
3. Limestone buildings and sculptures are eroded primarily by which of the following?
  - a. UV radiation
  - b. acid rain
  - c. ozone pollution
  - d. CFCs
4. The phenomenon of pollutants adding up in an organism for life is known as
  - a. bioaccumulation
  - b. accumulation
  - c. bio addition
  - d. biopollutants
5. Which fish species would typically contain the most mercury?
  - a. krill
  - b. shark
  - c. trout
  - d. oyster

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Lung cancer rates are increasing entirely due to more people smoking.
- \_\_\_\_\_ 7. Ozone loss near the North and South Poles is about the same.
- \_\_\_\_\_ 8. On a pH scale, numbers below 7 are basic.

\_\_\_\_\_ 9. Particulates reduce the amount of sunshine that reaches the ground.

\_\_\_\_\_ 10. Acid rain is produced by nitrogen and sulfur-oxides in the atmosphere.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. High \_\_\_\_\_ levels increase asthma and lung diseases.

12. \_\_\_\_\_ occurs as toxic substances increase up the food web.

13. \_\_\_\_\_ can dissolve limestone structures.

14. The ozone layer protects Earth surface from \_\_\_\_\_.

15. For ozone loss to occur, \_\_\_\_\_ in CFCs break apart ozone.

### Short Answer

*Answer each question in the space provided.*

16. Describe how ozone breaks down in the stratosphere.

17. How does bioaccumulation of mercury occur?

---

## Answer Key

1. a 2. d 3. b 4. a 5. b

6. false 7. false 8. false 9. true 10. true

11. particulate 12. Bioaccumulation 13. Acid rain 14. ultraviolet radiation (high energy UVC) 15. chlorine

16. CFCs float into the stratosphere and are broken apart by sunlight. The chlorine breaks apart the ozone into an O<sub>2</sub> and an O and then moves onto destroy another ozone.

17. Heavy metals are taken in by organisms. The organism higher up the food chain eats a lot and accumulates all of the metals in all of its prey. As you go further up the food chain the heavy metals become very concentrated.



## 22.3 Reducing Air Pollution

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. A carbon tax
  - a. encourages people to reduce carbon emissions
  - b. encourages conservation
  - c. charges money for carbon emissions
  - d. all of the above
2. A car that runs on gasoline and electric power is
  - a. a combustible engine vehicle
  - b. a hybrid vehicle
  - c. an electric vehicle
  - d. a diesel vehicle
3. Catalytic converters
  - a. break pollutants into non-toxic compounds
  - b. only work for particulates
  - c. reduce pollutants to zero
  - d. all of these
4. Removing carbon from the atmosphere is known as
  - a. carbon sequestration
  - b. carbon stealing
  - c. unpolluting
  - d. carbon burying
5. Nations benefit from developing emission reducing technologies in
  - a. trade-and-spend
  - b. spend-and-reduce
  - c. cap-and-trade
  - d. cap-and-reduce

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Since the passage of the Clean Air Act, emissions of the six major pollutants have decreased by 50%.
- \_\_\_\_\_ 7. Removing particles from emissions is a difficult process.
- \_\_\_\_\_ 8. Destruction by ozone creates the ozone hole.

\_\_\_\_\_ 9. Efforts to reduce greenhouse gas emissions have been successful.

\_\_\_\_\_ 10. Without the Montreal Protocol, skin cancer cases in the U.S. would have been higher.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Carbon can be removed from the atmosphere through the process of \_\_\_\_\_.

12. To remove pollutants from exhaust, use a(n) \_\_\_\_\_.

13. To reduce pollutants, modern cars are equipped with a(n) \_\_\_\_\_.

14. To reduce energy use, people could be charged a(n) \_\_\_\_\_ when they emit carbon dioxide.

15. Trees in a forest store carbon dioxide. When the forest burns, the greenhouse gas \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What is the Montreal Protocol?

17. Describe how carbon sequestration works. Give a natural example.

---

## Answer Key

1. d 2. b 3. a 4. a 5. c

6. true 7. true 8. false 9. false 10. true

11. carbon sequestration 12. scrubber 13. catalytic converter 14. carbon tax 15. enters the atmosphere or is released

16. The Montreal Protocol is an international agreement on regulating almost 100 ozone destroying chemicals, like CFCs. Signed in 1987, it aims to return the ozone layer to its normal state. It has been effective and will be more effective in the future.

17. In carbon sequestration, carbon dioxide is removed from the atmosphere and stored. Forests do this naturally when they take in carbon dioxide for photosynthesis.

## 22.4 Human Actions and the Atmosphere

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Pregnant women should not eat much large fish due to
  - a. the possibility of lead poisoning
  - b. volatile organic compounds
  - c. bioaccumulation of mercury
  - d. none of these
2. Which of the following is NOT a primary pollutant?
  - a. carbon dioxide
  - b. volatile organic compounds
  - c. sulfur dioxide
  - d. ozone
3. Acid rain
  - a. forms when nitrogen oxides dissolve in rain
  - b. has a high pH
  - c. affect only location where it forms
  - d. all of these
4. Rain
  - a. is naturally acidic
  - b. is turned to acid rain by ozone
  - c. has become more alkaline in recent decades
  - d. all of these
5. Particulates can
  - a. cause acid rain
  - b. reduce photosynthesis
  - c. cause lung and heart disease
  - d. none of these
6. Homes should have a detector to detect the deadly gas
  - a. carbon dioxide
  - b. carbon monoxide
  - c. sulfur dioxide
  - d. sulfur monoxide
7. You are likely to consume more toxic metals
  - a. if you eat phytoplankton and other producers

- b. if you eat filter feeders like oysters
  - c. the lower on the food chain you eat
  - d. the higher up the food chain you eat
8. In carbon sequestration
- a. nations have an upper limit on their carbon dioxide emissions
  - b. carbon dioxide is removed from the atmosphere and stored
  - c. a tax is placed on carbon emissions
  - d. none of these
9. What reduces air pollutants from motor vehicles?
- a. muffler
  - b. fuel cell
  - c. catalytic converter
  - d. all of these
10. The effect of banning CFCs has been to
- a. eliminate the ozone hole
  - b. increase the ozone hole
  - c. stabilize the ozone hole
  - d. none of these

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Ozone levels are worst during the early evening.
- \_\_\_\_\_ 12. The Montreal Protocol banned ozone-destroying substances abruptly.
- \_\_\_\_\_ 13. Increased particles in the air could increase rainfall.
- \_\_\_\_\_ 14. Volatile organic compounds are secondary pollutants.
- \_\_\_\_\_ 15. The Clean Air Act as passed in 1970 regulates only six pollutants.
- \_\_\_\_\_ 16. Air pollution is an annoyance but doesn't do any real damage.
- \_\_\_\_\_ 17. Photochemical smog occurs most in hot, humid locations.
- \_\_\_\_\_ 18. The increase in motor vehicles in cities has increased pollutants.
- \_\_\_\_\_ 19. Particulates reduce the amount of sunshine that can reach the ground.
- \_\_\_\_\_ 20. The asthma rate has been decreasing worldwide.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. A measure of pollutants in the air is a measure of \_\_\_\_\_.
22. \_\_\_\_\_ provides a monetary incentive for nations to develop technologies that will reduce emissions.
23. A \_\_\_\_\_ is a financial method of trying to reduce carbon dioxide emissions.
24. To remove carbon dioxide from the atmosphere, you could plant trees. This is one method of \_\_\_\_\_.
25. \_\_\_\_\_ is a heavy metal that bioaccumulates.
26. Nitrogen- and sulfur-oxides emitted from coal plants create \_\_\_\_\_.
27. To clear land for farming, forests may be burned in a process known as \_\_\_\_\_.
28. \_\_\_\_\_ can occur naturally from volcanic eruptions or windblown dust.

29. \_\_\_\_\_ is a greenhouse gas that is released with livestock wastes.

30. In the stratosphere, \_\_\_\_\_ screens out harmful ultraviolet radiation.

**Short Answer**

*Answer each question in the space provided.*

31. How do secondary pollutants come about?

32. What caused the ozone hole? What effect has the Montreal Protocol had on it?

33. Explain how cap-and-trade works.

---

**Answer Key**

1. c 2. d 3. a 4. a 5. b 6. b 7. d 8. b 9. c 10. c

11. true 12. false 13. true 14. false 15. true 16. false 17. false 18. true 19. true 20. false

21. air quality 22. Cap-and-trade 23. carbon tax 24. carbon sequestration 25. Mercury 26. acid rain 27. slash-and-burn agriculture 28. Particulates 29. Methane 30. ozone

31. Primary pollutants are released into the air and react together in the presence of sunlight. Nitrogen oxides and volatile organic compounds are heated by the sun and the oxygen atoms break off. The oxygen atoms combine with oxygen molecules to form ozone.

32. The ozone hole is an area where the ozone layer is dangerously thin near the South Pole. The reactions of CFCs and ozone in the stratosphere causes ozone to break down. The Montreal Protocol got nations to phase out the worst ozone destroying substances. The hole was largest in 2006 and it seems to be stabilizing and will shrink in the future.

33. Each nation is given a cap on the amount of carbon dioxide it can emit. If the nation goes over its cap it can trade with another nation. The nation that is below its cap can sell its emissions and make money.

---

CHAPTER

**23**

# MS Observing and Exploring Space Assessments

## Chapter Outline

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- 23.1 TELESCOPES
  - 23.2 EARLY SPACE EXPLORATION
  - 23.3 RECENT SPACE EXPLORATION
  - 23.4 OBSERVING AND EXPLORING SPACE
-

## 23.1 Telescopes

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- To view the stars in the night sky you should use
  - an electron microscope
  - a refracting telescope
  - a magnifying glass
  - a radio telescope
- If you see a star that is 30,000 light years away, you are viewing it as it
  - appears right now
  - appeared 1 light year ago
  - appeared 30,000 years ago
  - appeared when it formed
- An electromagnetic wave
  - has an electric field and a magnetic field
  - oscillates between high and low energy values
  - is visible to the human eye
  - all of these
- Visible light is
  - a small part of the electromagnetic spectrum
  - the only wavelengths that come from most stars
  - best for observing astronomical objects
  - all of these
- The Greeks knew that planets were different from stars because they
  - are larger and brighter
  - move in the opposite direction
  - are not included in any constellations
  - wander across the background of the other stars

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. A light year is a measure of time.
- \_\_\_\_\_ 7. The most distant objects are viewed with radio waves.
- \_\_\_\_\_ 8. Radio telescopes can be linked together to gather more data on a space object.



\_\_\_\_\_ 9. The longer the wavelength, the higher the frequency.

\_\_\_\_\_ 10. Space telescopes are able to gather more types of waves than land-based telescopes.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A pattern of stars in the sky is a(n) \_\_\_\_\_.

12. A telescope that uses mirrors to collect and focus light is a(n) \_\_\_\_\_.

13. A(n) \_\_\_\_\_ is a scientist who uses telescopes and other tools to study the universe.

14. Hubble, a \_\_\_\_\_ telescope, has been in orbit since 1990

15. Starlight can be broken into colors by a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What can astronomers learn from the light spectrum of a star?

17. What are three observations that Galileo made with his (very primitive) telescope?

---

## Answer Key

1. b 2. c 3. a 4. a 5. d

6. false 7. false 8. true 9. true 10. false

11. constellation 12. reflecting telescope 13. astronomer 14. space 15. spectrometer

16. A spectrometer can be used to determine all of the following about a star: its temperature, composition and whether the star is moving toward or away from Earth.

17. List any of the following three things that Galileo observed: (1) there are more stars in the night sky than we can see with the naked eye, (2) the Milky Way is actually many stars, (3) the Moon has craters, (4) Venus has phases like our Moon, (5) Jupiter has moons that orbit the planet, (6) there are dark spots that move across the Sun's surface.

## 23.2 Early Space Exploration

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Voyager 1 is the first human-made object to
  - a. leave Earth's orbit
  - b. orbit the Sun
  - c. leave interstellar space
  - d. leave the solar system
2. Which of the following is one of Newton's Laws of Motion?
  - a. To every action, there is an equal and opposite reaction
  - b. An object in motion will remain in motion forever and always
  - c. Every object is attracted to every other object proportionately to its volume
  - d. Gravity equals mass times acceleration
3. A rocket has multiple stages so that it
  - a. can take humans into space
  - b. is able to orbit Earth
  - c. reduces the rocket's weight in steps
  - d. none of these
4. Which two countries were involved in the space race?
  - a. China India
  - b. U.S.A and U.S.S.R.
  - c. Brazil U.S.S.R.
  - d. U.S.A. U.K.
5. For a rocket to enter Earth orbit, it must be launched
  - a. at the right speed
  - b. from the right location
  - c. straight up
  - d. all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Only two nations have put a human on the moon: the U.S. and China.
- \_\_\_\_\_ 7. A satellite is an object that orbits a smaller object.
- \_\_\_\_\_ 8. It was only 12 years between when the first artificial satellite was launched and Neil Armstrong walked on the Moon.

- \_\_\_\_\_ 9. An object can go into orbit because of the law of conservation of momentum.
- \_\_\_\_\_ 10. Newton's Third Law of Motion helps explain how a rocket will travel in space.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. The president who challenged the US to put a man on the moon was \_\_\_\_\_.
12. A \_\_\_\_\_ is an unmanned spacecraft that collects data on objects in space.
13. The path a satellite takes around an object is its \_\_\_\_\_.
14. The launch of spacecraft \_\_\_\_\_ ignited the Space Race.
15. If you multiply mass times acceleration, you get \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. How does a rocket move through the vacuum of space?

17. How did the conflict between the U.S. and the U.S.S.R. lead to Neal Armstrong's step on the Moon?

---

**Answer Key**

1. d 2. a 3. c 4. b 5. c

6. false 7. true 8. true 9. false 10. true

11. John F. Kennedy 12. space probe 13. orbit 14. Sputnik 1 15. force

16. The rocket has fuel that is ignited, causing an explosion of gases. The explosion creates pressure that forces gases out of the rocket. The gases fly out of the rocket and push the rocket in the opposite direction, according to Newton's Third Law of Motion.

17. After WWII the U.S. and USSR were in a Cold War. Each nation tried to develop the best weapons, which helped to drive the development of new technology. When the USSR launched Sputnik 1 in 1957, Americans launched Explorer 1 and established NASA. President Kennedy announced in 1961 that the US would put a man on the moon before the end of the decade and they did. Neal Armstrong stepped on the moon in July 1969.

