

Student tasks

Read the following information on **Our Earth** and then answer the questions.

Our Earth

The Earth is composed of **four layers**.

The outer layer is the **crust**; this is solid and relatively thin. The **mantle** is underneath the crust; this is made of semi molten rock. Convection currents in the mantle move the separate slabs of crust called plates. Underneath the mantle, we have the **outer core**; this is liquid and is made of iron and nickel. At the centre of the Earth, we find the **inner core** made of solid iron and nickel. Scientists believe the core may be as hot as 5,500°C or hotter than the surface of the sun!



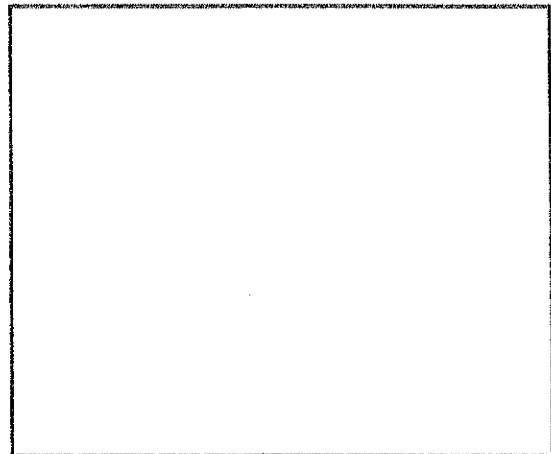
1. On the paragraph above, highlight or underline the names of the four separate layers that make up the Earth.

2. Give four facts about the structure of the Earth:

- a.
- b.
- c.
- d.

3. In the box on the right, draw a simple diagram of the Earth. Include the labels:

- Crust
- Mantle
- Inner core
- Outer core
- Solid
- Liquid
- 5,500°C
- Nickel and iron



4. Give one difference between the Inner core and the Outer core:

- The outer core is liquid whereas the inner core is ...

Extension task - GCSE question

Describe the structure of the Earth.


(4 Marks)

Read the following information on **Continental and oceanic crust** and then answer the questions.

Continental and oceanic crust

Continental crust is found on the land (the continents). It is relatively light and made of the rock **granite**. Continental crust is old, as it is never destroyed at destructive plate margins. Continental crust is thicker and less dense than oceanic crust.

Oceanic crust is found under the oceans and is much younger and thinner than continental crust. It is constantly being created at constructive plate boundaries and so is much younger. Oceanic crust is made of heavier, denser **basalt** rock.

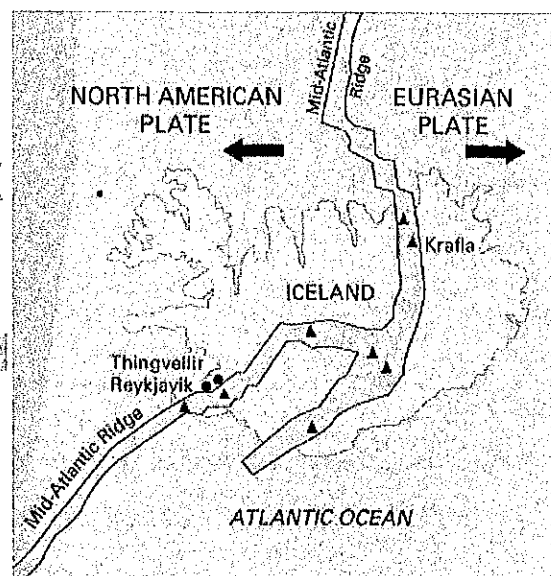


1. On the paragraph above, highlight or underline the two rock types mentioned.
2. Complete the table below to compare continental and oceanic crust:

	Continental crust	Oceanic crust
Found on land or under the sea?		
Heavier or lighter?		
Older or younger?		
Less or more dense?		
Rock type?		

3. Describe what is happening in this map of Iceland:
4. Describe the distribution of volcanoes shown by red triangles on the map of Iceland.

Map used courtesy of the US Geological Survey
pubs.usgs.gov/gip/dynamic/understanding.html



Extension task

1. Use the map in the PowerPoint to identify
 - a constructive plate boundary where two plates are moving apart.
 - a destructive plate boundary where two plates are moving together.

Task 1:

Draw lines to match up the words with the correct meaning.

