

Volcanoes

What is a Volcano?

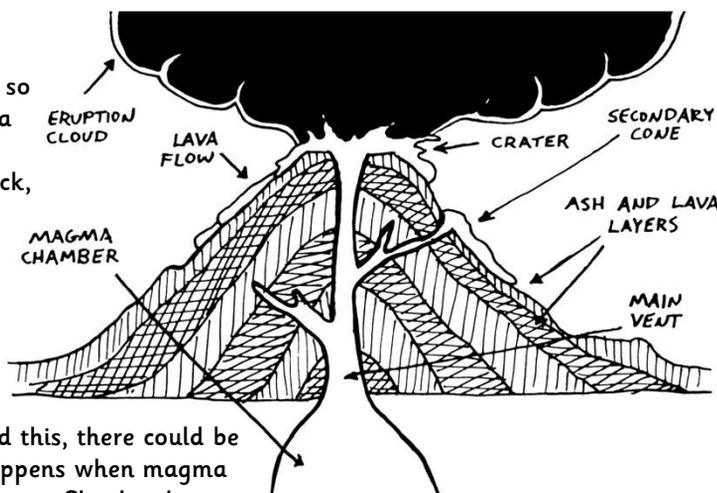
A volcano is an opening on the Earth's surface, where liquid rock shoots out from under the ground. They can appear as cone-shaped mountains or as wide sloping hills, some even occur under the sea. Volcanoes have helped to shape much of the Earth's surface.

Why do they happen?

Is the ground beneath your feet solid? You would think so wouldn't you! However, the surface of the Earth is like a giant 3D jigsaw puzzle. These enormous puzzle pieces, known as tectonic plates, fit together tightly. Melted rock, called magma, forms under this layer and when a gap appears between the pieces (plates) the magma is able to bubble up through the gap, as a volcano.

Why do volcanoes erupt?

There are 500 active volcanoes around the world and about 60 of these will erupt each year. Even as you read this, there could be at least 10 volcanoes blowing their top! An eruption happens when magma collects inside the magma chamber, deep below the volcano. Slowly, the pressure builds up and the magma rises up the crater pipe to the surface. Eventually it gushes upwards, forcing its way out. Once magma has escaped the volcano, it is called lava.



Did you know that not all volcanoes are the same?

What kind they are, depends on how they erupt! Shield volcanoes produce a hot, runny lava, which flows from the volcano's vents. The lava spreads over a wide area, helping to create a gently sloping volcano. When a cinder cone volcano erupts, hot ash, lava and rocks shoot high into the air, creating tall, steep slopes with a crater on the top. A stratovolcano is made by big, blasting explosions. Lava, rock and ash explode out of the volcano, coating the sides of the mountain.

So what makes a volcano so deadly?

Lava flows – These are extremely dangerous. They can knock down buildings, bury objects and set light to things. However, most lava flows travel slower than walking pace, so people and animals have a good chance of escaping.

Ash – This can be deadly. It feels like finely crushed glass, and is often scorching hot. This settles over large areas, making it difficult for people and animals to breathe.

Gas – Dangerous gases get blasted out of an erupting volcano, creating a poisonous environment.

Lahars – These devastating mudflows are caused by hot volcanic materials mixing with water, snow or ice on volcanic slopes. They slide down the slopes, ripping houses and trees from the ground.

Pyroclastic flow – When large amounts of ash and gas explode out of the volcano, deadly pyroclastic flows can occur. Temperatures inside the flow can reach hundreds of degrees Celsius. These deadly flows of boiling gas and ash, travel at terrifying speeds, destroying everything in their path.

Active, dormant or extinct?

An active volcano is one which is erupting now, or seems likely to erupt soon. Scientists say that an active volcano must have erupted during the last 10,000 years. A dormant volcano could be described as sleeping, because it is still active, but not erupting at the moment. If a volcano has not erupted during the last 10,000 years, then it can be called extinct, however experts can't be completely sure that it will never erupt again!

How deadly can a volcano be?

It is possible for just one volcano to have a big impact on the Earth and its climate. The eruption of Tambora, a volcano in Indonesia, is a good example of this. In April 1815, Tambora erupted. The ash column from Tambora reached a height of 43 kilometres. Wind helped to spread the ash and gases around the world. The following year, 1816, was known as 'the year without a summer'. The lack of sun and harsh conditions made it very difficult for crops to grow. Thousands of people died from lack of food or illness.



Can the power of an eruption be measured?