## 23.3 Recent Space Exploration

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. The International Space Station has had people on board since \_\_\_\_\_.
  - a. 1969
  - b. 1989
  - c. 2000
  - d. 2008
2. A space station is
  - a. launched and constructed in pieces
  - b. designed for defense purposes
  - c. home to astronauts from one country at a time
  - d. none of these
3. What features make a space shuttle unique?
  - a. It can explore the inner solar system.
  - b. It can haul cargo into space.
  - c. It can fly like an airplane.
  - d. It can land on the moon and return.
4. If you want to see what happened to a lake before and after a hurricane, you would use
  - a. geospatial satellites
  - b. Landsat images
  - c. rovers.
  - d. none of these
5. Smaller solar system objects, like asteroids, may give us clues as to
  - a. how the solar system formed
  - b. what planets are made of
  - c. when the solar system formed
  - d. all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. One purpose of the International Space Station is to conduct medical research.
- \_\_\_\_\_ 7. Private companies are increasingly getting into space exploration.
- \_\_\_\_\_ 8. There are currently rovers on Venus and Mars.

\_\_\_\_\_ 9. The mission of NASA is to study everything in the solar system except Earth.

\_\_\_\_\_ 10. The record for one crew inhabiting a space station is ten years.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Besides studying other solar system bodies, NASA satellites keep an eye on planet \_\_\_\_\_.

12. If you wanted to live for several months in space, you would try to get aboard a(n) \_\_\_\_\_.

13. The part of the space shuttle that comes back to Earth with astronauts aboard is the \_\_\_\_\_.

14. Humans are currently in orbit around Earth in the \_\_\_\_\_.

15. Besides Earth, the planet we know the most about is \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. What caused the accidents that brought down two space shuttles and killed their crews?

17. Why are satellites important for understanding changes on Earth? Give an example.

---

## Answer Key

1. c 2. a 3. b 4. b 5. d

6. true 7. true 8. false 9. false 10. false

11. Earth 12. space station 13. orbiter 14. International Space Station 15. Mars

16. The Challenger shuttle had a faulty o-ring in one of the rocket boosters and broke apart just 73 seconds after launch. The Columbia shuttle had a small piece of insulating foam break off of the fuel tank and smash into the

front of one wing. This damaged a tile that was part of the shuttle's heat shield. When Columbia re-entered Earth's atmosphere, the temperatures were too high.

17. Satellites can get a big view of Earth systems. They can also compare views over time. For example, the extent of the polar ice sheets is changing and satellite views taken at the same time of year over a number of years can detect how.



## 23.4 Observing and Exploring Space

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- How long does it take sunlight to get from the Sun to Earth?
  - 8 seconds
  - 8 minutes
  - 8 hours
  - 8 days
- After the sun, which star is closest to us?
  - Proxima Centauri
  - Sirius
  - Polaris
  - Betelgeuse
- The distance between two adjacent oscillations is called a(n) . . .
  - wavelength
  - frequency
  - amplitudes
  - crest
- Which telescopes are best for the viewing the surface of Earth's moon?
  - refracting telescope
  - reflecting telescope
  - radio telescope
  - none of the above
- Who created the first reflecting telescope?
  - Galileo
  - Sir Isaac Newton
  - Hermann Oberth
  - John Herschel
- With his first telescope, Galileo could see
  - stars outside our galaxy
  - the orbiting moons of Mars
  - sunspots
  - all of these
- The United States space program has
  - spacecraft out beyond the edges of the solar system

- b. rovers on Mars
  - c. satellites around the inner planets
  - d. all of these
8. Satellite studying Earth can tell us
- a. how Earth systems affect one another
  - b. what the weather will be like in a region
  - c. how the planet changes over time
  - d. all of these
9. The Milky Way
- a. is the galaxy closest to Earth
  - b. is about 100 light years across
  - c. contains fewer stars than other galaxies
  - d. none of these
10. A reflecting telescope collects more light than a refracting telescope so it can see
- a. larger objects
  - b. colder objects
  - c. more distant objects
  - d. younger objects

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Cassini found life on Saturn's moon Titan.
- \_\_\_\_\_ 12. Visible light is a large part of the electromagnetic spectrum.
- \_\_\_\_\_ 13. Very hot stars emit light in the ultraviolet.
- \_\_\_\_\_ 14. The earliest telescopes were refracting telescopes.
- \_\_\_\_\_ 15. The United States launched Sputnik in 1957.
- \_\_\_\_\_ 16. President Kennedy challenged the Soviet Union to a Cold War.
- \_\_\_\_\_ 17. All five space shuttles returned to Earth safely.
- \_\_\_\_\_ 18. The International Space Station has housed scientists from the US, Russia and elsewhere.
- \_\_\_\_\_ 19. Early space exploration success was due to cooperation between the United States and the USSR.
- \_\_\_\_\_ 20. Rockets must be launched straight up to escape Earth's gravity.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. Light is one type of \_\_\_\_\_ energy.
22. A(n) \_\_\_\_\_ is the distance that light travels in one year.
23. \_\_\_\_\_ measures the number of wavelengths that pass a given point every second.
24. Radio telescopes collect and focus \_\_\_\_\_ waves.
25. The Ancient Greeks called bright bodies that wander across the night sky \_\_\_\_\_.
26. \_\_\_\_\_ are patterns of stars in the sky.
27. A(n) \_\_\_\_\_ is any object that orbits a larger object.
28. Astronaut Neal Armstrong stepped on the moon in July of \_\_\_\_\_.

29. A \_\_\_\_\_ is an unmanned spacecraft that collects data by flying near or landing on an object in space.
30. The Cassini mission has been studying the planet \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

31. Why is a telescope in Earth orbit better than one on Earth's surface?

32. How did Galileo's observations change people's view of the universe?

33. What can an astronomer learn from the spectrum of a star?

---

**Answer Key**

1. b 2. a 3. a 4. a 5. b 6. c 7. d 8. d 9. d 10. c

11. false 12. false 13. true 14. true 15. false 16. false 17. false 18. true 19. false 20. true

21. electromagnetic (EM) radiation 22. light-year 23. Frequency 24. radio waves 25. planets 26. Constellations 27. satellite 28. 1969 29. space probe 30. Saturn

31. The atmosphere interferes with electromagnetic radiation. The atmosphere blocks some radiation. Motion in the atmosphere distorts light; this causes the stars to twinkle.
32. Galileo made people think about Earth's place in the solar system. They had thought that Earth was at the center and Sun & planets revolved around it. Galileo's observations helped people to accept the ideas of Copernicus.
33. How hot the star is, what elements the stars contain, whether and how fast the star is moving toward or away from Earth.

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CHAPTER **24** **MS Earth, Moon, and Sun Assessments**

**Chapter Outline**

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- 24.1 PLANET EARTH
  - 24.2 EARTH'S MOON
  - 24.3 THE SUN
  - 24.4 THE SUN AND THE EARTH-MOON SYSTEM
  - 24.5 EARTH, MOON, AND SUN
-

## 24.1 Planet Earth

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. An imaginary line running through the poles of Earth is called
  - a. orbit
  - b. pole
  - c. magnetic pole
  - d. axis
2. How long does it take the Earth to make one rotation on its axis?
  - a. one day
  - b. one month
  - c. one year
  - d. one week
3. How many degrees does the Earth turn in one day?
  - a. 90 degrees
  - b. 180 degrees
  - c. 360 degrees
  - d. 1080 degrees
4. What causes Earth's seasons?
  - a. the planet's rotation
  - b. the planet's tilt
  - c. the planet's revolution
  - d. the planet's orbit
5. Earth's magnetic field is due to
  - a. the movement of metal in Earth's outer core
  - b. a bar magnet that is lodged between the magnetic poles
  - c. the force of the Sun's magnetic field
  - d. mantle convection

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Earth is divided into four hemispheres.
- \_\_\_\_\_ 7. Leap year is needed because Earth takes more than 365 days to orbit the Sun.
- \_\_\_\_\_ 8. Earth gets more gravitational pull from the Sun than the Moon because it is larger.

\_\_\_\_\_ 9. The planets move in fixed paths around the Sun.

\_\_\_\_\_ 10. The Earth's mostly iron crust produces the magnetic field.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The region between the equator and South Pole is the \_\_\_\_\_

12. One \_\_\_\_\_ of Earth takes one day.

13. Earth's path around the sun is in the shape of a(n) \_\_\_\_\_ .

14. In Northern Hemisphere summer, the \_\_\_\_\_ points toward the Sun.

15.  $23\frac{1}{2}^{\circ}$  is Earth's \_\_\_\_\_

### Short Answer

*Answer each question in the space provided.*

16. How does Foucault's pendulum show that Earth rotates on its axis?

17. What evidence does a ship moving away from shore give that Earth is round?

---

## Answer Key

1. d 2. a 3. c 4. b 5. a

6. false 7. true 8. false 9. true 10. false

11. Southern Hemisphere 12. rotation 13. ellipse 14. North Pole 15. tilt

16. Foucault hung a heavy weight from a long wire. The weight swings back and forth in a straight line. Earth rotates beneath the pendulum so the pendulum appears to change direction.

17. If Earth was flat a ship moving away from you would just get smaller. But when you observe a ship going away from shore, it gets smaller and the bottom of it disappears below the horizon. It appears to sink into the sea.



## 24.2 Earth's Moon

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The flat dark areas on the Moon are
  - lavas
  - dried lake beds
  - dried ocean basins
  - seawater
- What are the lighter areas on the Moon?
  - maria
  - craters
  - lakes
  - mountain ranges
- What is the dominant feature on the lunar surface?
  - volcanoes
  - craters
  - river basins
  - fault lines
- The Moon has more extreme temperatures than Earth because it
  - is closer to the Sun
  - rotates faster on its axis
  - doesn't have an atmosphere
  - has higher internal heat
- The interior structure of the Moon is
  - exactly like Earth's
  - higher in metal
  - different on the near and far sides
  - the same as Earth's but with less core

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The Moon is Earth's only natural satellite.
- \_\_\_\_\_ 7. Most of the maria are on the Moon's near side.
- \_\_\_\_\_ 8. The lunar crust is thicker on the far side than on the near side.

\_\_\_\_\_ 9. The Moon rotates on its axis once for every orbit it makes around the Sun.

\_\_\_\_\_ 10. You would weigh six times as much on the Moon as on Earth.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A smaller body that moves around a larger body in space is a(n) \_\_\_\_\_

12. You would weigh much less on the Moon than Earth because \_\_\_\_\_ is lower.

13. A(n) \_\_\_\_\_ results from meteorite impacts on the surface of an object.

14. The lunar highlands are called \_\_\_\_\_.

15. Lunar craters were created by impacts from \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. When and how were the maria created?

17. What are the two reasons that the Moon has so many more craters than Earth?

---

## Answer Key

1. a 2. d 3. b 4. c 5. d

6. true 7. true 8. true 9. false 10. false

11. satellite 12. gravity 13. crater 14. terrae 15. meteorites or asteroids

16. About 3 to 3.5 billion years ago the Moon was continually bombarded by meteorites. Through the surface and caused volcanic eruptions. Magma filled the craters to create the maria.

17. The Moon is not geologically active so the craters have not been erased by geological processes. It doesn't have an atmosphere so they have not been erased by weathering and erosion.

## 24.3 The Sun

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. The layer that shows beyond the Moon in a solar eclipse is the
  - a. corona
  - b. photosphere
  - c. radiative zone
  - d. prominence zone
2. Which layer of the Sun contains slow moving photons?
  - a. corona
  - b. core
  - c. radiative zone
  - d. convection zone
3. Most atoms in the Sun exist as
  - a. photons
  - b. plasma
  - c. light
  - d. silicate minerals
4. The energy that powers the Sun comes from
  - a. hydrogen fusing into helium
  - b. radioactivity
  - c. helium fusing into heavier elements
  - d. nuclear fission
5. Cool areas where the magnetic field disrupts the surface are
  - a. solar flares
  - b. solar prominences
  - c. solar winds
  - d. sunspots

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The Sun's core is molten metal.
- \_\_\_\_\_ 7. A solar flare can knock out power grids on Earth.
- \_\_\_\_\_ 8. The Sun makes up 99.8% of the mass of the solar system.

\_\_\_\_\_ 9. The Sun does not have a defined outer boundary.

\_\_\_\_\_ 10. Plasma is a solid.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A(n) \_\_\_\_\_ is a plasma loop flowing between sunspots.

12. The \_\_\_\_\_ is the visible surface of the Sun.

13. Sunspots occur in cycles lasting \_\_\_\_\_ years.

14. Violent explosions from the Sun's magnetic field that release energy are \_\_\_\_\_.

15. Highly energetic particles streaming away from the Sun make up the \_\_\_\_\_

### Short Answer

*Answer each question in the space provided.*

16. Describe the three internal layers of the Sun.

17. Describe the three layers of the Sun's atmosphere.

---

## Answer Key

1. a 2. c 3. b 4. a 5. d

6. false 7. true 8. true 9. true 10. false

11. solar flare 12. photosphere 13. 11 14. solar flares 15. solar wind

16. The core is the innermost layer made of plasma where hydrogen fuses into helium. The radiative zone is next out where energy travels extremely slowly. The convection zone surrounds the radiative zone and its material is heated from below and then convects.

17. The photosphere is the visible surface of the Sun. Around it is the chromosphere that glows red. The corona is the outermost part; it is the halo around the Sun.

## 24.4 The Sun and the Earth-Moon System

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What are the two distinct parts of Earth's shadow during a solar eclipse?
  - a. light and dark
  - b. panera and umbrella
  - c. umbra and penumbra
  - d. inner and outer
2. If the Moon is more than half lit, but the left side is dark, the phase is
  - a. first quarter
  - b. waxing gibbous
  - c. waning gibbous
  - d. last quarter
3. When the full moon moves through Earth's shadow, what occurs?
  - a. solar eclipse
  - b. high tide
  - c. low tide
  - d. lunar eclipse
4. A quarter moon is
  - a. halfway between a full moon and a new moon
  - b. two weeks after a full moon
  - c. when one quarter of the moon you see is lit
  - d. when one quarter of the moon you see is dark
5. What is the moon called when it is more than half lit?
  - a. a harvest moon
  - b. a blue moon
  - c. a crescent moon
  - d. a gibbous moon

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. A lunar eclipse generally lasts between 5-10 minutes.
- \_\_\_\_\_ 7. Birds may become confused during a solar eclipse and think that it is nighttime.
- \_\_\_\_\_ 8. During a total lunar eclipse the moon is entirely dark.

