

What happens in an earthquake?

Earthquakes make the ground shake and may cause buildings and other structures to collapse. Some earthquakes are violent and may cause severe hazards for people.

1 The drawing shows some of the effects of an earthquake. Read the statements about the effects and sort them into four categories by shading them as follows:

- flood risks in blue
- communications in green
- risk of explosions in red
- damage to buildings or ground in yellow.

Landslides may block roads

Earthquakes can cause tidal waves

Water mains burst and supplies are cut off

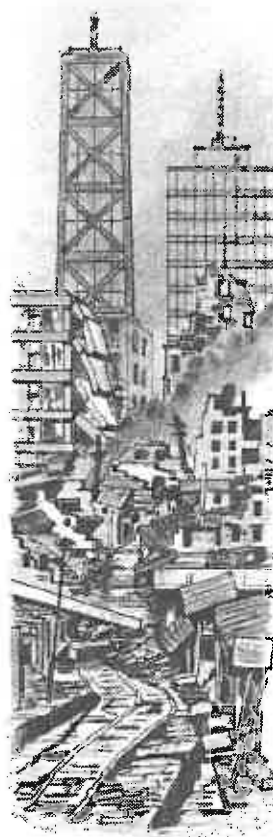
Electricity wires get torn down

Skyscrapers sway and shudder, develop cracks and collapse

Gas and sewage pipes fracture and break

In homes, ceilings fall down and doors jam

Airports close after buildings and runways are damaged



Dams may burst

Roads crack and bridges collapse

Railway lines buckle

Falling bricks and glass injure people

Communication links are cut with telephone wires down

Fires rage out of control

Some survivors are trapped under rubble and fallen debris

Deaths and injuries are caused by buildings collapsing

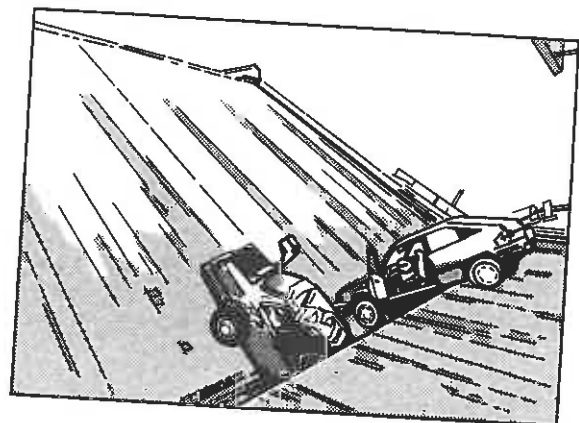
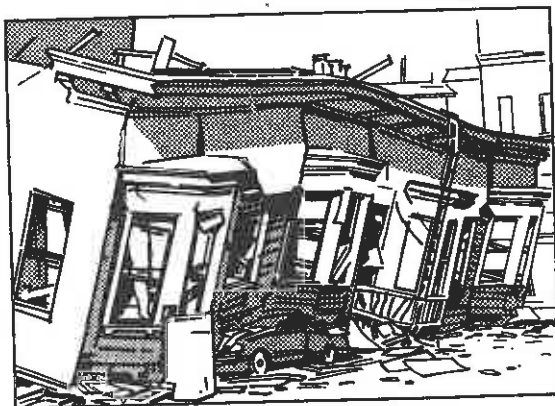
- 2 Write five sentences to describe how earthquakes affect people's lives and how people may feel after an earthquake.
- 3 Write five sentences to describe how earthquakes affect places.
- 4 Rank the statements in the four categories according to how severely they would affect your family in the event of an earthquake. Write them down, starting each category with the one that would have the most impact.
- 5 Explain why the top two effects in each list would have the greatest impact.
- 6 Working with a partner, discuss the problems you would have in bringing help to areas damaged by earthquake.

What happens in an earthquake?

On Tuesday, 17th October 1989 an earthquake hit the Californian city of San Francisco.

