



PROGRAMME 11: EARTHQUAKE

AIM

The aim of this unit is for students to have a clear understanding of how earthquakes are formed and what to do if one hits during a class session.

LEARNING OBJECTIVES

Students will be able to:

- understand the need for earthquake preparedness
 - investigate how earthquakes affect buildings and people
 - demonstrate what to do in an event of an earthquake when in the classroom.
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SKILLS

- Communication
 - Self-management
 - Information Technology
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MATERIALS

- Episode Earthquake, DVD 1, Bryan & Bobby Series 3
 - Two signs; one with the word 'False' and the other 'True'
 - Boiled egg and spoon
 - Prepared jelly
 - Cake tin for the jelly
 - Sugar cubes
 - Plastic wrap
 - Small materials to represent buildings
 - One onion
 - Two cookies
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VIRTUES

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| - Courage | - Co-operation |
| - Curiosity | - Knowledge |
| - Responsibility | - Confidence |
| - Understanding | |

LESSON *(this is more or less a two-day unit, please adapt for junior students)*

1. Begin the lesson with children standing along an imaginary line from one side of the classroom to the other. One wall should have a sign that says TRUE and the other wall should have FALSE. Read out the following few statements and ask the children to stand somewhere on the imaginary line that reflects what they agree with most (they can stand in the middle if they are unsure).
 - a) Earthquakes usually happen on flat ground rather than on hills. (False, they occur in any kind of environment or area.)
 - b) Earthquakes usually happen in the afternoon. (False, they can happen at any time.)
 - c) You cannot predict an earthquake. (True, they are random events.)
 - d) Earthquakes are caused by the sun's heat. (False, the sun does not influence an event of an earthquake.)
 - e) All earthquakes are different. (True, there are different kinds of earthquakes in terms of size and depth.)
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2. WHAT ARE EARTHQUAKES?

Earthquakes happen along 'fault lines' in the earth's crust. Show the children a boiled egg with cracks running over the shell. Use the cracks in the shell to illustrate the plate boundaries and the fault lines in the earth's crust. (You could also use an orange with the peel being the crust/surface and the orange being the earth's core, where the 'plates' are in pieces, moving around on the core).

Explain that earthquakes usually happen when the giant tectonic plates, underneath the ground, grind past one another. When the plates get stuck energy builds up so that when they move again the force can be hard and sharp, causing shock waves through the ground around the fault line – this is what is called an earthquake. They can be felt over long distances and, in New Zealand, don't usually last for more than one minute.

3. TASTY QUAKE EXPERIMENT

Make a jelly in a cake tin with your students (it may take several packets of jelly to get the jelly deep enough to really show the experiment well). Once the jelly has set, lay plastic wrap over top of the cooled jelly. On the plastic wrap put sugar cubes or small, light plastic items to represent buildings in a town. Ask your students what they believe will happen next. Gently tap the sides of the cake tin and see how the waves get bigger. Continue with smaller taps and discuss the findings. (This explains the waves of energy that reach the surface when the tectonic plates rub together.)

Ask the students how they would know if they were in an earthquake? Discuss any experiences the students have had (eg, gentle shaking of the ground, slow, large movements, very quick and violent movements etc).

4. HOW TO MEASURE AN EARTHQUAKE

Discuss intensities of earthquakes and how they are measured. A Seismograph is an instrument that measures the size and depth of an earthquake. The earthquake is then given a number on a Richter Scale. A measurement of 6.0 on the Richter Scale is considered strong and a 7.0 is considered a major earthquake and is 10 times larger than a magnitude 6.0 earthquake. Magnitudes of 4 or below do not usually cause damage. But it all depends on the depth at which the earthquake occurs – the nearer to the surface the greater the potential damage.

5. WHAT WOULD YOU DO?

Ask your students what they should do in an earthquake. DROP, COVER AND HOLD. Discuss the safer places to hide indoors - under a sturdy table or desk, and how to hold onto its legs and cover your head. If you are not near a table, drop and curl yourself into a ball and cover your head next to a clear wall.

If you are outside, steer clear of tall buildings, signs and power lines. Get to a clear area, drop down and cover your head. Practice this with your students inside and outside the class.

Play the episode 'Earthquake' from DVD1 of Bryan & Bobby Series 3.

Visit www.bryanandbobby.co.nz for more information.

Watch the following episodes in the previous Bryan & Bobby Resource Kits:

Episode Civil Defence, DVD1, Bryan & Bobby Series 1 and use the corresponding unit in Workbook 1

Episode Emergency, DVD1, Bryan & Bobby Series 1 and use the corresponding unit in Workbook 1

Episode Escape, DVD1, Bryan & Bobby Series 1 and use the corresponding unit in Workbook 1

Episode Flood, DVD1, Bryan & Bobby Series 2 and use the corresponding unit in Workbook 2

SUPPLEMENTARY ACTIVITIES

Topic

Research major earthquakes across the globe and write a report/presentation on the findings.

Look up earthquake facts and report/present findings using various technology.

Make a collage of various earthquake photos and incorporate explanations to show where the photos were taken, when the earthquakes happened and how large the earthquakes were.

Research the various methods of measuring earthquakes (particularly with a Seismograph and the Richter Scale), and explain how they work.

Examine earthquake myths and interview people about these myths to see what they think.

Investigate the current earthquake risks in your area. Research any earthquakes from within your area/country. Investigate how earthquakes and volcanoes are connected.

Cut out a world map on the known tectonic boundaries and glue on paper.

Research your house and determine the safest places for you to be in an earthquake.

Research whether earthquakes happen on other planets in our solar system.

Technology

Design an earthquake-proof model of a building and discuss what works and what does not.

Written Language

Write a fiction story about the time a character was caught in an earthquake.

Write a report on an actual survivor's story and what they went through.

Information Technology

Initiate a pen pal/email pen pal/ social network/ programme with other children from another country who have been through earthquakes. Have students exchange information about what they were doing when the earthquake hit.