\_\_\_\_\_ 9. A solar eclipse is seen on all of the Earth that is having daytime.

\_\_\_\_\_ 10. The time between two full moon phases is 29.5 days.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A(n) \_\_\_\_\_ moon is when the moon is 51 –99% full.

12. A(n) \_\_\_\_\_ is the outer part of the shadow that remains partially lit during an eclipse.

13. A(n) \_\_\_\_\_ is when the Moon falls into the shadow of the Earth.

14. If the Moon is between Earth and Sun and the nearside is dark, it is a(n) \_\_\_\_\_

15. The moon is less than half lit during its \_\_\_\_\_ phase.

### Short Answer

*Answer each question in the space provided.*

16. Where are the Earth, Moon and Sun relative to each other during a solar eclipse?

17. What causes a lunar eclipse?

---

## Answer Key

1. c 2. b 3. a 4. a 5. d

6. false 7. true 8. false 9. false 10. true

11. gibbous 12. penumbra 13. lunar eclipse 14. new moon 15. crescent

16. For there to be a solar eclipse the Moon, Earth and Sun must be on the same plane, the plane of the ecliptic. The Moon gets directly between the Sun and Earth. Only part of Earth is beneath the Moon's shadow.



17. During a lunar eclipse the full moon moves through Earth's shadow. The Moon travels in Earth's umbra during total lunar eclipse. During a partial lunar eclipse, only a portion of the Moon enters the umbra.

## 24.5 Earth, Moon, and Sun

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. The Sun moves which way across the sky?
  - a. North to South
  - b. East to West
  - c. West to East
  - d. South to North
2. The Sun has less effect on tides than the Moon because
  - a. the Sun has less gravity
  - b. the Moon is so much larger
  - c. the Sun is so much farther away
  - d. the Sun's effect is cancelled out by the Moon's effect
3. Why does the Earth have seasons?
  - a. its tilt
  - b. its elliptical orbit
  - c. its rotation
  - d. its magnetic field
4. Conditions on the Moon are
  - a. extremely wet and dry
  - b. very stormy near the equator
  - c. extremely hot and extremely cold
  - d. very like on Earth
5. Water on the Moon is found as
  - a. vapor in the atmosphere
  - b. liquid in soil
  - c. ice in deep craters
  - d. vapor, liquid and ice like on Earth
6. The far side of the Moon
  - a. is the same as the near side
  - b. faces us only at night
  - c. faces us only in the day
  - d. has only been seen by spacecraft
7. What is the visible surface of the sun?
  - a. photosphere

- b. chromosphere
  - c. corona
  - d. none of the above
8. The movement of molten metal in the outer core results in
- a. plate tectonic motions
  - b. volcanism
  - c. the auroras
  - d. the magnetic field
9. Solar flares
- a. release large amounts of radiation
  - b. can knock out entire power grids
  - c. can knock out communications
  - d. All of the above
10. One of these is true about the geology of the Moon.
- a. The light colored mountains crystallized from magma.
  - b. The dark colored lavas erupted from mantle convection.
  - c. The craters are parts of volcanoes.
  - d. The features are very similar to those found on Earth.

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. The magnetic field protects Earth from harmful radiation.
- \_\_\_\_\_ 12. Earth's orbital path is an ellipse.
- \_\_\_\_\_ 13. Earth's orbit causes its seasons.
- \_\_\_\_\_ 14. The Moon is Earth's only natural satellite.
- \_\_\_\_\_ 15. The chromosphere is much hotter than the photosphere.
- \_\_\_\_\_ 16. Solar prominences are only visible during a total eclipse.
- \_\_\_\_\_ 17. The summer solstice occurs on July 21.
- \_\_\_\_\_ 18. A lunar eclipse occurs when a full moon moves through the Earth's shadow.
- \_\_\_\_\_ 19. Flat areas of basaltic rock are characteristic of the terrae areas of the Moon.
- \_\_\_\_\_ 20. Earth is the only planet known to have liquid water.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. The Northern Hemisphere summer solstice occurs in the month of \_\_\_\_\_.
22. The Moon's surface has been altered tremendously by the \_\_\_\_\_ left by meteorite impacts.
23. The lunar maria are made of \_\_\_\_\_.
24. The fourth state of matter made up of superheated gas with a positive electrical charge is called \_\_\_\_\_.
25. \_\_\_\_\_ are cooler, darker areas on the Sun.
26. \_\_\_\_\_ are violent eruptions that release huge amounts of energy.
27. The more massive an object the greater the pull of its \_\_\_\_\_.
28. A \_\_\_\_\_ occurs when the new moon passes directly between the Earth and the Sun.

29. Earth's shadow has two distinct parts: the \_\_\_\_\_ and \_\_\_\_\_.
30. Earth's \_\_\_\_\_ shields the planet from harmful solar radiation.

**Short Answer**

*Answer each question in the space provided.*

31. Describe the phases of the Moon from full to new.

32. What are sunspots and what causes them?

33. What causes Earth's seasons?

---

**Answer Key**

1. b 2. c 3. a 4. c 5. c 6. d 7. a 8. d 9. d 10. a

11. true 12. true 13. false 14. true 15. true 16. false 17. false 18. true 19. false 20. false

21. June 22. craters 23. basalt or lava 24. plasma 25. Sunspots 26. Solar flares 27. gravity 28. solar eclipse 29. umbra; penumbra 30. magnetic field

31. The full moon is completely lit, when Earth is between the Moon and Sun. One week later, the Moon is half lit. One week after that the Moon moves between Earth and Sun and appears dark to Earth.
32. Sunspots occur where loops of the Sun's magnetic field breaks through the surface. They are cooler and darker making them cooler and darker and have an 11 year cycle.
33. Earth tilts 23.5 degrees on its axis. The portion of the planet that points to the Sun has longer days and shorter nights so it is summer. The portion pointing away is winter.

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CHAPTER **25**

# MS The Solar System Assessments

## Chapter Outline

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- 25.1 INTRODUCTION TO THE SOLAR SYSTEM
  - 25.2 INNER PLANETS
  - 25.3 OUTER PLANETS
  - 25.4 OTHER OBJECTS IN THE SOLAR SYSTEM
  - 25.5 THE SOLAR SYSTEM
-

## 25.1 Introduction to the Solar System

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The planets appear to move
  - in the same direction as the stars
  - some with and some opposite the stars
  - in a circular motion
  - sometimes with and sometimes opposite the stars
- The model that put the Sun at the center of the universe was proposed by
  - Aristotle
  - Galileo
  - Copernicus
  - Ptolemy
- Extrasolar planets are found by
  - the wobble of a star on its axis
  - the periodic dimming in of a star
  - being visible through a telescope
  - the excess gravity of a star
- All of the planets in the solar system
  - lie in the same plane
  - are made mostly of rocks and metals
  - rotate in the same direction
  - all of these
- The force of gravity between objects depends on their mass and \_\_\_\_\_
  - acceleration
  - distance apart
  - gravitational potential energy
  - density

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. If you know a planet's orbit you can determine its approximate distance from the Sun.
- \_\_\_\_\_ 7. The planets in order from the Sun are Mars, Venus, Earth, Mercury, Saturn, Uranus, Jupiter and Neptune.
- \_\_\_\_\_ 8. The orbits of the planets are circular.

- \_\_\_\_\_ 9. One astronomical unit is the distance from Earth to Sun.
- \_\_\_\_\_ 10. All of the planets in the solar system rotate in the same direction.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. The widely accepted explanation for how the solar system formed is the \_\_\_\_\_.
12. The \_\_\_\_\_ is the center of the solar system.
13. The 2nd largest object in the solar system is \_\_\_\_\_.
14. Ptolemy thought that the \_\_\_\_\_ was at the center of the universe.
15. Pluto is classified as a(n) \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. What are the four characteristics a planet must have?

17. How did the Sun form the solar nebula?

---

**Answer Key**

1. d 2. c 3. b 4. a 5. b

6. true 7. false 8. false 9. true 10. false

11. nebular hypothesis 12. Sun 13. Jupiter 14. Earth 15. dwarf planet

16. A planet must: 1) orbit a star, 2) be round, 3) not be a star, 4) have cleared its orbit of debris

17. Gravity pulled matter into the center of the disk. The center became dense and pressure was high. When the pressure was high enough nuclear fusion began. The burning star kept the Sun from collapsing further.



## 25.2 Inner Planets

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What explains the number of impact craters on Mercury?
  - a. It is very close to the Sun.
  - b. The craters have been overrun by lava flows.
  - c. It is not geologically active.
  - d. It is subject to constant storms.
2. The largest volcano in the solar system is a \_\_\_\_\_ volcano on the planet \_\_\_\_\_.
  - a. composite; Mars
  - b. shield; Mars
  - c. composite; Venus
  - d. shield; Venus
3. What is true of life on the inner planets?
  - a. Earth's Moon had life in ancient oceans.
  - b. Venus has microbes beneath its thick atmosphere
  - c. Mars has ancient fossil microbes
  - d. There is only life on Earth
4. Why is Venus the hottest planet?
  - a. It is closest to the Sun
  - b. It has a powerful greenhouse effect.
  - c. It has the most internal heat
  - d. It spins the fastest.
5. Evidence for liquid water in the Martian past includes
  - a. water-eroded canyons
  - b. fossil fish
  - c. the presence of polar ice currently
  - d. all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. All of the inner planets were once geologically active.
- \_\_\_\_\_ 7. Venus has the largest greenhouse effect of the inner planets.
- \_\_\_\_\_ 8. Venus is the only inner planet with a large moon besides Earth.

- \_\_\_\_\_ 9. Besides Earth, the inner planets are all solid.
- \_\_\_\_\_ 10. The inner planets spin faster than the outer planets.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

11. Large volcanoes surrounded by plains of lava describes the surface of \_\_\_\_\_.
12. The main rock type of the inner planets is \_\_\_\_\_.
13. The deepest canyon in the solar system is on the planet \_\_\_\_\_.
14. The planet most similar to Earth in size and density is \_\_\_\_\_.
15. The planet with the most volcanoes is \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

16. If humans wanted to build a colony on another planet, which should they choose and why?

17. Which of the inner planets (besides Earth) is most likely to have once had life and why?

---

**Answer Key**

1. c 2. b 3. d 4. b 5. a
6. true 7. true 8. false 9. false 10. false
11. Venus 12. igneous 13. Mars 14. Venus 15. Venus
16. Mars is by far the most Earth-like, even though it has very little atmosphere. Temperatures wouldn't be too bad and there is some water ice that could be harvested.

17. Mars has evidence for liquid water and conditions are not too extreme. There could have been microbial life in the past.

## 25.3 Outer Planets

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The heat to create liquid water on Europa is from
  - radioactive decay
  - its molten core
  - the Sun
  - the gravitational pull of Jupiter
- What are Saturn's rings?
  - ice and dust
  - a broken up moon
  - a magnetic field
  - captured asteroids
- What is the Great Red Spot?
  - Iron oxide in the asteroid belt
  - A giant storm on Jupiter
  - The planet Mars
  - An enormous volcano on Neptune
- How was Neptune discovered?
  - through a radio telescope
  - by the Hubble Space telescope
  - Uranus' orbit was unexpected
  - because it wanders across the sky like the other planets
- Why are Uranus and Neptune blue?
  - They are composed of solid water ice.
  - Methane in their atmosphere filters out red light.
  - They are covered by blue oceans.
  - They are covered by blue algae.

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. It takes Jupiter 5 Earth years to make one orbit around the Sun.
- \_\_\_\_\_ 7. Most moons in the solar system are captured asteroids.
- \_\_\_\_\_ 8. Jupiter's four largest moons are larger than the dwarf planet Pluto.

\_\_\_\_\_ 9. Astronauts have tested samples from Europa for signs extraterrestrial life.

\_\_\_\_\_ 10. Saturn is unique because it is the only planet with rings.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The planet that is tilted on its side is \_\_\_\_\_.

12. Jupiter's is made mostly of \_\_\_\_\_ with some helium and methane.

13. The planets beyond the asteroid belt are known as the \_\_\_\_\_.

14. The planet that is less dense than water is \_\_\_\_\_.

15. The liquid on Europa is probably mostly \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Galileo saw the Great Red Spot through his telescope. What is it and what is the significance of this fact?

17. Why is Europa a good place to look for extraterrestrial life?

---

## Answer Key

1. d 2. a 3. b 4. c 5. b

6. false 7. true 8. true 9. false 10. false

11. Uranus 12. hydrogen 13. gas giants 14. Saturn 15. water

16. The Great Red Spot is a giant oval storm on Jupiter. Clouds rotate counterclockwise and make a complete turn every 6 days. Since Galileo saw it we know that the storm has lasted more than 300 years.

17. Europa seems to have liquid water. If there is enough heat to produce liquid water, there could be life in the ocean.

## 25.4 Other Objects in the Solar System

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. Near-Earth asteroids
  - a. have orbits that cross Earth's
  - b. number more than 4,500
  - c. could strike Earth
  - d. all of these
2. Which two planets does the asteroid belt fall between?
  - a. Earth Mars
  - b. Mars Jupiter
  - c. Jupiter Neptune
  - d. Mercury Venus
3. Why do scientists value meteorites?
  - a. They are material from the earliest solar system.
  - b. They are an important source of valuable metals.
  - c. They contain metals not otherwise found on Earth.
  - d. none of these
4. What is the asteroid belt?
  - a. It is a large planet that was broken apart by an asteroid impact.
  - b. It is where the Sun's gravity is perfect for asteroids.
  - c. It is debris that couldn't form a planet due to Jupiter's gravity.
  - d. none of these
5. Why is the dwarf planet Ceres not classified as a large asteroid?
  - a. it is rounded
  - b. it is too large
  - c. it does not have craters
  - d. it is a moon of Pluto

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. All shooting stars become meteorites.
- \_\_\_\_\_ 7. Comet orbits are similar in shape to planet orbits.
- \_\_\_\_\_ 8. The longest period comets come from the Kuiper belt.

\_\_\_\_\_ 9. Any object whose orbit crosses Earth's can collide with Earth.

