Portfields Primary School Medium Term Plan

Year Group – **4** Subject - **Geography** Topic – **Earthquakes and Volcanoes** Term – **Summer 1**

National Curriculum	Key Questions	Substantive Knowledge	Key Vocabulary	Real-Life Links
- Locate the world's countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human characteristics, countries, and major cities. - Identify the position and significance of latitude, longitude, equator, northern hemisphere, southern hemisphere, the Tropics of Cancer and Capricorn, Arctic and Antarctic Circle, the Prime/Greenwich Meridian and time zones (including day and night). - Describe and understand key aspects of physical geography, including climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle. - Describe and understand key aspects of human geography including types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water. - Use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied.	• **What is happening when the Earth shakes?** • **What is happening when the Earth rattles and rolls?** • **Does the Earth shake, rattle and roll all over?** • **How and why do people live where the Earth shakes, rattles and rolls?** • **How disastrous have recent earthquakes and/or volcanic eruptions been?**	Can give reasons why physical processes can cause hazards to people, e.g. flooding, earthquakes, etc. Can describe some advantages and disadvantages of living in hazard-prone areas (eg dangers of rivers and mountains). Can use simple geographical vocabulary to describe significant physical features and talk about how they change. Can describe a volcano, volcanic eruption and an earthquake (e.g. make a working model of a volcano, label its features and explain what happens when it erupts).	City State Country Continent Region Ocean River Stream Valley Mountain Hill Urban Rural Village Town Capital Earthquake Volcano Advantages Disadvantages	Earthquakes and volcanoes in the news. Any holidays to locations of volcanoes or earthquakes (e.g. Italy, Mount Vesuvius).

Technical Questions

How are earthquakes caused?

The tectonic plates are always slowly moving, but they get stuck at their edges due to friction. When the stress on the edge overcomes the friction, there is an earthquake that releases energy in waves that travel through the earth's crust and cause the shaking that we feel.

How does a volcano erupt?

The Earth's crust is made up of huge slabs called plates which fit together and sometimes move around. When these plates move and crash against each other, one of them is pushed down and slides underneath. This allows magma to squeeze between the plate and rise to the surface of the Earth, causing a volcano eruption.

Where are the world's most active earthquake and volcanic zone?

The Ring of Fire, also referred to as the Circum-Pacific Belt, is a path along the Pacific Ocean characterized by active volcanoes and frequent earthquakes. The majority of Earth's volcanoes and earthquakes take place along the Ring of Fire.
A string of 452 volcanoes stretches from the southern tip of South America, up along the coast of North America, across the Bering Strait, down through Japan, and into New Zealand.

What measures can be taken to make life safer in earthquake zones?

Protection involves constructing buildings so that they are safe to live in and will not collapse. Some examples of building improvements are:
Rubber shock absorbers in the foundations to absorb the earth tremors.
Steel frames that can sway during earth movements.
Open areas outside of the buildings where people can assemble during an evacuation.
Low cost methods, such as wire mesh retrofitting, are used in rural areas and developing countries. These are affordable and appropriate to the resources and people living there.
Lightweight roofs and safety glass designed to reduce damage and injury.

What are the associated issues of earthquakes and volcanic eruptions?

Earthquakes and volcanic eruptions can lead to loss of life, destruction of buildings, loss of jobs and businesses, and damage to transport networks, power, and water supply.

Where are some volcanoes located?

Along the ring of fire. Countries with volcanoes include; Guatemala, Tonga, Iceland, Costa Rica, Italy, Papau New Guinea

Orange papers

1. **Where do earthquakes usually occur?** Earthquakes mostly occur at or near tectonic plate boundaries. (Also accept Ring of Fire).
2. **What causes a volcano to erupt?** Tectonic plates rubbing together and moving.
3. **What is the Ring of Fire?** The Ring of Fire, also referred to as the Circum-Pacific Belt, is a path along the Pacific Ocean characterized by a string of 452 active volcanoes and frequent earthquakes.
4. **What are the advantages of living near a volcano?** The advantages are minerals, geothermal energy, fertile soils and tourism.

Disciplinary Knowledge

Can use an atlas to locate volcanoes and locations of earthquakes and describe the position of the Pacific Ocean, mountain chains, etc.

Technical Vocabulary	Fieldwork opportunities
Rock strata Core Mantle Crust Tectonic plate Plate boundary Tectonics Crater	This unit creates a good opportunity to introduce children to the main groups of rocks – sedimentary (e.g. sandstone and limestone), igneous (e.g. granite) and metamorphic (e.g. slate and schist). Discover which of

	5. **What is the Richter scale?** A measurement system used to measure the magnitude of an earthquake. 6. **What is the difference between magma and lava?** Magma is molten rock that is underground and lava is molten rock that breaks through the Earth's surface and comes out of the volcano. **7. Name a well-known volcano.** Accept any well-known volcano e.g. Mount Vesuvius, Mount Fugi, Cotopaxi, Popocatepetl etc. NB: If, after completing the orange paper assessment, you find a large amount of your pupils lack understanding of one particular star knowledge, you should adapt the flashback four questions for "Last Topic" in the next topic, in order to give you time to re-visit this. Please speak to the subject lead to discuss how to do this before editing the questions.	Can use appropriate vocabulary to describe the main land uses within urban areas and identify the key characteristics of rural areas (e.g. using Google Earth, atlases and images, research several major cities in North and South America and identify how they are different and similar). Can use the zoom function of a digital map to locate places (e.g. global rivers and mountain ranges, locations of earthquakes and volcanoes).	Cone Vent Eruption Lava Molten Ash plume Caldera Converge Diverge Active Dormant Extinct Tsunami Richter scale Magnitude	these are present in your local area and visit appropriate localities. Volcanic rocks are a subdivision of igneous. Pumice stone is one light and bubbly form of volcanic lava which you may have in your bathroom. A museum with a good geological display would be worth a visit to see a wider range. However, if you are in an area of former volcanic activity (e.g. the Lake District), with your local geology including volcanic rocks, you may have opportunities for fieldwork.