Richter Scale	An instrument to measure the strength of the earthquake
Magnitude	The place in the earth where rocks are moving
Focus	Smaller earthquakes after the main, large one
Epicentre	The point at the surface above the focus
After-shock	The scale on which the strength of the earthquake is measured
Seismometer	How strong an earthquake is

Task 2:

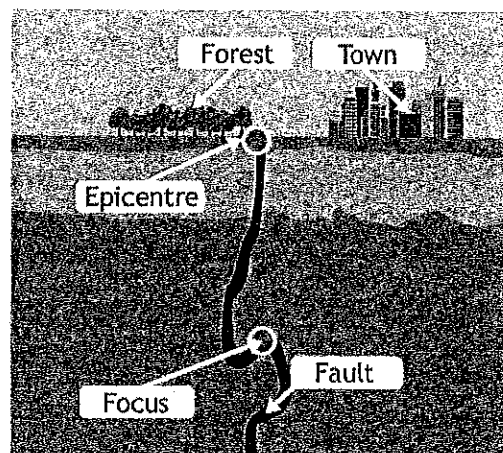
The statements below explain how earthquakes happen. Rearrange the statements into the correct order by numbering them 1 to 5.

	A. This pressure is suddenly released in a jerky movement.
	B. Earthquakes occur at plate margins.
	C. The plates sometimes lock, causing pressure to build up.
	D. This release of pressure is called an earthquake.
	E. As the plates move past each other at the margins the movement is not smooth.

Task 3:

1. Study the diagram and answer the following questions in full sentences.

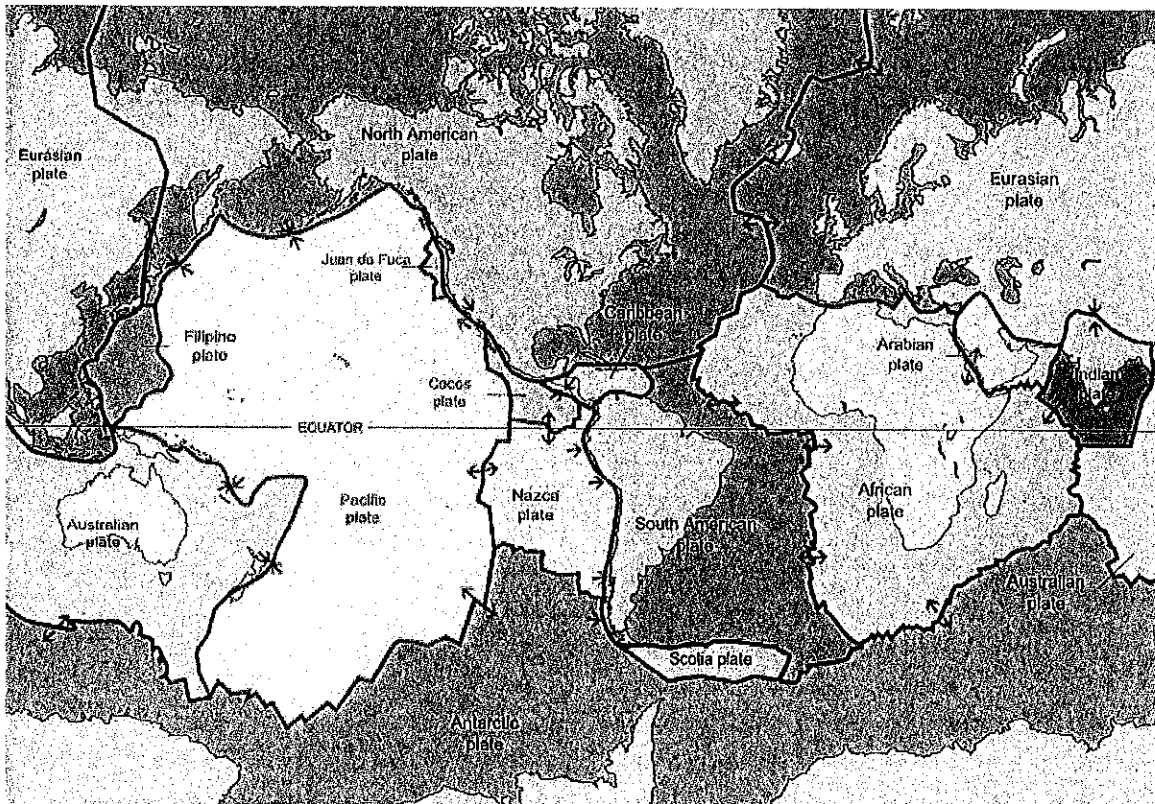
- A. Where would the earthquake be felt most strongly - the forest or the town? Explain your answer.
- B. The depth of the focus varies. Explain how the effects of the earthquake would be different if the focus were deeper in the crust.



Do you understand plate boundaries?

The CRUST is divided into huge slabs called PLATES. Where the plates meet there are three types of plate boundary:

- **Constructive or divergent plate boundaries** where the two plates are moving apart.
- **Conservative or transform plate boundaries** where the plates are sliding past each other.
- **Destructive or collision or convergent plate boundaries** where the plates are moving together.



