ACET Junior Academies'

Scheme of Work for geography

What is beneath my feet? Part 2

About this unit:

This unit continues student's exploration of tectonic hazards and the world beneath their feet. It introduces the physical processes of earthquakes and reinforces knowledge and understanding of plate tectonics. It builds towards a case study of the human impact of the Nepal 2015 earthquake, which provides many opportunities to interleave and revisit knowledge and understanding from "What is beneath my feet? Part 1".

Unit structure

This unit is structured around the following geographical enquiries:

1. What is an Earthquake?
2. Where do earthquakes happen and what causes them?
3. How do we measure earthquakes?
4. How can we protect against earthquakes?
5. How to earthquakes cause Tsunamis?
6. What happened in the 2015 Nepal Earthquake?
7. What were the impacts on Nepal and its people?

National Curriculum unit:

- Locational knowledge (name and locate the world's mountains, volcanoes and earthquakes, concentrating on their key human and physical characteristics)
- Place knowledge (understanding geographical similarities and differences between the UK, Europe and North and South America)
- Physical geography (describe and understand key aspects of mountains volcanoes and earthquakes)
- Human geography (describe and understand key aspects of types of settlement and land use)
- Geographical skills and fieldwork (use maps and digital/computer mapping to locate countries and describe features studied)

<table>
<tr><th colspan="5">Enquiry 1: What is an Earthquake?</th></tr>
<tr><th>Links to previous learning</th><th>Knowledge and second order concepts</th><th>Geographical skills:</th><th>Assessment criteria:</th><th>Curriculum Links:</th></tr>
<tr>
<td>Concept of impacts and dangers to people from Volcano

Map skills from previous units.</td>
<td>Substantive knowledge:
(What the children should know.)

<u>How to describe an earthquake?</u>

<u>How do earthquakes travel?</u>

<u>What are the long-term and short-term dangers of an earthquake?</u></td>
<td>Use atlases, globes and digital/computer mapping to locate countries and describe features studied

Locational Knowledge
Describe and understand key aspects of physical geography, including… earthquakes

Place Knowledge:
Interpret a range of geographical information</td>
<td>Can your children:

Describe an earthquake

Identify the types of damage that earthquakes can cause

Explain how people might be affected by an earthquake

Explain that buildings collapsing is the primary risk to humans.</td>
<td>Horizontal:

Vertical:</td>
</tr>
<tr><th colspan="2">Suggested activities:</th><th>Resources:</th><th colspan="2">Useful links:</th></tr>
<tr>
<td colspan="2">Literacy challenge: provide students with images, video, sound or descriptions of earthquakes. Students have to create a word collage of adjectives. E.g. shut off lights and play audio from earthquakes to simulate experience.

Earthquake through the window: as students to describe/visualise what they would see through the classroom window during an earthquake.</td>
<td>https://www.usgs.gov/natural-hazards/earthquake-hazards/multimedia

https://www.youtube.com/watch?v=GQQCvsxHtJo

Earthquake in a classroom.pdf</td>
<td colspan="2">https://nysci.org/shake-rattle-roll-earthquake-simulation/

http://ds.iris.edu/seismon/swaves/index.php

Vocabulary:
Earthquake
Tectonic Plate
Plate Margin</td>
</tr>
</table>

Students move ropes/springs up and down and side to side to show the waves of an earthquake. Human molecules: students use their bodies to simulate how earth bunches up and expands in waves. Earthquake in a classroom. Ask one of your pupils to sit at your desk or table in front of the class, to help you to act out the effects of an earthquake as you describe what happens at each level of the intensity scale. Students create a ranked list of earthquake hazards, ordered by danger to humans.	Human Molecules.pdf https://www.theguardian.com/lifeandstyle/2009/may/30/experience-earthquake	Waves Collapse Short Term Long Term

Enquiry 2: Where do earthquakes happen and what causes them?				
Links to previous learning	**Knowledge and second order concepts**	**Geographical skills:**	**Assessment criteria:**	**Curriculum Links:**
Map skills from previous units. **Tectonic plates in volcanos unit** **Tectonic Boundaries**	**Substantive knowledge:** ***(What the children should know.)*** Where do earthquakes mostly occur? What causes an earthquake? Why do we not get many earthquakes in the UK? What is the Ring of Fire?	Use atlases, globes and digital/computer mapping to locate countries and describe features studied use the eight points of a compass, symbols and key **Locational Knowledge** Describe and understand key aspects of physical geography, including… earthquakes **Place Knowledge:** Interpret a range of geographical information	**Can your children:** **Identify that earthquakes mostly occur along plate margins** **Explain that an earthquake is caused by releases in pressure** **Explain the we do not get significant earthquakes in the UK because of the distance from a plate margin.** **Describe the significance of the Ring of Fire**	**Horizontal:** **Vertical:**
Suggested activities:		**Resources:**	**Useful links:**	

