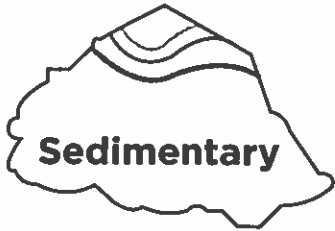


Rocks and Minerals



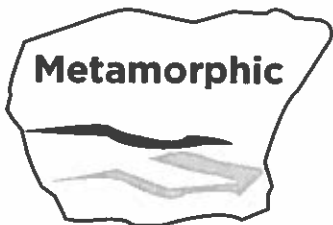
How am I formed?

Names of Rock



How am I formed?

Names of Rock



How am I formed?

Names of Rock

Minerals: The Building Blocks of Rocks

Use your textbook to help you fill in the blanks.

What is a mineral?

1. Many common substances found on Earth are made up of _____.
2. Minerals are natural, nonliving substances that make up _____.
3. Each mineral has its own chemical makeup. They are made of the same _____.
4. Different minerals have different types of _____ shapes, which are often shaped like cubes and hexagons.
5. Only about 30 minerals are common in rocks. They are called _____.

How are minerals identified?

Luster

6. Some minerals are shiny while other minerals may be dull. Luster describes _____.

Cleavage

7. The way a mineral _____ is called cleavage.

Streak

8. Quartz can be white, pink, or purple, and the powder left when it is scratched is called _____.

How can hardness be used to identify minerals?

9. The _____ shows the hardness of some common minerals. Hardness is a property of minerals.
10. _____ is the hardest mineral, and talc is the softest.

What are minerals used for?

11. Minerals are used to make _____

12. Rocks that are mined because they contain useful substances are called _____.
13. Diamonds, rubies, and emeralds are some _____ that are removed from Earth's crust.

Summarize the Main Idea

14. What properties do scientists use to identify minerals?

Minerals: The Building Blocks of Rocks

- | | | |
|-------------|-------------|--------------------------|
| a. minerals | d. luster | g. elements |
| b. cleavage | e. crystals | h. gems |
| c. ores | f. streak | i. rock-forming minerals |

Match the correct letter with the description.

- _____ The natural nonliving substances that makes up rocks
- _____ What minerals are made up of
- _____ Shapes of minerals made by the way their atoms are arranged
- _____ Found in common rocks
- _____ Describes the way light reflects off the surface of a mineral
- _____ The property that describes the way minerals split
- _____ Identifies the mineral by the color of the powder left behind when it is scratched across a plate
- _____ Rocks that are mined because they contain useful substances
- _____ Minerals prized for their beauty

Minerals: The Building Blocks of Rocks

ores	properties	salt	crystal
soft	atoms	minerals	hexagons
common	textures	hardness	reflects

Fill in the blanks.

No matter where you go in the world, minerals are everywhere. Table _____ is a mineral as is the graphite in your pencil.

Scientists have identified about 3,000 different kinds of minerals.

Rocks are made of _____. About 30 of them make up most _____ rocks. Rocks come in many shapes, colors, and _____.

Minerals can be _____ or gems. Minerals have a certain _____ shape. Some are shaped like cubes or _____. The shape of the mineral comes from the way its _____ are arranged.

Scientists identify minerals by their _____. Luster is one property. It identifies the way light _____. off a mineral. Some minerals are hard while others are _____. The Mohs hardness scale can be used to identify the _____ of minerals.

Igneous Rocks

Use your textbook to help you fill in the blanks.

How are igneous rocks formed?

1. The layer of melted rock below Earth's crust is called _____.
2. Magma that reaches Earth's surface is called _____.
3. When melted rock cools and hardens, it forms _____.
4. Igneous rocks are classified according to the way they are _____.
5. When melted rock cools and hardens _____, an intrusive igneous rock is formed.
6. Because magma cools very slowly below Earth's surface, _____ mineral crystals are formed.
7. When melted rock cools and hardens _____, an extrusive igneous rock is formed.
8. Because lava cools rather _____ above Earth's surface, the crystals in extrusive igneous rock are usually small.

What are the properties of some igneous rocks?

9. The properties of an igneous rock depend upon the way it is formed and the _____ that make it up.
10. The _____ of the mineral crystals within a rock gives a rock its texture.
11. Large mineral crystals give granite its _____ texture.
12. Granite's many colors come from the variety of _____ that make it up.