1 Working with a partner or in a small group, read through the statements below.

Teachers and pupils in schools across San Francisco practise the earthquake drill every month.	Highly-skilled rescue teams reached the disaster areas within minutes.
Skyscrapers are now built to sway during an earthquake, but not collapse.	San Francisco lies close to the boundary of two giant plates called the San Andreas fault.
Main highways have been improved and strengthened.	Earthquake kits, including bottled water, emergency food, torch, first aid kit, radio and protective fireproof headgear, are always on sale in shops in San Francisco.
The plates move past each other causing friction and earth tremors.	Helicopters were used to transport rescuers and evacuate the injured.
An estimated 200 people died when a mile of two-tier road collapsed.	Well-trained fire crews quickly brought several huge fires under control.
Many households have earthquake kits of bottled water, emergency food, torch, radio and fire extinguishers.	£10 billion was spent on repairing damage and preparing for the next earthquake.
People are advised not to store things on high shelves.	Water mains burst and supplies were cut off.
People are now advised to switch off electrical appliances and gas ovens during an earthquake.	Skyscrapers swayed and shuddered, developed cracks and collapsed.
Scientists use instruments to measure earth movements. They may be able to predict future earthquakes.	One main zone of earthquake activity lies along the west coast of the Americas.
Gas pipes fracture and break and fires rage out of control.	Electricity wires get torn down and cause fires.
Architects and builders must follow the rules for building safe buildings.	



Despite public awareness and training, panic and chaos was widespread.	Pneumatic drills and heavy lifting equipment for the removal of earthquake debris were brought in to help with search work.
Normally the movement is slight but in 1989, the plates became jammed and enormous pressure was built up. When pressure is released, there is a major earthquake.	Emergency services such as police, fire and ambulance crews are trained on dealing with earthquake situations.
In homes, ceilings fell down and doors jammed.	Existing buildings, roads and bridges should be strengthened.
The earthquake measured 6.9 on the Richter Scale.	Hospitals are prepared and evacuation centres are set up in safe areas.
Falling bricks and flying glass injured people.	Building regulations must be adhered to and frequent safety checks must be carried out.
Some survivors were trapped under rubble and fallen debris	Earthquake-proof buildings must be safe and protect people rather than cause danger in an earthquake.
Deaths and injuries were caused by buildings collapsing.	Emergency supplies of water, food and power are organised in advance.
Roads cracked, bridges fell and communication links were cut.	An efficient earthquake warning system must be set up.
Hundreds of dead people lay buried in the rubble and thousands were homeless.	Radio and TV stations should be prepared to give out earthquake advice.
All new buildings must comply with strict earthquake planning regulations.	Most Earthquakes are found in long narrow belts across the Earth's surface.
Many fires proved hard to put out because water ran short.	The Earth's surface is made up of several plates that move about very slowly. Earthquakes are most likely to occur in areas where the plates meet.
People scabbled, using bare hands, to remove fallen debris in search of survivors.	Rescue and emergency services were put on red alert and saved many lives.
Government and international aid and charity organisations launched fundraising schemes.	

2 Sort the statements into the three categories by shading them as follows:

- causes of earthquakes in yellow
- effects of earthquakes in red
- human responses to earthquakes in green.

3 Now classify your statements further by writing them out under the appropriate headings in a table like the one on Activity Sheet 2.5c.