\_\_\_\_\_ 10. Halley's Comet is it expected to return in 2061.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. The scientific term for a shooting star is a(n) \_\_\_\_\_.

12. When a space rock strikes Earth, it is a(n) \_\_\_\_\_.

13. A rocky body that has not yet entered Earth's atmosphere is a(n) \_\_\_\_\_.

14. Pluto's orbit is located in in the \_\_\_\_\_.

15. When Earth passes through a comet trail we experience a(n) \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Why do comets have tails?

17. Why is Pluto a dwarf planet, but not a planet any more?

---

## Answer Key

1. d 2. b 3. a 4. c 5. a

6. false 7. false 8. false 9. true 10. true

11. meteor 12. meteorite 13. asteroid 14. Kuiper belt 15. meteor shower

16. Comet ice vaporizes as the comet flies close to the Sun and reflects sunlight. This forms a glowing coma. Radiation and particles streaming from the Sun push the gas and dust into a long tail that always points away from the Sun.



17. Both a planet and a dwarf planet must be a nearly spherical body that is not a star, but that orbits a star. A planet must have cleared its area of smaller objects, but a dwarf planet must not have done that. Pluto has not done that.

## 25.5 The Solar System

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What observation did Galileo make to support the Copernican model of the solar system?
  - a. Venus orbits the Sun
  - b. Moons orbit Jupiter
  - c. The planets have elliptical orbits
  - d. None of these
2. Which planet has the longest year?
  - a. Jupiter
  - b. Saturn
  - c. Uranus
  - d. Neptune
3. If you know a planet's orbital period you can determine its
  - a. composition
  - b. age
  - c. distance from the Sun
  - d. rotation rate
4. The asteroid belt is most likely
  - a. a failed planet
  - b. a large planet that broke apart
  - c. something that formed at the beginning of the solar system
  - d. no one knows
5. All of the outer planets are primarily composed of what elements?
  - a. hydrogen and helium
  - b. hydrogen and carbon
  - c. carbon and neon
  - d. lithium and carbon
6. Jupiter has
  - a. exactly the composition of the Sun.
  - b. a storm that has been active for at least 300 years
  - c. a total of four moons
  - d. all of these
7. How long does it take the Earth to revolve around the Sun?
  - a. 29.5 days

- b. 24 hours
  - c. 365.24 days
  - d. 1 month
8. What is the most likely place for extraterrestrial life in the solar system?
- a. the surface of Venus
  - b. the Great Dark Spot of Neptune
  - c. the moon of a gas giant
  - d. nowhere. There is no chance of finding extraterrestrial life in the solar system.
9. What could Pluto-Charon be classified as?
- a. two asteroids
  - b. a double dwarf planet
  - c. a planet and a moon
  - d. a planet and a dwarf planet
10. Neptune's appearance is always changing because
- a. its temperature rises above and falls below the freezing point of water.
  - b. its dark spots are on an 11-year cycle
  - c. it has strong seasons
  - d. it has an extremely turbulent atmosphere

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Neither the Earth nor our Sun is at the center of the universe.
- \_\_\_\_\_ 12. More than a million exoplanets have been identified.
- \_\_\_\_\_ 13. Besides Earth, Mars is the only planet in the solar system with liquid water.
- \_\_\_\_\_ 14. A day is longer than a year on Venus.
- \_\_\_\_\_ 15. The outer planets all have a lot of weather.
- \_\_\_\_\_ 16. Mars is red due large amounts of iron in the soil.
- \_\_\_\_\_ 17. In the Ancient Greek model, the planets and stars are in spheres around Earth.
- \_\_\_\_\_ 18. The Kuiper Belt is the home of short-period comets.
- \_\_\_\_\_ 19. Saturn's rings probably formed from the breakup of one of its moons.
- \_\_\_\_\_ 20. Neptune was knocked sideways by a collision with a giant asteroid.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

21. Long period comets come from the \_\_\_\_\_ cloud.
22. A \_\_\_\_\_ is a giant cloud of gas and dust.
23. Venus is extremely hot due to \_\_\_\_\_.
24. The only inner planet with a large natural satellite is \_\_\_\_\_.
25. The solar system body, \_\_\_\_\_, may have a liquid ocean.
26. The planet most like Earth is \_\_\_\_\_.
27. Uranus and Neptune are blue due to \_\_\_\_\_.
28. \_\_\_\_\_ is also known as the morning star and the evening star.

29. Bodies that move forward across the sky, then reverse, then move forward again are \_\_\_\_\_
30. Small, icy objects that have very elliptical orbits around the Sun are called \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

31. How do scientists discover extrasolar planets?

32. What observations did the nebular hypothesis need to explain about the solar system?

33. What information do meteorites contain? Why are they so valuable to scientists?

---

**Answer Key**

1. b 2. d 3. c 4. a 5. a 6. b 7. c 8. c 9. b 10. d

11. true 12. false 13. true 14. true 15. true 16. true 17. true 18. true 19. false 20. false

21. Oort 22. nebula 23. greenhouse effect 24. Earth 25. Europa 26. Mars 27. methane 28. Venus 29. planets 30. comets

31. Some have been directly imaged but most have found through indirect methods. Indirect methods include: 1) detecting the very slight motion of a star caused by the gravitational pull of a planet or another star orbiting the star, 2) measuring a star's brightness over time - a temporary decrease when a planet transits the star it is orbiting.

32. The nebular hypothesis was designed to explain some of the basic features of the solar system:

- The orbits of the planets lie in nearly the same plane with the Sun at the center
- The planets revolve in the same direction
- The planets mostly rotate in the same direction
- The axes of rotation of the planets are mostly nearly perpendicular to the orbital plane
- The oldest moon rocks are 4.5 billion years

33. Meteorites represent the material of the early solar system. Parts of planets that we can't get to, such as their cores, can become meteorites. They are especially valuable because they are just lying around on Earth and so don't cost much to acquire compared with other ways of getting space rocks.

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CHAPTER **26** MS Stars, Galaxies, and the Universe Assessments

**Chapter Outline**

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- 26.1 STARS
  - 26.2 GALAXIES
  - 26.3 THE UNIVERSE
  - 26.4 STARS, GALAXIES, AND THE UNIVERSE
-

## 26.1 Stars

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- Particle collisions in accelerators simulate
  - nuclear fission in a black hole
  - fusion of hydrogen into helium
  - the conditions of the birth of the universe
  - all of these
- Stars emit energy as
  - neutrino streams
  - radio waves
  - solar wind
  - electromagnetic radiation
- When our Sun stops fusion it will first become a(n)
  - red giant
  - red supergiant
  - white dwarf
  - blue neutron star
- What is the energy source for all stars?
  - nuclear fusion
  - nuclear fission
  - solar
  - hydrothermal
- Energy production in a star takes place in the
  - convective zone
  - core
  - radiative zone
  - corona

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The hottest stars blue-white; the coolest stars are red.
- \_\_\_\_\_ 7. Stars in a constellation are near each other in space.
- \_\_\_\_\_ 8. Our Sun is about half way through its life span.

\_\_\_\_\_ 9. A black hole emits dark electromagnetic radiation that we cannot see.

\_\_\_\_\_ 10. The same constellations appear in a location all year-round.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. A small to mid-sized star that has collapsed is called a(n) \_\_\_\_\_.

12. A star that is fusing hydrogen into helium is a(n) \_\_\_\_\_ star.

13. An explosion of a red giant star results in a(n) \_\_\_\_\_.

14. A group of stars that appear in close proximity is a(n) \_\_\_\_\_.

15. Astronomers can calculate the distance to a star by observing its \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. How do the elements heavier than helium form?

17. What is a black hole? How do astronomers locate them?

---

## Answer Key

1. c 2. d 3. a 4. a 5. b

6. true 7. false 8. true 9. false 10. false

11. white dwarf 12. main sequence 13. supernova 14. constellation 15. parallax

16. In a red supergiant star, fusion continues after the helium is used up. This creates the elements up to iron. When there is nothing left to fuse, it explodes in a violent supernova. There is so much energy that atoms fuse to produce the heavier elements.



17. A black hole is what remains after a supernova explosion of a star that was more than five times the mass of the Sun. Black holes have so much gravity that not even light can escape. A black hole can be identified because its gravity affects objects around it and radiation leaks out its edges.

## 26.2 Galaxies

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. A galaxy can contain how many stars?
  - a. up to 500
  - b. up to 30,000
  - c. up to 10 million
  - d. up to many billions
2. How are irregular galaxies deformed?
  - a. from collisions with other galaxies
  - b. from gravitational pull from a black hole
  - c. from extremely rapid spin
  - d. from extremely rapid formation
3. Most elliptical galaxies have very little gas and dust because
  - a. they are very young
  - b. the dust and gas have already formed stars
  - c. the dust and gas is pulled into supermassive black holes at the center
  - d. none of these
4. Spiral galaxies have
  - a. only old stars
  - b. fewer stars than globular clusters
  - c. a bulge at the center
  - d. an elliptical shape
5. Globular clusters
  - a. have a lot of dust in them
  - b. contain a few hundred to a few thousand stars
  - c. contain mostly reddish stars
  - d. all of these

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. The Milky Way appears as a band of light across the night sky.
- \_\_\_\_\_ 7. Most of the galaxies we see from Earth are dwarf galaxies.
- \_\_\_\_\_ 8. Elliptical galaxies have mostly younger blue stars.

\_\_\_\_\_ 9. Every star that you see without a telescope is in the Milky Way Galaxy.

\_\_\_\_\_ 10. Our solar system is slowly spinning around our galaxy.

### Fill in the Blanks

*Fill in the blank with the term that best completes the sentence.*

11. Why would two galaxies collide? \_\_\_\_\_

12. Two stars in a solar system is a(n) \_\_\_\_\_.

13. Earth resides in the \_\_\_\_\_ Galaxy.

14. A relatively small collection of young blue stars is a(n) \_\_\_\_\_.

15. Stars are grouped closely together into \_\_\_\_\_.

### Short Answer

*Answer each question in the space provided.*

16. Describe the three types of galaxies.

17. Describe the Milky Way Galaxy and Earth's place in it.

---

## Answer Key

1. d 2. a 3. b 4. c 5. c

6. true 7. false 8. false 9. true 10. true

11. gravity or gravitational attraction 12. binary star 13. Milky Way 14. open cluster 15. star systems

16. Spiral galaxies are rotating discs of stars and dust. There is a bulge at the center and several arms spiral outward. Elliptical galaxies are oval. They can be very small or very large. They contain little dust and gas because this

material has already formed stars. Irregular galaxies are deformed. They have had a collision with another galaxy or have been pulled out of shape by the gravity from another galaxy.

17. The Milky Way is a spiral galaxy of about 400-billion stars with a central bulge and spiral arms. It is about 3000 light years thick. At the center of the Galaxy is a supermassive black hole. Our solar system is a little more than halfway out one of the spiral arms of the Milky Way Galaxy and we orbit the center of the Galaxy.

## 26.3 The Universe

### Lesson Quiz

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

1. What explains the phenomenon that Hubble discovered?
  - a. the universe is becoming warmer
  - b. the universe is becoming cooler
  - c. the universe is expanding
  - d. the universe is collapsing
2. Scientists believe dark energy can explain what phenomenon?
  - a. the creation of the universe
  - b. the increasing rate of expansion of the universe
  - c. the collapse of the universe
  - d. the shape of the universe
3. The farther away a galaxy is
  - a. the faster it is moving away from us
  - b. the slower it is moving away from us
  - c. the faster it is coming toward us
  - d. the slower it is coming toward us
4. What does it mean if light is red shifted?
  - a. The object is moving away from the observer
  - b. The object is moving towards the observer
  - c. The object is slowing down
  - d. The object is moving perpendicular to the observer
5. The outside edges and interior of a galaxy rotate at the same speed. This is evidence for the existence of
  - a. gravitational lensing
  - b. the Big Bang
  - c. dark energy
  - d. dark matter

#### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 6. Redshift is the shift of absorption bands toward the red end of the spectrum.
- \_\_\_\_\_ 7. Hubble's Law states, the farther away a galaxy is, the faster it is moving away from us.
- \_\_\_\_\_ 8. Redshift was discovered by Edwin Hubble.



17. The red-shift of most objects means that they are moving apart. If they are now moving apart it is likely that they were once together. If all the matter and energy of the universe was together at a point, there must have been a big bang to get them to move outward. The energy left over from that bang can be detected, just like there is warmth after you hit a rock with a hammer.

## 26.4 Stars, Galaxies, and the Universe

### Chapter Test

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

#### Multiple Choice

*Circle the letter of the correct choice.*

- The main way to classify a star is by
  - size
  - temperature
  - age
  - color
- What powers a main sequence star?
  - the fusing of helium into the heavier elements
  - nuclear fission reactions
  - the fusing of hydrogen into helium
  - a supernova explosion
- What is the color of the coolest stars?
  - yellow
  - blue
  - orange
  - red
- The Sun will likely end its life as a
  - red giant
  - black hole
  - white dwarf
  - supernova
- A star forms
  - within a nebula
  - from gas and dust
  - from a tiny amount of material that formed in a supernova explosion
  - all of these
- Evidence for the Big Bang includes
  - the background energy of the universe
  - blue shift, indicating that the universe is expanding
  - ancient matter that appears in stardust
  - none of these
- Galaxies are
  - made of billions to trillions of stars



- b. stationary in space
  - c. elliptical, spiral or irregular
  - d. none of these
8. What did the Andromeda Nebula turn out to be?
- a. a galaxy
  - b. a gas cloud
  - c. the farthest galaxy that astronomers can see
  - d. none of these
9. The farther away a galaxy, the faster it is moving away from us is
- a. Hubble's Law
  - b. the Big Bang Theory
  - c. the Doppler Effect
  - d. the law of reverse gravitation
10. Spiral galaxies are
- a. stationary discs
  - b. the smallest galaxies
  - c. made of many young stars
  - d. made of mostly old stars

**True or False**

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 11. Blue stars are the oldest stars.
- \_\_\_\_\_ 12. Stars have a life cycle.
- \_\_\_\_\_ 13. The element helium comes from nuclear fusion of hydrogen.
- \_\_\_\_\_ 14. A neutron star is made almost entirely of neutrons.
- \_\_\_\_\_ 15. Black holes are so dense that light cannot escape.
- \_\_\_\_\_ 16. Galaxies are divided into three types according to their shape.
- \_\_\_\_\_ 17. The Sun is a very large very bright star.
- \_\_\_\_\_ 18. The Big Bang Theory is the scientific explanation for how the universe formed.
- \_\_\_\_\_ 19. Dark matter can be observed even though it emits no electromagnetic radiation.
- \_\_\_\_\_ 20. Dark energy is found at the center of black holes.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

21. A \_\_\_\_\_ is a giant ball of glowing gas.
22. The heavy elements formed in \_\_\_\_\_ explosions.
23. A deformed galaxy is a(n) \_\_\_\_\_ galaxy.
24. The \_\_\_\_\_ contains all the matter and energy in existence.
25. Stars are composed of hydrogen and \_\_\_\_\_.
26. The \_\_\_\_\_ of light from galaxies means that the universe is expanding.
27. A pattern of stars in the sky is a(n) \_\_\_\_\_.
28. \_\_\_\_\_ are groups of young stars held together by gravity.