Students create an earthquake model and annotate features such as focus and seismic waves. Students look at the interactive map of earthquakes provided by the United States Geological Survey (which shows major plate margins in red lines) and identify that earthquakes mostly occur at plate margins. They create a map of major earthquake locations overlapping plate margins. Students create a poster/infographic of the ring of fire including facts and the extent of the area highlighted. Could be part of a classroom display.	https://www.3dgeography.co.uk/earthquake-models https://earthquake.usgs.gov/earthquakes/map/ https://www.youtube.com/watch?v=ROVuhDENYh0 Recommended settings (30 Days, Magnitude 2.5+ U.S.) https://www.nationalgeographic.com/science/earth/ring-of-fire/	**Vocabulary:** Earthquake Tectonic Plate Plate Margin Epicentre Focus Pressure

Enquiry 3: How do we measure earthquakes?				
Links to previous learning	**Knowledge and second order concepts**	**Geographical skills:**	**Assessment criteria:**	**Curriculum Links:**
Concepts of severity increasing with scale from Volcano hazards	**Substantive knowledge:** ***(What the children should know.)*** What do we measure an earthquake with? What scale do we measure earthquakes against? What levels of damage occur at different intensities of earthquakes?	**Locational Knowledge** Describe and understand key aspects of physical geography, including… earthquakes **Place Knowledge:** Interpret a range of geographical information	**Can your children:** **Explain that we measure earthquakes by the strength of vibration** **Identify that we measure using a seismograph** **Identify that the further away from the focus of the**	**Horizontal:** **Vertical:**

			earthquake, the less intense it is **Identify levels of damage on the Richter Scale**	

Suggested activities:	**Resources:**	**Useful links:**
Living graph. Students examine a seismograph trace and identify where certain events would occur. Example in resources. Living graphs and seismograph traces could be added to a classroom display Students illustrate a story board of damages caused as the intensity of an earthquake increases. Students/teacher create or collaborate on creating a shakeable model of an earthquake. Teacher/students can install a vibration monitor (seismograph) app on their phone, and record the vibrations made when the phone is vibrated. Several apps available will match the vibration to the Richter scale or intensity level to help student understanding. Students and teachers create a model seismometer to record vibrations.	https://nysci.org/shake-rattle-roll-earthquake-simulation/ https://www.youtube.com/watch?v=u-QbqGB1Ooc https://www.youtube.com/watch?v=Gbd1FcuLJLQ earthquake-living-graph – example.jpg https://www.youtube.com/watch?v=mMnEXukSmdg	https://www.science-sparks.com/make-model-seismometer/ **Vocabulary:** Seismograph Destruction Richter Scale Epicentre/focus

Enquiry 4: How can we protect people from earthquakes?				
Links to previous learning	**Knowledge and second order concepts**	**Geographical skills:**	**Assessment criteria:**	**Curriculum Links:**
How earthquakes function (shaking) and that collapses cause deaths.	**Substantive knowledge:** ***(What the children should know.)*** **How do earthquakes damage buildings?** **How can we design an earthquake proof building?** **What is an earthquake drill like?**	**Locational Knowledge** Describe and understand key aspects of physical geography, including… earthquakes	**Can your children:** **Explain that buildings are strong vertically, but weak horizontally (laterally)** **Explain that earthquake resistant**	**Horizontal:** **Vertical:**

	Can we predict earthquakes?	**Place Knowledge:** Interpret a range of geographical information	**buildings work by absorbing the waves.** **Identify that earthquakes are sudden and cannot be predicted**	
Suggested activities:		**Resources:**	**Useful links:**	
Students should look at the properties that make a building resistant to horizontal movement. They construct a model and test it in a competition. Students practice an earthquake drill, compare it to the purpose of fire drills, and identify how it may help protect people. Identify risks in the classroom/playground.		https://www.sciencebuddies.org/teacher-resources/lesson-plans/earthquake_resistant_buildings https://mrsgeographyblog.wordpress.com/2017/01/28/earthquake-resistant-buildings/ KS2 Earthquake Activity Sheet.pdf https://www.shakeout.org/dropcoverholdon/	**Vocabulary:** Vertical Lateral Resistant Absorb Predict Epicentre/focus	

Enquiry 5: How do earthquakes cause Tsunamis?				
Links to previous learning	**Knowledge and second order concepts**	**Geographical skills:**	**Assessment criteria:**	**Curriculum Links:**
Causes of earthquakes **Ring of Fire**	**Substantive knowledge:** ***(What the children should know.)*** **How do earthquakes cause Tsunamis?** **What impacts do Tsunamis have on people?** **Why is Japan so often affected by Tsunamis?**	Use atlases, globes and digital/computer mapping to locate countries and describe features studied use the eight points of a compass, symbols and key **Locational Knowledge** Describe and understand key aspects of physical geography, including… earthquakes	**Can your children:** **Identify that both earthquakes and Tsunamis are energy moving as waves** **Explain that the shock of an earthquake** **Identify that Tsunami is a Japanese word with the English**	**Horizontal:** **Vertical:**

