NEW ERA
international school

2.18 Plate tectonics

THEME-2 TOPIC-18

Aims:

1. **Structure of the Earth's Interior.**
2. **Plate tectonics**
3. **Types of plate boundaries**
4. **Task 1-4**

Key words

Plate tectonics- тектоникийн хавтан

Crust-газрын давхрага

Plate boundary-хавтангийн хил зааг

Convergent-ойртон нийлэх хил

Divergent-холдон салах хил

Fold mountains-атираат уулс

Volcano-галт уул

Earthquakes-газар хөдлөлт

Sub duction zone-шургалтын бүс, субдүкцийн бүс

Sea floor spreads-далайн ёроолын тархалт

Convection currents-Дулааны горимын өөрчлөлтөөс болж үүсэж буй мантийн бодисуудын дээш, доош чиглэсэн хөдлөгөөн.

Asthenosphere- дээд мантийн дээгүүр хөвж байдаг уян нарийхай шингэн давхрага бөгөөд үүний дээгүүр тектоникийн хавтангууд чөлөөтэй хөдөлгөөнд оршиж байдаг.

Destructive plate -доош сууж буй хавтан

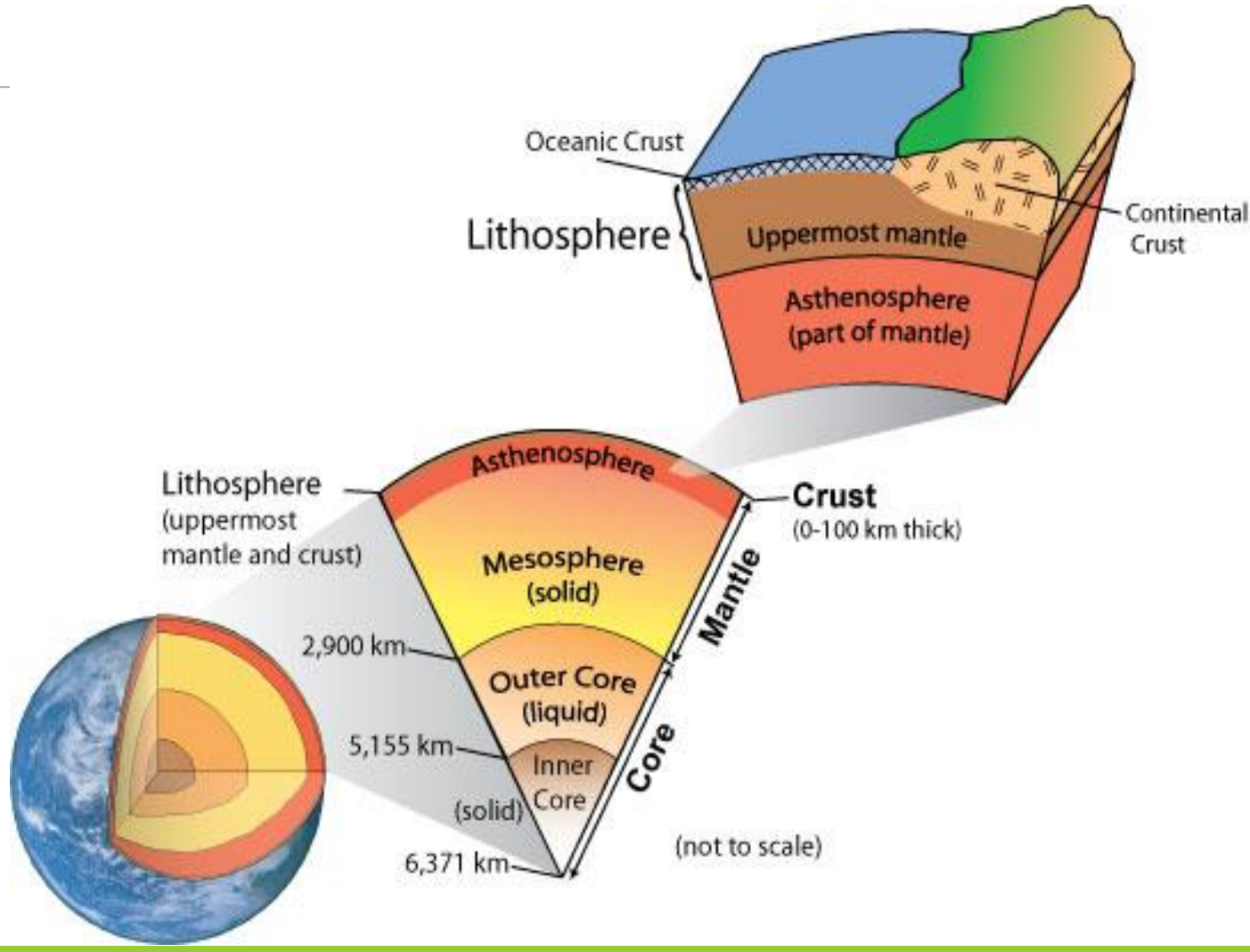
Constructive plate - шинээр үүсэж буй хавтан

Strato volcano-давхраат галт уул
Shield volcano-бамбай хэлбэрт галт уул
Sedimentary rock-тунамал чулуу

1. Structure of the Earth's Interior.

The Earth is believed to have a *solid inner core*, made mostly of iron and nickel. This is surrounded by a *liquid outer core*, also mostly iron and nickel. The diameter of the core is estimated to be 6000 km.