The power of an eruption is measured on the VEI scale. This stands for Volcanic Explosivity Index. Scientists measure the amount of material erupted from a volcano, and the height of the ash column. The VEI scale is made up of 8 stages in total, with stage 1 being a 'gentle' eruption and stage 8 being classed as a 'mega colossal' eruption! Scientists believe that a VEI 8 eruption happens once every 100,000 years. These are called super-eruptions! The last super-eruption happened over 74,000 years ago, when the eruption of Toba, in Indonesia, nearly ended all human life. So when and where will the next super-eruption happen? Yellowstone National Park in the USA may be next! It has seen three super-eruptions over the last two million years!

Can we predict when a volcano will erupt?



Scientists who study volcanoes are called volcanologists. They use special equipment to measure how much gas is building up inside a volcano. This can warn them that an eruption is about to happen. Scientists also measure vibrations in the ground, which occur just before an eruption. The study of old lava flows help provide evidence of how large past eruptions were, and how often they occurred. Scientists cannot prevent volcanoes from happening, but they can predict when a volcano might erupt and with what force, helping people to escape in time!

Can volcanoes help us?

Millions of people live near active volcanoes. They live with the constant threat of an eruption occurring at any time. However, there are many benefits to living close to a volcano. Volcanic soil is ideal for growing crops. The heat from the ground can also be used to power homes. Power stations pump water into the ground, allowing the hot rocks to heat it up. The hot water is used to heat homes, whilst the steam is used to generate electricity. This power source is used very successfully in Iceland. Volcanoes can also boost tourism in an area. The Roman city of Pompeii, buried during the eruption of Mount Vesuvius in AD 79, attracts 2.5 million tourists a year, providing lots of jobs for local people.



Did you know?

Lava erupts at temperatures of up to 1200°C.

About 60 million years ago, an underwater volcano poured out so much lava it made new land - we know this land as Iceland!

Volcanoes can even be found in space! Astronomers have discovered volcanoes on Venus and Mars.

Mount Etna in Italy is Europe's highest active volcano.

Glossary

climate	the weather conditions in an area over a long period of time
crater pipe	a tube connecting a magma chamber to the surface
generate	to produce or create
magma chamber	hollow space underground where magma collects
poisonous	a substance capable of causing illness or death
vent	openings in the Earth's surface that allows molten rock and gases to escape

Sue Chattoe

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Comprehension – Volcanoes – 3c – Tricky

Volcanoes

What is the surface of the Earth like? (AF2)

How many active volcanoes are there around the world? (AF2)

What is magma? (AF2)

Are all volcanoes the same? (AF3)

Why are lava flows dangerous? (AF2)

- A. They make the air poisonous.
- B. They make it hard to hard to breathe.
- C. They knock down buildings and set fire to things.

How did the volcano Tambora, manage to affect so much of the Earth? (AF3)

What is a VEI 8 eruption classed as? (AF2)

What is the purpose of a subheading? (AF4)

What is the name of a scientist who studies volcanoes? (AF2)

Identify two ways a volcano can help the people who live by them. (AF2)

Would you like to live by a volcano? Explain your answer. (AF6)

What is the purpose of a glossary? (AF4)

Volcanoes

What is the surface of the Earth like? (AF2) **The surface of the Earth is like a giant 3D Jigsaw puzzle.**

How many active volcanoes are there around the world? (AF2) **There are 500 active volcanoes around the world.**

What is magma? (AF2) **Magma is melted rock.**

Are all volcanoes the same? (AF3) **No, because they erupt in different ways and this tells us what type they are.**

Why are lava flows dangerous? (AF2)

- A. They make the air poisonous.
- B. They make it hard to hard to breathe.
- C. **They knock down buildings and set fire to things.**

How did the volcano Tambora, manage to affect so much of the Earth? (AF3) **Due to a combination of the height of the eruption (43km) and the winds helping to spread the ash and gas around the world.**

What is a VEI 8 eruption classed as? (AF2) **Mega colossal.**

What is the purpose of a subheading? (AF4) **A subheading tells you what the information below it is all about. They also help you to find the information you need quickly.**

What is the name of a scientist who studies volcanoes? (AF2) **A volcanologist.**

Identify two ways a volcano can help the people who live by them. (AF2) **The soil is good for growing crops. The hot ground can heat and power homes. Tourists bring money to the area.**

Would you like to live by a volcano? Explain your answer. (AF6) **Various answers. Encourage children to link answers to information they have read in the text.**

What is the purpose of a glossary? (AF4) **A glossary explains the meaning of tricky words.**