Outline

Name _____ Date _____

13. The tiny holes in pumice are caused by _____ that escape as lava cools.
14. Because of the way it forms, pumice is very light and often _____.
15. The lava that forms obsidian can cool in just a few _____.
16. Obsidian looks like shiny black _____.

What are some uses of igneous rocks?

17. Because of its hardness, _____ makes a strong and long-lasting building material.
18. The rough texture of _____ makes it a good substance to scrub off dirt.

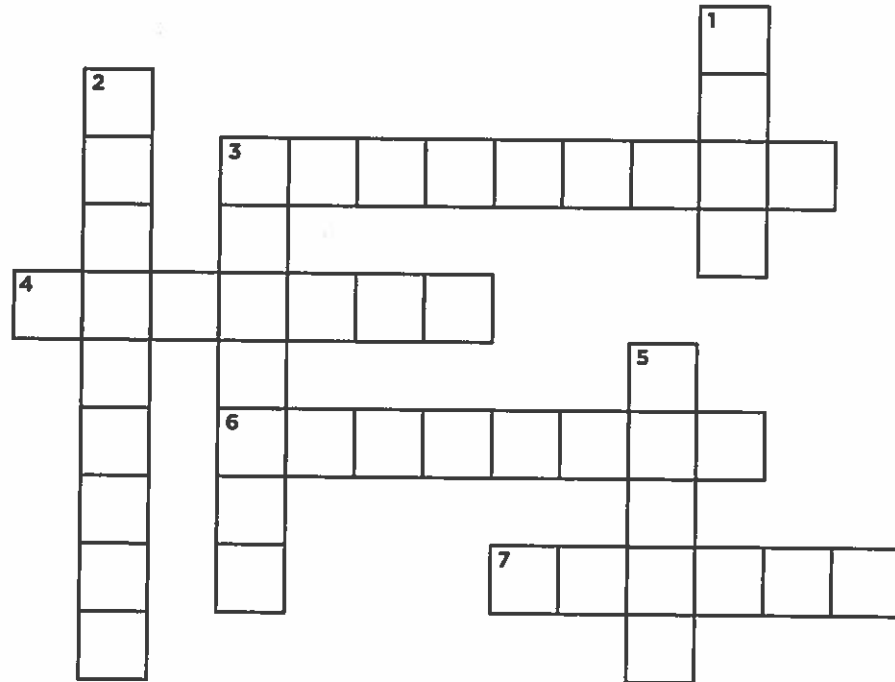
Summarize the Main Idea

19. The properties of igneous rocks depend on what two factors?

Igneous Rocks

Complete the crossword puzzle using words from the lesson.

- extrusive
- granite
- igneous
- intrusive
- lava
- magma
- obsidian
- pumice



Across

- 3. Igneous rocks formed below Earth's surface

- 4. A hard igneous rock used in buildings _____
- 6. A shiny black rock

- 7. A lightweight igneous rock that is full of tiny holes

Down

- 1. Melted rock _____
- 2. Igneous rocks formed above Earth's surface _____
- 3. The rocks formed when melted rock cools and hardens.
_____ rocks
- 5. Melted rock below Earth's surface _____

Igneous Rocks

Use your textbook to help you fill in the blanks.

A layer of melted rock lies beneath Earth's crust. When this melted rock, called _____, cools and hardens, it becomes _____ rock. Sometimes it remains _____ Earth's surface and hardens slowly over hundreds or thousands of years.

As it slowly cools, large mineral _____ form within it. The rock that results is called _____ igneous rock. An example of this kind of rock is _____, which has a coarse texture from the large crystals it contains.

When melted rock reaches Earth's surface, it is called _____. Once above the surface of Earth, it cools rapidly. Only small mineral crystals have time to form before it _____.

The rocks that form from the cooled lava are called _____ igneous rocks. One example of extrusive igneous rock is _____, which is full of tiny holes from the gas bubbles that were in the lava when it hardened. Another is _____, which has a shiny, glass-like texture.

Every year, for about a month, Sisir Mondal travels across the globe to places like India and South Africa. Sisir travels to those places to study rocks.

In the field, Sisir studies large layers of igneous rock. Sisir collects rock samples. He studies them closely to figure out their textures and what kinds of minerals the rocks contain. Based on his observations, he makes a geologic map of the area.