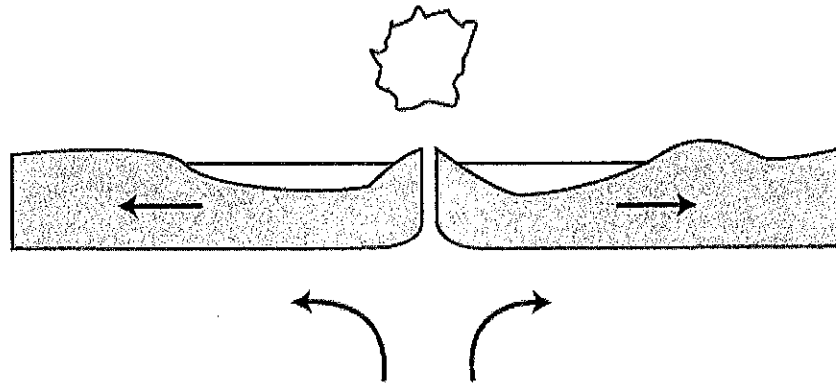
Map used courtesy of the US Geological Survey en.wikipedia.org/wiki/Plate_tectonics#/media/File:Plates_tect2_en.svg

Student tasks

Complete the following statements:

1. The South American and African plates are moving
2. The North American and Eurasian plates are moving
3. The South American and Nazca plate are moving
4. Constructive plate boundaries are where new crust is being made or constructed, so destructive plate boundaries are where the crust

Constructive plate boundaries



1. On the diagram above add the following labels:

- Convection currents
- PLATES MOVING APART
- Volcano
- New land being formed.
- Mantle
- CRUST

2. Use the word bank to complete the sentences below:

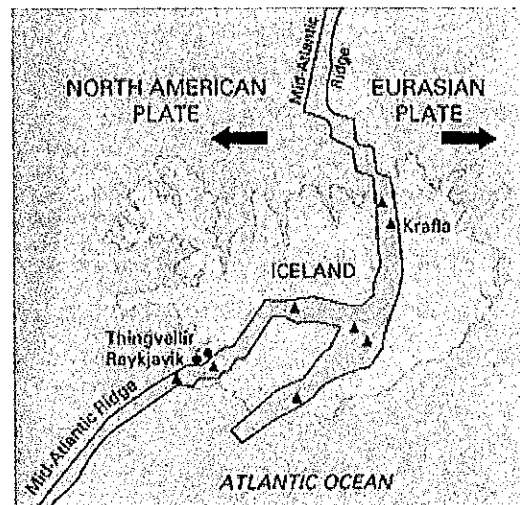
Why do volcanoes form at constructive plate boundaries?

- a. Plates are moving due to rising currents.
- b. Magma from the mantle rises through the in the to form a
- c. The lava cools to form

Word bank					
gap	apart	crust	volcano	convection	new land

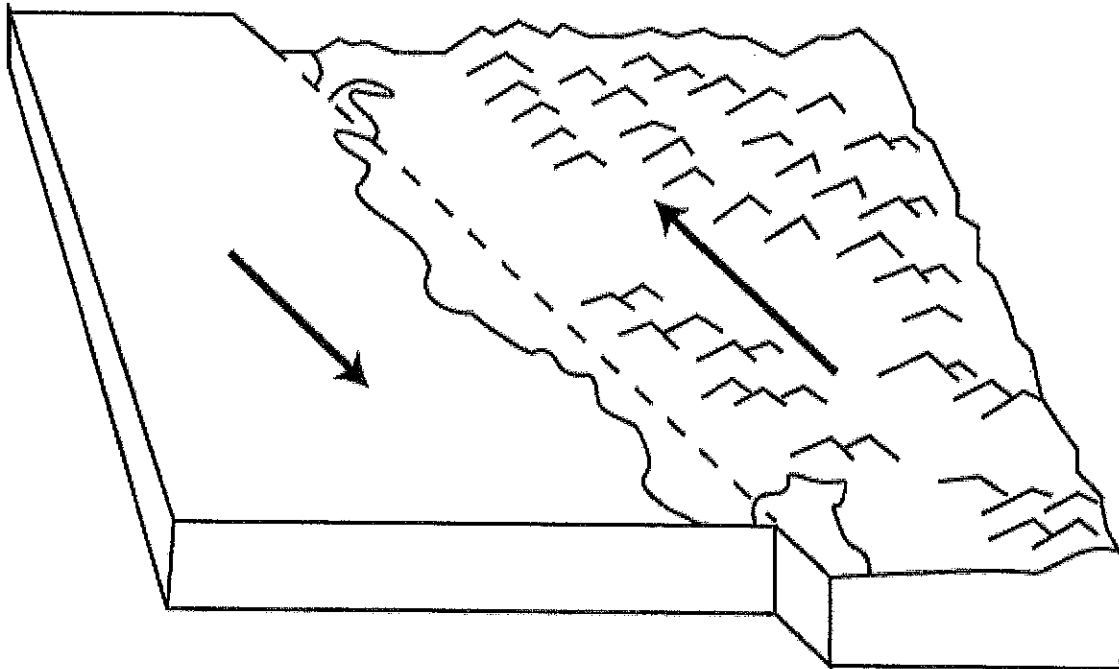
3. Describe what is happening in this map of Iceland.

