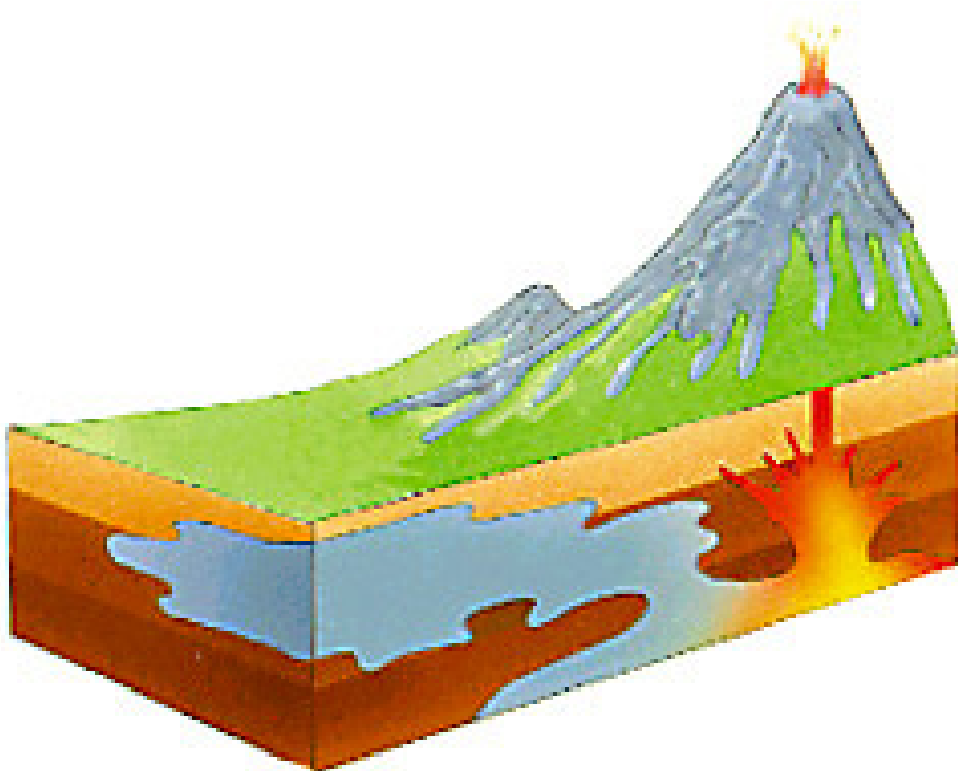


Volcanoes and Earthquakes

Academic Content Standards

- Learn that volcanic activity produces a variety of products.
- Learn how igneous rocks form, as well as the characteristics of granite and basalt.
- Understand how volcanic activity influences our lives.
- Comprehend the causes of earthquakes and how to react when an earthquake occurs.



Name: _____

Student Number: _____

Homeroom: _____



What is a volcano?



Write and/or draw pictures to show what you already know about this question.



Use soft clay and other materials to make a place on Earth that has a volcano. The volcano will be an empty Yakult bottle. When you have finished making your land in a tray, half fill the Yakult bottle with vinegar. Add a few drops of red food coloring. Quickly add a teaspoon of baking soda.



Take notes of what you saw. Draw pictures to help show your observations.

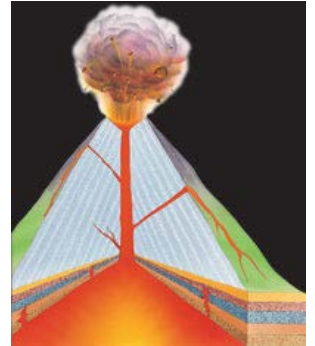
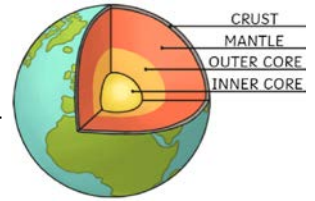


Share Your Results.