29. \_\_\_\_\_ are collections of millions to many billions of stars.
30. \_\_\_\_\_ are spherical groups of old stars held together by gravity.

**Short Answer**

*Answer each question in the space provided.*

31. What is a supernova? Why are they important?

32. Our Sun is an ordinary star. What does this mean?

33. Describe the location of planet Earth as accurately as you can.

---

**Answer Key**

1. d 2. c 3. d 4. c 5. d 6. a 7. c 8. a 9. b 10. c
11. false 12. true 13. true 14. true 15. true 16. true 17. false 18. true 19. false 20. false
21. star 22. supernova 23. irregular 24. universe 25. helium 26. redshift 27. constellation 28. open clusters 29. galaxies 30. globular clusters

31. When there are no elements to fuse, a star's core collapses and creates a violent supernova explosion. The energy in a supernova fuses to produce the heavier elements. They all fly out into space. Without supernovas, there would not be elements spread through space.

32. The Sun is a main sequence star, where hydrogen fuses to form helium. It is about halfway through its life. It is yellow so not too hot but not too cool.

33. Earth is the third planet out in a solar system with an ordinary star at its center. The solar system is a little more than halfway out one of the spiral arms of the Milky Way Galaxy, about 26,000 light years from its center. The galaxy is a spiral galaxy that is part of the universe, which has billions of galaxies. We are not at the edge of the known universe.

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**CHAPTER 27****MS Earth Science Unit Assessments****Chapter Outline**

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- 27.1 UNIT 1: INTRODUCTION TO THE STUDY OF EARTH TEST**
  - 27.2 UNIT 2: EARTH'S MINERAL AND ENERGY RESOURCES TEST**
  - 27.3 UNIT 3: PROCESSES INSIDE EARTH TEST**
  - 27.4 UNIT 4: PROCESSES ON EARTH'S SURFACE TEST**
  - 27.5 UNIT 5: EARTH'S PAST TEST**
  - 27.6 UNIT 6: EARTH'S WATER TEST**
  - 27.7 UNIT 7: WEATHER AND CLIMATE TEST**
  - 27.8 UNIT 8: THE ENVIRONMENT AND HUMAN ACTIONS TEST**
  - 27.9 UNIT 9: ASTRONOMY TEST**
-

## 27.1 Unit 1: Introduction to the Study of Earth Test

Unit 1 chapters: *What is Earth Science?* and *Studying Earth's Surface*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

- Which of the following is the longest mountain range on Earth?
  - mid-ocean ridge
  - Andes
  - Great Dividing Range
  - Himalayas
- Computers work in conjunction with satellites
  - by using satellite data to generate maps
  - by allowing the viewing of fine details on satellites images
  - by helping to store and link data from satellites
  - all of the above
- Which of the following is not created by constructive forces?
  - Mt. Fuji
  - Mt. Everest
  - Barringer (aka Meteorite) Crater in Arizona
  - East African Rift
- What is the main disadvantage of a Mercator projection?
  - distortion near the equator
  - distortion of landmasses
  - distortion near the poles
  - true direction is not shown
- Latitude and longitude is
  - A coordinate system
  - One way of finding locations on Earth
  - Measured relative to 0-degree lines
  - All of the above
- Which of these coordinates is not valid?
  - $41^{\circ}52'55''\text{N } 87^{\circ}37'40''\text{W}$
  - $S 22.90^{\circ}, W 43.20^{\circ}$
  - $N 98.33^{\circ}, W 76.15^{\circ}$
  - $0^{\circ}0'00''\text{N } 0^{\circ}0'00''\text{W}$
- Which of the following scientists would most likely study hurricanes?
  - hydrologist
  - meteorologist
  - geochemistry
  - paleontology

8. Which of the following should not be done in the laboratory?
  - a. wearing goggles
  - b. tying long hair back
  - c. keeping your area clean
  - d. eating and drinking
9. Think about this question: What is the most absorbent paper towel?
  - a. This is a question that can be answered using the scientific method.
  - b. This cannot be answered via the scientific method, but it could be explained using a model.
  - c. This is not a question that science can address.
  - d. Scientists do not care about paper towels.
10. What is the goal of science?
  - a. Answer all questions.
  - b. Explain how things work.
  - c. Understand the natural world.
  - d. Find a cure for cancer.
11. Which is a hypothesis to the question: "Which type of rock is most porous?"
  - a. Porosity of rocks varies.
  - b. Limestone is the most porous rock.
  - c. A scientist cannot know this until after the experiment.
  - d. The scientific method cannot be used to answer this question.
12. A scientist is conducting an experiment to determine which of three building structure types will best withstand the force of an earthquake. Which of the following is the best "independent variable" he might use?
  - a. The magnitude of the earthquake
  - b. The structure of the building
  - c. The type of soil each building is sitting on
  - d. The amount of damage each building receives.
13. A Gnomonic Projection
  - a. Uses a cylinder to create the projection
  - b. Uses a paper that touches only one point or tangent
  - c. Is good mainly for large areas like an entire hemisphere
  - d. Uses a cone shaped wrapping to project the map
14. A geological map
  - a. uses colors to show different types of rocks
  - b. will often use a cut away diagram
  - c. can be large or small scale
  - d. all of the above
15. A gentle slope is shown on a contour map by contour lines
  - a. that cross
  - b. that are not close together
  - c. that are randomly spaced
  - d. with a large contour interval

**True or False**

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 16. Research is not essential to the scientific process.

- \_\_\_\_\_ 17. The field of oceanography consists entirely of the movements of seawater and its chemical composition.
- \_\_\_\_\_ 18. A map is not a good example of a physical model.
- \_\_\_\_\_ 19. A well developed idea can be a model.
- \_\_\_\_\_ 20. Seismology is the study of earthquakes.
- \_\_\_\_\_ 21. In the science lab, it is important to follow directions at all times.
- \_\_\_\_\_ 22. In the field, it is not necessary to have a first aid kit.
- \_\_\_\_\_ 23. A scientific question must be testable.
- \_\_\_\_\_ 24. Volcanic eruptions are an example of a constructive force.
- \_\_\_\_\_ 25. Constructive forces cause landforms to grow

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. The Marianas Trench is the deepest \_\_\_\_\_ in the world.
27. The first map projection was developed by Gerardus \_\_\_\_\_ in 1569.
28. On a globe, the shortest distance between two points is a(n) \_\_\_\_\_.
29. A chart used to locate an underwater shipwreck is a(n) \_\_\_\_\_.
30. A weather satellite travels around Earth in a \_\_\_\_\_ orbit.
31. The two main surface features are ocean basins and \_\_\_\_\_.
32. A plausible explanation to a scientific question is a(an) \_\_\_\_\_.
33. The branch of Earth science that interests me most is \_\_\_\_\_.
34. \_\_\_\_\_ maps show elevations using contour lines to reveal landforms.
35. Why are there more earthquakes in India than in South Africa? is a(n) \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

36. Why are four satellites required by the GPS system to determine your location?

37. What does a geologist study?

38. What is peer review? Why is it important to the scientific community?

39. List 4 major branches of Earth Science and explain how they relate to the Earth.

40. What is GIS and why is it useful?

---

### Answer Key

1. a 2. d 3. c 4. c 5. d 6. c 7. b 8. d 9. a 10. c 11. b 12. b 13. b 14. d 15. b  
16. false 17. false 18. false 19. true 20. true 21. true 22. false 23. true 24. false 25. true



26. ocean trench 27. Mercator 28. arc (curved line) 29. bathymetric map 30. polar orbit 31. continents 32. hypothesis 33. Any branch is be acceptable. 34. Topographic 35. scientific question

36. Four satellites are needed because each will calculate a distance from itself, but that is just a circle. At least three circles (that is, three distances from three receivers) are needed to know an exact location. The fourth makes the calculation more certain.

37. A geologist studies Earth's solid material and structures and the processes that create them.

38. When a scientist submits a professional paper for publication, that paper is sent out to other scientists for peer review. The reviewers make sure that the scientist followed good scientific method and made logical inferences from the data. Peer review helps the scientific community to maintain high standards and to be sure that science is different from other ways of thinking.

39. Geology - study of the land. Oceanography -the study of the oceans. Meteorology - the atmosphere. Climatology - the climate and Earth systems. Astronomy - Earth's place in the universe. Environmental science - how people interact with the Earth.

40. Geographic information systems - use exact geographic locations from GPS along with any type of spatial information to create maps and images. GIS can be used to make maps of population density, natural resource distribution, flood damage, and much more.

## 27.2 Unit 2: Earth's Mineral and Energy Resources Test

Unit 2 chapters: *Earth's Minerals, Rocks* and *Earth's Energy*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

- Which statement is false?
  - Silicates are the largest group of minerals
  - oxides contain oxygen
  - halides are another name for salts
  - substances with only one type of atom cannot be classified as minerals
- Which is rarely very useful for mineral identification?
  - cleavage
  - color
  - luster
  - hardness
- Which of the following is not a mineral?
  - coal
  - diamond
  - table salt
  - quartz
- Why does the igneous rock obsidian have no visible crystals?
  - The magma cooled very deep underground.
  - The magma exploded onto the surface.
  - The magma cooled too rapidly.
  - none of these
- An ore deposit is
  - easy to mine
  - profitable to mine
  - a mineral deposit in which the price is rising
  - always made of different metals
- Deposits of minerals in the cracks of rocks are called
  - geodes
  - solutions
  - veins
  - tufa towers
- Weathering breaks rocks down into
  - minerals
  - crystals
  - sediments
  - rocklets

8. During metamorphism, extreme pressure often leads to
  - a. foliation
  - b. the creation of magma
  - c. extremely high temperatures
  - d. crystallization
9. The Sun is directly or indirectly responsible for which of the following energy types?
  - a. solar, wind, geothermal, and biomass
  - b. solar, wind, geothermal, biomass and fossil fuels
  - c. solar, wind, biomass and fossil fuels
  - d. solar, geothermal, and fossil fuels
10. In the rock cycle
  - a. an igneous rock or a metamorphic rock can become a sedimentary rock.
  - b. a sedimentary rock can become an igneous or a metamorphic rock.
  - c. a sedimentary rock can become a different sedimentary rock.
  - d. any rock can become any other type of rock.
11. A roller coaster car at the top of a hill, right before it plunges downward has
  - a. potential energy
  - b. kinetic energy
  - c. momentum
  - d. electrical energy
12. What type of energy is derived from heated groundwater?
  - a. solar energy
  - b. geothermal energy
  - c. hydroelectric energy
  - d. nuclear energy
13. Compared to non-renewable energy sources, renewable energy sources typically are
  - a. less polluting
  - b. cheaper
  - c. better developed
  - d. more transportable
14. Useful solar power comes from
  - a. panels on a building's roof
  - b. plants with large numbers of mirrors and a receiver
  - c. metal boxes that can be used as ovens
  - d. all of these
15. The least expensive and most practical way to meet our energy needs into the future is to
  - a. drill for oil wherever it is found
  - b. develop renewable energy sources
  - c. develop nuclear fusion
  - d. conserve energy whenever possible

**True or False**

Write true if the statement is true or false if the statement is false.

\_\_\_\_\_ 16. If water has too many dissolved minerals, they precipitate.

\_\_\_\_\_ 17. An atom's nucleus has a positive electrical charge.

- \_\_\_\_\_ 18. A mineral is a naturally-occurring, inorganic substance, that has a specific chemical composition, and a crystalline structure.
- \_\_\_\_\_ 19. The United States produces as much energy as it consumes.
- \_\_\_\_\_ 20. The more a metamorphic rock resembles its parent rock, the more metamorphism it has likely undergone.
- \_\_\_\_\_ 21. A substance that is not made by living things and does not contain carbon is inorganic.
- \_\_\_\_\_ 22. A mineral deposit that can be mined for profit is an ore.
- \_\_\_\_\_ 23. Metamorphism occurs because of crystallization and pressure.
- \_\_\_\_\_ 24. Silicate minerals form in different shapes due to the different ways the silica pyramids join.
- \_\_\_\_\_ 25. One way to make a sedimentary rock is by compaction, when sediments are squeezed by the weight of overlying sediments.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. \_\_\_\_\_ are valuable minerals found in stream gravels.
27. Halide minerals are \_\_\_\_\_ that form when water evaporates.
28. A \_\_\_\_\_ sedimentary rock can contain sediments, organic materials and chemical precipitates.
29. The substance that physical objects are made of is called \_\_\_\_\_ .
30. Energy moves from higher to lower temperatures through material by \_\_\_\_\_.
31. The density of a mineral describes how much \_\_\_\_\_ is in a 3-dimensional space.
32. The largest mineral group is the \_\_\_\_\_.
33. Mohs scale ranks the \_\_\_\_\_ of 10 minerals.
34. Multiple elements are bonded together in a(n) \_\_\_\_\_.
35. \_\_\_\_\_ metamorphism takes place in rock that is exposed to the heat of a nearby magma.