The *crust* is only a few tens of kilometers thick. The region between the core and the crust is called the *mantle*. The upper part of the mantle and the crust together are called the *lithosphere*. Sitting just below the lithosphere is a region of plastic consistency called the ***asthenosphere***.



2. Plate tectonics

The surface of the earth is known as the crust.

This is a collection of solid tectonic plates that join together like a **jigsaw puzzle**. Around the core at the center of the Earth is a layer of molten magma. This is called the mantle. Through this layer flow convection currents.

The plates float on the mantle. The convection currents move these plates away from, or towards, or alongside each other. These movement along plate boundaries give rise to earthquakes, volcanoes and fold mountains.

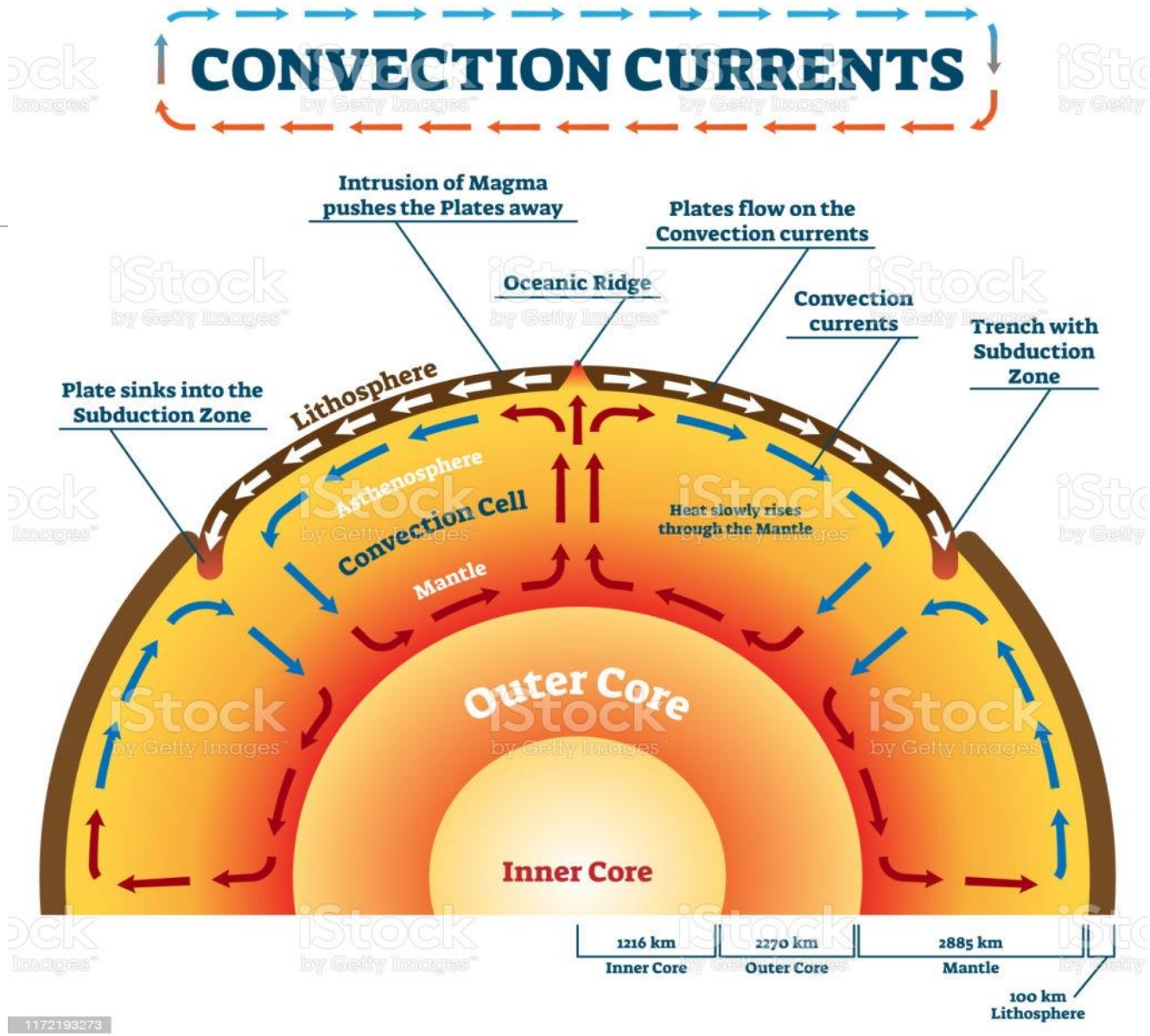
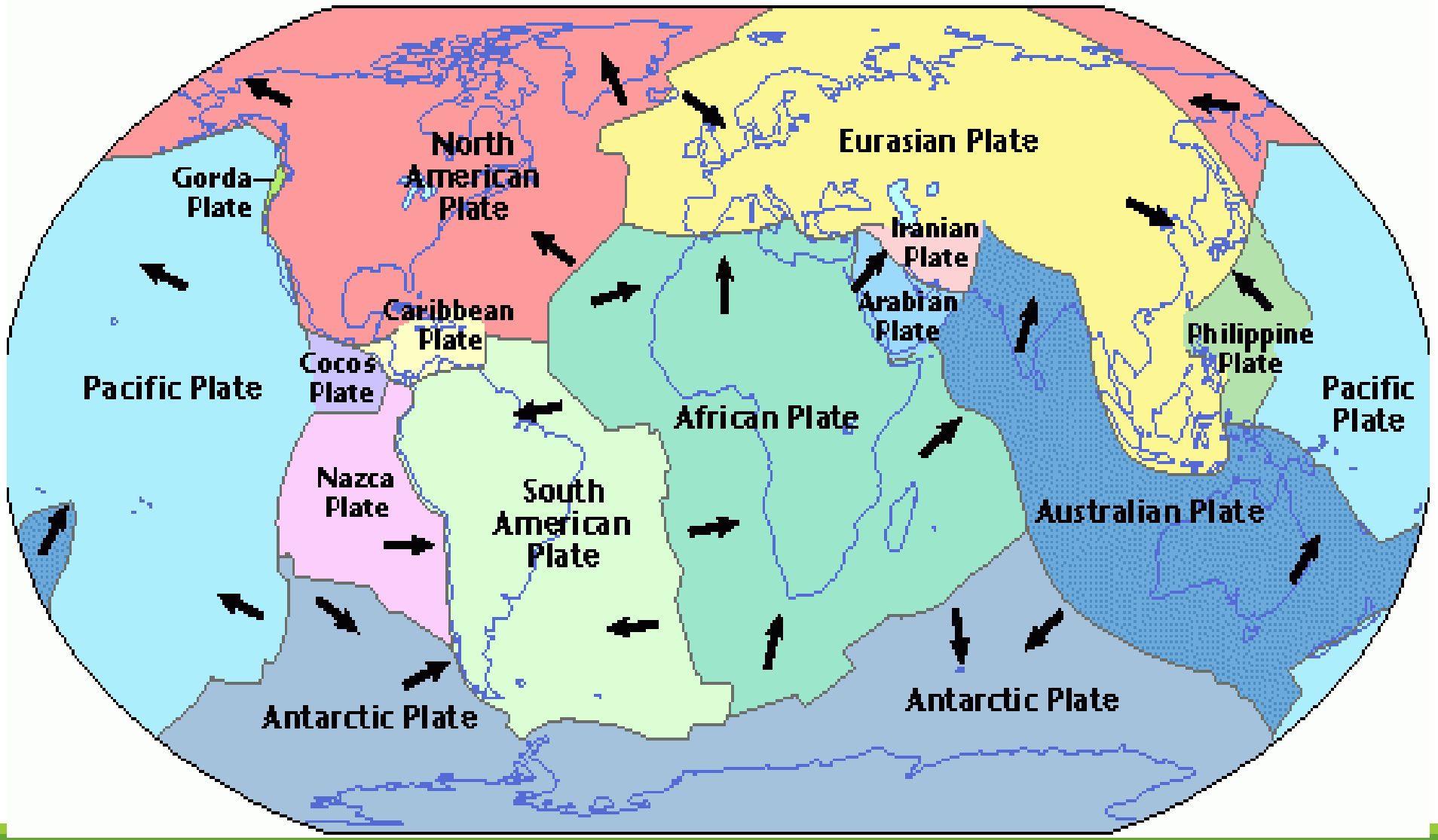


