

## Earthquake through the window - what would you see, what would you feel?

Asking pupils to picture for themselves what an earthquake through the window might look like

What would it look like through the window if an earthquake hit now! Introduce your pupils to what an earthquake might be like – then take them to a window/doorway and ask them to discuss these questions.

If an earthquake struck now:

- What would you see through the window/ doorway?
- What would be happening to the ground?
- What would be happening to the buildings and trees?
- What would the people be doing?
- What would it be like inside this building?
- How would you be feeling?
- What would you do? What should you tell your friends to do?
- What might have caused an earthquake like this?
- Can we tell when earthquakes like these are coming?

Afterwards, reassure your pupils that, although small earthquakes often occur in many parts of the world, larger earthquakes are less frequent, and usually only affect badly-built buildings, whilst major earthquakes usually only affect certain parts of the world and are uncommon. Only about twenty magnitude 7 or above earthquakes, which can cause major widespread damage, occur on Earth each year.

Campus bookstore following the 1994 Northridge earthquake. Taken at the California State University, Northridge campus, USA.



From the American Geological Institute Earth Science World Image Bank at: <http://www.earthscienceworld.org/images/> Photo ID: h32fxi. Copyright California State University Northridge Geology Department.

This damage to the house next to the Coalinga TV Repair Shop, which was constructed of non-reinforced brick and brick facades, was caused by California's Coalinga earthquake of May 2, 1983. Photo by K. Harms.



Collapsed and burned buildings in the Marina District, San Francisco. Loma Prieta, California, Earthquake October 17, 1989.

From the U.S. Geological Survey Photographic Library at: <http://libraryphoto.cr.usgs.gov/> Slide 1-5, U.S. Geological Survey Open-File Report 90-547



Government Hill Elementary School torn apart by subsidence that occurred during the 1964 earthquake. Notice the large crack in the foreground that also was caused by the earthquake, (9.2 magnitude).

From the American Geological Institute Earth Science world Image Bank at: <http://www.earthscienceworld.org/images/> Photo ID: hfyysg. Courtesy United States Geological Survey.



From the American Geological Institute Earth Science world Image Bank at: <http://www.earthscienceworld.org/images/> Photo ID: h5ipqu. Courtesy United States Geological Survey.

## The back up

**Title:** Earthquake through the window - what would you see, what would you feel?

**Subtitle:** Asking pupils to picture for themselves what an earthquake through the window might look like.

**Topic:** Creating a picture of an earthquake 'in action' in the imaginations of your pupils.

**Age range of pupils:** 8 – 18 years

## Earthlearningidea

**Time needed to complete activity:** 15 – 30 mins

**Pupil learning outcomes:** Pupils can:

- describe what an earthquake might look and feel like;
- explain the causes of what might be happening;
- suggest how they could keep safe;
- explain the cause of the earthquake;
- discuss how effectively earthquakes can be predicted.

**Context:** Through discussion, pupils might suggest answers like the following for an earthquake striking now.

- What would you see through the window/ doorway? – *falling debris, birds taking off in panic; if a major quake - lots of movement.*
- What would be happening to the ground? - *in a major earthquake, the ground might be moving up and down in waves.*
- What would be happening to the buildings and trees? – *solid buildings would be collapsing; any tall buildings would be swaying and glass from windows might be falling; timber buildings would be flexing; trees would be waving around.*
- What would the people be doing? – *probably panicking, but as they are outside - they should be running towards open spaces.*
- What would it be like inside this building? – *everything would be swaying; unfixed objects would be falling or toppling; the ceiling, floor or walls might be collapsing; there would be a rumbling noise from the earthquake and other cracking and breaking noises; people might be panicking and screaming.*
- How would you be feeling? - *very scared.*
- What would you do? What should you tell your friends to do? - *shelter under any tables or desks. Encourage people not to panic but to wait until the main shock is over – then leave the building, to avoid potential fire danger.*
- What might have caused an earthquake like this? *Earthquakes are caused by movement on a major fault underground. Pressure builds up due to movement of the Earth's tectonic plates. Eventually the rocks break at the fault, sending seismic waves to the surface. These cause surface waves, wave-like movement of the ground surface. It is these that cause the most damage.*

- Can we tell when earthquakes like these are coming? *The simple answer is 'no'. Geoscientists have been working on earthquake prediction techniques for many years and now we often have good ideas **where** earthquakes will strike – but usually cannot easily predict **when** that might be.*

**Following up the activity:**

- Try the Earthlearningidea 'Surviving an earthquake' activity.
- Discuss contingency plans for when earthquakes strike.
- Discuss which buildings are likely to be most vulnerable to earthquakes – and how this vulnerability could be reduced.

**Underlying principles:**

- As tectonic plate movement occurs, stress builds up and the rocks bend (deform elastically).
- Eventually the stress becomes too great, friction is overcome and the rocks fracture (brittle failure) at a fault; the rocks spring back, producing seismic P- (longitudinal) and S- (transverse) waves.
- The P- and S-waves travel outwards from the point of fault movement (the focus); when they reach the surface, they cause surface waves.
- The point on the surface above the focus is the epicentre; surface waves travel outwards from the epicentre, causing ground movement, and potentially landslides and tsunamis.
- The power of an earthquake is measured on the Richter scale, earthquakes of magnitude 5 and above are often damaging.

**Thinking skill development:**

Pupils have to 'bridge' between their understanding of the impact of an earthquake and the likely effects on the surrounding area.

**Resource list:**

- just a window/doorway and imaginative thinking

**Useful links:** Try the US Geological Survey site <http://earthquake.usgs.gov/learning/kids/> for lots of information on earthquakes.

**Source: Devised by** Chris King of the Earthlearningidea team. Thanks to Dave Rothery of the Open University for his helpful comments.

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