

# Volcanoes assignment



When a volcano throws UT material from within, it is erupting. The ways in which volcanoes erupt can vary widely. When some volcanoes erupt, they produce rivers of molten lava. When others erupt, they produce vast clouds of ash, and little or no lava. Some volcanoes produce a mixture Of both lava flows and ash. All eruptions also produce gases. Volcanic eruptions are extremely hazardous events. Anybody and anything near an erupting volcano faces serious dangers, such as being burnt by scalding lava, choked by clouds of ash and gas or hit by lumps of flying rock.

Erupting volcanoes also set of secondary hazards, such s fires, mudflows, landslides and tsunamis (giant waves at sea). This volcano is blasting molten rock from the ground, producing an orange lava fountain and lava flow. Over hundreds, thousands or millions of years, volcanoes build up and alter the landscape. Lava cools and turns solid, and ash builds up in layers, creating new rocks on the surface. This new rock forms can-shaped mountains and even whole mountain ranges. Volcanoes that erupt under sea build up islands and chains of islands.

Even though volcanoes are so dangerous, hundreds of millions of people around the world vive close to them and some large cities are located in danger areas for example Kobo. Why do so many people live near volcanoes? One of the main reasons is that the soil around volcanoes is very rich and good for agriculture. Another is that shortage of space means that many people have no choice over where they live. And many cities were founded before people understood the real dangers of volcanoes. Some people think disasters happen only to the other people; they ignore the dangers and get on with life.

Japanese farmers work in fields of volcanic soil close to the dormant Mount Fuji. Paleontologists categorize volcanoes as active, dormant or extinct. An active volcano is one that is erupting today or that we know has erupted in the last 10, 000 years. A dormant volcano is an active volcano that is not erupting at the moment. An extinct volcano is a dead volcano that experts believe will never erupt again. Why volcanoes erupt Volcanoes occur where molten rock from many kilometers under the Earth's surface forces its way out above the ground. When it is underground, the molten rock is known as magma.

It is lighter in weight than the rock around it, so it pushes up through the surrounding rock, like a beach ball floating up through water, finding the easiest route to the surface. When the magma reaches the surface, it either flows out as lava or breaks up and cools to form ash and small pieces of solid rock. Volcanoes form only in certain parts of the world. In many places there are no volcanoes at all. As have mentioned before the Earth is split up into plates and these collide to form volcanoes. This island volcano, called Knack Sauerkraut, emerged after an eruption in 1927.

It lies over a subduction zone in Indonesia. An older volcano, Sauerkraut, exploded here in 1883. What is magma? Magma is a mixture of minerals and gases such as water vapor and carbon dioxide. There are different types of magma, with different mixtures of minerals and gases. The magma that emerges at divergent boundaries is normally runny. As it reaches the surface, the gas it contains escapes easily and the minerals form lava flows. The magma that emerges at convergent boundaries is much thicker. Its gas

cannot escape so easily and it causes explosive eruptions that produce clouds of ash and rock.

These are the most dangerous volcanic events. Paleontologists classify volcanoes by their shape and the materials they are made from. A shield volcano is made of layers of solidified lava. It has gently sloping sides. A composite cone, or stratovolcano, is steep-sided and made up of layers of solidified lava and ash. The opening in any volcano, through which it erupts, is called the vent. There can also be a secondary event because the magma just wants to get out. A volcanic eruption creates many different hazards, from red-hot lava flows to deadly tsunamis waves at sea.

Some of these hazards affect only the area local to the volcano, but others cause damage hundreds of kilometers away. When the largest volcanoes, called 'supercargoes', erupt they can affect the whole planet. Mudflows  
Volcanic mudflows, called Lahars, happen when water mixes with volcanic ash. The water often comes from snow and ice melted by the heat of an eruption. Mudflows travel fast, when they stop they set hard, like concrete. Lava flows  
When lava erupts from a volcano it pours down the mountain's side until it cools and solidifies.

The flow can travel tens of kilometers from the volcano itself. Lava is often thrown into the air as it leaves a volcano's vent, forming lava fountains. Because of its intense heat, lava destroys everything in its path. However, it rarely kills people because lava normally flows at less than 1000°C. A  
pyroclastic flow is a piece of rock that is thrust into the air by a volcanic eruption. Pyroclastics are thrown upwards by gas released from magma as it reaches

the surface. There are several different kinds of portals. Ash is made up of tiny particles of rock.

It is formed when frothy magma blows apart and the pieces cool quickly in the air. Pumice is made up of grape-sized pieces of solidified lava, full of gas pockets. The largest portrayals are known as volcanic bombs. These are fist-sized or larger. Some land before they completely solidify and then break open, releasing lava. Volcanic bombs are a hazard within a few kilometers of an erupting volcano. Ash clouds Thick, gas-filled lava breaks up into ash as it leaves a volcano's vent. The gas blasts the ash upwards, forming a tall cloud called an eruption column.

The heat of the gas carries the ash further upwards, and eruption columns often reach over 15 kilometers in height. Ash can be carried for thousands of kilometers through the atmosphere. It blocks sunlight and causes imperative to fall. Where the ash falls back to the ground, it smothers everything, killing plants and crops, damaging machinery and buildings and making it difficult for people and animals to breathe. This is a photograph which shows how heavy volcanic ash can cause houses to collapse. Ash avalanches Ash clouds are often so heavy with portrayals that they cannot keep rising upwards.

Instead they collapse, forming avalanches of ash and gas that stream down the sides of the volcanoes. These avalanches are called parasitic flows. They move at speeds of up to 160 kip, and inside the flow he temperature can reach 600 degrees Celsius. A parasitic flow destroys everything it touches.