Back in the museum, Sisir takes a much closer look at the rock samples he collected. He uses microscopes and other tools to see what stories the rocks tell. Sisir wants to know why certain minerals are found in the rocks. He's particularly interested in finding rocks that contain metallic elements like chromium and platinum. Why are those metals important? People use them every day. Chromium is used to make many things including steel. Platinum is a precious metal, used in everything from jewelry to catalytic converters in cars.

Compare and Contrast

- Look for similarities and differences.
- Use your own experiences to apply to the situation.

Compare and Contrast

1. What is the same about the work Sisir does in the field and the work he does in the lab?

2. What is different about the work Sisir does in the field and the work he does in the lab?

Write About It

To explore the differences and similarities between Sisir's work in the field and in the museum, write two short journal entries on a separate piece of paper. Treat these entries like games of make-believe, and pretend that you actually are Sisir. Use words such as "I," "me," "my," and "mine" to make it seem as if Sisir were speaking. One entry will be written on the last day of your studies in the field in South Africa. The other entry will be written on your first day back to the museum to study the rocks you found. Each entry should be at least six sentences long and should have a natural flow.

Guidelines—What to write in the entry for South Africa:

- Start with a clear beginning, and discuss the type of day you have had in the field.
- Describe the texture and minerals of the igneous rocks you've found.
- Briefly describe the weather, sights, and sounds in the field.
- Summarize how different your work will be in the museum.

What to write in the entry for Sisir's return to the museum:

- Start with a clear beginning, and discuss whether or not you're glad to be back at the museum.
- Explain whether or not you enjoy working in the field or the museum. Do you enjoy both?
- Describe the atmosphere in the museum.
- Discuss what you accomplished in the museum today and why you couldn't accomplish those same things in the field.
- Sign off. Example: "I am tired from my trip, so I must get to bed. Good night."

Sedimentary Rocks

Use your textbook to help you fill in the blanks.

How are sedimentary rocks formed?

1. Rocks can be formed from tiny particles called _____.
2. _____ are rocks formed of layers of sediment pressed together.
3. Over a long period of time, the layers of sediment turn into _____.

How do layers of rock form?

4. Sediments can be picked up by _____.
5. Over time, new layers of sediment are dropped on top of _____.
6. The _____ of the top layers squeezes out the water and air from the lower layers.
7. _____ cement the sediments together forming the sedimentary rock.

What are the properties of some sedimentary rocks?

8. Limestone is usually white and forms _____.
9. Limestone contains _____.
10. The remains of plants and animals from millions of years ago are called _____.
11. Another type of sedimentary rock called _____ is made from sand and quartz cemented together.

12. _____ often cements red sandstone together.
13. A conglomerate rock is formed from _____ .
14. Conglomerate rocks _____ show distinct layers like other types of sedimentary rocks do.

What are some uses of sedimentary rocks?

15. Limestone is useful in the classroom as
_____ .
16. _____ coal is sedimentary rock.
17. Sedimentary rock often contains _____ that can show us what living things in the past looked like.

Summarize the Main Idea

18. What are the three different types of sedimentary rocks, and what are the differences among them?
- _____ .
- _____ .
- _____ .

Sedimentary Rocks

- | | | |
|-----------------|---------------------|--------------|
| a. conglomerate | d. limestone | g. sediments |
| b. fossils | e. sandstone | |
| c. iron oxide | f. sedimentary rock | |

Match the correct letter with the description.

1. _____ Tiny particles of rocks or minerals
2. _____ Remains of animals or plants from millions of years ago
3. _____ Rock made up of rounded pebbles, stones, or even boulders once carried by fast-flowing waters
4. _____ Bits of sand that had become cemented together
5. _____ The type of rock formed from sediments that become pressed together
6. _____ Rocks formed from the remains of once-living things on the bottom of the ocean
7. _____ Often the cementing material, stains the rock red

Sedimentary Rocks

conglomerate	iron oxide	moving water	sediment
fossils	limestone	sandstone	weight

Fill in the blanks.