Plate tectonics.

On Earth, there are 6-10 major plates and many minor plates. Where plates meet, their relative motion determines the type of boundary convergent, divergent, or transform. Earthquakes, volcanic activity, formation occur along these plate boundaries.



Movement of the plate's.

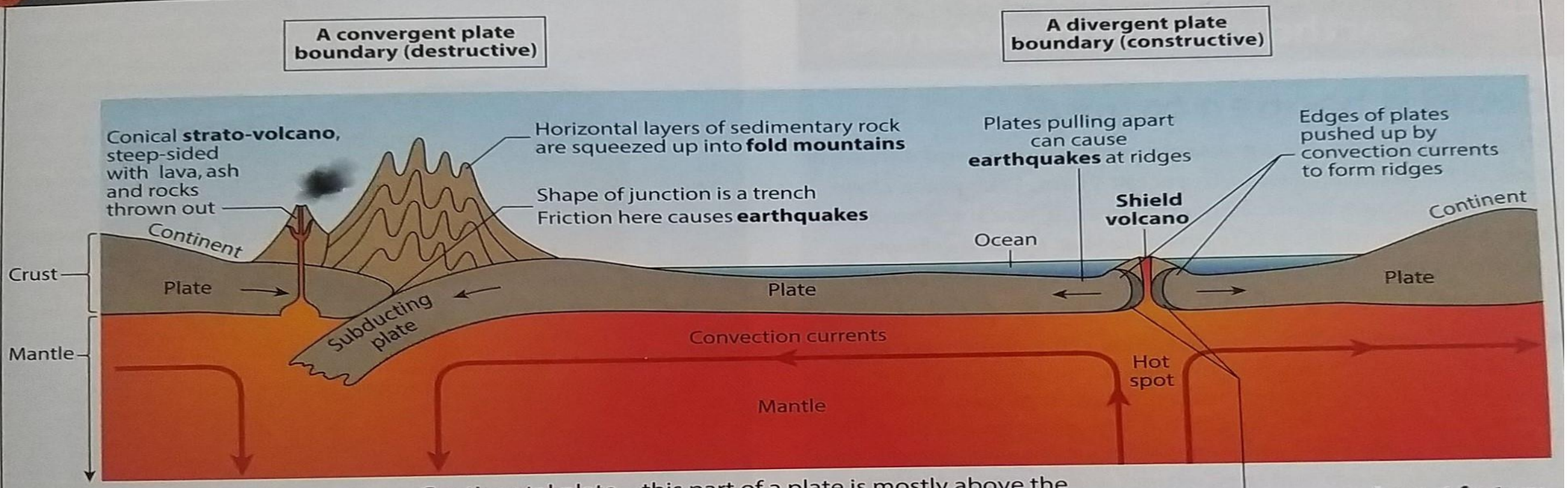
Tectonic plates are able to move on the asthenosphere.

