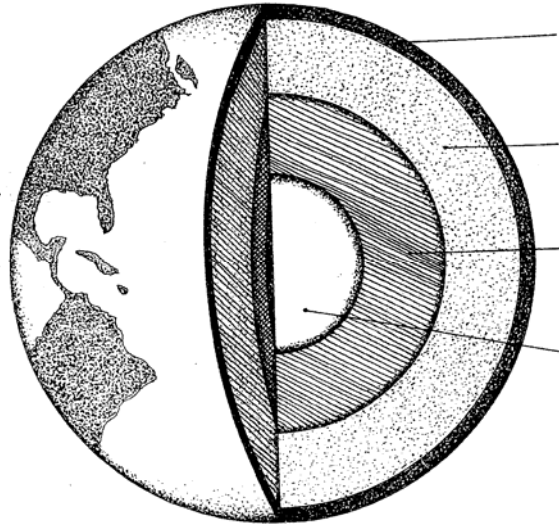


Fourth Grade “Geology: The Earth and Its Changes” Assessment

- 1a. What is the center layer of the Earth called?
- a. crust
 - b. core
 - c. mantle
 - d. middle
- 1b. Label each layer of the Earth.



- 1c. What are the Earth’s three layers? Tell what each is called and what each is made of:

1. Outer Layer - _____

2. Middle Layer - _____

3. Inner Layer - _____

- 2a. Which of the following is true?
- a. The crustal plates are all in constant motion.
 - b. The crustal plates are stationary and never move.
- 2b. The formation of mountains, valleys, volcanoes, and earthquakes can all be related to the _____ of crustal plates.
- a. explosion
 - b. movement
 - c. dissection
 - d. floating

- 2c. List three results from the movement of crustal plates that occur on the Earth:
1. _____
 2. _____
 3. _____
- 3a. Movement in the Earth's crust causes vibrations known as _____.
- a. epicenter
 - b. earthquakes
 - c. focus
 - d. faults
- 3b. Which of the following is true?
- a. Earthquakes are extremely rare.
 - b. Earthquakes happen every single day although some may not be felt.
 - c. Earthquakes only occur in the Southern Hemisphere.
 - d. All of the above
- 3c. What is an earthquake?
- _____
- _____
- _____
- 4a. A(n) _____ is a large crack in the Earth's surface.
- a. epicenter
 - b. earthquakes
 - c. focus
 - d. faults
- 4b. Large cracks in the Earth's surface are called _____.
- 4c. You are planning to build a new house on a piece of land that you have purchased. You find out that geologists have discovered a new fault line along your new property. What will you do? Explain.
- _____
- _____
- _____
- _____
- _____
- 5a. The San Andreas Fault is located in which state?
- _____
- 5b. Which major fault is located in California?
- _____

5c. What fault line is located where the Pacific Plate and North American Plate meet? What state in the United States is this located in? What happens more often along this line?

6a. A seismograph measures _____.

- a. Earth movement
- b. ocean depth
- c. length
- d. temperature

6b. A _____ is used to measure an earthquake.

- a. Richter Scale
- b. seismograph

6c. What is a seismograph and how does it work?

7a. The Richter Scale reports the _____ of an earthquake.

- a. strength
- b. distance

7b. Which of the following earthquakes would be felt but not cause any damage. Circle the correct answer.

Earthquake	Richter Scale
A	8.9
B	3.5
C	6.2

7c. Describe the damage that may occur with an earthquake that measured 6.9 on the Richter Scale.

8a. A(n) _____ is a tidal wave caused by an earthquake.

- a. tornado
- b. tsunami

8b. A(n) _____ is an huge wave caused by an earthquake.

8c. Describe three possible causes of a tsunami.
1. _____
2. _____
3. _____

9a. A(n) _____ is a mountain created by the flow of melted rock through an opening in the Earth's surface.

9b. Name three volcanic mountains.
1. _____
2. _____
3. _____

9c. Describe the three different types of volcanoes and tell how they are formed.
- _____
- _____
- _____

10a. What is magma called when it reaches the Earth's surface?

10b. Hot melted rock inside the Earth is called _____ and when it reaches the Earth's surface, it is called _____.

10c. Describe the difference between magma and lava.

11a. Which type of volcano is the least dangerous?
a. an active volcano
b. an extinct volcano
c. a dormant volcano

11b. List the three types of volcanoes in order from the least to the most dangerous.
active volcano
extinct volcano _____, _____, _____
dormant volcano

11c. Explain the differences between an extinct volcano, dormant volcano, and an active volcano.

