

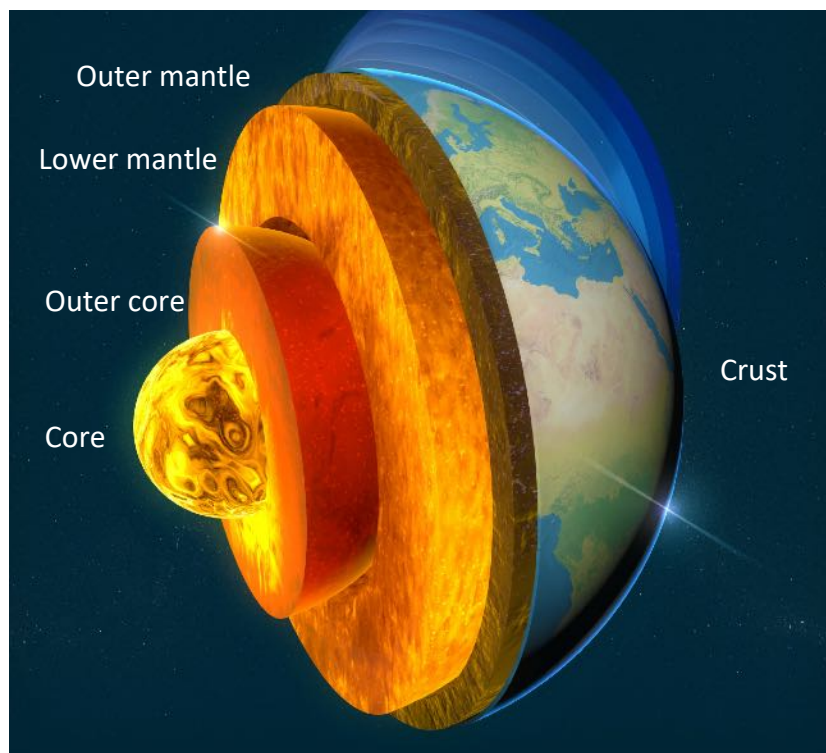
Lesson 2: Resource Sheet 1

Our Restless Earth

Earth's interior

The **Earth** is divided into three main layers: The dense, hot inner core and the surrounding molten outer core; the mantle (upper and lower); and the thin outer crust, which supports all life in the known universe. The currents with molten material drive the movement of sections of the Earth's crust.

Figure 1: Inside the Earth



The Earth's plates

The Earth's thin outer crust is broken into eight large and several smaller pieces. We call these 'plates'. These plates move ever so slowly across the face of the planet – at a speed of about 15 centimetres a year. Currents deep within the earth's liquid mantle cause this movement.

Some plates move towards each other while others move away from each other. Others just grind past each other. Where plates move towards each other great mountain ranges are pushed up. Where plates move away from each other deep ocean trenches are formed.

The edges of the plates are often areas of great stress and activity. Because the plates do not slide smoothly past each other, there is often an enormous build-up of pressure. When it is released the earth shakes violently. We call this shaking an earthquake.

Many of the earth's earthquakes and volcanoes occur at the edge of these plates. Figure 2 shows the location of the earth's plates and the directions in which they are moving. Figure 3 shows the pattern of volcanic and earthquake activity. Can you see the relationship?

