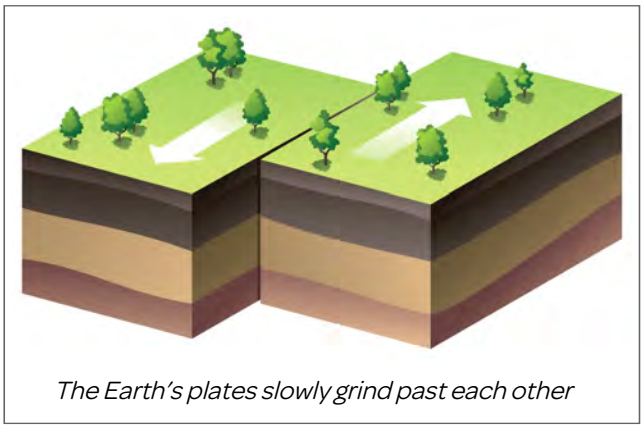
FACT-FILE EARTHQUAKES

What is an earthquake?

An earthquake is a natural hazard – it's when the ground shakes beneath your feet. These events can be very destructive.



The Earth's plates slowly grind past each other

Why do they occur?

The Earth's outer layer is made up of massive slabs of rock, called plates. As these plates move, they rub against each other. Sometimes, plates become stuck, even though they're still being pushed or pulled along. The pressure builds and then... snap, crack! One plate suddenly slips or snaps. This release of energy causes the earth to shake – it's an earthquake!

People can't predict exactly when earthquakes will happen.

Where do they occur?

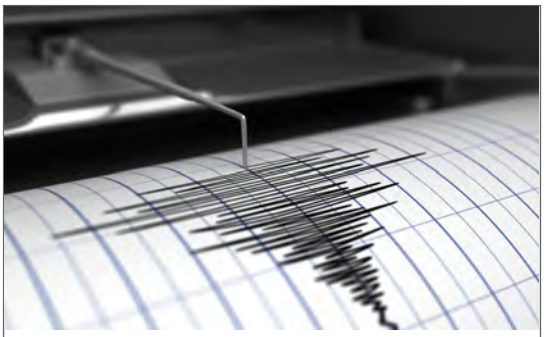
Most earthquakes occur along plate boundaries, but some take place on or near a crack (called a 'fault') within a plate. An earthquake event can cause even more 'faulting' (cracking) of rocks underground.

Did you know?

About 90% of the world's earthquakes occur around the Pacific Ring of Fire.

The Richter scale

Earthquake events are measured against the Richter scale (named after Charles Francis Richter, one of its inventors). This is a scale of earthquake strength: it's based on the distance moved by the vibrating pen of a seismometer (an instrument that detects waves of energy). The graph drawn by the shaking pen is called a seismograph.



Seismometers around the world detect quakes

Earthquake damage in Italy 2016

With each jump up the Richter scale – for instance, from 6 to 7, or from 7 to 8 – the earthquake's energy is ten times stronger. So what might sound like a small difference – between a quake measuring 6.0, for example, compared with another measuring 6.3 – could actually mean a big difference in terms of the chaos caused on the ground, and the death toll.

What effects do earthquakes have?

An earthquake can last for just a few seconds – and might not do too much damage – but could last for several minutes. Violent shaking for several minutes, or a series of shorter, more powerful shakes, can cause even the tallest skyscraper, or strongest bridge, to collapse in a pile of rubble. People inside may be injured or killed by falling masonry.

Quakes have an instant effect! But they also create longer-term problems for communities. Electricity, water and gas supplies can be cut when pipes move and break. Often, people can't even get away from the affected area, as transport routes – roads and railways – are likely to be closed due to damage from the quake. Food supplies can run low and diseases may spread amongst people living in makeshift camps.

