

# Earthquakes & Volcanoes | Sample answer

## Case Study: Mount St Helens

Mount St Helens is a volcano located on a convergent plate boundary where the Pacific plate subducts under the North American plate. It is a part of the Pacific Ring of Fire. Volcanoes occur when two plates separate. Magma rises up to the surface where it cools and solidifies to form solid rock. This rock builds up in layers to form a volcanic mountain. Magma builds up in the magma chamber below the volcano. Gases and steam are also held at high pressure. The gases expand forcing the magma up until it is forced through a hole or crack. When a volcano erupts, broken rock including ash dust and pebbles are blasted into the sky. This is called pyroclastic material. When clouds of ash and gas travel downhill under gravity it is called a pyroclastic flow. Sometimes the ash and dust can get mixed up with rain or melted snow to form a lahar.

In 1980 Mt St Helens had a perfect cone shape and had not erupted in 200 years. A magnitude 4 earthquake occurred in March signalling the start of volcanic activity. Approximately 10000 mini earthquakes and small eruptions occurred regularly. A new crater formed which was 500m long and 100m deep. A large bulge formed which was 150m in height. A state of emergency was then declared.

In May a magnitude 5 earthquake broke the bulge causing one of the largest landslides ever recorded. This opened up the vent of the volcano releasing a cloud of gas and ash which rushed out sideways reaching speeds of up to 500km/h. A pyroclastic flow of gas, steam and ash went on for 10km. A plume of ash and steam went 25km into the air with some falling back in rain and the rest drifting across America in 3 days and the rest of the world in 15 days.

400m was lost of the south side of the mountain and 900m off the north. The river channel became clogged with mud and debris. 250km of road 27 bridges and 25km of railway was destroyed. 57 people were killed along with thousands of animals and fish. Forests close by were also destroyed.

The volcano is now a national monument and attracts many tourists each year. It is also the site of a laboratory which studies volcanic activity. Volcanic activity still occurs but on a much smaller scale. A new dome is building up again on the mountain.