-

-

-

12a. Mount St. Helens is located in which state?

12b. Label the major volcanic mountain associated with each location.

Southern Italy _____
Southwestern Washington _____
Southwestern Indonesia _____

12c. Match the volcano with the year of its major eruption and list where it is located:

Location	Volcano	Year
_____	Krakatoa	79
_____	Mt St. Helens	1980
_____	Vesuvius	1883

13a. When hot water bubbles up to the surface it can form steamy ponds called _____.

- a. hot springs
- b. geysers

13b. When hot water bubbles up to the surface it can form steamy ponds called _____.

- a. hot springs
- b. geysers
- c. seas
- d. glaciers

13c. What is a hot spring? How are they formed and how are they different from geysers?

14a. A famous geyser is _____ in Yellowstone National Park.

14b. A hot spring that erupts intermittently in a column of steam and hot water is called a _____.
Give one example: _____

14c. What is a geyser? Give one example and its location.

15a. The theory that all seven continents were once one large land mass and over time have broke apart into the seven continents is the theory of _____.
a. continental drift
b. Pangaea

15b. The theory that all seven continents were once one large land mass and over time have broke apart into the seven continents is the theory of _____.

15c. What are some of the clues that have led to the Theory of Continental Drift.?

16a. _____ is the hypothetical supercontinent that scientists believe broke up into today's seven continents.
a. Pangaea
b. Atlantis

16b. _____ is the hypothetical supercontinent that scientists believe broke up into today's seven continents.

16c. Describe what the land mass "Pangaea" was and what happened to it over time.

17a. The Hawaiian Islands are examples of _____ mountains.
a. volcanic
b. folded
c. fault-block.
d. dome-shaped

17b. Which type of mountains can form the quickest?

- a. folded mountains
- b. volcanoes
- c. fault-block mountains
- d. dome-shaped

17c. How are volcanic mountains formed?

18a. What type of mountain forms when two crustal plates collide?

- a. folded mountains
- b. volcanoes

18b. What type of mountain forms when two crustal plates collide?

18c. Describe how folded mountains are formed.

19a. What type of mountain forms when two crustal plates cause the Earth's surface to crack or tilt?

- a. fault-block mountains
- b. dome-shaped

19b. The Grand Tetons in Wyoming are an example of _____ mountains.

- a. folded
- b. volcanic
- c. fault-block
- d. dome-shaped

19c. List an example of a fault-block mountain, volcanic mountain, folded mountain, and dome mountain.

Fault-block _____

Volcano _____

Folded _____

Dome _____

20a. Mountains that form when magma fills a chamber under the surface of the Earth and create a bump above ground are called?

- a. fault-block mountains
- b. dome-shaped

20b. The Black Hills in South Dakota are an example of _____ mountains.

- a. folded
- b. volcanic
- c. fault-block
- d. dome-shaped

20c. Explain how dome-shaped mountains are formed.

21a. On our earth, mountain peaks and trenches can also occur in the _____.

- a. ocean/sea
- b. north pole

21b. On our earth, mountain peaks and trenches can also occur in the _____.

- a. ocean/sea
- b. north pole
- c. south pole
- d. Mariana Trench

21c. Mountain peaks and trenches can also occur in what parts of our earth and how are they formed?

22a. What is the deepest place in all of the oceans of the Earth?

- a. Mariana Trench
- b. Grand Canyon

22b. What is the deepest place in all of the oceans of the Earth?

22c. Describe the Marianas Trench:

23a. _____ rocks often have layers that you can see.

- a. Sedimentary
- b. Igneous

23b. Fossils are often found in _____ rocks.

23c. There are large deposits of limestone in Ohio and Kentucky. Why would this fact lead scientists to believe that there used to be an ocean covering these two states?

24a. Rocks which form from layers of mud and clay pressed together are called?

- a. sedimentary
- b. metamorphic

24b. List three sedimentary rocks and describe one way that they can be formed.

- 1. _____
 - 2. _____
 - 3. _____
-
-

24c. Describe two ways that sedimentary rocks are formed.

- 1. _____
 - 2. _____
-
-

25a. What types of rocks are formed from slow cooling magma?

- a. igneous
- b. metamorphic

25b. Which statement is true?

- a. The cooling of molten material forms igneous rocks.
- b. The hardening of mud forms igneous rocks.
- c. Igneous rocks are formed by sedimentary activity.
- d. All of the above

25c. Describe how igneous rocks are formed.

26a. Granite is an example of a(n) _____ rock.