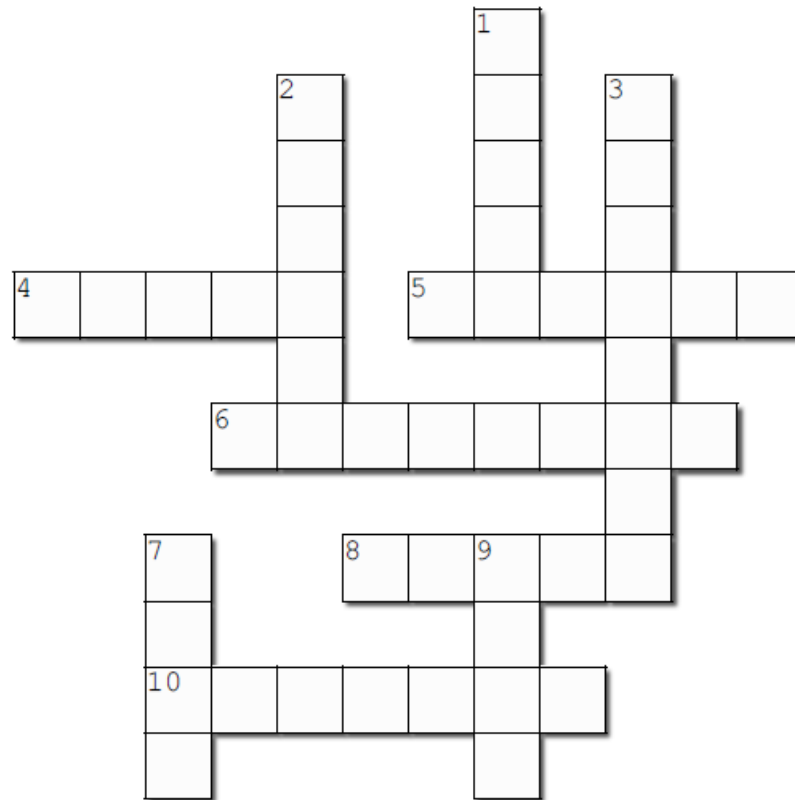
Discuss your ideas and findings with your classmates. Were there any interesting observations?



Below the hard, rocky crust of the Earth is the mantle. This is hot, liquid rock that moves all the time. This liquid rock is called magma. Some parts of the crust are weak and has cracks. Volcanoes are made when the magma rises through the cracks to the Earth's surface and hardens into a cone shape that has a hole at the top. This hole is called a crater. Once the magma explodes out the top of the hole, it is called lava. The lava pours down the sides of the volcano. Rocks, thick clouds of ash, and gas also explode out. The lava is so hot that it destroys everything it touches. When a volcano explodes, it is called an eruption.



Use the information above to complete the crossword.



Across

- 4. The outside of the Earth is called the Earth's ____.
- 5. The layer that is under the Earth's crust.
- 6. A volcano exploding is called an ____.
- 8. These can also fly out during an eruption.
- 10. Looks similar to a mountain, but it can erupt.

Down

- 1. Hot, liquid rock.
- 2. The hole at the top of a volcano.
- 3. Lava ____ everything it touches.
- 7. Magma becomes this when it explodes out of a volcano.
- 9. The shape of many volcanoes.



What is a volcano?



Why do volcanoes erupt?



Write and/or draw pictures to show what you already know about these questions.



Fill a large transparent container with cold water. Fill a smaller glass bottle with warm water and add a few drops of red food coloring. Gently lower the small glass bottle into the large container.



Take notes of what you saw. Draw pictures to help show your observations.



Share Your Results.

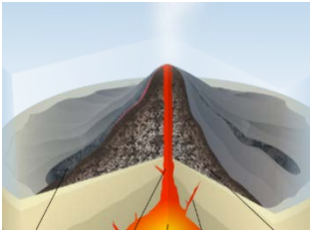
Discuss your ideas and findings with your classmates. Were there any interesting observations?



Have you ever shaken a can of soda and then opened it? What happened? It probably exploded all over you because of the pressure the bubbles of the gas made, which forced the drink out quickly. This is similar to why volcanoes erupt.



Magma is lighter than the rocks that surround it, so it moves upwards towards the Earth's surface. As the magma rises, bubbles form from the gases that are inside the magma. The gas bubbles build up pressure. When the pressure becomes too great, the magma rises to the top and is forced into the air as lava, causing the volcano to erupt.



In the activity that we did, it is also like underwater volcanoes. There are many underwater volcanoes under the sea because this is where the Earth's crust is thinnest and weakest. As lava erupts from these volcanoes, new islands are made from the lava as it cools down.

