

Fact sheet 1: Earthquakes

What is an earthquake?

New Zealand lies on the boundary of the Pacific and Australian tectonic plates.

Tectonic plates are always on the move. Tension builds up as they scrape over, under or past each other. In some places movement between the plates is happening all the time, causing frequent small or moderate earthquakes. Other areas, where the movement is not constant, are prone to stronger quakes separated by longer periods of time.

Most (though not all) earthquakes occur at faults, which are breaks extending deep within the earth, caused by the movement of these plates. The point under the ground where the earthquake actually begins is called the hypocentre or focus, while the place directly above it on the surface is known as the epicentre.

Earthquakes cause vibration waves to travel through the ground. The first sign of a quake is often the rumbling sound caused by the 'P' (primary or push) waves travelling at about 20,000 kilometres an hour, twenty times faster than a jet aircraft. The 'S' (secondary or shear) waves follow along at about 10,000 kilometres an hour, and cause the main rolling and shaking effects of an earthquake.

There are two ways of measuring earthquakes:

- The Richter scale uses instruments to measure the energy released by the earthquake. The scale ranges from one to nine (the largest so far was the 9.5 Chilean earthquake in 1960). It is a logarithmic scale, which means that a magnitude seven earthquake is 32 times as powerful as a magnitude six quake. The 1855 Wellington earthquake had an estimated magnitude of 8.2, and Napier was struck by a 7.8 quake in 1931.
- The Modified Mercalli (MM) scale is a judgmental measure of intensity based on the effects of the earthquake on people and structures. This scale ranges from MM1 (smallest) to MM12 (largest). The 1855 Wellington and 1931 Napier earthquakes were both MM10 at their epicentres.

What do we do before an earthquake?

- Practise your earthquake drill: **drop, cover** and **hold**.

- Identify safe places at home and at school.
- A safe place is under a strong table (remember to hold onto the legs), or next to an interior wall. Take no more than a few steps to avoid injury.
- Talk with your family about an emergency plan and survival items.
- Help your parents to secure heavy items of furniture to the floor or wall. Find out more at www.eq-iq.org.nz.

What do we do during an earthquake?

- If you are inside a building, take no more than a few steps, **drop, cover** and **hold**.
- If you are outside, move no more than a few steps, **drop, cover** and **hold**.
- If you are in the car you should ask the driver to pull over and stop.
- If you are at the beach or near the coast, **drop, cover** and **hold**, then move to higher ground immediately in case a tsunami follows the quake.

What do we do after an earthquake?

- Remember there may be some aftershocks.
- Listen to and follow all instructions from adults or the radio.
- If you are in a damaged building, try to get outside and find a safe, open place.
- Help others who may need it, if you can do so safely.
- Watch out for possible dangers or hazards.
- Remember your prepared emergency plan and follow it, if it is safe to do.

