Earthquakes

What is an earthquake?

When two plates are sliding past each other, parts get locked like teeth. Enormous tension builds up.

Suddenly, rock gives way. The plates lurch forward. Tension is released, and waves of energy ...

... called seismic waves travel in all directions. The earthquake is the vibrations they cause.

The focus of the earthquake is the point where the rock gives way. The epicentre is directly above it on the Earth’s surface.

As the rocks settle into their new positions, there will be lots of smaller earthquakes called aftershocks.

A large earthquake and its aftershocks can be detected thousands of kilometres away, on the other side of the Earth.

Any large rock movement will cause an earthquake. That explains why earthquakes occur along the edges of plates. But even the collapse of an old mine shaft can cause a small one.

How are earthquakes measured?

- Earthquakes are measured using machines called seismometers.
- A graph of the vibrations is called a seismograph. This is part of one:

  ![Graph of a seismograph with the depth of a wave called its amplitude.](image)

  The more the ground shakes to and fro, the greater the amplitude of the waves.
- You can tell where the epicentre of an earthquake was, by comparing seismographs recorded at different places.
How big?
- The amount of energy released in an earthquake is called its magnitude.
- It is measured on the Richter scale.
- An increase of 1 on this scale means a 10-fold increase in the amplitude of the waves and a 30-fold increase in their energy.

So far, no earthquake has measured more than 8.9 on the Richter scale. Rock usually gives way before it can store up this much energy!

What harm can earthquakes do?
A large earthquake makes everything shake. So...

- Landslides may block roads.
- Gas pipes fracture, and electricity wires get torn down. These cause fires.
- Transport comes to a standstill.
- Earthquakes in the ocean floor can cause giant waves called tsunami (say soonami) in shallow coastal water. They slam onto the land and do a huge amount of damage.
- At home, cookers and heaters fall over and start fires. Ceilings fall down. Doors jam. Everything slides off shelves and tables.
- Water mains burst—which means no water.

Your turn
1. Why do earthquakes happen so suddenly?
2. Write out and complete these.
   a. A seismic wave is ...
   b. The focus of an earthquake is ...
   c. The epicentre of an earthquake is ...
   d. The magnitude of an earthquake means ...
   e. A seismograph is ...
3. Look at the diagram on the right.
   a. Will the vibrations be stronger at A, or at B? Why?
   b. Will the damage be greater at A, or at B? Explain.
   c. Will an earthquake of magnitude 7 do more damage than this one, or less? Why?
4. An earthquake can occur at any time of day. At which time might an earthquake do more harm at B above? at 5 am at 9.30 am
   Explain your answer.