

# MAKE YOUR OWN EARTHQUAKE DETECTOR

**WARNING:** Always ask for assistance from an adult when using sharp tools or instruments.

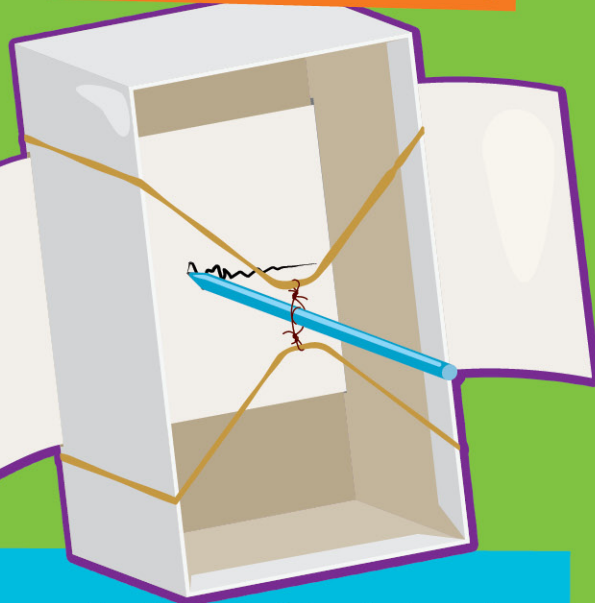
Follow these instructions to make your own seismometer to measure movement.

## YOU WILL NEED

- small open-topped cardboard box (a shoebox works)
- three sheets of A4 paper
- two rubber bands
- string
- fine-pointed marker pen
- sticky tape
- scissors
- ruler
- chair
- another person

## WHAT TO DO

1. Cut three sheets of A4 paper in half long-ways. Stick the pieces together with sticky tape to make one long strip of paper.
2. Measure an 11 cm line in the bottom of each of the long sides of the box. The lines should be about equal distance from either end and opposite each other. Cut along the lines to make two slits.
3. Stretch two rubber bands around the box.
4. Tie your marker pen to the middle of one rubber band using some string. With a second piece of string, tie the marker pen to the second rubber band. The rubber bands will stretch, so the marker pen will be hanging in the middle of the box.
5. Slide the paper strip through the slits in the lid, so the paper extends out each end. Move the marker pen up or down so that it lightly rests on the strip of paper.
6. Now your earthquake detector is ready for action, it's time to test it out. Tape the detector onto a chair that you can shake like a little earthquake. Work together with a partner. One person pulls the paper through slowly so the pen draws a continuous line. While the paper is moving, the other person gently shakes the chair to simulate the earthquake. Try softer and harder shakes. Observe your paper strip. What happened during the 'earthquake'?



## WHAT'S HAPPENING

Earthquake detectors are called seismometers, and measure the movement of the ground (or in this case, a chair). All objects want to stay where they are until something makes them move – this is called inertia. The chair moves because you shake it. The box moves because it's taped to the chair. But the pen is attached by string and rubber bands. Nothing directly pushes the pen and so inertia means it doesn't move. During an earthquake, the marker pen doesn't move, but the seismometer does. The line it draws will be straight when the box is still, wobbly when shaking a little and have tall peaks when shaking a lot. So how can the Earth move at all?

The ground beneath you is part of a tectonic plate – a huge section of solid crust that sits on top of liquid rock called magma. Normally these plates move around relatively smoothly. Earthquakes occur when friction between two plates stops them moving easily. An earthquake sends waves of energy called seismic waves through the Earth. Measuring the waves with a seismometer tells scientists where the earthquake started and how strong it was.



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