Unscramble the letters to make words. Can you explain what each word means?

1. etmanl

2. ncaovl

3. gamma

4. alav

5. trcrae

6. notrpuie

7. sah

8. rcsut

9. seeprrus

10. uelbbbs



Why do volcanoes erupt?



What are igneous rocks?



Write and/or draw pictures to show what you already know about this question.



1. Use a magnifying glass to observe some igneous rocks. Write information about the color, texture, and grain size in the chart below.
2. Try making your own igneous rock.



| Rock Samples | Information about the rock (color, texture, grain size, etc.) |
|--------------|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |



Share Your Results.

Discuss your ideas and findings with your classmates. Were there any interesting observations?



Lava is extremely hot and pours down the sides of volcanoes. Eventually, the lava starts to cool down and turns into rock. Sometimes magma hardens under the ground to make rocks too. The rocks that are made are called igneous rocks. "Igneous" means fiery.



Granite is a very hard igneous rock that is made under the ground. It has a bright color and has a large grain size. You can sometimes see granite sticking out of the ground. It is hard and strong and is often used to make buildings.



Basalt is an igneous rock that is made when lava cools down. It is a dark gray or black color and has a small grain size. If it cools down quickly, it can have a glassy look. It is also very hard and heavy and is often used to make roads.

Use the information above and the clues below to help you complete the wordsearch.

1. This pours down the sides of volcanoes.
2. Hot, liquid rock under the ground.
3. A type of rock that is made when lava or magma cools down.
4. "Igneous" means ____.
5. Lava needs to ____ down to make igneous rocks.
6. A hard igneous rock made under the ground.
7. A hard igneous rock made when lava cools down.
8. Granite is often used to make ____.
9. Basalt is often used to make ____.
10. When lava cools down quickly, basalt can look ____.
11. Granite is a ____ color.
12. Basalt is a ____ color.

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



What are igneous rocks?

What makes an earthquake?



Write and/or draw pictures to show what you already know about this question.



On a Styrofoam board, make a 3D city. Design roads, buildings, cars, etc. Stick these things onto the Styrofoam board. Then, slowly push the ends of the Styrofoam board together.

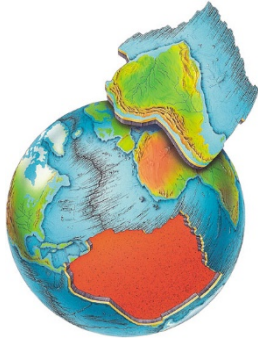


Take notes of what you saw. Draw pictures to help show your observations.



Share Your Results.

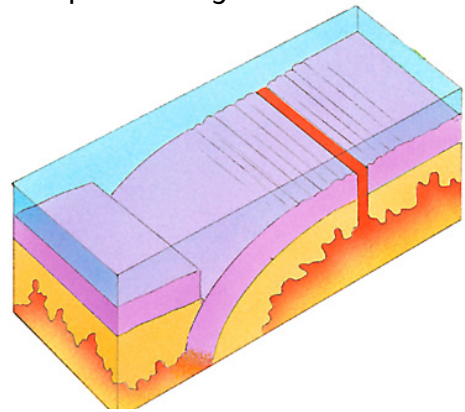
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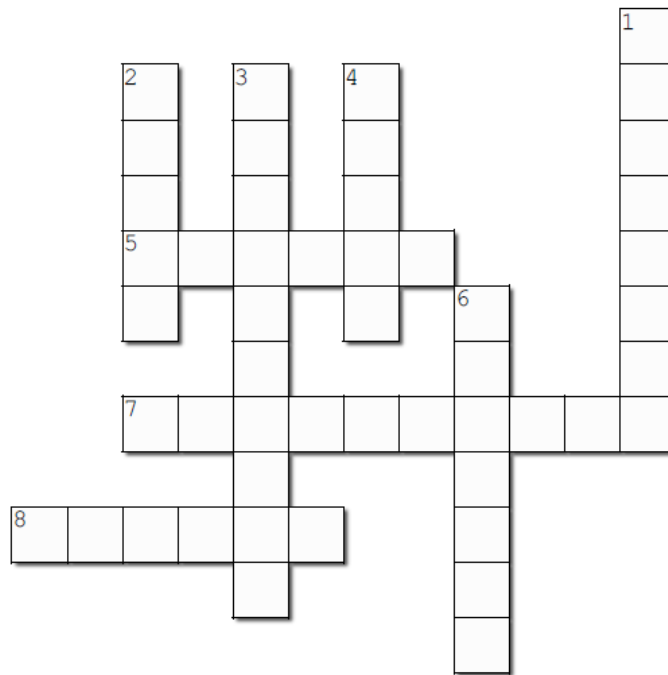
The Earth's crust is not one whole piece. It is made up of separate pieces that fit together like a jigsaw puzzle. These pieces are called plates. The area where the plates' edges meet each other is called the plate boundaries. The plates float on the mantle because the mantle has hot, liquid rock called magma.