Anybody caught in a parasitic flow stands no chance of survival. Nevada Del Uric Nevada Del Uric is a volcano in Colombia, South America. In 1985, a

small eruption of Nevada Del Uric triggered massive mudflows that swept down the volcano's slopes and into the river valleys.

Communities along the rivers were destroyed, including the town of Rammer, which was completely wiped out along with 22, 000 of its inhabitants. Paleontologists predicted the eruption, but poor emergency planning and communications meant that there were no evacuations. This event was the worst volcanic disaster since the destruction of SST Pierre more than 80 years earlier. Nevada Del Uric is one of a line of extraneousness at the northern end of the Andes mountain range. The volcanoes are in a subjection zone where the NCAA tectonic plate slides under the South American plate.

Nevada Del Uric is 5, 400 meters high and has a permanent cap of snow and ice. Steep-sided river valleys carry water drained from its slopes. The town of Rammer lay on a flat plain, about 75 kilometers east of the volcano's summit. It was located next to the ROI Lugsails Canyon a few kilometers upstream. The city was a thriving centre for rice and cotton production, with a population of about 23, 000 people. We know about two other eruptions of Nevada Del Uric in the past – in 1585 and in 1845. Both caused mudflows in the river valleys. The 1 845 eruption killed more than 1 , 0HO people, many along the ROI Lugsails.

But people gradually forgot this disaster, and 50 years later the town of Rammer began to grow on top of the old, dried-out mudflows. This photograph shows the snow-capped summit of Nevada Del Uric, with steam erupting from the vent. First warnings The first signs that Nevada Del Uric

might erupt anew were several earthquakes and fountains of steam late in 1984. These continued throughout 1985 and gradually increased in power. In September 1985, scientists from the Colombian Institute of Geology and Mining, together with international experts, surveyed the volcano and set up instruments to monitor the eruption.

In October they completed a hazard map that showed the areas at risk from mudflows if the eruption worsened. Rammer would be hit. An emergency committee was formed. The scientists advised government officials and local authorities about the dangers of mudflows. The Civil Defense organization prepared for an eruption by gathering together emergency equipment, improving radio communications, talking to the public about the risks, and distributing advice leaflets. The eruption and mudflow In the evening of 13 November, the main eruption began.

Four parasitic flows moved across the mountaintop. Their heat melted snow and ice, releasing he amounts of water, which mixed with ash and flowed down into the river valleys. As the mudflows traveled they were swelled by river water and more falling debris. Some flows became 50 meters deep. Moving at up to 40 kip, they swept more than 100 kilometers from the volcano. Two hours after the eruption a mudflow poured from the end of the Lugsails Canyon into Rammer. The flow was equivalent to ten Olympic-sized swimming pool of mud every second.

It spread out on to the plains, becoming 2.5 kilometers wide in places. Mudflow effects Darkness and bad weather meant that by the time the scientists monitoring Nevada Del Uric realized what was happening, the mud

was well on its way to Rammer. The scientists raised the alarm as soon as they could. Warnings were roads on official radio channels, but few people were in bed when the liar hit the town. As the sticky mud poured into the streets, it was up to 6 meters deep. It flowed through some buildings, knocked down others, crushed cars and carried away the debris.

As the hours passed, more waves Of mud arrived. When the mud eventually stopped flowing it became almost solid, trapping everything In it. The first the sleeping inhabitants of Rammer knew about the liar was a rumbling noise and shouting in the streets. The town’s lights failed. Some people managed to run to high ground, but most ere caught by the mud. Only 2, 000 (less than one in ten) residents survived. Another 1 , 800 were killed by mudflows in the town of Cinchona on the western side of the mountain. Thousands more were injured.

Nevada Del Uric today Nevada Del Uric is still an active volcano and it could easily set off mudflows in the future. More than 50, 000 people live in the danger area, some in cities larger than Rammer. The volcano is now closely monitored, better emergency plans are in place and the public is better informed. Next time there is an eruption, a disaster should be avoided. Eruption predictions and protection Paleontologists work hard trying to understand why volcanoes erupt, studying what happens during eruptions and attempting to predict when volcanoes are going to come to life.

They use several techniques and many technical instruments to monitor volcanoes. Quakes and bulges A paleontologist’s most important weapon is seismology, which is the study of earthquakes. Small earthquakes show that



magma is moving underground, and eruptions are always preceded by hundreds of them. Earthquakes can be detected by instruments called seismometers. Paleontologists normally place overall of these around a volcano, which allows them to pinpoint where earthquakes come from. Paleontologists also monitor ground movements. If the ground bulges, it means that magma is pushing up from below.

Ground movements are measured using telemeters, and by checking the position of markers on the ground using lasers and the global positioning system (GAPS). Heat and gas Measuring temperature is another way of gauging volcanic activity. The temperature of the ground rises as magma approaches the surface. Paleontologists measure temperature with electronic thermometers and infra- red sensors. They also take samples of gases coming from a volcano's Vents. A high level of sulfur dioxide indicates that fresh magma is moving towards the surface.

Building a picture Remote sensing is another useful tool for paleontologists. From space, satellites can build up surface-temperature maps, photograph how clouds of ash and gas are spreading and use radar to make three-dimensional maps of volcanoes. Paleontologists can also get an idea of what the effects of an eruption might be by studying the deposits of ash and other debris from previous eruptions. These old deposits tell them how far mudflows and yardstick flows have reached in the past, and which areas are therefore most at risk in the future.

Protecting the public Careful disaster planning is as important as accurate prediction. Local officials, the emergency services and the general public all

need to know what action to take if paleontologists recommend an evacuation. In some places where cities are threatened by mudflows and parasitic flows, barriers and channels have been built to divert the flows. For example, the Indonesian city of Yogurts is protected from Lars from the volcano Mermaid by a series of mud-capturing dams called Saba dams.