Volcanoes and Earthquakes

Year: Three
Term: Summer

Prior knowledge for teachers

The children will now have knowledge of continents, oceans and the main countries and cities that are located in the continent of Europe. In this topic children will be moving on to study the physical processes of volcanoes and earthquakes. They will be retrieving key knowledge of rocks from the Year 3 science curriculum and will be applying this to the patterns and processes of volcanoes and earthquakes. Children will be exploring how land use and settlements in these active areas can change over time and understand the impact it can have on an area.

Key vocabulary

- **Aftershocks** - Earthquakes that follow the largest shock of an earthquake sequence.
- **Ash** – Volcanic ash is a mixture of rock, mineral, and glass particles expelled from a volcano during a volcanic eruption.
- **Crater** - A crater is a bowl-shaped depression, or hollowed-out area, produced by the impact of a meteorite, volcanic activity, or an explosion.
- **Crust** - The outermost layer of rock of which a planet consists, especially the part of the earth above the mantle.
- **Earthquake** - A sudden violent shaking of the ground, typically causing great destruction because of movements within the earth's crust or volcanic action.
- **Epicentre** - The point where an earthquake or an underground explosion originates.
- **Eruption** - A volcanic eruption is when lava and gas are released from a volcano—sometimes explosively.
- **Fault** - A crack in the Earth's crust.
- **Fertile -** ability of soil to sustain plant growth
- **Inner core** - This is the very centre of the Earth, and the hottest part of the planet.
- **Lava** -Hot, liquefied rock that flows from a volcano or other opening in the surface of Earth.
- **Lower mantle** - This approximately 56% of the Earth's total volume and is located 660–2900 km below the Earth's surface in between the transition zone and the outer core.

Key vocabulary continued

- **Magma –** Magma is molten rock that is found below the earth's surface.
- **Volcano** - A mountain or hill, typically conical, having a crater or vent through which lava, rock fragments, hot vapour, and gas are or have been erupted from the earth's crust.
- **Magnitude** - A number that characterises the size of an earthquake.
- **Mount Vesuvius** - Active volcano near Naples, Italy, famous for its eruption in 79 CE that destroyed the Roman cities of Pompeii.
- **Outer core** - This is a fluid layer that lies above Earth's solid inner core and below its mantle.
- **Pompeii** - Pompeii was an ancient Roman city near modern Naples in the Campania region of Italy. Pompeii was buried under 4 to 6 m of volcanic ash and pumice in the eruption of Mount Vesuvius in AD79.
- **Population** - The whole number of people living in a country, city, or area.
- **Richter scale** - Measures the magnitude of an earthquake (how powerful it is).
- **Settlement** - A place, typically one that has previously been uninhabited, where people establish a community.
- **Seismic waves** - Seismic waves are waves of energy that travel through the Earth's layers, and are a result of earthquakes, volcanic eruptions or magma movement.
- **Tectonic plates** - Slip on faults that define the plate boundaries commonly results in earthquakes.
- **Tremor** - The shaking of the surface of the Earth.
- **Upper mantle** - This begins just beneath the crust about 35 km and ends at the top of the lower mantle at 670 km.
- **Vent** - a small opening for the passage or escape of fumes, liquids, etc. the shaft of a volcano or an aperture in the earth's crust through which lava and gases erupt.

