

*What sequence of events occurs when an earthquake is hazardous?*

Every earthquake is different in terms of the length of time it lasts and the strength of the force involved. However where earthquakes are hazardous to people, a general sequence of events tends to occur.

### 16.1 SEQUENCE OF EVENTS

#### STAGE 1: PROCESSES WITHIN THE EARTH

**Magma** rises to the **crust** within the **mantle**. As it moves against the underside of the crust, friction is created. This friction causes the plates to move. The plates move:

- against each other
- away from each other
- alongside each other in opposite directions.



#### STAGE 2: PROCESSES ON THE EARTH

- As pressure builds up between **plates** *foreshocks* are often felt. These are a cluster of small earthquakes that can be felt in the days or weeks before a large earthquake.
- A sudden rupture of the plates along a fault line is experienced as a severe shaking for 15-40 seconds.
- The centre point of the rupture below the earth's surface is called the **focus**. Seismic waves radiate in all directions from the focus. The centre point on the earth's surface above the focus is called the **epicentre** (see resource 1, page 42).
- There are three types of seismic waves radiating from the focus:
  - P wave** (primary wave) – a sound wave that travels through solids, liquids and gases. It is the first movement felt by people when an earthquake occurs and feels like a sonic boom. It does little damage other than rattling windows.
  - S wave** (secondary wave) – the second wave arrives shortly after the *P* wave as it travels through solids only. It makes the ground shake vertically and horizontally, like a jelly, and can be very destructive.
  - L wave** (long wave) – arriving after the *P* and *S* waves it moves through the earth in waves making the earth's surface ripple like water on a lake. It moves the ground sideways and can be very destructive.



#### STAGE 3: EMERGENCY RESPONSE

The shaking can tear land and the **cultural** features on it. The shaking can also cause buildings and cultural features to collapse. The result is the crushing of people, the disruption of **communications** and the destruction of property. The immediate emergency response is to save as many lives as possible and get help for the injured.