		Place Knowledge: Interpret a range of geographical information	**translation, "harbor wave."** **Explain that Japan and other pacific nations suffer Tsunamis more often sue to the tectonic activity on the Ring of Fire** **Explain how flooding damages coastlines**	
Suggested activities:		**Resources:**	**Useful links:**	
Students annotate a diagram of a Tsunami wave Identifying the earthquakes that starts it, and the building waves heading towards the shore. Students start with a map and illustrate and annotate how waves would spread from an earthquake, based on videos of scientific modelling. Students create a piece of creative writing/story board depicting the hours leading up to and following a Tsunami in Japan. Students create models of coastlines in containers and model how waves and flooding damage coastlines		https://www.youtube.com/watch?v=4yFNOuo_YxI https://www.youtube.com/watch?v=aHljDIDf6js https://www.natgeokids.com/uk/discover/geography/physical-geography/tsunamis/ https://superbrainybeans.com/geography/tsunami/ https://hillsideprimary.org.uk/tsunami-in-year-three/ https://www.youtube.com/watch?v=cU0ev82dl5w	https://www.youtube.com/watch?v=ILlyfwDwJVs https://www.nationalgeographic.com/environment/2007/04/tsunami-facts-saftey-tips/ https://www.youtube.com/watch?v=xyKgamjegtQ **Vocabulary:** Tsunami Waves Flooding Epicentre/focus	

Enquiry 6: What happened in the 2015 Nepal Earthquake?				
Links to previous learning	**Knowledge and second order concepts**	**Geographical skills:**	**Assessment criteria:**	**Curriculum Links:**

<table>
<tr>
<td>Nepal and Himalayan mountain range</td>
<td>Substantive knowledge:
(What the children should know.)

What are the facts of the 2015 Nepal Earthquake?</td>
<td>Use atlases, globes and digital/computer mapping to locate countries and describe features studied

use the eight points of a compass, symbols and key

Locational Knowledge
Describe and understand key aspects of physical geography, including… earthquakes

Place Knowledge:
Interpret a range of geographical information</td>
<td>Identify Nepal on a map, and locate the epicentre of the 2015 earthquake

Relate and connect the earthquake to knowledge from previous unit including the avalanche on Mount Everest

Explain the causes of the Nepal Earthquake</td>
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Vertical:</td>
</tr>
<tr>
<td colspan="2">Suggested activities:</td>
<td>Resources:</td>
<td colspan="2">Useful links:</td>
</tr>
<tr>
<td colspan="2">The lessons on Nepal are an opportunity to reinforce and revisit all the concepts and vocabulary of both What is beneath my feet units.

Students should complete a guided investigation into the 2015 Nepal earthquake. Example in resources. Linked to geography Pod link in resources.</td>
<td>http://story.maps.arcgis.com/apps/MapSeries/index.html?appid=34934c03445649cd9fcb422a2a7279c7

http://www.geographypods.com/nepal-earthquake-2015.html

https://www.rgs.org/schools/teaching-resources/nepal-earthquakes,-avalanches-and-landslides/</td>
<td colspan="2">https://www.geography.org.uk/teaching-resources/earthquakes-tsunamis/nepal-2015

Vocabulary:
Avalanche</td>
</tr>
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Enquiry 7: What were the impacts on Nepal and its people?

<table>
<tr><th>Links to previous learning</th><th>Knowledge and second order concepts</th><th>Geographical skills:</th><th>Assessment criteria:</th><th>Curriculum Links:</th></tr>
<tr>
<td>Nepal and Himalayan mountain range
Nepalese culture from previous unit</td>
<td>Substantive knowledge:
(What the children should know.)

Why were the impacts on Nepal and its people so severe?

How did the people of Nepal respond?

How did the international community respond?</td>
<td>Use atlases, globes and digital/computer mapping to locate countries and describe features studied

use the eight points of a compass, symbols and key

Locational Knowledge
Describe and understand key aspects of physical geography, including… earthquakes

Place Knowledge:
Interpret a range of geographical information</td>
<td>Identify that Nepal is a low income country and explain that poverty, and a lack of resources exacerbates the impacts of a hazard.

Identify the types of aid and responses that the people of Neapal have put in place, as well as the international community,</td>
<td>Horizontal:

Vertical:</td>
</tr>
<tr><th colspan="2">Suggested activities:</th><th>Resources:</th><th colspan="2">Useful links:</th></tr>
<tr>
<td colspan="2">Students create a poster for an Oxfam appeal to generate assistance for Nepal. Possibly two posters, one set in the past immediately after the earthquake, and one currently to identify that tectonic hazards have long lasting impacts.</td>
<td>https://story.maps.arcgis.com/apps/StorytellingSwipe/index.html?appid=97ab135daee04ee7bac9dac34f65277f

Nepal_Oxfam.ppt</td>
<td colspan="2">Vocabulary:
Aid
charity</td>
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