**Short Answer**

*Answer each question in the space provided.*

36. How would you test the hardness of an unknown mineral?

37. What is the process of land reclamation?

38. How do igneous intrusive rocks form? How could you tell an igneous intrusive rock from an igneous extrusive rock?

39. What are non-renewable resources? What happens to them over time?

40. What would be a good renewable energy source in your part of the country and why?

---

## Answer Key

1. d 2. b 3. a 4. c 5. b 6. c 7. c 8. a 9. c 10. d 11. a 12. b 13. a 14. d 15. d
16. true 17. true 18. true 19. false 20. false 21. true 22. true 23. false 24. true 25. true
26. Placers 27. salts 28. clastic 29. matter 30. conduction 31. mass 32. silicates 33. hardness 34. chemical compound 35. Contact
36. To test the hardness of an unknown mineral, find the minerals on the Moh's hardness scale. See which minerals the unknown can scratch and which can scratch it. From this you should be able to determine the hardness of the mineral. That is one bit of evidence for figuring out what the mineral is.
37. After a region is mined, the land must be restored to its natural state by reclamation. Holes are filled and the land is reshaped. Native plants are planted on the lands. The pits may be filled with water to become a lake or with trash to become a landfill. Underground minds may be sealed or may become a cave for bats.
38. When magma cools beneath the surface, it cools slowly. In these intrusive igneous rocks the minerals that are larger and better formed than rocks that form from lava on the surface.
39. Non-renewable resources are not being replaced by natural processes. When they are gone, they are just gone. Eventually we will need to replace them.
40. Answers will vary. Students can choose wind, hydroelectric, solar, geothermal, or biomass depending on where they live. They will need to explain the benefits of their choice.

## 27.3 Unit 3: Processes Inside Earth Test

Unit 3 chapters: *Plate Tectonics, Earthquakes and Volcanoes*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

1. Asthenosphere is
  - a. the crust and mantle
  - b. rigid, where earthquakes take place
  - c. everything below the crust
  - d. a solid that can flow
2. At a divergent plate boundary in the ocean,
  - a. sediments are extremely thick
  - b. new seafloor is created
  - c. old seafloor is destroyed
  - d. crust is neither created nor destroyed
3. Which is not true of Earth's lithosphere?
  - a. it is brittle
  - b. it is broken into plates
  - c. it can flow
  - d. it can have both oceanic and continental crust
4. When an oceanic plate converges with a continental plate, the
  - a. oceanic plate subducts under the continental plate
  - b. oceanic plate slides over the continental plate
  - c. two plates smash upward
  - d. two plates slide past each other
5. The theory of plate tectonics is
  - a. the idea that plates of lithosphere move around Earth's surface - continental drift
  - b. not well understood
  - c. the idea that new seafloor is created and old seafloor is destroyed - seafloor spreading
  - d. the idea that seafloor spreading moves continental plates
6. With increasing distance from the epicenter, the difference in P and the S wave arrival times \_\_\_\_\_.
  - a. increases
  - b. decreases
  - c. stays constant
  - d. none of the above
7. Which of the following may come before a destructive earthquake?
  - a. an increase in the frequency of smaller earthquakes
  - b. rapid tilting of the ground
  - c. rapid changes in water levels in wells
  - d. all of these

8. When stresses build up in a rock, the rock will
  - a. break
  - b. fold
  - c. remain unchanged
  - d. any or all of these
9. The Richter magnitude scale measures the
  - a. total energy released by an earthquake
  - b. largest jolt of an earthquake
  - c. the damage an earthquake did
  - d. all of these
10. Deadly ocean waves that come from an earthquake are called
  - a. tidal waves
  - b. sea waves
  - c. tsunami
  - d. rogue waves
11. Volcanic activity is common
  - a. at divergent plate boundaries
  - b. at convergent plate boundaries
  - c. at hotspots
  - d. all of these
12. An explosive eruption is caused
  - a. when lava flows into the ocean
  - b. by a buildup of gases
  - c. when crust pulls apart
  - d. none of these
13. A large volcano with shallow slopes made from lots of fluid flows of mafic lava is a(n)
  - a. shield volcano
  - b. supervolcano
  - c. composite volcano
  - d. cinder cone
14. A volcano's slope may change shape before an eruption because
  - a. gases and magma move up into a magma chamber
  - b. earthquakes move ground around
  - c. gases expand as they change in composition
  - d. none of these
15. Above a hotspot, you may find
  - a. chains of composite volcanoes
  - b. volcanoes that increase in age with distance
  - c. evidence of catastrophic eruptions
  - d. nothing but normal continental crust

**True or False**

Write true if the statement is true or false if the statement is false.

\_\_\_\_\_ 16. Continental crust is thicker than oceanic crust.

\_\_\_\_\_ 17. Sediment is thickest along the mid-ocean ridges.



- \_\_\_\_\_ 18. The mantle is heated by the core, which results in convection.
- \_\_\_\_\_ 19. Heat flow by the rapid collisions of atoms from a warmer to a cooler place is called convection.
- \_\_\_\_\_ 20. Alfred Wegener proposed that the continents were once united into a single supercontinent called Pangaea.
- \_\_\_\_\_ 21. A reverse fault in which the fault plane angle is nearly horizontal is a strike-slip fault.
- \_\_\_\_\_ 22. An anticline forms by folding of rock layers caused by compressive forces.
- \_\_\_\_\_ 23. All major earthquakes occur at plate boundaries.
- \_\_\_\_\_ 24. The ground type is a major factor in determining how much damage an earthquake will cause.
- \_\_\_\_\_ 25. Pangaea was Earth's first supercontinent.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. When the magnetic polarity reverses, the magnetic \_\_\_\_\_ pole becomes the magnetic south pole.
27. \_\_\_\_\_ in the mantle drive plate movements.
28. Oceanic crust is created at features in the oceans called \_\_\_\_\_.
29. Tectonic plates slide past each other at a(n) \_\_\_\_\_ plate boundary.
30. Plumes of magma rise to the surface and create volcanoes at \_\_\_\_\_.
31. The highest magnitude earthquakes are just above a \_\_\_\_\_.
32. Most volcanoes are found around the Pacific Ocean basin because there are so many \_\_\_\_\_ plate boundaries.
33. A bend that causes rocks to be folded downward is a(n) \_\_\_\_\_.
34. A \_\_\_\_\_ volcano is composed of layers of lava and ash.
35. The lithospheric plates can be identified by mapping \_\_\_\_\_ epicenters.

**Short Answer**

*Answer each question in the space provided.*

36. How do fossils provide evidence for continental drift?

37. Describe the three types of plate boundaries. At which are volcanoes and earthquakes found?

38. What determines how deadly an earthquake is?

39. Why are no rocks in the oceans older than 180 million years? Why was this discovery so important?

40. Describe the three types of volcanoes (not supervolcanoes).

---

### Answer Key

1. d 2. b 3. c 4. a 5. d 6. a 7. d 8. d 9. b 10. c 11. b 12. b 13. a 14. a 15. b

16. true 17. false 18. true 19. false 20. true 21. false 22. true 23. false 24. true 25. false

26. north 27. Convection 28. mid-ocean ridge 29. transform 30. hotspots 31. 9 32. convergent 33. syncline 34. composite 35. earthquake

36. Two fossils are from the same species and the organism could not travel across the oceans. If the fossils are found on continents that are now far apart the continents must have once been joined.

37. Divergent: Plates move apart. In the oceans, new seafloor is created. This occurs at mid-ocean ridges, which are long chains of volcanoes. There are shallow earthquakes. Within a continent, the continent breaks apart.

Convergent: Plates move together. If one is an oceanic plate, the denser plate will subduct. There are earthquakes and volcanoes that form. If both plates are continents, a large mountain range will be created. There are lots of earthquakes, but no volcanoes.

Transform: Plates slide past each other. There are enormous earthquakes, but no volcanoes.

38. Population density: the more people, the more can die. Not size: A large earthquake will kill more people than a small one all other things being equal, but lots of times other factors come into play. Ground type: solid rock vibrates less and so is safer, sediments can undergo liquefaction and become like quicksand

39. New oceanic crust is constantly being created at mid-ocean ridges and being destroyed at trenches. So the oldest oceanic crust is much younger than the oldest continental crust. This was the evidence needed to provide a mechanism for plate tectonics.

40. Shield volcanoes are massive, and spread out. They are made of fluid lavas and tend to have effusive eruptions. Composite volcanoes are tall and peaky. They have more explosive eruptions. Cinder cones tend to be small and are often the result of just one eruption.

## 27.4 Unit 4: Processes on Earth's Surface Test

Unit 4 chapters: *Weathering and Formation of Soil* and *Erosion and Deposition*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

- Which is not a type of mass movement?
  - creep
  - avalanches
  - beaches
  - landslides
- Soil that was moved by erosion is a
  - residual soil
  - tropical soil
  - mass wasting soil
  - transported soil
- As sediments exit a steep canyon onto open land, they form a(n) \_\_\_\_\_.
  - fluvial fan
  - sediment fan
  - alluvial fan
  - fan
- Gases such as carbon dioxide mix with water in the atmosphere to create
  - calcium carbonate
  - acids
  - greenhouse gases
  - ozone
- Soil is
  - easily eroded
  - essential for modern society
  - a renewable resource if carefully managed
  - all of these
- Wind erosion is strongest in which type of region?
  - arid
  - humid
  - ocean
  - tropical
- Farms on hillsides may have soil plowed in curved bands because it
  - prevents fires from spreading
  - exposes more topsoil
  - reduces landslides
  - reduces erosion

8. The characteristics of laterite include
  - a. low fertility
  - b. high organic material
  - c. good for farming
  - d. not easily eroded
9. Plants increase chemical weathering by
  - a. breaking apart rock
  - b. creating calcium carbonates
  - c. exchanging elements
  - d. adding oxygen
10. A small lake on flat land in limestone rock is probably a(n)
  - a. tarn
  - b. kettle
  - c. cirque
  - d. sinkhole
11. Long- term temperature and precipitation determine
  - a. weather
  - b. climate
  - c. soil type
  - d. vegetation
12. Streams erode the outer bend and deposit along the inside curve, so
  - a. meanders migrate laterally over time
  - b. meanders straighten out over time
  - c. they become incised meanders
  - d. they overflow onto the floodplain
13. A column forms when
  - a. a stalactite from the ceiling and a stalagmite from the floor join
  - b. a stalagmite from the ceiling and a stalactite from the floor join
  - c. travertine flows downhill in a column-like structure
  - d. calcite flows downhill in a column-like structure
14. Creep is
  - a. the transport of sediment grains pushed along the surface by wind
  - b. the sliding of soil slowly down a hillside
  - c. both of these
  - d. neither of these
15. Which of the following is NOT a feature of valley glaciers?
  - a. a rounded hollow near the top of a mountain
  - b. a lake in glacial till
  - c. a U-shaped valley
  - d. three cirques forming a horn

**True or False**

Write true if the statement is true or false if the statement is false.

\_\_\_\_\_ 16. Mechanical weathering increases the rate of chemical weathering.

\_\_\_\_\_ 17. Flowing water does the work of erosion, but not deposition.

- \_\_\_\_\_ 18. If you stop water from flooding one area, the water will probably flood a nearby location.
- \_\_\_\_\_ 19. Wind and streams both cause abrasion.
- \_\_\_\_\_ 20. Rust is iron plus oxygen.
- \_\_\_\_\_ 21. The layer of soil containing the most organic material is the C horizon.
- \_\_\_\_\_ 22. Stalactites are found in glacial till.
- \_\_\_\_\_ 23. A natural levee does not protect nearby lands from flooding.
- \_\_\_\_\_ 24. Plate tectonics processes build up landforms, erosional processes destroy landforms.
- \_\_\_\_\_ 25. All rocks weather at the same rate.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. A(n) \_\_\_\_\_ is movement of a mass of soil or rock.
27. Windblown silt and clay deposited layer on layer over a large area is called \_\_\_\_\_.
28. A river starts in the \_\_\_\_\_.
29. A(n) \_\_\_\_\_ is formed as waves erode undercut cliffs.
30. Wind-blown sand forms features called \_\_\_\_\_.
31. \_\_\_\_\_ carries dissolved minerals to lower layers in the soil.
32. Organic material that holds topsoil together is \_\_\_\_\_.
33. Small bits of minerals, rocks, shells and coral are sediments found on \_\_\_\_\_.
34. A \_\_\_\_\_ is a curve in a stream channel.
35. \_\_\_\_\_ water does the work of both erosion and deposition.

**Short Answer**

*Answer each question in the space provided.*

36. Explain how mechanical weathering differs from chemical weathering.

37. Draw and describe a soil profile.

38. How do streams deposit natural levees and why are they important?

39. As glaciers melt back, what depositional features do you expect to see?

40. Briefly describe three types of structures that people build to protect shorelines.

---

### Answer Key

1. c 2. d 3. c 4. b 5. d 6. a 7. d 8. a 9. c 10. d 11. b 12. a 13. a 14. b 15. b

16. true 17. false 18. true 19. true 20. true 21. false 22. false 23. false 24. true 25. false

26. slump 27. loess 28. mountains 29. wave-cut platform 30. sand dunes 31. Leaching 32. humus 33. beaches 34. meander 35. Flowing or running

36. Mechanical weathering breaks down rocks into smaller pieces but the composition of the rock is the same. Chemical weathering changes the chemical composition of the minerals into minerals that are more stable at the conditions found at the surface.

37. Students should draw a profile with the following layers:

A Horizon - topsoil –darkest layer –contains the most organic material and biological activity.

B Horizon –subsoil –where soluble minerals and clays accumulate. It is lighter brown and holds more water.

C Horizon –partially alter bedrock - rocks can be identified even though they have been weathered.

38. A flooding stream overflows its banks and broadens its channel. The stream deposits its sediments, the largest first, at the channel lip. This creates a natural levee. After many floods the levees build up high enough that they protect the floodplain from all but the highest floods.

39. A melting glacier will dump glacial till, creating moraines. Till may form a drumlin. An esker is a ridge of sand modified by meltwater. A kettle is a lake in till that results from a melted chunk of ice.

40. Groin –long narrow pile of rocks built perpendicular to the shoreline

Breakwater –structure built in the water parallel to shore

Seawall –parallel to the shore but it is built onshore.