- a. sedimentary
- b. igneous

26b. Which of the following is not an igneous rock?

- a. pumice
- b. marble
- c. obsidian
- d. granite

26c. How are igneous rocks and metamorphic rocks different? How are they the same?

27a. Which rocks are created when other rocks undergo a change due to heat or pressure?

- a. igneous
- b. metamorphic

27b. Metamorphic rocks form from _____ and _____.

- a. sun, wind
- b. lightning, pressure
- c. heat, pressure
- d. fire, water

27c. Explain how metamorphic rocks are formed.

28a. Slate is an example of a(n) _____ rock.

- a. igneous
- b. metamorphic

- 28b. List three metamorphic rocks.
1. _____
 2. _____
 3. _____
- 28c. When heat and pressure is applied to these sedimentary rocks they change into which metamorphic rocks.
- Limestone becomes _____
- Shale becomes _____
- Sandstone becomes _____
- 29a. Larger rocks are broken down into smaller rocks and soil through _____.
- a. weathering
 - b. earthquakes
- 29b. _____ occurs when rocks are broken down to form soil.
- a. Weathering
 - b. Earthquakes
 - c. Lakes
 - d. Lightening
- 29c. List three causes of weathering:
1. _____
 2. _____
 3. _____
- 30a. Which of the following is true?
- a. Erosion occurs when soil and rocks are worn down and moved around by water or wind.
 - b. Erosion occurs when water is worn down and moved around by soil and rocks.
 - c. Erosion occurs when a fire spreads across a grassy field.
- 30b. Which of the following is **not** a type of erosion?
- a. glaciers
 - b. fire
 - c. rivers
 - d. wind
- 30c. List three major causes of erosion and tell how each takes place.
1. _____
 2. _____
 3. _____

31a. Acid rain is an example of _____.
a. physical weathering
b. chemical weathering

31b. The type of weathering where the actual minerals change in a rock is called:
a. physical weathering
b. chemical weathering

31c. Explain how acid rain is an example of chemical weathering.

32a. Weathering where only the size or shape of the rock is changed is called:
a. physical weathering
b. chemical weathering

32b. Water that freezes in a crack of a rock and causes the rock to break apart into smaller rocks is an example of _____.

32c. Give one example of physical weathering and explain how it works.

33a. Which type of soil contains the most nutrients of plant and animal material?
a. subsoil
b. topsoil

33b. Which type of soil contains the most nutrients of plant and animal material?

33c. Why does topsoil contain the most nutrients of the layers of the Earth's soil? Explain.

34a. Below the topsoil is the _____ which is made of most rock and some soil.

34b. List the three layers of soil and rock from that closest to the surface to the deepest layer.

1. _____
2. _____
3. _____

34c. Why does subsoil contain less nutrients than the topsoil above it?

35a. Topsoil and subsoil rest on a layer of unweathered rock called _____.

- a. flatrock
- b. bedrock

35b. Topsoil and subsoil rest on a layer of unweathered rock called _____.

35c. Which layer of the crust contains the least amount of nutrients? Explain.

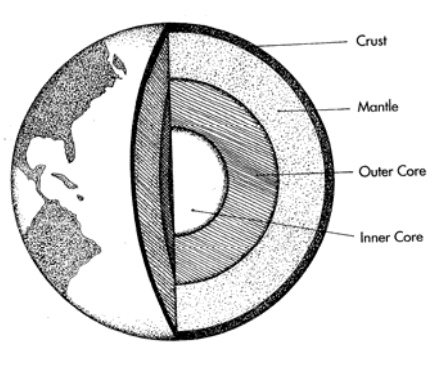
- a. flatrock
- b. bedrock
- c. marble
- d. straightrock

The following Colorado Model Content Standards are covered in this assessment by the questions indicated:

None

Answer Key

- 1a. b. core
1b.



- 1c. Acceptable answers could include:
1 – Crust; mostly igneous rock
2 – Mantle; solid rock or melted rock that between solid and liquid
3 - Core; nickel and iron
- 2a. a. The crustal plates are all in constant motion.
2b. b. movement
2c. Acceptable answers could include:
-mountains
-rift valleys
-volcanoes
-earthquakes
-faulting
- 3a. b. earthquakes
3b. b. Earthquakes happen every single day although some may not be felt.
3c. Acceptable answers could include:
-An earthquake is a motion in the Earth's crust. It is caused by the sudden release of slowly built-up stress with the crust.
-vibrations caused by movement of the Earth's crust
- 4a. d. faults
4b. faults
4c. Acceptable answers could include:
-Question geologists about whether or not the fault is active.
-Find out exactly where the fault is on the property.
-Decide whether it would be safe to still build the house on the property.
-Ask others living in the area about their feelings of living on the fault line.
- 5a. California
5b. San Andreas Fault
5c. San Andreas Fault; California; more earthquakes