Year 3 – Volcanoes and Earthquakes

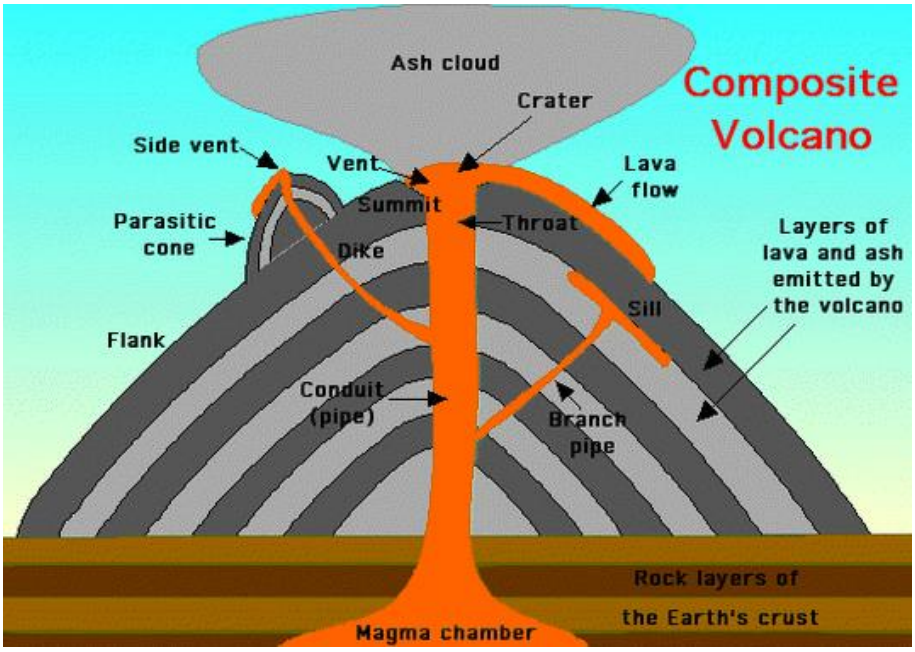
Geography - Know that geography is the study of places and the relationships between people and their environments

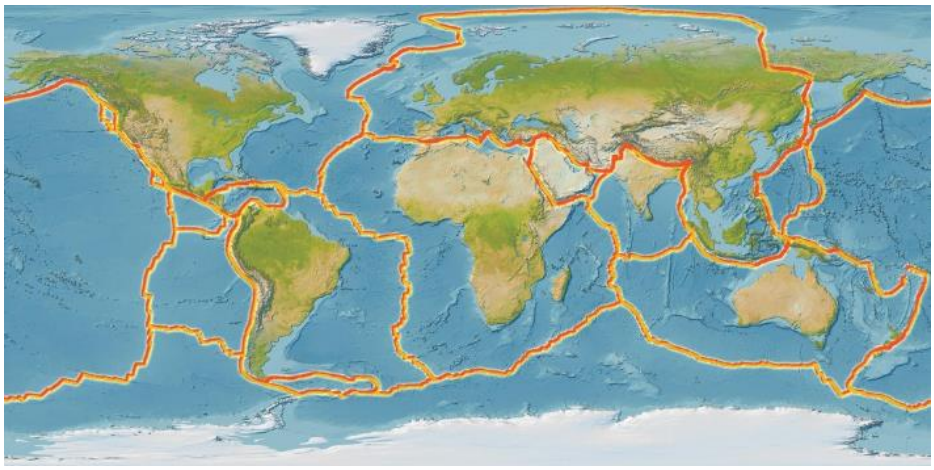
https://onedaycreative.com/workshop/earthquakes-volcanoes/

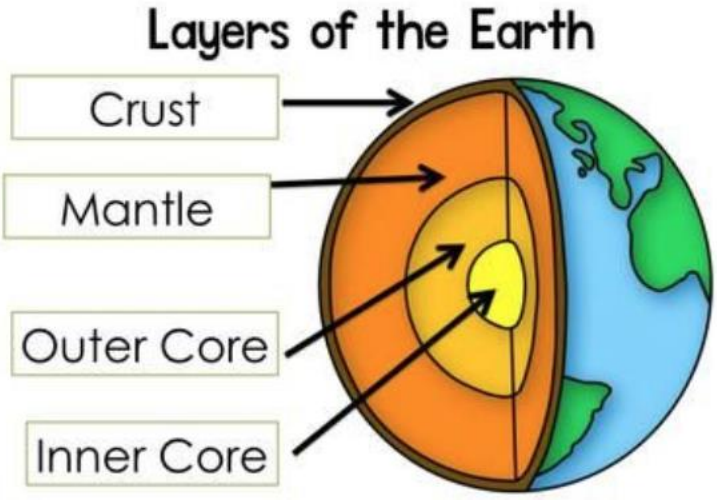
Question: What impact do volcanoes have on the people who live near them?