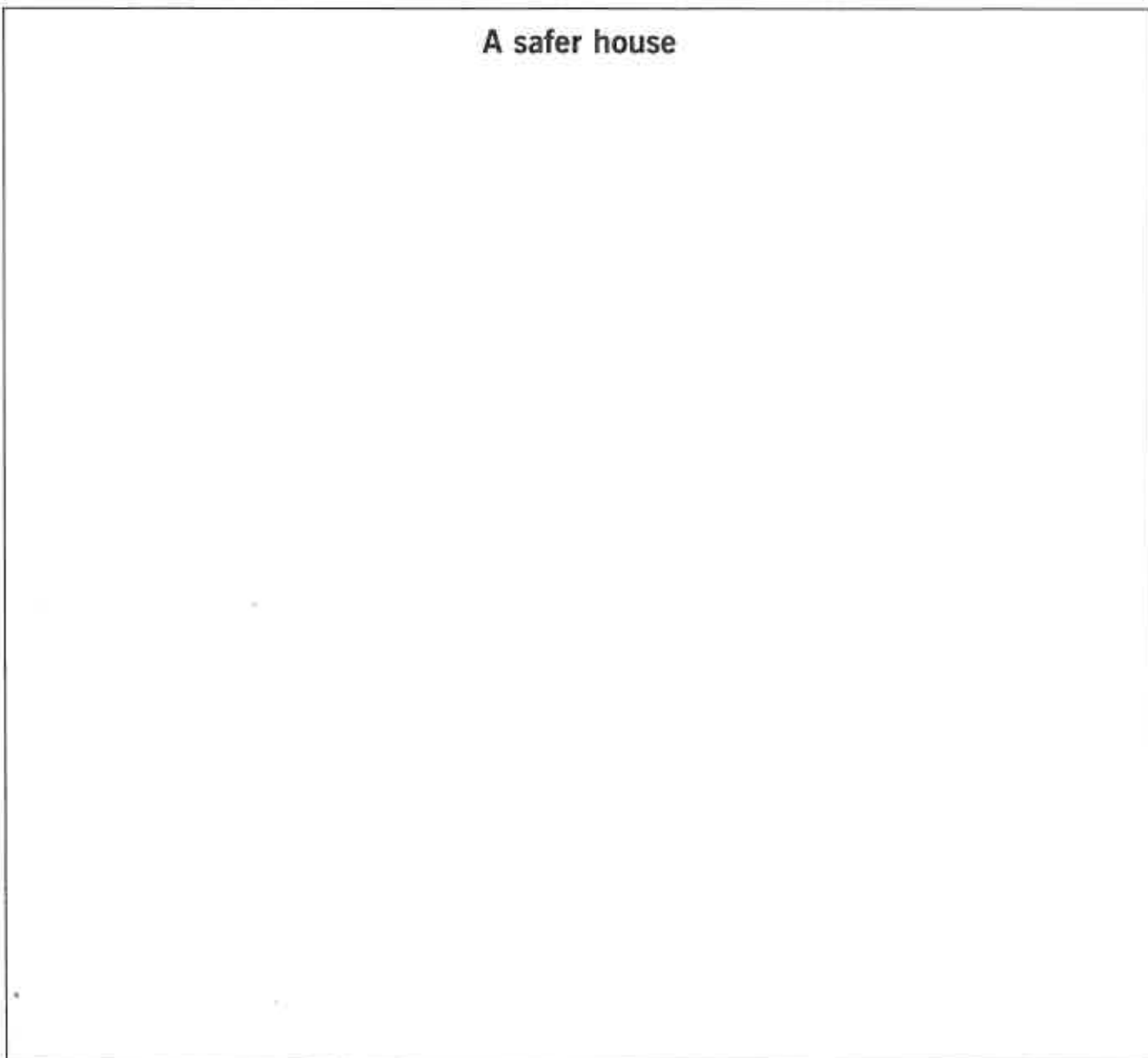
How can the earthquake danger be reduced?

It is impossible to prevent earthquakes from happening but poorer countries can build safer houses at relatively little cost. Houses are more likely to survive an earthquake if they have:

- cube shapes
- deep foundations
- doors and windows that are not built near corners
- 'through' stones at regular intervals
- large stones to secure the corners
- timber plates to prevent the walls from twisting
- roofs made of lightweight materials
- lintels above windows and doors that run deep into the walls on either side.

Draw a sketch of a house that would be safer in an earthquake below and label its features.

A safer house



Two earthquakes compared

Imagine that you are a newspaper reporter. You have to report on the earthquake that has just hit the city of San Francisco. After you receive a photograph on your laptop computer, you must plan your research.

- 1 Work with a partner or in a small group. Use the information below and add other questions that would give the newspaper's readers a better understanding of the disaster. Your questions should begin: What? Where? Who? When? Why? How? This has been started for you.

When did this happen?

What was the damage?

Where did this happen?



Who are the heroes?

Why did this happen?

How were people affected?

- 2 Number your questions into order of importance.
- 3 Why did the San Francisco earthquake receive more media attention than the one in India? Give at least two contrasting reasons.