Figure 2: The Earth's plates – direction and speed of movement

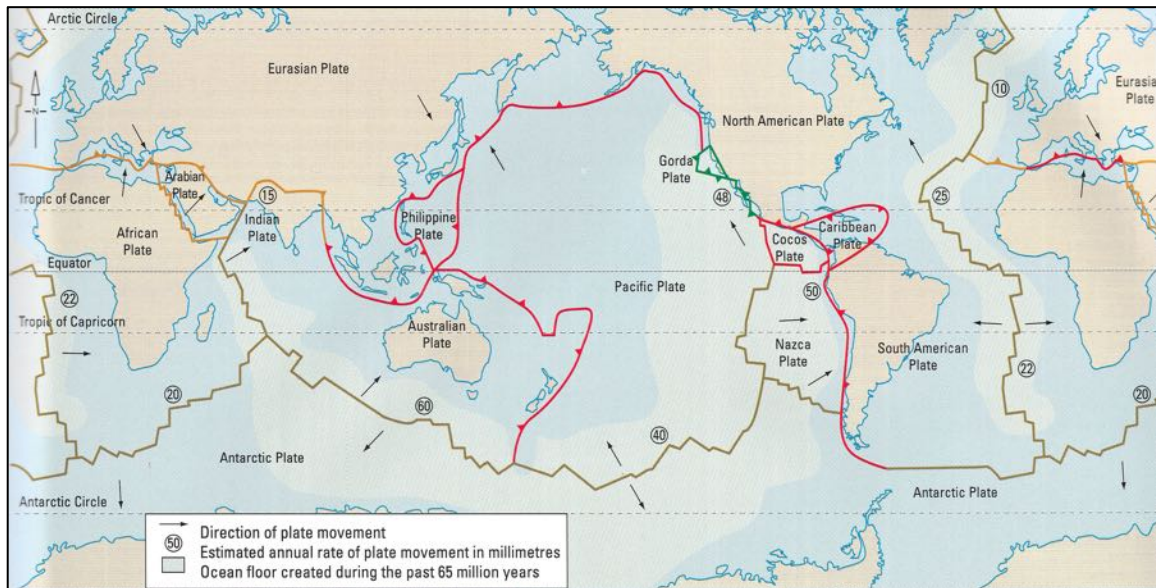
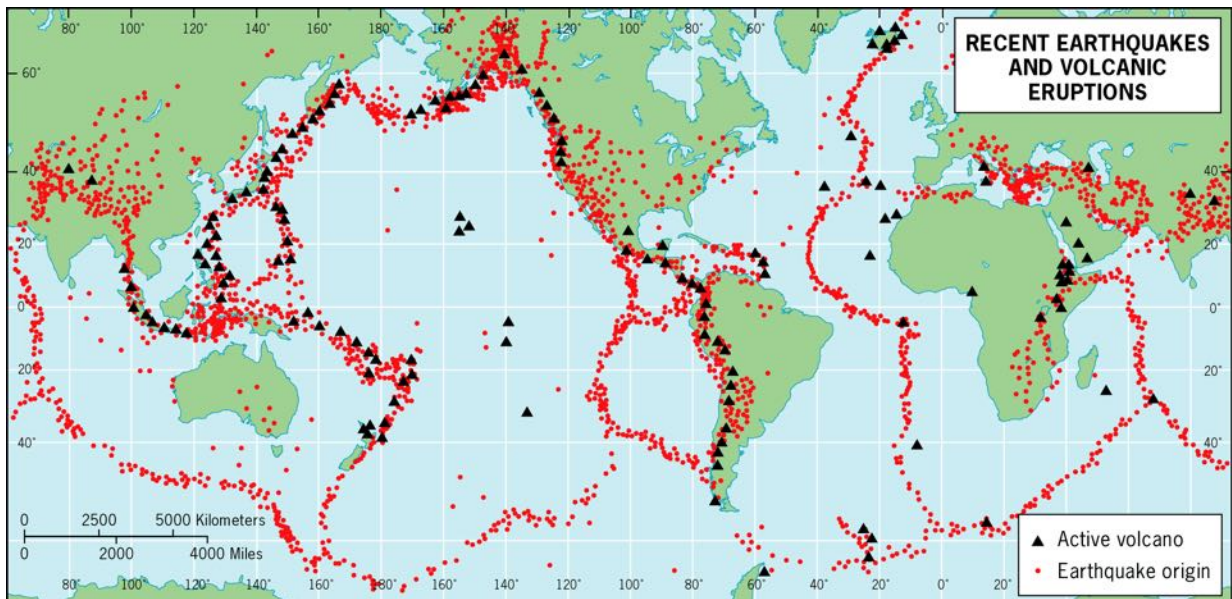


Figure 3: Where earthquake and volcanic activity occurs



Scientists believe that all the earth's continents were once part of one large supercontinent, known as Pangaea (a Greek word meaning 'all lands'). Pangaea had two main parts: Gondwanaland (Australia, Antarctica, Africa, India and South America) and Laurasia (Asia, Europe, Greenland and North America). These two main areas began to move apart and break up about 200 million years ago. Over time they 'drifted' to their present locations.

As Australia moved north its climate changed. The continent became hotter and drier. Australia moves to the north by about seven centimetres a year. Because Australia lies in the middle of one of the earth's plates it does not have any active volcanoes and we don't have major earthquakes.

Figure 4: The movement of continents