	Key geography knowledge	Key geography skills
Week 1 (Retrieval) **(retrieval from science curriculum)**	• Know that Europe is the northern hemisphere. • Know that there are many sites in Europe that have Signiant physical features. • **Know that there are three kinds of rocks: igneous, sedimentary and metamorphic** • **Know that the Earth has a solid crust made up of tectonic plates with molten rock beneath.** • **Know that granite and basalt are types of igneous rock and that igneous rocks form from molten rock below the Earth's crust** • **Know that marble and slate are types of metamorphic rock which form when rocks in Earth's crust get squashed and heated in processes such as when tectonic plates press against each other**	**<u>To locate places</u>** • I can locate Italy and the city of Pompeii and 'L'Aquila. **<u>To understand places and the geographical patterns and processes</u>** • I can describe and understand key aspects of physical geography: volcanoes, earthquakes and how these might have changed over time. • I can describe and understand key aspects of human geography: settlements and land use. **<u>To organise and communicate geographically</u>** • I can use age appropriate maps, atlases, globes and digital/computer mapping to locate countries and describe features studied. • I can ask and answer geographical questions about the physical and human characteristics of a location.
Week 2	**Structure of the earth** • Know the structure of the Earth - crust, mantle, outer core and inner core (see the diagram below) • Know that the crust is a layer of rock on the surface of the Earth • Know that the mantle forms about half of the inside of the Earth and is a layer of rock underneath the crust • Know that the upper mantle is hard but there is magma (liquid rock) beneath • Know that the core is mostly made of iron, which is in the centre of the Earth • Know that temperatures at the core can reach 5500°C • Know that the crust and upper mantle of the earth are divided into large tectonic plates that 'float' on the liquid rock beneath; this means they are able to move very slowly; often a few cm per year. (see diagram below)	
Week 3	**All about volcanoes** • Know that a fault is a crack in the surface of the Earth • Know that volcanoes form at the edges of tectonic plates where there are faults; magma – which is molten (hot liquid) rock bursts through the Earth's crust (becoming lava); this builds up in layers leading to a cone shape; some volcanoes are even tall enough to be classed as mountains; know that volcanoes are either classified as active – meaning that they have erupted recently – or dormant – meaning they have not erupted for a long time. (NB: there are different definitions of active and dormant depending on how 'recently' is defined; for example, the Smithsonian Global Volcanism Program defines a volcano as active only if it has erupted in the last 10,000 years.) • Know that volcanic eruptions can be deadly for people living near to active volcanoes, but that the soil around volcanoes is very fertile meaning that people live there to ensure that crops grow successfully on farms. • To know the risks and benefits of living next to a volcano –case studies.	

	https://www.bbc.co.uk/bitesize/topics/z849q6f/articles/zd9cxyc	
Week 4	**Structure of volcanoes** ● Know the basic structure of a volcano including and the associated vocabulary, including magma, lava, vent, crater, ash and flank	
Week 5	**Earthquakes** ● Know that tectonic plates move very slowly over time and that when they suddenly slip past each other, this causes earthquakes that can have devastating consequences for human life through destruction of buildings and tsunamis (extremely large series of waves) ● Know that the strength of earthquakes can be defined using the Richter scale ● Know that people have attempted to lessen the effects of earthquakes through the building of earthquake-proof buildings with foundations that absorb the shock of an earthquake, protecting the building from collapse. Italy, in the city of L'Aquila – earthquake proof houses. ● Give examples of earthquakes – and the affect they had on the area. How has it changed now?	
Week 6	**Case study** ● Know that Mount Vesuvius is an example of a volcano and that the eruption at Pompeii in the times of ancient Rome (79 AD) is a famous historical example; compare this to the 2018 eruption of Anak Krakatoa in Indonesia, the deadliest eruption of the 21st Century responsible for the deaths of 426 people. ● Is there any news around at the moment regarding volcanoes and earthquakes? ● **Question: What impact do volcanoes have on the people who live near them?**	


Composite Volcano
Ash cloud
Crater
Side vent
Vent
Lava flow
Summit
Parasitic cone
Throat
Dike
Layers of lava and ash emitted by the volcano
Sill
Flank
Conduit (pipe)
Branch pipe
Rock layers of the Earth's crust
Magma chamber




Layers of the Earth
Crust
Mantle
Outer Core
Inner Core