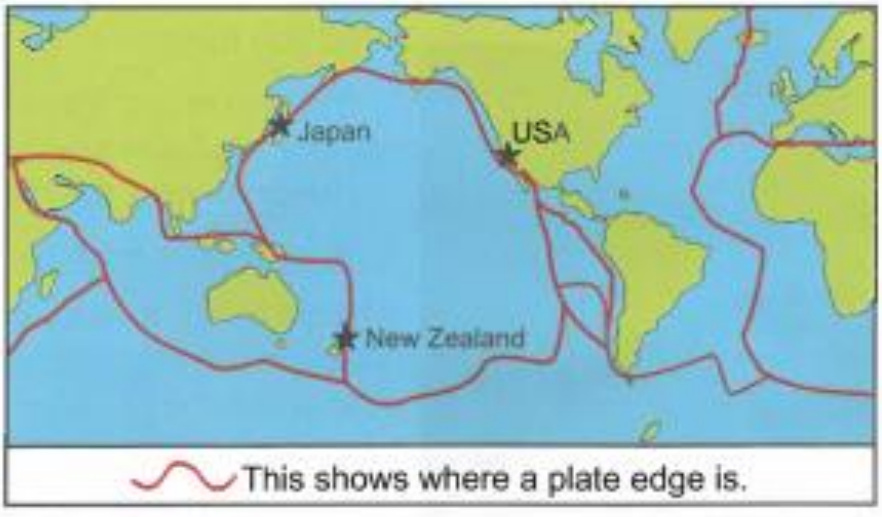
Earthquakes

Each year across the world, millions of earthquakes cause the Earth to shake and shudder beneath us. Their severity is measured on the Richter scale, with most of them so low on the scale that we don't even notice they are happening. But every so often, a powerful earthquake strikes, leaving devastating damage and disruption in its wake.

Earthquakes are caused by movements of the Earth's surface. The outer layer of the Earth is composed of vast floating plates that interlink like pieces of a jigsaw puzzle. These plates are constantly moving at an average of a few centimetres each year. Sometimes when two neighbouring plates manoeuvre past each other, they get stuck. Pressure builds up and when the plates finally jerk free, the ground shakes: this bone-shaking phenomenon is an earthquake.

Earthquakes are most common along the edges of these shifting plates. The west coast of the USA is located at a plate edge, making it prone to earthquakes. One such earthquake, the Hector Mine Earthquake, occurred in 1999 in the Mojave Desert in southern California. Very few people live there, so fortunately it caused almost no damage.



Japan, like the USA, is also situated at a plate boundary and, in 2011, suffered its most powerful earthquake since records began. It unleashed a tsunami (a huge ocean wave) that wreaked havoc in many coastal towns and villages. In the same year, the bustling city of Christchurch in New Zealand was hit by two powerful earthquakes just months apart. In an unfortunate turn of events, the second struck before there had been time to repair all the damage caused by the first earthquake.

Across the world, earthquake zones are not left empty and unoccupied; quite the opposite in fact. Many people live in places where earthquakes are a real threat. The work of specialised engineers and scientists is indispensable in these highly populated areas where earthquakes are common. Engineers have developed earthquake-resistant buildings like the US Bank Tower, which are designed to waver and wobble during an earthquake, but not actually collapse. Scientists also monitor common signs that an earthquake might be on its way, for example, changes in water levels and cracks in the ground. However these indicators don't appear before every earthquake, so scientists can't precisely predict the time or location of an earthquake.

The US Bank Tower

Fire from broken gas pipes

Homes in earthquake zones are often adapted to reduce earthquake damage. Heavy pieces of furniture can be secured with robust, flexible straps so they can move without falling and sticky putty can keep smaller objects from tumbling. Taller pieces of furniture like wardrobes can be fixed to the wall using metal brackets. Some recently built homes have flexible pipes which are less likely to break during an earthquake. This reduces the risk of fire following an earthquake, when gas from broken pipes can come into contact with a flame, with explosive results.

Many schools and businesses in earthquake zones hold regular earthquake drills to practise what they should do if there is a real emergency. A three-step approach is common: drop, cover and hold on. During an earthquake, you should drop to the floor and shield your head with your arms. Then, if possible, you should take cover under a table and hold on until the danger has passed. In Japan, 1st September is National Disaster Prevention Day, when all Japanese citizens practise these drills.

Another way that people prepare for earthquakes is to assemble an earthquake survival kit. Damage from earthquakes often prevents rescue services from reaching everyone affected immediately, so these survival kits should allow an individual to survive for a minimum of three days without outside help. They usually contain such vital supplies as bottled water, tinned foods and a tin opener. First aid kits are included to allow people to treat minor injuries at home because hospitals are normally stretched to their limits after an earthquake.

Earthquake survival kit

Electricity supplies can also be cut off by an earthquake, so a torch and spare batteries are essential; at best, the electricity supply is likely to be unpredictable. Dust masks and a whistle to signal for help are also useful — shouting when trapped can cause people to inhale large amounts of dust which is thrown up and lingers in the aftermath.

Damage after an earthquake

Although running is tempting, after a major earthquake, people should initially remain where they are as there may be aftershocks. These are smaller earthquakes which follow in the footsteps of the main earthquake, as the Earth's plates adjust to the movement.

When any aftershocks subside, uninjured people should tend to the wounded and inspect houses for signs of damage; if the damage is bad, people may need to be evacuated. At this point in time, the lengthy clean-up process can begin.

With so many earthquakes occurring with little or no warning, it is difficult for scientists to predict them accurately. This means that it is essential for people living within earthquake zones to be properly prepared.