'Bringing Learning to Life: No Limits. No Barriers.'

Ocean Academy Poole
an Aspirations Academy
Self-Worth | Engagement | Purpose

Learning Journey Map

Year: 6 Term: Autumn 1
Subject: Geography Topic: Earthquakes

Driving Question: How can we research and analyse information to explain the types of plate boundaries and their impact?
Power Skill: Communication: Articulate your understanding of earthquakes and what could be put in place to make living near fault lines safer.

National Curriculum Learning Objectives

- physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle

Key Vocabulary

Continent	Tectonic Plate	Plate Boundary	Destructive (plate boundary)	Constructive (plate boundary)
Transform (plate boundary)	Epicentre	Focus	Seismic Wave	Magnitude
MMS	Seismometer	Seismograph	Seismologist	

Key Learning

The Earth's Crust, Tectonic Plates and Plate Boundaries
Every 30 seconds there is an earthquake in the world and each year there are approximately 100 earthquakes that cause serious damage. The Earth's surface – the crust - is not one smooth unbroken covering.
Rather, it is made of different sections called plates (like a cracked egg shell). There are eight major plates:

1. Eurasian
2. Pacific
3. Indo-Australian
4. Antarctic
5. Nazca
6. North American
7. South American
8. African

Thinking Point
Why do people live on or near tectonic plate boundaries?





The Earth's plates are constantly moving. On average, this movement is between 1 and 10 cm per year. Convection currents in the mantle cause the tectonic plates to move. The mantle is made of molten rock (magma). As the magma moves, so do the plates above. Where the plates meet is called the plate boundary. Each plate moves in a certain direction. Because of this, at the plate boundaries, the plates react differently.

Destructive plate boundaries
At a destructive plate boundary (also called convergent boundaries) two plates move towards another. One plate is then pushed underneath the other. It is the heavier plate that is forced beneath the lighter plate. The point at which one plate is forced beneath the other is called the subduction zone. The plate then melts to become molten rock (magma). The magma then forces its way up to the plate boundary to form a volcano.

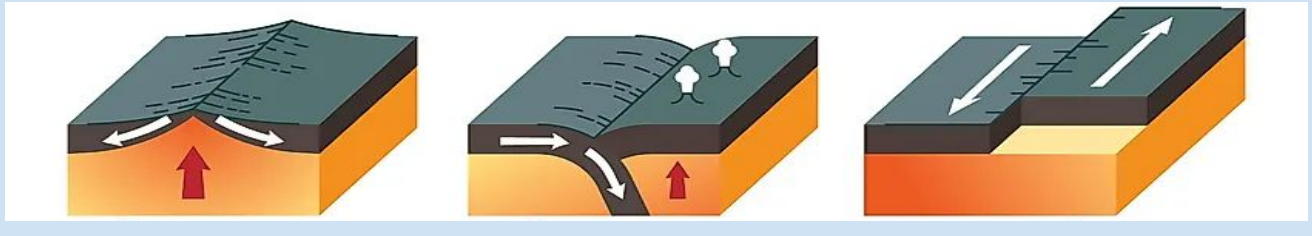
Example: Eurasian plate and Pacific plate where over 400 volcanoes are formed – most underwater.

Constructive plate boundaries
Constructive plate boundaries (also called divergent boundaries) move apart from each other. As they move apart, molten rock (magma) rises from the mantle, then cools and hardens to form new rock.

Example: Eurasian plate and North American plate (Iceland)

Transform plate boundaries
At transform plate boundaries two plates move past each other.
Friction (rubbing) may cause them to stick, but when they eventually become unstuck, often with a violent jolt, an earthquake results.

Example: Part of the Pacific plate and the North American plate boundaries is known as the San Andreas Fault (Western USA)



Resources: Atlases

Key Learning

Earthquakes
Like volcanoes, earthquakes occur primarily along the boundaries of **tectonic plates**. Earthquakes happen when two **tectonic plates** suddenly slip. This causes **seismic waves** to shake the surface of the Earth in the form of an earthquake. These plates slowly move over a long period of time. Sometimes the edges, which are called **fault lines**, can get stuck, but the plates keep moving. Pressure slowly starts to build up where the edges are stuck and, once the pressure gets strong enough, the plates will suddenly move causing an earthquake.

