

Mentor Handout 4.3

Sequencing lessons so that pupils secure foundational knowledge before encountering more complex content

Study the sequence of learning below, which is three lessons from a unit on tectonic hazards in Key Stage 3 geography. Think about the following for discussion with your mentor:

1. Are pupils being required to master foundational concepts first? If yes, what are they? If yes, does this happen within lessons, over the course of the sequence or both?
2. How has the teacher planned to assess whether the foundational knowledge is secure before moving on?
3. How has the teacher planned to support pupils who have not secured the foundational knowledge at the same rate as their peers?

Sequence of learning (3 lessons)

Lesson	Title	Expected outcomes	Key activities	Notes and guidance
1	Why does the earth move?	<p><u>Pupils can:</u></p> <ul style="list-style-type: none"> • Identify the four layers which make up the earth • Describe the characteristics of the different layers of the earth including the plates • Explain what convection currents are 	<p>Do now: label the layers of the earth and match the descriptions of the different layers to the correct layer. Hinge question to check understanding.</p> <p>Connect the learning: study a map of the world (link back to scheme of learning on continents) with the plates outlined and imposed on top where tectonic activity takes place. Ask pupils to make inferences about the connection. (Tectonic activity takes place at the plate boundaries).</p> <p>Teacher exposition: introduce the idea of convection currents using a diagram on the board. 'This is a diagram to show convection currents. Convection currents take place in the mantle. Remember that the mantle is very hot and is semi-molten. This means that the mantle is in a semi-liquid state. It therefore behaves like other fluids when they are heated. It rises up from the bottom of the mantle after becoming hotter</p>	<p>Mixed ability grouping</p> <p>Foundational knowledge is secure if:</p> <ul style="list-style-type: none"> • Pupils are clear that the earth is made of layers and that there are four layers • Pupils can name the different layers • Pupils have a grasp of the idea that the crust is divided into plates • Pupils understand that the mantle is moving <p>More complex content:</p> <ul style="list-style-type: none"> • That tectonic hazards take place at boundaries because there is more activity here

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		<ul style="list-style-type: none"> Link convection currents and plates to tectonic activity 	<p>(remember that the temperature gets hotter as you move closer to the core). As the rock loses heat as it gets closer to the crust, it sinks back down. As there is constant movement underneath, the plates on top also move.'</p> <p>Consolidation: video observation on convection currents. Pupils must label their diagram.</p> <p>Demonstrate: pupils to talk to their partner to explain how convection currents work and make the earth move. Teacher circulation.</p> <p>Plenary: review of lesson outcomes with questioning.</p>	<ul style="list-style-type: none"> That convection currents cause the mantle to move and how this process works.
2	How do the plates move?	<p><u>Pupils can:</u></p> <ul style="list-style-type: none"> Recall key geographical vocabulary in relation to plate tectonics Identify the four different kinds of plate boundary Explain how the four different plate boundaries move Explore what the result is of different kinds of plate movement 	<p>Do now: unscramble a series of key words from the previous lesson, e.g. plates, boundary, Ring of Fire etc.</p> <p>Connect the learning: short recap video on the concept of plate tectonics and convection currents. Hinge questions to check understanding.</p> <p>Teacher exposition: introduce that there are four different plate boundaries (destructive, constructive, collision and conservative).</p> <p>Demonstrate: each pupil has a worksheet scaffolded depending on the extent to which pupils need support. Pupils need to draw a simple labelled diagram of plate movement, write an explanation of the movement, explain which tectonic hazard occurs at this boundary and an example. Model how pupils should gather information and complete the worksheet by doing the constructive plate boundary together as a class. Check understanding through live marking.</p> <p>Plenary: five quick questions.</p>	<p>Pupils who have secured foundational knowledge from the previous lesson will pick up the key words quickly. In marking the activity, check whether pupils understand the words meaning and not simply what the words are, e.g.</p> <ul style="list-style-type: none"> 'Can you use the words in a sentence?' 'Can you tell me what a plate boundary is?' <p>Pupils who have secured more complex content from the previous lesson will be able to explain that convection currents cause the plates to move and that the movement of the plates causes tectonic hazards.</p> <p>Consider regrouping pupils based on to what extent the foundational knowledge has been grasped.</p>

Lesson	Title	Expected outcomes	Key activities	Notes and guidance
3	What causes earthquakes?	<p><u>Pupils can:</u></p> <ul style="list-style-type: none"> Define key words Explain in detail what causes earthquakes <p>Demonstrate understanding about what will happen when an earthquake strikes</p>	<p>Do now/connect the learning: draw a diagram of each of the four plate boundaries.</p> <p>Defining key terms: watch the video and develop definitions of earthquake, focus, epicentre, seismometer, seismograph, Richter scale. Use sentence stems to scaffold.</p> <p>Teacher exposition: ask pupils to complete an earthquake storyboard employing the key words to show how an earthquake forms underground. Model the first box of the storyboard. Use scaffolded storyboard to ensure access.</p> <p>Checking for understanding: show a diagram of two Richter scale graphs. Can the pupils work out which shows an earthquake taking place? How do they know? Check understanding using mini whiteboards.</p> <p>Demonstrate: using a diagram of an earthquake occurring near a settlement, written answers to the following questions:</p> <ol style="list-style-type: none"> Will the ground shaking be stronger at A, or at B? Explain your answer. Will the damage be greater at A or B? Explain your answer. An earthquake can occur at any time of day or night. When will more harm be done – if the earthquake happens at a) 5am or b) 10.30am? Explain your chosen answer. <p>Use sentence stems and/or modelling to scaffold.</p> <p>Plenary: 3, 2, 1 (3 key words, 2 interesting facts, 1 question for next time).</p>	<p>Introduction of new key words in this lesson as they relate specifically to earthquakes as opposed to tectonic hazards more generally.</p> <p>Pupils who have secured foundational knowledge from the previous lesson will be able to recall the four plate boundaries. Understanding how these plates move and therefore what tectonic hazard is caused is more complex. Grasping this depends on understanding that plates are always moving, moving in different ways and that different kinds of crust behave in different ways.</p> <p>Application of this understanding to be able to make inferences about the scale of damage earthquakes can cause relies on the foundational knowledge of understanding:</p> <ul style="list-style-type: none"> The depth of the focus affects how strongly the earthquake is felt on the surface How far from settlements the earthquake epicentre is What time of day the earthquake takes place. <p>Consider regrouping pupils based on what foundational knowledge has been grasped.</p>

After this sequence of learning, pupils will study:

- Impacts of earthquakes
- Impacts of earthquakes on less economically developed countries
- Impacts of earthquakes on more economically developed countries.