Name: _____ Class: _____

Why do volcanoes erupt?

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Volcanic eruptions are amazing events in nature, but what causes a volcano to erupt? In this information text, Heather Handley provides valuable information on volcanoes. As you read, take notes on the details provided about magma.

[1] The rock inside the planet we live on can melt to form molten[1] rock called magma. This magma is lighter than the rocks around it and so it rises upwards. Where the magma eventually reaches the surface we get an eruption and volcanoes form.

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The top part of the Earth is made up of a number of hard pieces called tectonic plates. Magma and volcanoes often form where the plates are pulled apart or pushed together but we also find some volcanoes in the middle of tectonic plates.

Volcanoes have many different shapes and sizes, some look like steep mountains (stratovolcanoes), others look like bumps (shield volcanoes) and some are flat with a hole (a crater or caldera) in the centre that is often filled with water.

The shape of the volcano and how explosively it erupts depend largely on how "sticky" and how "fizzy" (how much gas) the magma is that is erupted.

[5] For example, if you try to blow bubbles in cooking oil through a straw, the bubbles can escape quite easily because the cooking oil is runny.

If you try to blow bubbles in jam or peanut butter you would find it very difficult because the jam and peanut butter are very sticky, they wouldn't move much at all if you tried to pour them out of the jar.

It is the same with volcanoes. When magma rises towards the surface gas bubbles start to form. Whether or not they can escape as the magma is rising affects how explosive the eruption will be.

Where the magma is runny like cooking oil and doesn't have much bubbly gas mixed in it, such as places like Hawaii, then we see lots of slow-moving lava flows and shield volcanoes. Lava is what we call magma when it reaches the surface.

1. turned to liquid by heat

However, where the magma is very sticky, like jam or peanut butter, and if it contains a lot of bubbly gas then the gas can get stuck and eruptions can be very powerful and explosive, like the recent eruptions at Fuego volcano in Guatemala.

Damage caused by eruptions

[10] In explosive eruptions the frothy, bubbly magma can be ripped apart into tiny bits called volcanic ash. This is not ash like you get after a barbecue or fire, it does not crumble away in your fingers. It is very sharp and is dangerous to breathe in.

Some explosive volcanoes can send ash high up into the sky and it can travel around the world over different countries. If aeroplanes travel through an ash cloud from a volcano it can cause a lot of damage to the engine.

Other explosive eruptions create fast-moving, hot clouds of volcanic ash, gas and rocks that travel down the sides of the volcanoes and destroy pretty much everything in their path.

The benefits of volcanoes

Despite the great damage they can cause, volcanoes also help us to live. Volcanic ash provides food for the soil around volcanoes which helps us grow plants to eat. The heat from some volcanoes is used to make energy to power lights, fridges, televisions and computers in people's houses.

Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which sentence describes the central idea of the text?
    A. Volcanoes are the most destructive forces in nature and do little good for people, plants, or animals.
    B. How large a volcanic eruption will be depends on the strength of the volcano's exterior and whether it can keep the lava in.
    C. Volcanoes can vary in their shape and erupt in different ways which can be dangerous yet beneficial to humans.
    D. Volcanic eruptions have a bad reputation for hurting people and causing damage, but the number of deaths caused by volcanoes is very small.

2. PART B: Which TWO details from the text best support the answer to Part A?
    A. "The rock inside the planet we live on can melt to form molten rock called magma. This magma is lighter than the rocks around it and so it rises upwards." (Paragraph 1)
    B. "Magma and volcanoes often form where the plates are pulled apart or pushed together but we also find some volcanoes in the middle of tectonic plates." (Paragraph 2)
    C. "Volcanoes have many different shapes and sizes, some look like steep mountains (stratovolcanoes), others look like bumps (shield volcanoes)..." (Paragraph 3)
    D. "For example, if you try to blow bubbles in cooking oil through a straw, the bubbles can escape quite easily because the cooking oil is runny." (Paragraph 5)
    E. "If you try to blow bubbles in jam or peanut butter you would find it very difficult because the jam and peanut butter are very sticky, they wouldn't move much at all if you tried to pour them out of the jar." (Paragraph 6)
    F. "Despite the great damage they can cause, volcanoes also help us to live. Volcanic ash provides food for the soil around volcanoes which helps us grow plants to eat." (Paragraph 13)

3. How does the section "Damage caused by eruptions" contribute to central idea of the text (Paragraphs 10-12)?
    A. It emphasizes how good ash is for the environment.
    B. It warns people that ash from eruptions can be deadly.
    C. It stresses how powerful volcanic eruptions can be.
    D. It suggests that it's impossible to escape a volcanic eruption.

4. How does the author's comparisons of magma to other substances contribute to the text?
    A. They help readers understand the different consistencies of magma.
    B. They suggest that magma isn't as dangerous as most people believe.
    C. They show how the consistency of magma can't be easily described.
    D. They help readers imagine what it would be like to touch magma.

5. What connection does the author draw between magma and volcanoes?

Discussion Questions

Directions: Brainstorm your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.

1. In the text, the author discusses how volcanic eruptions are dangerous, but also important to life. What are other events in nature that are dangerous but serve an important purpose?

2. How could the information provided in the text about different types of volcanoes and different eruptions help people that live nearby volcanoes? How might this knowledge help them prepare for an eruption?