Most sedimentary rocks are formed over a long period of time. _____, or tiny particles, is pressed together in layers to form a rock. Most often, these particles are carried by _____ and dropped off in a new place. The _____ of the top layer presses out the water and air from the lower layers to form the sedimentary rock. _____ is formed on the bottom of the ocean. Plant and animal remains, called _____, help create the layers of limestone. _____ is another type of sedimentary rock made up of bits of sand cemented together. Sometimes _____ stains the rocks red. Another type of sedimentary rock is a _____, which is formed from larger sediments lumped together.

Metamorphic Rocks

Use your textbook to help you fill in the blanks.

How are metamorphic rocks formed?

1. Heat and pressure can cause the physical _____ and mineral contents of rocks to change.
2. Extreme heat and pressure cause _____ to form deep inside Earth.
3. Examples of metamorphic rocks are _____ and slate.

What are properties of some metamorphic rocks?

4. The amount of heat and pressure a metamorphic rock undergoes determines its _____.
5. Gneiss has mineral layers called bands and its texture is _____.
6. A metamorphic rock with a medium texture is _____.
7. The texture of marble depends on the size of the _____ inside it.
8. Slate feels _____ because it contains small crystals.

What are some uses of metamorphic rocks?

9. Statues and buildings can be made from _____.
10. _____ can be created from the rock lapis lazuli.

11. Small chunks of metamorphic rocks can be found in _____ .
12. _____ is a metamorphic rock found deep inside Earth. It is used as a fuel.

How can you be a rock detective?

13. To identify a rock, geologists examine physical properties, crystal size, layers, and _____ .
14. A(n) _____ might contain a fossil.
15. An igneous rock looks smooth and might _____ when held in the light.
16. A metamorphic rock will have certain minerals and _____ .

What is the rock cycle?

17. The _____ occurs when a rock changes from one form to another.

Summarize the Main Idea

18. How is a metamorphic rock created?

Metamorphic Rocks

anthracite	lapis lazuli	metamorphic	rock cycle
igneous	marble	quartzite	sedimentary

Fill in the blanks with the correct vocabulary word. Then use the clues to solve the message.

1. I am a rock used in statues.
5

2. I am a rock found deep in Earth and used as fuel.

11

3. I am a type of rock that may contain fossils.

1 2

4. I am a smooth and shiny rock.
6

5. I am the process by which rocks change from one form to another.

7 8

6. I am a rock with a medium texture, and I am used in swimming pools and ceramics.
4

7. I am a rock used in jewelry.

9 10

Use the numbered letters from your vocabulary words to solve the message below.

Extreme heat and pressure can cause rocks to become

t
5 1 9 2 7 4 10 11 6 8

Metamorphic Rocks

clues

gneiss

physical

colored bands

igneous

properties

crystals

metamorphic rocks

texture

Fill in the blanks.

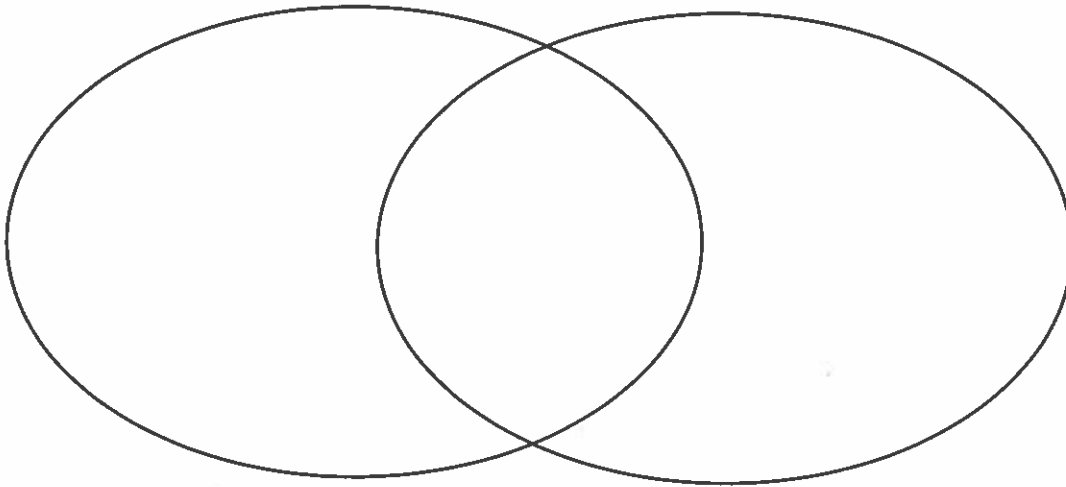
The extreme heat and pressure within Earth squeezes rocks together. This causes the _____ properties of rocks to change. _____ are formed deep inside Earth. Metamorphic rocks can be made from _____, sedimentary, or other metamorphic rocks. For example, traces of the igneous rock granite can be found in the metamorphic rock _____. The physical _____ of metamorphic rocks are different. The minerals and _____ in metamorphic rocks determine their _____ and appearance. A geologist can classify a rock by looking for _____. One clue to help identify metamorphic rocks are _____. Because of their useful properties, metamorphic rocks are used to make items such as tile, jewelry, statues, and even gravel.