Plates are moving very slowly. The average movement is about 40 mm per year with a range of 10 mm to 180 mm estimated- but over a million years this can amount to a great distance in kilometres.

3. Types of plate boundaries.

Type of boundary	Convergent boundary	Divergent boundary	Conservative boundary
Movement	Sub duction	Spreading	The plates slide sideways by each other.
Effect	Destructive- old crust destroyed. A crust 'bin'	Constructive- new crust created. A crust 'factory'	Crust neither created nor destroyed.
Relief	trench	ridge	No major effect
Activity	Earthquakes and strato-volcanoes	Earthquakes and shield-volcanoes	Earthquakes

C Converging and diverging plates



A crust bin

Oceanic crust (heavy) sinks beneath continental crust (light) and melts, creating heat and pressure and magma (molten rock)

Continental plate – this part of a plate is mostly above the ocean, forming land. It is between 25 and 100 km thick and is mostly made of granite, a lighter rock than basalt.

Oceanic plate – this part of a plate is mostly below the ocean. It is mainly made of basalt between 5 and 10 km thick. It is a dense, heavy rock so it sinks below the continental plates.

A crust factory

New crust as magma cools from mantle

Sea floor spreads as plates move apart or diverge

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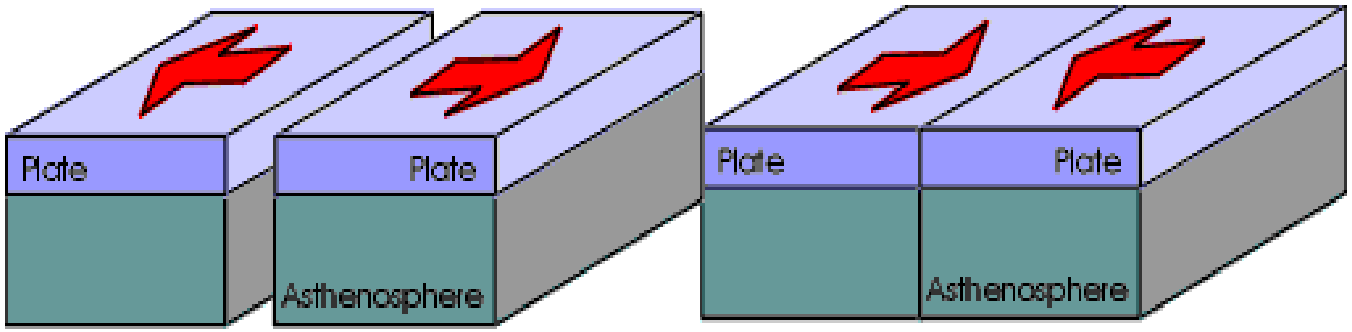
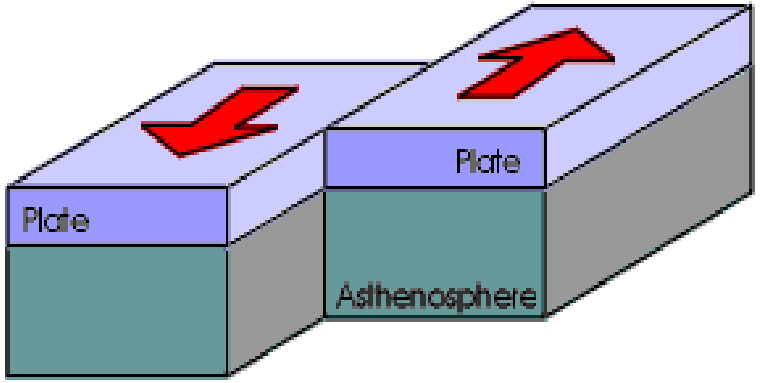
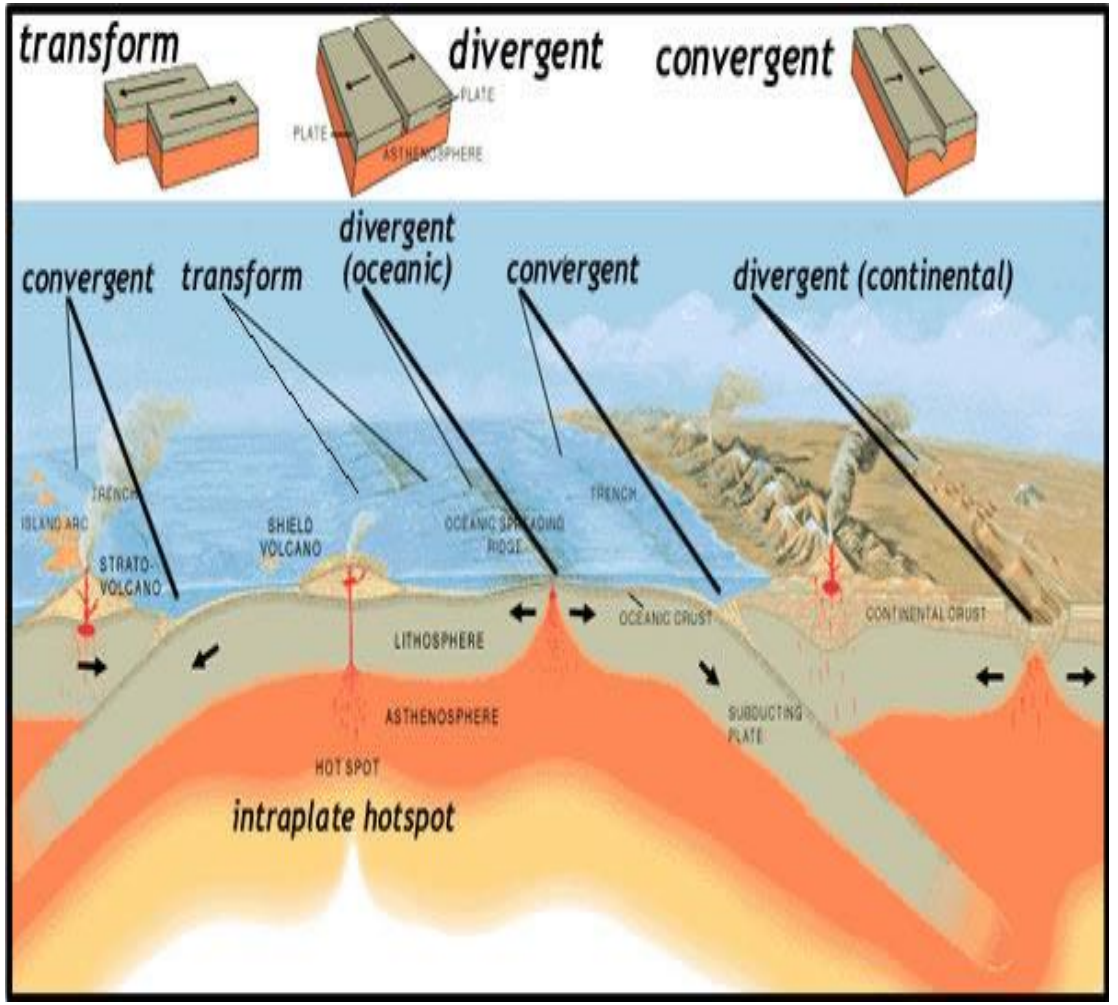