## 27.5 Unit 5: Earth's Past Test

Unit 5 chapters: *Evidence about Earth's Past* and *Earth's History*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

- Fossils give clues about
  - past climate
  - a region's geologic history
  - the age of a rock layer
  - all of these
- Which of the following spans of time is the longest?
  - Cambrian
  - Precambrian
  - Phanerozoic
  - Paleozoic
- Fossils are
  - the remains of ancient life
  - the evidence of the activities of ancient life
  - formed by permineralization, replacement, and compression, among others
  - all of these.
- Using the law of lateral continuity, geologists can
  - link together the geologic history of a region
  - determine the relative ages of rock strata
  - determine the absolute ages of rock strata
  - all of these.
- The ozone layer
  - provides oxygen for animals to breathe
  - is pollution
  - provides protection from ultraviolet radiation
  - all of these
- When plants moved to land
  - animals had a source of food and shelter
  - they needed to evolve a stronger structure
  - they could evolve into more complex forms
  - all of these
- Carbon 14 has a half-life of 5,730 years. In 11,460 years the ratio of parent to daughter isotope will be
  - 75:25
  - 50:50
  - 25:75
  - 12.5:87.5

8. Gases in the early atmosphere came from
  - a. comets, volcanism and photosynthesis
  - b. comets and volcanism
  - c. volcanism, photosynthesis and cellular respiration
  - d. photosynthesis and cellular respiration
9. Fossilization
  - a. is likely to happen to organisms with bones or shells
  - b. is a common occurrence
  - c. is more common for animals from mountains and forests than for those from deserts and oceans
  - d. is likely to happen to soft bodied organism
10. Earth's early atmosphere was
  - a. composed mostly of hydrogen and helium
  - b. very similar to the atmosphere we have now
  - c. lacking in oxygen
  - d. very rich in ozone and carbon dioxide
11. Scientists think the mass extinction that occurred 65 million years ago was the result of
  - a. massive volcanic eruptions
  - b. the impact of a Mars-sized planet
  - c. an asteroid impact
  - d. climate change
12. Life on Earth wouldn't be what it is today without
  - a. free oxygen
  - b. the ozone layer
  - c. a changing environment
  - d. all of these
13. A cell needs
  - a. to replicate itself
  - b. to use nutrients to produce work
  - c. to separate itself from its environment
  - d. all of these
14. The fossil record shows that
  - a. present day life forms evolved from earlier life forms
  - b. life evolves from simple to complex in a straight line
  - c. animals evolved from plants, which evolved from bacteria
  - d. life does not change over time, but may go extinct.
15. Biological evolution is
  - a. the idea that humans evolved from chimps
  - b. the changes in a population that accumulate over time
  - c. the idea that all life was created by a supreme being over a very brief period of time
  - d. the idea that the changes in life forms over time have led to the pinnacle - humans

**True or False**

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 16. Land organisms can be buried by mudslides, volcanic ash, or sand to eventually become fossilized.
- \_\_\_\_\_ 17. Cross-cutting relationships helps geologists to determine the older and younger of two rock units.

- \_\_\_\_\_ 18. Time is missing in a geologic section when there is an unconformity.
- \_\_\_\_\_ 19. The largest mass extinction occurred at the end of the Cenozoic, when the dinosaurs died out.
- \_\_\_\_\_ 20. All isotope pairs can be used to date any geological materials.
- \_\_\_\_\_ 21. About fifty percent of all living organisms become fossils.
- \_\_\_\_\_ 22. Changes in populations over time is biological evolution.
- \_\_\_\_\_ 23. Prokaryotes are different from eukaryotes because they have a nucleus.
- \_\_\_\_\_ 24. Present day life forms evolved from earlier life forms.
- \_\_\_\_\_ 25. There is fossil evidence that modern horses evolved from an earlier animal.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. Continents sometimes collide and form a(n) \_\_\_\_\_, like Rodinia.
27. Absolute ages of substances can be determined using \_\_\_\_\_.
28. A species that dies out completely is \_\_\_\_\_.
29. Fossils that lived over a wide area for a brief period are useful as \_\_\_\_\_ fossils.
30. Continents come together to form a(n) \_\_\_\_\_.
31. Scientists can tell when an event occurred in the relative age known as \_\_\_\_\_.
32. The Earth is approximately \_\_\_\_\_ years old.
33. The \_\_\_\_\_ era was the age of the dinosaurs.
34. The first organisms on Earth were simple \_\_\_\_\_.
35. A random change in an organism's genes is a(n) \_\_\_\_\_.

**Short Answer**

*Answer each question in the space provided.*

36. Why was oxygen needed in the atmosphere before complex life could evolve?

37. What is a key bed used for in earth history and how?

38. Explain the difference between absolute age and relative age.

39. If the environment changes, what will happen to a species?

40. What are adaptations? How do adaptations develop?

---

### Answer Key

1. d 2. b 3. d 4. a 5. c 6. d 7. c 8. b 9. a 10. c 11. c 12. d 13. d 14. a 15. b

16. true 17. true 18. true 19. false 20. false 21. false 22. true 23. false 24. true 25. true
26. supercontinent 27. radiometric dating 28. extinct 29. index 30. supercontinent 31. the geologic time scale 32. 4.6 billion 33. Mesozoic 34. bacteria or cyanobacteria 35. mutation
36. Oxygen is essential for life on Earth for two reasons: (1) three oxygen ions come together to make ozone, which protects the surface from harmful ultraviolet radiation, and (2) animals need oxygen to breathe.
37. A key bed is a thin, widespread and distinctive rock layer. It indicates that some event occurred and where it occurred. When that key bed is found it show that the event occurred in that area. The clay layer with iridium found worldwide is left from the asteroid that killed off the dinosaurs and other organisms at the end of the Cretaceous.
38. Absolute age is the exact age of rocks and is determined using radiometric dating or another technique in which an exact age can be determined. Relative age is the dating of objects based upon their relationship to each other. So one object is older than another but we can't determine how old either object is exactly.
39. The species must evolve or go extinct.
40. Adaptations are favorable traits that organisms inherit. Adaptations develop when variations in a species help them survive better than others. Often adaptations come from mutations.

## 27.6 Unit 6: Earth's Water Test

Unit 6 chapters: *Earth's Fresh Water* and *Earth's Oceans*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

- The difference between a pond and a lake is
  - salt content; lakes are saltier than ponds
  - lakes form from ice age glacial activity; ponds from volcanic eruptions and faulting
  - ponds are smaller and they usually have no outlet
  - none of these
- What type of rock layer makes a good aquifer?
  - impermeable
  - permeable and porous
  - impermeable and porous
  - porous
- Water basins are separated by a
  - separation
  - divide
  - barrier
  - levee
- Salt water from the sea mixes with fresh water from a river in a(n)
  - marsh
  - estuary
  - swamp
  - wetland
- The deepest trench in the ocean is the \_\_\_\_\_ in the \_\_\_\_\_ Ocean.
  - Indonesian; Indian
  - Marianas; Pacific
  - Marianas; Indian
  - Indonesian; Pacific
- After sea ice formation, the remaining water may
  - sink because it is more dense
  - sink because it is warmer than the ice
  - float because it is warmer than the ice
  - float because it is less dense
- Due to Coriolis effect, water moves \_\_\_\_\_ in the northern hemisphere and \_\_\_\_\_ in the southern hemisphere.
  - clockwise; counterclockwise
  - clockwise; clockwise
  - counterclockwise; clockwise

- d. counterclockwise; counterclockwise
8. Wetlands
- are not very valuable and so are often filled in
  - remove pollutants from water
  - are low in biodiversity
  - none of these
9. Ocean currents bring
- surface water to the deep sea; deep water to the surface.
  - cool polar water to the equator; warm equatorial water to the polar regions
  - nutrients from the deep sea to the surface
  - all of these
10. A tremendous amount of the world's food energy is made by
- phytoplankton
  - zooplankton
  - chemosynthetic bacteria
  - seaweed
11. The seafloor
- has features that are very much like the land surface
  - is completely flat
  - has mountains and trenches and flat areas
  - is too dark to understand
12. What percentage of the Earth's water is fresh water?
- 1%
  - 2%
  - 3%
  - 4%
13. What drives deep ocean circulation?
- downwelling
  - upwelling
  - wind
  - Coriolis effect
14. Tide pool organisms must be protected from
- the mix of fresh and salt water
  - drying out
  - intense predation
  - all of these
15. Chemosynthetic bacteria
- provide food to other organisms
  - receive shelter from other organisms
  - live at deep sea vents
  - all of these

**True or False**

Write true if the statement is true or false if the statement is false.

\_\_\_\_\_ 16. Water is stored in soil.

- \_\_\_\_\_ 17. A tributary is the larger of two streams that join together.
- \_\_\_\_\_ 18. Flooding is a natural part of a river's behavior.
- \_\_\_\_\_ 19. With transpiration, trees takes up water from the soil and releases it into the air through their leaves.
- \_\_\_\_\_ 20. Streams come together at a configuration.
- \_\_\_\_\_ 21. Seaweeds are found in the littoral (intertidal) zone.
- \_\_\_\_\_ 22. Whales and dolphins and are nekton.
- \_\_\_\_\_ 23. When rainfall is high, the water table may rise.
- \_\_\_\_\_ 24. Recharge into the Ogallala Aquifer is about equal to the draw down from pumping.
- \_\_\_\_\_ 25. The photic zone makes up the majority of the ocean.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. \_\_\_\_\_ occurs when water moves from the surface to deeper regions of soil.
27. Water vapor in the atmosphere becomes water droplets in a cloud by \_\_\_\_\_.
28. H<sub>2</sub>O in gaseous form is \_\_\_\_\_.
29. The flat area of the seafloor is known as the \_\_\_\_\_.
30. \_\_\_\_\_ are animals that float at or near the surface their whole lives.
31. The height of a(n) \_\_\_\_\_ increases as it nears the shore.
32. If a lot of water is pumped from an aquifer the water table will \_\_\_\_\_.
33. \_\_\_\_\_ are the daily rise and fall of sea level at any given place.
34. \_\_\_\_\_ currents bring nutrients to the surface from deep.
35. \_\_\_\_\_ tides occur when the Earth, Moon, and Sun form a 90° angle.

**Short Answer**

*Answer each question in the space provided.*

36. Draw a diagram of the water cycle and label the reservoirs and processes that connect them. What phase is water in in each of the reservoirs?

37. Describe the causes of floods and their effects.



38. Describe how wells access water. What can happen if a lot of wells are pumping from the same aquifer?

39. Describe the composition of ocean water.

40. Describe what causes tides. What are spring tides and neap tides?

---

### Answer Key

1. c 2. b 3. b 4. b 5. b 6. a 7. a 8. b 9. d 10. a 11. c 12. c 13. a 14. d 15. d

16. true 17. false 18. true 19. true 20. false 21. true 22. true 23. true 24. false 25. false

26. Infiltration 27. condensation 28. water vapor 29. abyssal plain 30. Zooplankton 31. wave 32. fall (decline) 33. Tides 34. Upwelling 35. Neap

36. See text

37. Floods usually occur when precipitation falls more quickly than that water can be absorbed into the ground or carried away by rivers or streams. Waters may build up gradually over a period of weeks, when a long period of rainfall or snowmelt fills the ground with water and raises stream levels. A flood may be really fast if the water is coming so fast that it runs rapidly off the ground. This is a flash flood.

Positive effects – deposits new nutrient-rich sediments when they flood, helping farming. Floods also move large amounts of sediments which provide habitats for animals.

Negative effects – can destroy homes, wipe out fields and crops, damage roads.

38. A well is created by digging or drilling to reach groundwater. When water is close to the surface, wells are convenient method for extracting water. They allow for access to water when no surface water is available. If too much water is taken, the ground may sink. The aquifer may no longer have enough water to supply the needs of the people.

39. Salt makes up 3.5% of the mass of ocean water. The salts are the ions chlorine, sodium, magnesium, sulfur, and calcium, among others.

40. The pull of the moon's gravity on Earth causes tides. The sun's gravity is a secondary cause. When the sun and moon are lined up with Earth, at either the full moon or new moon, the tidal range is greatest and the tides are spring tides. When the sun and moon are at 90-degrees to each other relative to Earth, the tidal range is least and the tides are neap tides.

## 27.7 Unit 7: Weather and Climate Test

Unit 7 chapters: *Earth's Atmosphere, Weather and Climate*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

- Which of the following decreases with an increase in altitude?
  - air pressure
  - visibility
  - air temperature
  - none of the above
- You are in a moist forest, thick with tall coniferous trees. Which biome are you probably in?
  - subpolar
  - humid continental
  - marine west coast
  - humid subtropical
- Which appear thin and wispy?
  - Stratus
  - Nimbostratus
  - Altostratus
  - Cirrus
- The sun is at its furthest north at
  - autumnal equinox
  - vernal equinox
  - winter solstice
  - summer solstice
- In which layer of the atmosphere does all weather take place?
  - Troposphere
  - Stratosphere
  - Mesosphere
  - Thermosphere
- Which of the following is a measure of how fast atoms in a material are moving?
  - pressure
  - albedo
  - temperature
  - radiation
- Thunderstorms form when
  - the ground is warm and updrafts form
  - ground temperature is higher than 28-degrees Centigrade
  - a high pressure cell is over the area
  - lightning releases heat energy so the storm grows

8. Which of the following adds oxygen to the atmosphere?
  - a. forest fires
  - b. photosynthesis
  - c. weathering of rocks
  - d. life processes of animals
9. What features does an air mass have nearly identical throughout?
  - a. fog and humidity
  - b. pressure and temperature
  - c. pressure and humidity
  - d. temperature and humidity
10. Which weather phenomena is the most deadly per year?
  - a. hurricane
  - b. heat wave
  - c. tornado
  - d. blizzard
11. If the readings on your barometer fall,
  - a. snow will fall within 24 hours
  - b. storm clouds are probably on the way
  - c. clear skies are probably coming
  - d. you don't know anything about the future; barometers can't be used to predict weather
12. A squall line is
  - a. the line where cold air transitions to warm air at a warm front.
  - b. the location where a cold front catches up to a warm front, resulting in cold, warm and then cold.
  - c. the location where a front stops and remains stationary.
  - d. a line of thunderstorms along a cold front.
13. Outside one morning the plants are coated with water but it didn't rain. The wetness is because
  - a. a fog came in overnight.
  - b. an inversion caused water to condense on the plants.
  - c. the air near the plants cooled to below its dew point.
  - d. this couldn't happen. It must have rained.
14. El Niño events
  - a. occur when ocean temperatures get high.
  - b. cause the trade winds to reverse direction or stop.
  - c. stop upwelling off of western South America.
  - d. all of these
15. Carbon dioxide levels in the atmosphere
  - a. have been rising at least since 1958
  - b. rose in the 1950s and 1960s, but are now stable
  - c. have been declining since around 1972
  - d. none of these

**True or False**

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 16. The sun is the only source of heat for the troposphere.
- \_\_\_\_\_ 17. Many characteristics of a storm can be mapped using radar.