**Write About It**

Compare two things made from rocks. Use words that tell about likenesses, such as “both,” “like,” and “too.” Use words that tell about differences, such as “but” and “unlike.”

Getting Ideas

Select two different things made of rocks. Write the name of each thing above each circle below. In the outer part of each circle, tell how it is different. In the part that overlaps, tell how they are the same.

**Planning and Organizing**

On her trip to the Children’s Museum, Kirsten learned that the little balls in the game “marbles” are made from marble, obsidian, and other rocks. She wants to compare and contrast the two types. Here are two sentences that she wrote. Write **Compare** by each sentence that tells how they are alike. Write **Contrast** by each sentence that tells how they are different.

1. The ones made from marble were pink or red or yellow, but the ones from obsidian were dark green or black. _____
2. Both marble and obsidian are igneous rocks. _____

Write three sentences comparing and contrasting your two objects made from rocks.

1. _____

2. _____

3. _____

Drafting

Write your own sentence to begin your comparison. It should tell your topic and your main idea.

Now write to compare and contrast two things made of rock. Use a separate piece of paper. Arrange your sentences in a way that makes sense. Remember to use words that tell about likenesses and differences.

Revising and Proofreading

Here are some sentences Kirsten wrote. Proofread them. Find five grammar errors she made and correct them.

Both sets of marble was beautiful, but I likes the obsidian ones more. They was so bright and shiny. They has such a rich, dark color. I couldn't wait to shot them.

Now revise and proofread your writing. Ask yourself:

- Have I used words that show likeness and words that show difference?
- Have I corrected all grammar errors?
- Have I corrected all spelling, punctuation, and capitalization errors?

Rocks and Minerals

Choose the letter of the best answer.

- The way a mineral splits is called
 - cleavage.
 - hardness.
 - luster.
 - streak.
- The rock cycle is the process by which rocks
 - are identified.
 - change into gems.
 - change into their final form.
 - change from one form to another.
- Melted rock beneath Earth's surface is called
 - lava.
 - magma.
 - ore.
 - sedimentary.
- How is a streak formed?
 - A light is shined on a streak plate.
 - A mineral is rubbed across a streak plate.
 - A mineral is scratched by a diamond.
 - A mineral is split.
- Once melted rock reaches Earth's surface, it is called
 - lava.
 - magma.
 - a mineral.
 - ore.
- The way light reflects off the surface of a mineral is called
 - cleavage.
 - hardness.
 - luster.
 - streak.
- Which type of rock is formed when melted rock cools near Earth's crust?
 - igneous
 - magma
 - metamorphic
 - sedimentary

Choose the letter of the best answer.

8. Intense heat and pressure deep beneath Earth's surface can cause some rocks to change into
- a. igneous rock. c. metamorphic rock.
b. sedimentary rock. d. obsidian.
9. Layers of tiny particles are compressed over time to form
- a. igneous rock. c. metamorphic rock.
b. magma. d. sedimentary rock.
10. The building blocks of rocks are
- a. gems. c. minerals.
b. ores. d. sedimentary rocks.
11. A mineral that can scratch another mineral has a greater
- a. cleavage. b. hardness. c. luster. d. streak.
12. Tiny particles of rocks, minerals, plants, or other animal materials are called
- a. fossils. b. gems. c. ores. d. sediments.
13. Bauxite is considered an ore because
- a. it is rare. c. it is a useful mineral that is mined.
b. it is a gem. d. it is the hardest mineral.
14. Mohs hardness scale is used to
- a. compare the luster of different minerals.
b. determine the hardness of a mineral.
c. measure the cleavage of a mineral.
d. weigh minerals.