- 6a. a. Earth movement
- 6b. b. seismograph
- 6c. Acceptable answers could include:
 -a seismograph is a device used for recording earth tremors
 -it is a pendulum suspended from a pole that swings from side to side when the Earth shakes
 -when the earth is still it marks a straight line
 -when the earth shakes it marks a squiggly line
- 7a. a. strength
- 7b. B 3.5
- 7c. Acceptable answers could include:
 -ground cracks
 -house collapses
 -trees sway
 -buildings destroyed
 -people are injured
- 8a. b. tsunami
- 8b. tsunami
- 8c. Acceptable answers could include:
 -undersea earthquake
 -volcanic eruption
 -coastal landslide
- 9a. volcano
- 9b. Mauna Loa, Kilauea, Kilimanjaro, Aconcagua, Mount St. Helens, Mount Fuji, etc.
- 9c. Acceptable answers could include:
 -Shield Volcanoes: have gentle slopes, made of many layers of lave that flows easily
 -Cinder Cones: made up rock and cinder that pile up. Create steep hills of rock and ash
 -Composite Cone: mix of layers of cinder and lava. Don't wear away fast
- 10a. lava
- 10b. magma, lava
- 10c. Acceptable answers could include:
 -hot, melted rock that is inside the Earth is called magma
 -when that same rock reaches the surface of the Earth or is erupted it is then called lava
- 11a. b. an extinct volcano
- 11b. extinct, dormant, active
- 11c. Acceptable answers could include:
 -An active volcano is one that has erupted recently or could possibly erupt soon.
 -A dormant or sleeping volcano is a volcano that has been quiet for a long time, but still has signs it may erupt again.
 -An extinct volcano is one that has not erupted for thousands of years.

- 12a. Washington
- 12b. Southern Italy Vesuvius
Southwestern Washington Mt. St. Helens
Southwestern Indonesia Krakatoa
- 12c. Southwestern Indonesia Krakatoa 1883
Southwestern Washington Mt St. Helens 1980
Southern Italy Vesuvius 79 AD

13a. a. hot springs

13b. a. hot springs

13c. Acceptable answers could include:

-A hot spring is a pond where hot water has bubbled up to the surface of the earth due to the magma forcing it way through the crust, thus heating water in its path.

-They are different from geysers because hot springs are ponds of hot water and geysers are places where the hot water is trapped in caves or chambers and develops into steam and is forced out an opening.

-Geysers do not form ponds, they are pressurized steam.

14a. Old Faithful

14b. geyser; answers will vary; Old Faithful

14c. Acceptable answers could include:

-Old Faithful in Yellowstone National Park

-a hot spring that erupts intermittently in a column of steam and hot water

-can last from a minute to years

-can be from 3 feet to 3000 feet

15a. a. continental drift

15b. continental drift

15c. Acceptable answers could include:

-fossils that are found in the rocks of different continents

-fossils of certain animals that could not swim are found on both South America and Africa

-shape of the continents that fit together

16a. a. Pangaea

16b. Pangaea

16c. Acceptable answers could include:

-Pangaea is the term that describes the crowding of all the continents we know today, into one mass that has since divided up into seven continents with oceans and seas separating them. This change from the Pangaea to the seven continents is called the continental drift.

17a. a. volcanic

17b. b. volcanoes

- 17c. Acceptable answers could include:
 -A volcano is a mountain that forms when layers of lava and volcanic ash erupt and build up.
 -Magma is less dense than the rock around it, so it is very slowly forced upward toward Earth's surface.
- 18a. a. folded mountains
 18b. folded
 18c. Acceptable answers could include:
 -a folded mountain forms when two crustal plates collide
 -the surface of the Earth where they meet is bent and folds upward
- 19a. a. fault-block mountains
 19b. c. fault-block
 19c. Acceptable answers could include:
 -Fault-block: Sierra Nevada, Grand Tetons
 -Volcano: Mount Egmont, Mount Ranier
 -Folded: Appalachian, Rockies, Alps
 -Dome: Black Hills, Adirondack
- 20a. b. dome-shaped
 20b. d. dome-shaped
 20c. Acceptable answers could include:
 -dome mountains are formed from magma rising from the Earth's mantle into the crust
 -the magma pushes overlying sedimentary rock layers upward to form a "dome" shape
 -magma does not usually reach the surface and cools to form the mountain
- 21a. a. ocean/sea
 21b. a. ocean/sea
 21c. Acceptable answers could include:
 -They can form in the ocean or seas and are formed through volcanic, fault-block or folded mountain activity just like on dry land.
- 22a. a. Mariana Trench
 22b. Marianas Trench
 22c. Acceptable answers could include:
 -the deepest spot in the ocean
 -in the Pacific
 -over 35,000 feet deep
 -caused by plate tectonics
 -different life-forms due to pressure and lack of light
- 23a. a. Sedimentary
 23b. sedimentary
 23c. Acceptable answers could include:
 -limestone is a sedimentary rock
 -sedimentary rocks are formed from layers of sediment
 -these layers often are built up at the bottom of streams, lakes and oceans