The plates can move around on the mantle. When the plates push against each other, the rocks get squeezed so hard that they break or slip. The cracks that form is called a fault. This area becomes weak, and it is easier for them to keep breaking.

The plates always move, and a lot of pressure starts to build up at the faults and plate boundaries. If the rocks slip quickly at these places, the Earth shakes. This is called an earthquake.



Use the information above to complete the crossword.



Across

- 5. The plates float on this.
- 7. The shaking of the Earth.
- 8. The separate pieces that make up the Earth's crust.

Down

- 1. This starts to build up at the faults.
- 2. The mantle is made up of this.
- 3. These are the edges where the plates meet.
- 4. The cracks that are formed due to the plates pushing against each other.
- 6. Two plates ___ together so hard that they break.



What makes an earthquake?



What are the effects of an earthquake?



Write and/or draw pictures to show what you already know about this question.



1. Draw the grid shown on the bottom of a cardboard box. Each box in the grid should be 5cm x 5cm.
2. Make three 5-storey sugar cube buildings. Put each one in A1, B2, and C3. Tap D4 with the eraser end of a pencil. Keep doing this until at least 1 sugar cube falls from each building. Notice the order this happens.
3. Put 3 sugar cubes on 1 bouillon cube. Put it in A1. Put a bouillon cube on 3 sugar cubes. Put it in A3. Tap C2 until at least one cube falls down. Do this two to three times. Did one cube fall down more often?



Take notes of what you saw. Draw pictures to help show your observations.

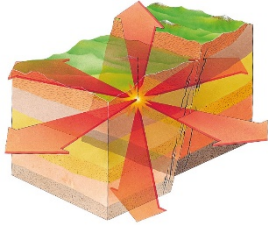
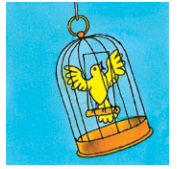


Share Your Results.

Discuss your ideas and findings with your classmates. Were there any interesting observations?



Most earthquakes are so weak that they can't be felt by people, but some can cause great damage. In weak earthquakes, hanging things will start to swing. Windows and dishes will start to rattle. Stronger earthquakes will crack walls and things will start to fall onto the ground. In very strong earthquakes, buildings and trees will fall down.



The point where energy is suddenly released is called the focus. The point on the Earth's surface above the focus is called the epicenter. Vibrations called seismic waves travel in all directions from the focus.



Use what you have learnt about earthquakes to find the answers.

1. The shaking of the Earth.
2. Strong earthquakes can cause a lot of ____.
3. This rattles in weak earthquakes.
4. These break in strong earthquakes.
5. These fall down in very strong earthquakes.
6. The point where energy is suddenly released.
7. The point on the Earth's surface above the focus.
8. Vibrations caused by earthquakes are called ____ waves.
9. The separate pieces of the Earth.
10. The cracks that form when the plates push against each other.

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



What are the effects of an earthquake?



What should you do in a strong earthquake?



Write and/or draw pictures to show what you already know about this question.



Japan has many earthquakes. Our school has regular earthquake drills to teach you how to stay safe.



Make a poster that tells people what they should do in a strong earthquake.



Plan your poster below. Get it approved by your teacher so that you can make a good copy to display in the classroom.



Share Your Ideas.

Discuss your ideas and findings with your classmates.

Main Ideas – Review Questions



After completing this unit, you should be able to answer these questions. Write your answers in complete sentences.

1) What is a volcano?

2) Why do volcanoes erupt?

3) What are igneous rocks?

4) What makes an earthquake?

5) What are the effects of earthquakes?

6) How can you stay safe during a big earthquake?