4. Explain what is happening in this map of Iceland.



Map used courtesy of the US Geological Survey
pubs.usgs.gov/gip/dynamic/understanding.html

Conservative plate boundaries



Why do we get earthquakes at conservative plate margins?

Circle/highlight or underline the correct word in each pair.

1. The two plates are moving [parallel with / apart from] each other.
2. They [slide past / slide apart] from each other.
3. Due to friction the plates [stick/move].
4. [Pressure/magma] builds up.
5. This pressure is released suddenly in a [jerking/smooth] movement.
6. This releases [shock waves / tidal waves] and an earthquake occurs.
7. These waves can be recorded on a [barometer/seismometer].

GCSE Question

The San Andreas Fault in California lies on a conservative plate margin.

Explain with the help of a diagram how earthquakes are caused at a conservative plate margin.

(4 Marks)

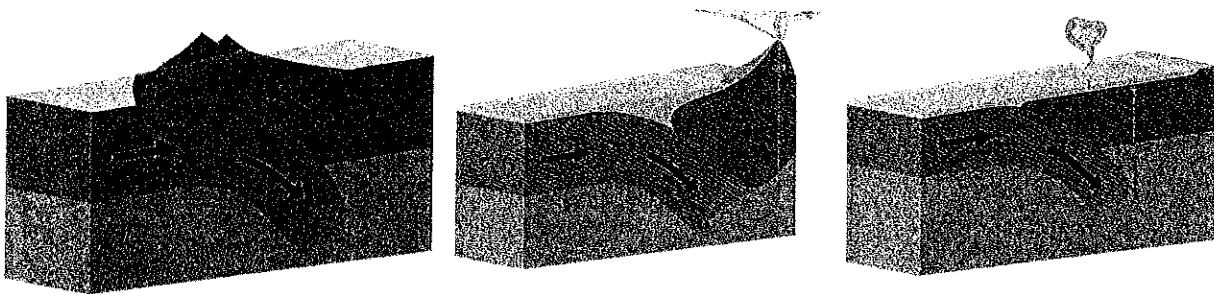
Do you understand plate boundaries?

Destructive plate boundaries

Destructive or collision or convergent plate boundaries occur where the plates are moving together. There are three possible boundary types:

- at a continental to continental plate boundary
- at an oceanic to continental plate boundary or
- at an oceanic plate to oceanic plate boundary.

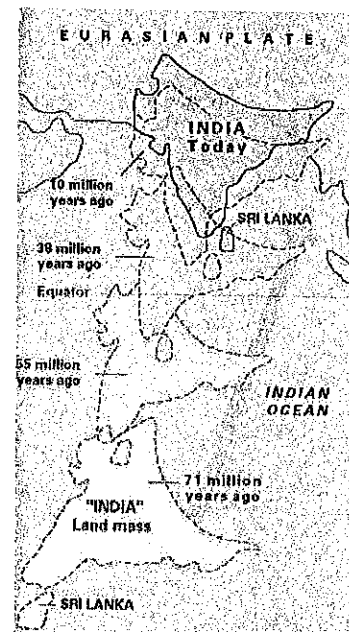
1. Label the three diagrams below using the three destructive plate boundary types.



Images used courtesy of domdomegg, 2015 under the Creative Commons Attribution 4.0 International license.
en.wikipedia.org/wiki/Convergent_boundary

2. Are the sentences below true or false?

- When two plates move towards one another, they form a subduction zone or a continental collision.
- Pressure and friction build up at destructive plate boundaries.
- Earthquakes and volcanoes are common near destructive plate boundaries.
- Large fold mountain ranges are formed during collisions between two continental plates.
- The Himalayas were formed by the Indian plate colliding with the Eurasian plate over millions of years.



Map used courtesy of the US Geological Survey
pubs.usgs.gov/gip/dynamic/himalaya.html

GCSE Question

There is a deep ocean trench in the Pacific Ocean, west of South America at the boundary of the Nazca Plate and South American Plates.

Explain the formation of an ocean trench.

(4 Marks)