- 24a. a. sedimentary
- 24b. Acceptable answers could include:
 -Types: limestone, shale, sandstone, chalk, dolomite, coal
 -How they are formed:
 -made underwater from the shells of animals
 -made from layers of sand, rock and other sediments
 -formed when layers of mud and clay are pressed together
 -formed through the deposition and solidification of sediments
 -formed when layers of materials from sedimentation are pressed together and harden
- 24c. Acceptable answers could include:
 -made underwater from the shells of animals
 -made from layers of sand, rock and other sediments
 -formed when layers of mud and clay are pressed together
 -formed through the deposition and solidification of sediments
 -formed when layers of materials from sedimentation are pressed together and harden
- 25a. a. igneous
- 25b. a. The cooling of molten material forms igneous rocks.
- 25c. Acceptable answers could include:
 -igneous rocks are formed by the cooling of lava or magma
 -igneous rocks can form above or below the surface of the earth
 -igneous rocks are made from very hot liquid matter that has cooled and hardened
- 26a. b. igneous
- 26b. b. marble
- 26c. Acceptable answers could include:
 -similar
 -both can be formed inside the earth
 -both could have been magma at one point in time
 -different
 -igneous are cooled lava, metamorphic formed from pressure
 -metamorphic rocks usually more harder
- 27a. b. metamorphic
- 27b. c. heat; pressure
- 27c. Metamorphic rocks are formed from heat and pressure.
- 28a. b. metamorphic
- 28b. Acceptable answers could include:
 -slate
 -schist
 -migmatite
 -marble
 -eclogite

- 28c. Acceptable answers could include:
 -limestone changes to marble
 -shale changes to slate
 -sandstone changes to quartzite
- 29a. a. weathering
 29b. a. Weathering
- 29c. Acceptable answers could include:
 -wind
 -ice
 -rain
 -temperature
 -plant seeding
- 30a. a. Erosion occurs when soil and rocks are worn down and moved around by water or wind.
 30b. b. fire
- 30c. Acceptable answers could include:
 -wind: rocks changed by air movement.
 -rivers: rocks changed as moved down stream.
 -glaciers: cutting rocks by movement of large pieces of ice.
 -snow: avalanches or other snow movement.
 -storms: drastic weather changes that move rock.
 -ocean waves: crashing waves which erode rocks at shore line.
- 31a. b. chemical weathering
 31b. b. chemical weathering
- 31c. Acceptable answers could include:
 -rain water mixes with Carbon Dioxide to form acid rain
 -this acid rain changes the minerals in rocks
 -the rocks then wear away or break apart
 -the acid changes the minerals of the rock causing weathering
 -this change is an example of chemical weathering
- 32a. a. physical weathering
 32b. physical weathering
- 32c. Acceptable answers could include explanations of any of the following:
 -water freezing in cracks of rocks
 -plants growing in rocks and the roots breaking rock apart
- 33a. b. topsoil
 33b. topsoil
- 33c. Acceptable answers could include:
 - Topsoil contains more plant and animal matter
 - Plant and animals rot and become good growing material
 - Over time, this mulch contains a great amount of nutrients when it is broken down

34a. subsoil

34b. topsoil, subsoil, bedrock

34c. Acceptable answers could include:

- Nutrients are formed from animal and plant matter on the surface of the Earth
- Most of those nutrients stay in the topsoil
- Some will seep deep enough in the soil to reach the subsoil

35a. b. bedrock

35b. bedrock

35c. b. bedrock

Acceptable answers could include:

- Bedrock does not include humus or decaying matter from plants and animals and thus it is not full of many nutrients.
- Bedrock is mostly solid rock and is far enough underground that it does not weather into soil.