Divergent

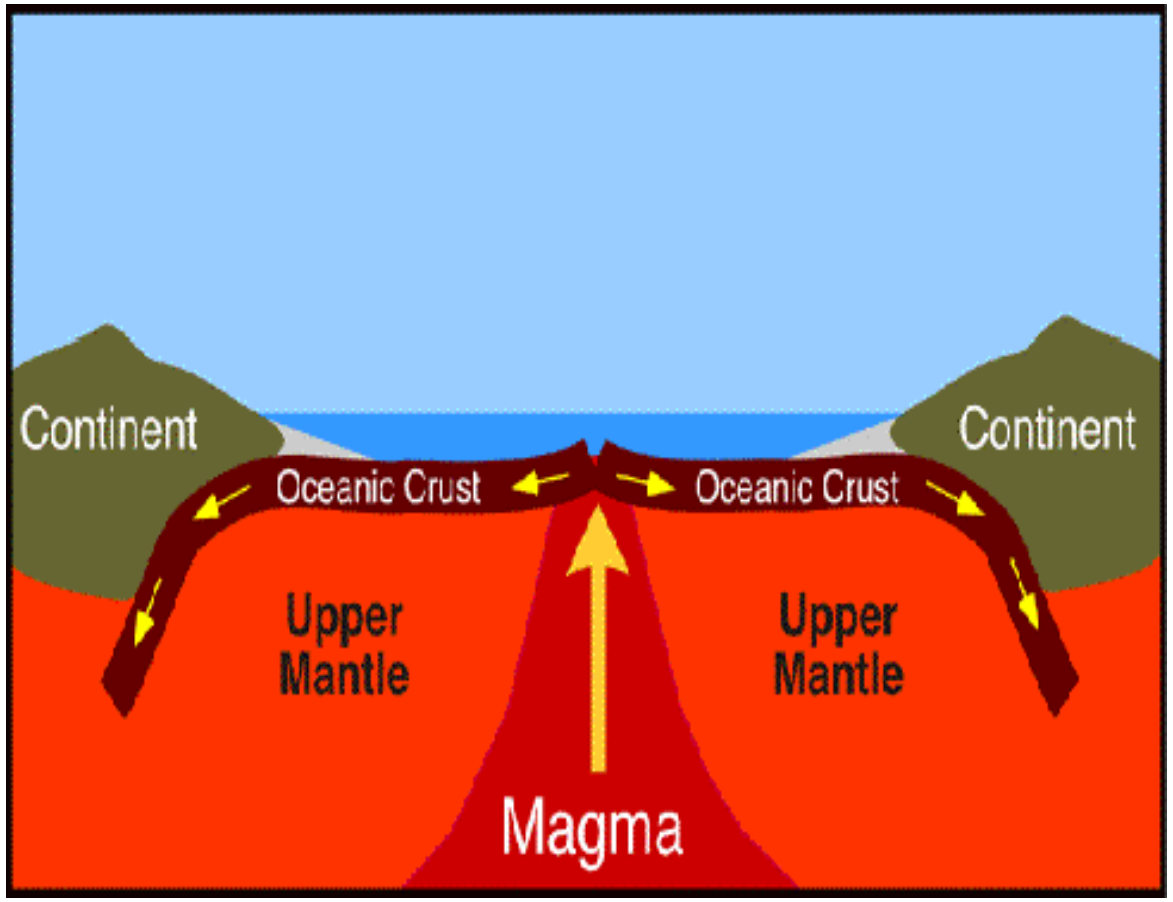
Convergent



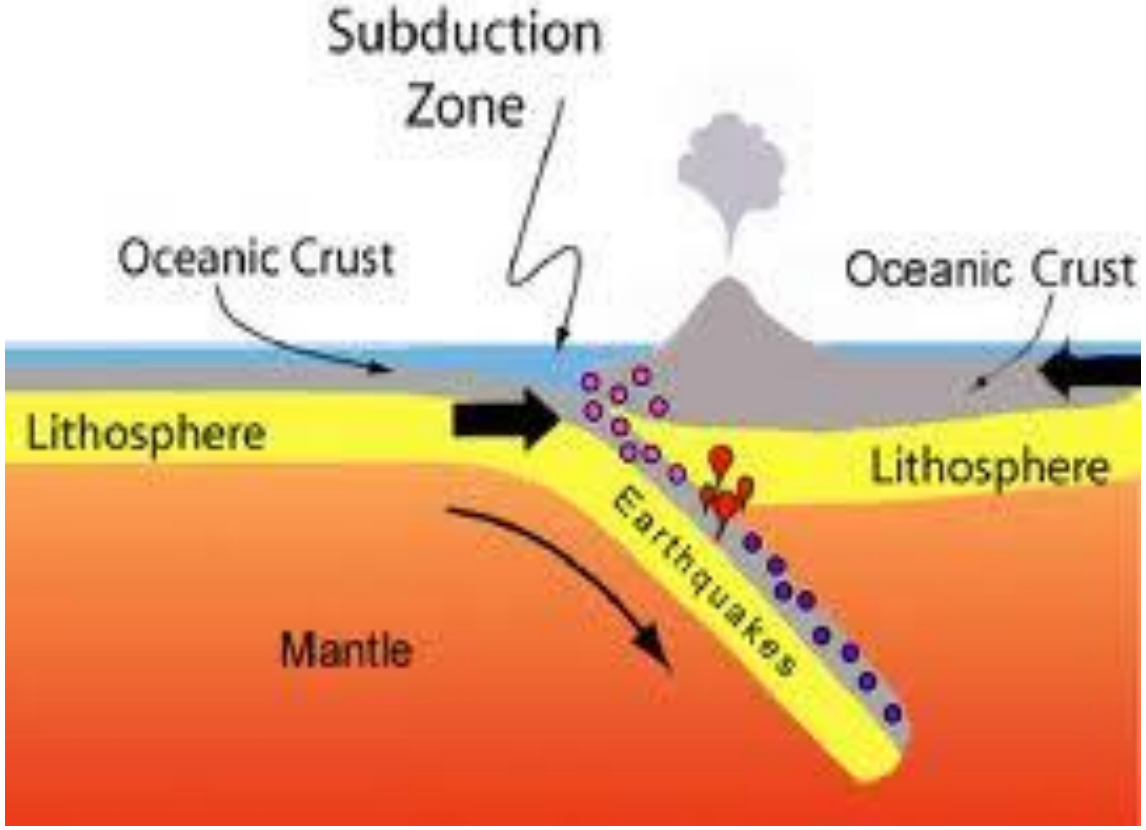
Transform



Sea-floor spreading



Sub duction zone



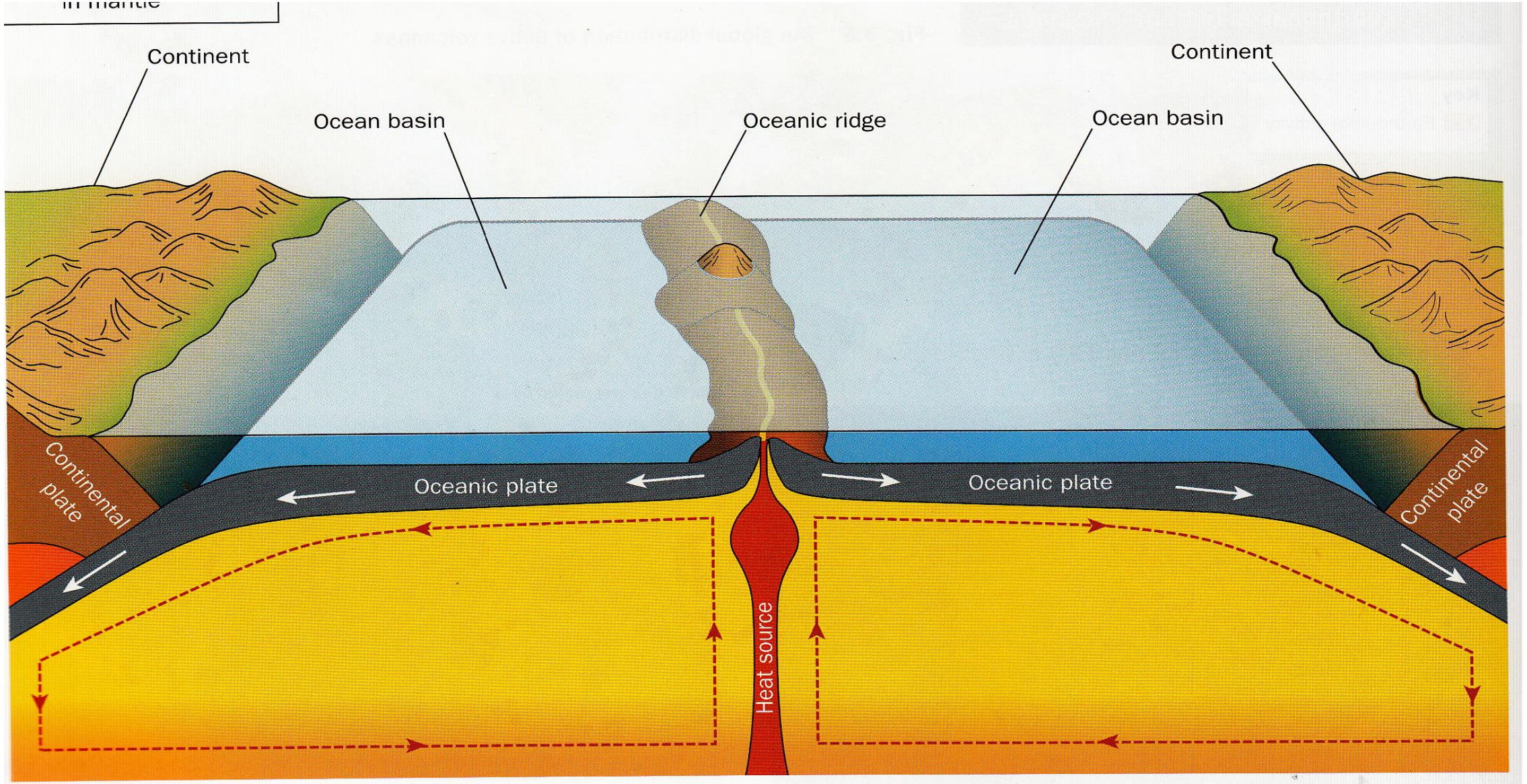


Fig. 3.7 How convection currents in the mantle cause the plates to move

Task1. Make your own labelled drawing of the Earth’s structure.

Task2

1. On an outline map of the world, draw the plate boundaries and name the plates.
2. Label the country where you live.
3. On which plate do you live.
4. How close do you live to your nearest plate boundary.