Image Credits: Thinkstock/Getty Images , Shutterstock.com and Shelterbox

Search and rescue team at work

A box of aid from ShelterBox

Tsunami hazard warning

Duck, cover hold in an earthquake

Help for victims: ShelterBox

The people at international charity ShelterBox provide emergency shelter and tools for families who have lost their homes in disasters. Depending on the local climate, a green ShelterBox crate of aid might contain:

- A tent
- Blankets
- Water bottles and water purification equipment
- Mosquito nets
- Solar-powered lights

The gift of a family-sized tent provides shelter to protect a family from burning heat, bitter cold, dangerous animals and disease. The tents are designed to withstand winds of up to 200km per hour!

The Indian Ocean tsunami of 2004

Eleven thousand families affected by the Indian Ocean tsunami of 2004 received a ShelterBox. Terrifying tsunami waves hit the coast of 14 different countries bordering the Indian Ocean on Boxing Day, 26th December 2004. The waves were created by the sudden upward movement of part of the sea bed when a huge earthquake (9.1 on the Richter scale) occurred close to Indonesia. Water that was displaced by the rise in the sea bed formed the waves – do you remember Archimedes and his bath?

How can you protect yourself in an earthquake?

The advice is 'Duck, cover, hold!'

- **Duck** or drop to the ground.
- **Cover** means take cover: get under a desk or another sturdy-looking piece of furniture. If you can't do this, crouch with your back to the wall and cover your head and neck with your arms.
- **Hold** on to the leg of the desk you're under. Also, 'hold' your position (stay there) until the shaking stops.
- **If you're outside**, move to a large open space, away from trees, signs and power lines, which could fall down. And if you're near the coast, move to higher land, away from the sea

Aid inside a ShelterBox

Key Words: **aid** **earthquake** **damage** **natural hazard** **plate boundary** **protect** **Richter scale** **shelter** **tsunami**

YOUR MISSION: **Earthquakes**

NAME:

1. Draw yourself in the circle to become a detective!
2. Answer the questions below to complete your mission.

A. Tick 'true' or 'false' for the statements below.

Statements	True	False
1. The Earth's crust is made up of giant pieces called plates.		
2. Most earthquakes occur at plate boundaries .		
3. Earthquakes are measured against the Richard scale.		

B. Circle the correct answer.

4. A tsunami is...
   a. a tropical storm
   b. a giant wave created by a quake
   c. a Japanese earthquake

5. A seismometer measures...
   a. the height of buildings left standing after a quake
   b. the length of faults in the sea bed
   c. the strength of an earthquake

6. An earthquake drill is...
   a. a set of instructions used to protect people, like 'Duck, cover, hold'
   b. something used to rescue people trapped under rubble
   c. the sound an earthquake makes in a city

C. Draw three effects of an earthquake in a town or city: who or what might be affected?

D. After a quake, why is the rebuilding and recovery of a community such a long-term task?

OBSERVER ODD'S MISSION: **Earthquakes**

NAME:

Observer Odd needs your help!

His mission is to write a report on the facts presented in the *Earthquakes* text. Answer the questions below in full sentences so that he can use the information in his report.

1. What is a seismograph?

2. What size was the earthquake that created tsunami waves in the Indian Ocean on Boxing Day in 2004?

3. How could you protect yourself in an earthquake?

4. Make a list of things you would like to receive in a parcel of aid, after an earthquake.

5. Where do most of the world's earthquakes take place?

GO ONLINE: Find out more about a powerful earthquake like the one that affected the Tohoku region of Japan in 2011 by visiting oddizzi.com - Physical Features - Earthquakes - Massive Quakes.

INPSECTOR IZZI'S MISSION: **Earthquakes**

NAME:

Inspector Izzi has a new job and needs a hand!

Her task is to write a detailed analysis of the *Earthquakes* text. She needs you to help her read 'between the lines' and answer the questions below in full sentences.

6. What is an earthquake?

7. What causes an earthquake?

8. How does an earthquake create tsunami waves?

9. Suggest a country where school children might have regular earthquake drills and explain your choice.

EXTRA MISSIONS:

1. Draft and design a 'Safety Poster' that clearly shows what to do during an earthquake.
2. Role-play a debate among a ShelterBox team: what will you include in a box for earthquake victims.
3. Write a letter to ShelterBox to thank them for all the work they do. Try to include examples and explain why ShelterBox is important.