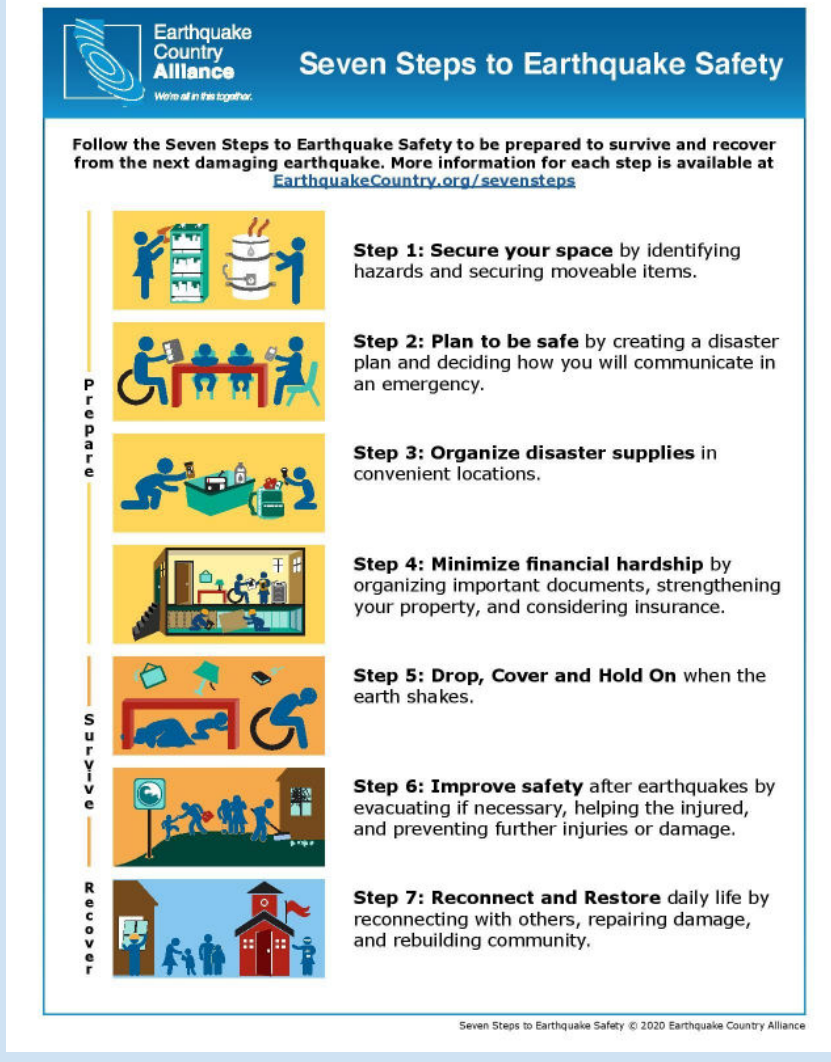
Seismic Waves
Shock waves from an earthquake that travel through the ground are called **seismic waves**. They are most powerful at the earthquake's epicentre. They move quickly at 20 times the speed of sound. Earthquake Scientists (**Seismologists**) use seismic waves to measure the size and destruction of an earthquake. They use a device called a **seismograph** to measure the size of the waves.
The size of the waves is called the **magnitude**. To measure the strength of an earthquake, seismologists use a scale called the **Moment Magnitude Scale (MMS).** The larger the number on the MMS scale, the larger the earthquake. You usually will not even notice an earthquake that measures less than 3 on the MMS scale.

Here are some examples of what may happen depending on the scale:
4.0: Could shake your house as if a large truck were passing close by. Some people may not notice.
6.0: Stuff will fall off of shelves. Walls in some houses may crack and windows break. Pretty much everyone near the centre will feel this one.
7.0: Weaker buildings will collapse and cracks will occur in bridges and on the street.
8.0: Many buildings and bridges fall down. Large cracks in the earth.
9.0 and up: Whole cities flattened and large-scale damage.

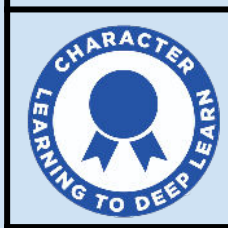
Epicentre and Focus
The place where the earthquake starts, below the surface of the earth, is called the **focus**.
The place directly above this on the surface is called the **epicentre**.

Earthquake hazards
Earthquakes can cause buildings to collapse, often killing or injuring the people trapped inside. They can destroy roads, railways and electricity cables which can delay communications and rescue attempts. Earthquakes can also trigger other natural hazards including rock falls, landslides, tsunamis and even volcanic eruptions. **Seismologists** know where earthquakes are likely to happen but it is impossible to predict exactly when an earthquake will occur. It is therefore important for earthquake-prone countries to be prepared at all times.

Earthquake mitigation measures
- Engineering that allows buildings to 'wobble' instead of remaining stationary can help stop buildings collapsing and therefore potentially save thousands of lives during a large earthquake.
- Educating the public is also very important so that people know what to do if they feel an earthquake. Generally, staying indoors under a sturdy table or door frame is the safest thing to do.



Power Skills

	Produce structured case studies, annotated maps, and earthquake risk assessments using research and data.
	Research, analyse, and interpret data (statistics, magnitude, impacts) to explain different plate boundaries and assess earthquake risks.
	Develop responsibility, resilience, and global awareness by understanding how communities prepare for and respond to earthquake hazards.
	Work collaboratively to research significant earthquakes and carry out a local earthquake risk assessment, sharing roles and findings effectively.
	Communicate complex geographical ideas clearly, explaining plate boundaries, earthquake measurement, and impacts using accurate vocabulary, data, maps, and presentations.