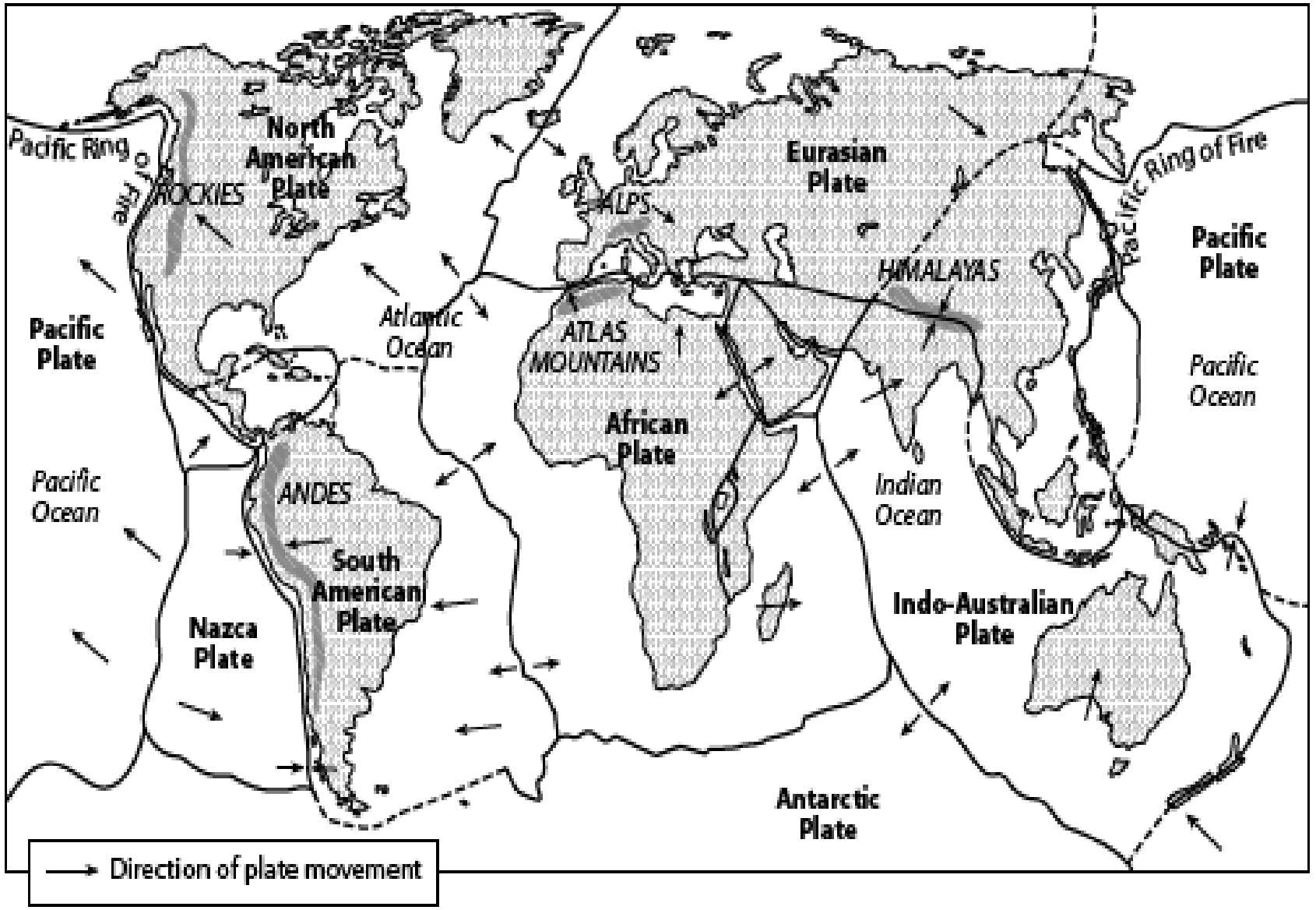
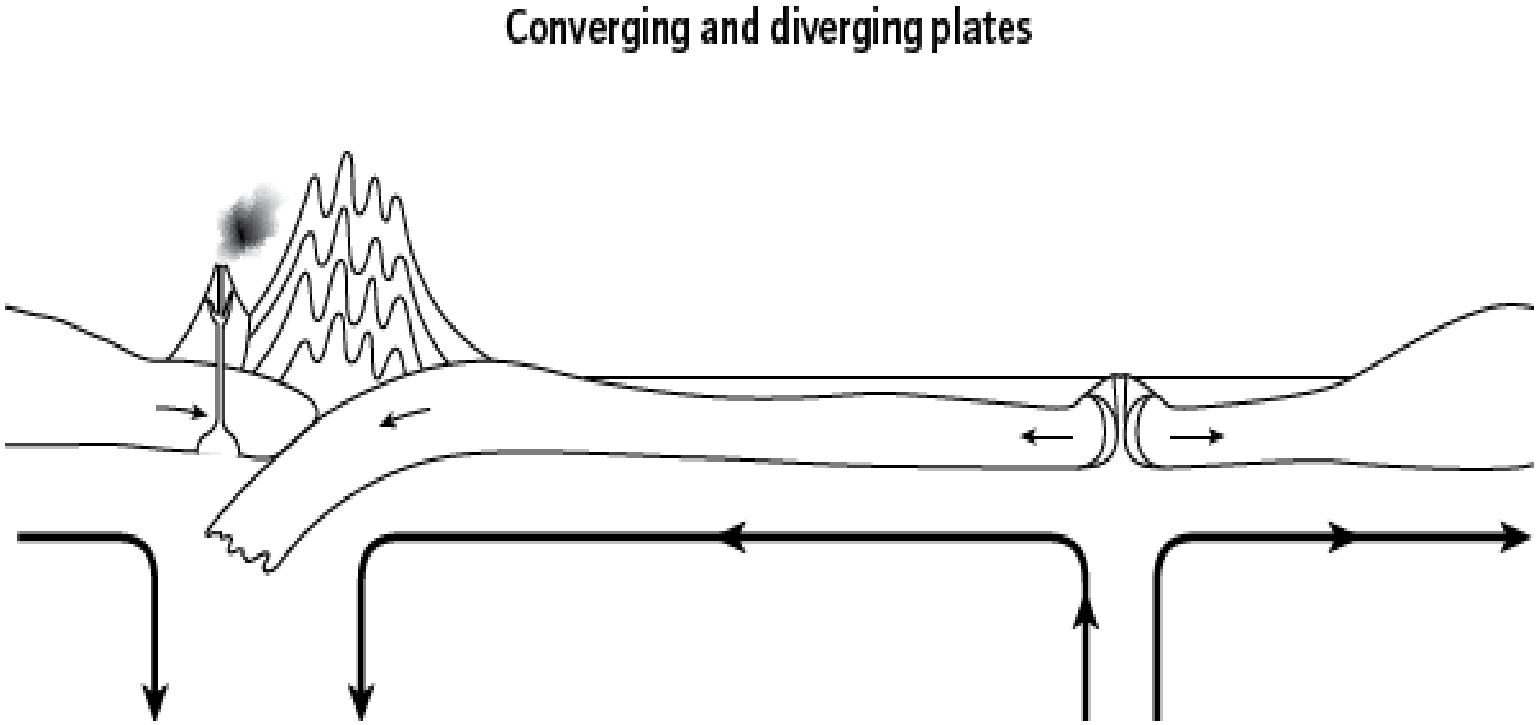


Fig. 1

Task4

1. Make your own copy of the diagram including labels.
2. Write down the meaning and location of each of the following by referring to plates and their boundaries:

-convergent boundary
-divergent boundary
-sub ducting plate
-trench
-ridge



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Task 3

(i) What is the outer layer of the Earth called? *(1)*

(ii) Use Fig. 1 to explain why the outer layer of the Earth can be compared with a jigsaw. *(2)*

(iii) The following processes take place at plate boundaries. For each process name two plates that share a boundary where it is happening:

A sea-floor spreading

B subduction

C formation of fold mountains. *(3)*

(iv) Explain why earthquakes occur at plate boundaries. *(4)*