Lesson Breakdown

Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**
Learning Objective LO: To have an understanding of the causes, outcomes and location of earthquakes Success Criteria • I know what earthquakes are. • I know how earthquakes are caused. • I can describe the location of some earthquakes.	Learning Objective LO: To have some understanding of the causes, outcomes and locations of volcanoes Success Criteria • I know what volcanoes are. • I can describe what happens when a volcano erupts. • I can describe the location of some volcanoes.	Learning Objective LO: To understand the distribution of earthquakes and volcanoes Success Criteria • I know where the world's most active earthquake and volcanic zone is today • I can describe the distribution earthquakes and volcanoes. • I understand that volcanoes can be active, dormant and extinct. • I know about the 'Pacific Ring of Fire'.	Learning Objective LO: To discover why people live in the vicinity of volcanoes. Success Criteria • I know what measures can be taken to make life safer in earthquake zones. • I can describe examples where, and know the main reasons why, people live in the vicinity of volcanoes. • I know some of the hazards for people who live in earthquake and volcanic zones. • I can describe how some of these can be/have been overcome, and life made safer for people.	Learning Objective LO: To provide an opportunity to investigate recent earthquakes and volcanic eruptions. Success Criteria • I know the associated issues of earthquakes and volcanic eruptions. • I can talk about a recent example(s) of an earthquake and/or volcanic eruption.
Star knowledge Earthquakes occur at tectonic plate boundaries. They result from the release of pressure that builds up in the Earth's crust.	**Star knowledge** When tectonic plates move against each other, heat is generated. This can move material in the earth. Along with other molten material underground, this can move upwards and come out through cracks in the earth's surface as lava.	**Star knowledge** The Ring of Fire is a path, where tectonic plates meet, along the Pacific Ocean. There are active volcanoes and frequent earthquakes here.	**Star knowledge** People have chosen to live close to volcanoes because most volcanoes are safe for long periods in between eruptions. The advantages of living near a volcano are geothermal energy, fertile soils and tourism.	**Star knowledge** The Richter scale measures earthquake strength. It is logarithmic, meaning each number is 10 times stronger than the last. A magnitude 6 quake shakes 10 times more than a magnitude 5.

Flashback Four									
Last lesson What shape does a river cut into the landscape? *A 'V' shape.*	**Last topic** What is the start of a river called? *The Source.*	**Last lesson** Where are earthquakes most likely to occur? *The Ring of Fire in the Pacific Ocean.*	**Last topic** What is the process called as water vapour rises up to form into clouds? *Evaporation.*	**Last lesson** How does a volcano erupt? *Deep within the Earth it is so hot that some rocks slowly melt and become a thick flowing substance called magma. Since it is lighter than the solid rock around it, magma rises and collects in magma chambers. Eventually, some of the magma pushes through vents and fissures to the Earth's surface.*	**Last topic** Where is the mouth of the River Thames? *North Sea.*	**Last lesson** What is the ring of fire? *The Ring of Fire is a horseshoe-shaped belt around the Pacific Ocean. It is about 25,000 miles long. It is home to three-quarters of the world's active volcanoes. Some of the most famous volcanoes are in the Ring of Fire.*	**Last topic** Name two things people can use rivers for. *Leisure activities, generating electricity, transportation, drinking, fishing.*	**Last lesson** What are the four advantages of living near a volcano? *Fertile land, minerals, tourism, geothermal energy.*	**Last topic** What shape does a glacier cut into the landscape? *A 'U' shape.*
Last year Name three of the coldest places on Earth. *Antarctica, Alaska, Greenland, Russia.*	**Previous key stage** How do people use green spaces? *Gardens, parks, woodlands. It improved physical fitness and reduces depression.*	**Last year** Name two of the world's deserts. *Arabian, Kalahari, Sahara, Arctic, Antarctic.*	**Previous key stage** How does our coast differ? *Pebbly, rocky, sandy beaches, cliffs.*	**Last year** Where do most monsoons occur? *June until September.*	**Previous key stage** Name three large cities around the world. *Tokyo, New York, Cairo, Beijing, Delhi, Mexico City, Moscow, Los Angeles etc.*	**Last year** What climate zone do we live in? *North temperature zone.*	**Previous key stage** List two facts about Emperor penguins. *They are found in Antarctica, biggest of the 18 species of penguin, they incubate their eggs during the long, dark winter months. The male incubates the egg for nine weeks whilst the female feeds at sea.*	**Last year** Name three countries in the Southern hemisphere. *Australia, New Zealand, South Africa, Ecuador, Paraguay, Mauritius, Seychelles, Zambia, Papa New Guinea.*	**Previous key stage** What is a continent? *A large solid area of land that contains countries.*

							https://www.wwf.org.uk/learn/fascinating-facts/emperor-penguins		