- \_\_\_\_\_ 18. Pilots prefer to fly in the stratosphere because of the lack of turbulence.
- \_\_\_\_\_ 19. As temperature decreases, relative humidity decreases.
- \_\_\_\_\_ 20. The thermosphere contains the ozone layer.
- \_\_\_\_\_ 21. Water has a high specific heat.
- \_\_\_\_\_ 22. Ozone is the only atmospheric gas that filters out some wavelengths of solar radiation.
- \_\_\_\_\_ 23. UVC causes sunburns and is dangerous to plants when it reaches the Earth's surface.
- \_\_\_\_\_ 24. Each layer of the atmosphere is different because it has a different temperature gradient.
- \_\_\_\_\_ 25. A continental climate has a greater difference in temperature between day and night than a maritime climate.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. The low pressure zone near the equator where Hadley Cells meet is the \_\_\_\_\_.
27. In \_\_\_\_\_ tropical rainforest is cleared and burned and then farmed until the soil is no longer fertile.
28. Winds blow from \_\_\_\_\_ pressure zones to \_\_\_\_\_ pressure zones.
29. A(n) \_\_\_\_\_ is an uphill airflow.
30. The planet is divided into \_\_\_\_\_ major climate groups.
31. Lines of equal pressure are called \_\_\_\_\_.
32. Relatively warm air on the cold ground may lead to \_\_\_\_\_.
33. In a(n) \_\_\_\_\_ the air mass does not move.
34. \_\_\_\_\_ describes what the atmosphere is like at a specific time and place.
35. \_\_\_\_\_ is the measure of how well a surface reflects light.

**Short Answer**

*Answer each question in the space provided.*

36. What is the effect of there being more solar radiation striking at the equator than toward the poles?

37. Describe the greenhouse effect. Why is greenhouse effect so important to life on Earth?

38. How and under what conditions does a hurricane form?

39. What happens when air masses meet?

40. Climate has changed throughout Earth history. Why is climate change dangerous now?

---

### Answer Key

1. a 2. c 3. d 4. d 5. a 6. c 7. a 8. b 9. c 10. b 11. b 12. d 13. c 14. d 15. a

16. false 17. true 18. true 19. false 20. false 21. true 22. false 23. false 24. true 25. true
26. Intertropical Convergence Zone 27. slash-and-burn agriculture 28. high; low 29. valley breeze 30. five 31. isobars 32. fog 33. stationary front 34. Weather 35. Albedo
36. There is more solar energy at the equator, which heats the air there. The air rises, which leads to convection cells. Advection at the base of the cells, along with Coriolis effect, determine the direction of the prevailing global winds.
37. The warming of the atmosphere because of insulation by greenhouse gases. Greenhouse gases moderate the earth's temperature.
38. When sea surface temperature reaches 28-degrees C or higher a low pressure cell, or tropical depression forms. Air rotates around the low pressure and the air in the center rises. This air cools, condenses and releases latent heat. If wind shear is low, the storm becomes a hurricane in two to three days.
39. A front develops which can bring winds, condensation, and precipitation. It can include stormy weather.
40. Earth has been warmer during much of its history. But people have built systems that depend on climate being the way it is now. Much development and many people are located at the coasts, which will be submerged as sea level rises. Species and ecosystems that keep the planet as we know it depend on current conditions. Conditions need to be good where farmland is prevalent.

## 27.8 Unit 8: The Environment and Human Actions Test

Unit 8 chapters: *Ecosystems and Human Populations, Human Actions and the Land, Human Actions and Earth's Resources, Human Actions and Earth's Water and Human Actions and the Atmosphere*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

Circle the letter of the correct choice.

- Nutrients are returned to the ecosystem by
  - decomposers
  - scavengers
  - grazers
  - prey
- Which of the following had the single greatest impact on allowing humans to increase their carrying capacity?
  - raising livestock
  - building shelter
  - making tools
  - farming
- Carbon dioxide is found in
  - forests, oceans, the atmosphere
  - volcanic eruptions
  - fossil fuels
  - all of these
- Toxic chemicals, flammable compounds, and substances that cause dangerous chemical reactions are all
  - cancer causing
  - hazardous wastes
  - illegal in the United States
  - all of these
- To conserve resources, we should all
  - reduce consumption
  - reuse products when we can
  - recycle materials
  - all of these
- A food web represents
  - the flow of energy through an ecosystem
  - a longer than average food chain
  - a system for obtaining food
  - the flow of matter into a food chain
- The net-energy ratio of solar energy is 5.8 and of petroleum is 4.9. This means that
  - solar energy is cheaper to use than petroleum
  - more usable energy is obtained per unit of solar than of petroleum
  - the overall energy loss is greater for solar than for petroleum



- d. all of these
8. Which of the following can increase the conservation of water?
- Convert to more efficient methods of irrigation
  - Reduce household demand
  - water lawns less
  - all of the above
9. The best way to be sure energy resources will continue to be available is to
- develop new sources of fossil fuels
  - develop new alternative energy sources
  - conserve energy
  - develop nuclear fusion
10. Clean, safe water is
- available to about one-fifth of all the world's people
  - going to become available to more people in the coming decades
  - available to nearly all of the world's people
  - none of these
11. The ozone hole is caused by
- photochemically produced ozone
  - ozone-destroying chemicals in the stratosphere
  - CFCs on polar stratospheric clouds near the north pole
  - none of these
12. World Health Organization estimates how many people per year die from complications caused by air pollution?
- 2 million
  - 12 million
  - 22 million
  - 200 million
13. Most ocean pollution comes from
- oil spills
  - ships at sea
  - acid rain
  - land
14. Which soil layer is the most likely to erode?
- topsoil
  - A Horizon
  - B Horizon
  - bedrock
15. A cap-and-trade system provides a monetary incentive
- to individuals to conserve energy
  - to nations to develop conservation strategies and technologies
  - to regions to reduce carbon dioxide emissions by promoting conservation
  - none of these

**True or False**

*Write true if the statement is true or false if the statement is false.*



38. For alternative energy sources like solar, wind and biofuels to replace fossil fuels, what would need to happen?

39. What has happened to water use in the past 100 years in developed and developing nations? What is predicted to happen to water use in the next 50?

40. How can people reduce air pollution?

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## Answer Key

1. a 2. d 3. d 4. b 5. d 6. a 7. b 8. d 9. c 10. a 11. b 12. c 13. d 14. a 15. b
16. false 17. true 18. true 19. false 20. true 21. true 22. true 23. false 24. false 25. false
26. Superfund 27. dead zone 28. producers 29. Conservation 30. non-renewable 31. point 32. ration 33. carbon sequestration 34. household 35. sewage
36. Niche is the way a species makes a living. For example: A bat eats mosquitoes. Habitat is the place where a species lives. Example: bats live in cracks and crevices or bat houses.
37. Open land erodes easily so land should be covered as much as possible. This could be done by leaf litter or cover crops in off seasons. Tall trees around fields can buffer the wind. Tractors break up soil and make it vulnerable to erosion so they should be used as little as possible. Placing irrigation water where it is needed keeps excess water from eroding soil. Flat fields are not vulnerable to erosion by gravity.
38. More research and development is needed to bring the costs of alternative energy sources down to be more in line with fossil fuels. Also, the costs of environmental damage should be weighed. It is not fair to say that oil costs only the amount it takes to deliver it to the consumer. It's costs are far greater in healthcare costs, and damage to the environment. Climate change will be extremely costly to deal with so that needs to be considered.
39. In developed nations, people use much more water than they did 100 years ago. People in developed nations use an enormous proportion of the world's water compared with those in developing nations. In the next 50 years, there will be more people in developing nations that do not have access to clean, safe water unless enormous advancements are made in getting such water to them.
40. Drive less, taking a bus or carpooling, buying cars with better fuel efficiency, turning off lights and appliances when not in use, using energy efficient lights and appliances, and buying fewer items manufactured with fossil fuels.

## 27.9 Unit 9: Astronomy Test

Unit 9 chapter: *Observing and Exploring Space; Earth, Moon, and Sun; The Solar System, and Stars, Galaxies, and the Universe*

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Multiple Choice

*Circle the letter of the correct choice.*

1. What is the shape of Earth's path around the Sun?
  - a. square
  - b. circle
  - c. sphere
  - d. ellipse
2. Which layer of the Sun sticks out past the Moon in an eclipse?
  - a. core
  - b. chromosphere
  - c. photosphere
  - d. corona
3. What happens when a new moon passes directly between Earth and the Sun?
  - a. a solar eclipse
  - b. neap tides
  - c. a lunar eclipse
  - d. none of these
4. Who was the first man to set foot on the moon?
  - a. James Lovell
  - b. Buzz Aldrin
  - c. Neil Armstrong
  - d. Edward Hubble
5. The Sun is made of
  - a. hydrogen and helium gas
  - b. hydrogen and a little helium in the form of plasma
  - c. helium gas and some rock and metal in the core
  - d. burning metal and gas
6. Why is a day on Mercury equal to 58 Earth days?
  - a. Mercury revolves very slowly around the Sun
  - b. Venus has a gravitational pull on Mercury
  - c. Mercury rotates very slowly on its axis
  - d. On Mercury, the time for one revolution is the same as for one rotation
7. Which planetary body has light-colored highlands surrounded by dark basalt lavas?
  - a. Mercury
  - b. Moon
  - c. Venus

- d. Mars
8. The nebular hypothesis states that the solar system formed
- from the collapse of a giant cloud of gas and dust
  - in a supernova explosion
  - in the first few minutes after the Big Bang
  - none of these
9. Who first observed that an object can orbit something besides Earth?
- Copernicus
  - Galileo
  - Ptolemy
  - Einstein
10. To learn about the interiors of planets, scientists study
- volcanic rocks
  - the surface of the Moon
  - meteorites
  - the solar wind
11. Spherical groups of old stars tightly held together by gravity are
- nebulae
  - galaxies
  - open clusters
  - globular clusters
12. Evidence for the Big Bang includes that the universe is expanding and there is
- a small amount of energy remaining
  - a small amount of reverberating sound remaining
  - blueshift of the farthest out galaxies
  - none of these
13. Why can't a planet be part of the asteroid belt?
- Planets have different orbit from asteroids.
  - Planets are made of different materials.
  - Planets clear their space of debris.
  - Planets are too large to be in the asteroid belt.
14. You can tell the brightest star Sirius from a bright planet because
- they are different colors
  - the planet moves backwards sometimes
  - Sirius is an obvious binary star
  - Sirius appears much larger than any planet
15. Where do shorter period comets come from?
- the Kuiper belt
  - other solar systems
  - the Moon
  - the asteroid belt

### True or False

*Write true if the statement is true or false if the statement is false.*

- \_\_\_\_\_ 16. The seasons are due to Earth's elliptical orbit around the Sun.

- \_\_\_\_\_ 17. Iron in Earth's crust creates the magnetic field.
- \_\_\_\_\_ 18. The Moon is Earth's only natural satellite.
- \_\_\_\_\_ 19. Galileo invented the first telescope.
- \_\_\_\_\_ 20. All of the spacecraft we have sent out for exploration are within our solar system.
- \_\_\_\_\_ 21. When you observe an object in space you are seeing what it looked like in the past.
- \_\_\_\_\_ 22. Radio telescopes are best used to study objects within our solar system.
- \_\_\_\_\_ 23. Space-based telescopes provide clearer views of the planets and other stars.
- \_\_\_\_\_ 24. The Universe began about 13.7 billion years ago.
- \_\_\_\_\_ 25. You would weigh one-sixth of your current weight on the Moon.

**Fill in the Blanks**

*Fill in the blank with the term that best completes the sentence.*

26. The \_\_\_\_\_ is an enormous, oval-shaped storm on Jupiter.
27. Most of the solar system's mass is in \_\_\_\_\_.
28. When Moon and Sun are on opposite sides of Earth the tides are \_\_\_\_\_.
29. The Moon has no weather because it has no \_\_\_\_\_.
30. During a solar eclipse, Earth falls into the \_\_\_\_\_ of the moon.
31. At the center of many galaxies is a(n) \_\_\_\_\_.
32. Sunspots occur in \_\_\_\_\_ year cycles.
33. Moving a rocket through space requires \_\_\_\_\_.
34. The light spectra of nearly all galaxies have a shift toward \_\_\_\_\_ wavelengths.
35. The \_\_\_\_\_ theory describes the origin of the universe.

**Short Answer**

*Answer each question in the space provided.*

36. List the inner planets and describe their common characteristics.

37. What did the Ancient Greeks think was the structure of the universe? What did Galileo observe with his telescope that changed the way people thought about the solar system? What was the new solar system model?

38. Explain the difference between asteroids, meteoroids, and comets.

39. Why is Pluto now considered a dwarf planet?

40. What started the space race? How did the United States react?

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### Answer Key

1. d 2. d 3. a 4. c 5. a 6. c 7. b 8. a 9. b 10. c 11. d 12. a 13. c 14. b 15. a



16. false 17. false 18. true 19. true 20. false 21. true 22. false 23. true 24. true 25. true

26. Great Red Spot 27. the Sun 28. spring tides 29. atmosphere 30. umbra 31. black hole 32. 11 33. thrust 34. red shift 35. Big Bang

36. Mercury, Venus, Earth and Mars – all have a crust, mantle and core. All have been geologically active at some point. All are made of igneous rocks with iron cores. None of them have rings.

37. The Greeks thought Earth was at the center of the Universe. Galileo saw that Jupiter has moons orbiting it. This suggested that other bodies in the solar system can have satellites. He used this to support the Copernican model of the solar system that said that the Sun is at the center and the planets orbit around it.

39. Asteroids are small rocky bodies that orbit the Sun, meteoroids are smaller than asteroids, and comets are small, icy objects that have very elliptical orbits around the sun. Comets orbits carry them for the outer solar system to the inner solar system.

39. While it orbits a star and has enough mass to be nearly spherical, it has not cleared its orbit of smaller objects thus no longer fulfilling the definition of planet which was adopted in 2006.

40. The USSR launched Sputnik on Oct. 4, 1957 which was the first artificial satellite in orbit. This shocked Americans and they responded by launching Explorer 1 on Jan. 31, 1958. NASA was established in 1958. The space reached its peak in 1969 when the US put the first man on the moon.