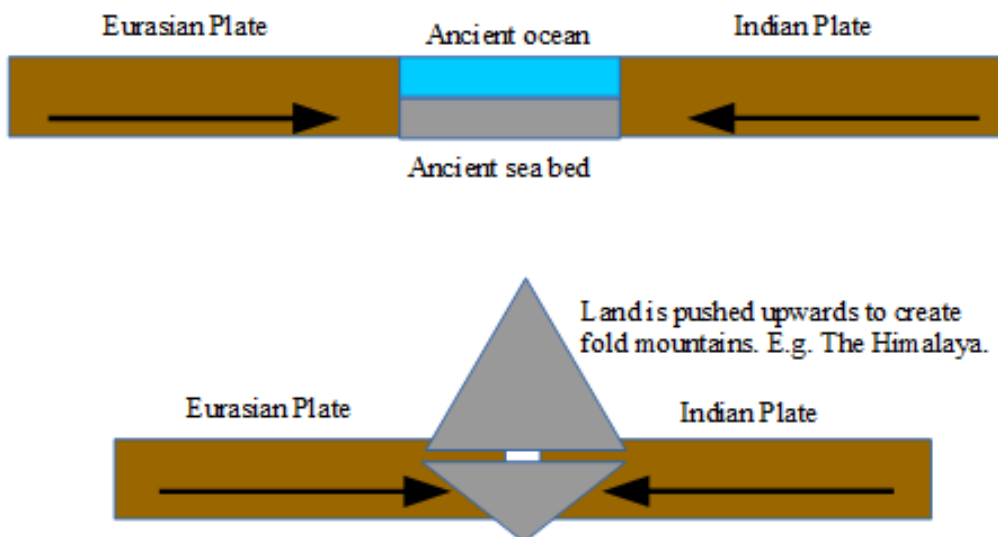


Collision and transform Boundaries

I. The collision boundary

Sometimes when two plates move together they are both continental rather than one being continental and one being oceanic as at the destructive margin. A good example of this is India moving north into the Eurasian plate.



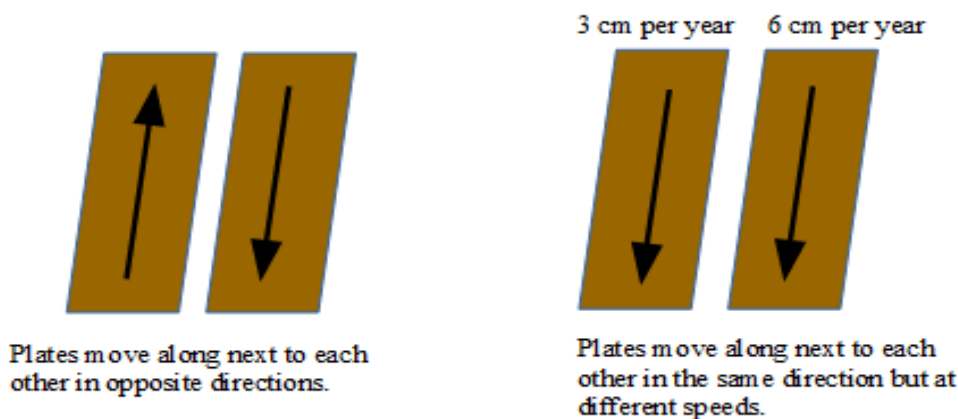
As the plates are the same density neither is forced down into the mantle. Instead the land is pushed upwards to create fold mountains. This explains why fossils of sea creatures are found on top of the world's highest mountains. The rock that makes up the Himalaya used to be a sea bed. Over millions of years this has been pushed upwards as India has steadily moved north into Asia. This process is still happening today and the Himalaya Mountains are still growing.

There are no volcanoes at this type of boundary. This makes sense if you think about it; no gap is being created to allow the magma through and no source of magma is being made as the plates are not being melted.

This type of boundary does suffer from earthquakes and they can be very large. As the plates push into each other they buckle and twist. Parts of the plates become jammed against each other and pressure is built up. When this pressure becomes too great one of the plates will give way; the sudden movement of the plates below the surface creates the vibrations we feel as earthquakes.

II. The conservative margin / transform boundary

The final type of boundary is one where the plates are moving along side each other; either in different directions or the same direction but at different speeds.

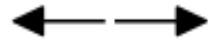


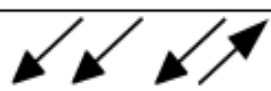


Again there are no volcanoes at this type of boundary; no gap is created to allow magma through and no source of magma is being made.

Earthquakes do take place here. As the plates move past each other they become stuck due to the large amounts of friction. The pressure builds up between the plates until one gives way and moves suddenly. This sudden movement creates the earthquake.

A well known transform boundary is the San Andreas fault on the west coast of the USA where the Pacific and North American plates meet. The Pacific plate is moving south east and the North American plate is moving east. This means that the city of Los Angeles is moving towards San Francisco at about 6 cm per year, in about 10 million years they will be side by side! This fault line is very well studied as it is where the city of San Francisco is built. The city was nearly completely destroyed in 1906 and another large earthquake struck in 1989 (also known as the Loma Prieta earthquake). If you look online you can see footage from security cameras in bars and offices that were recording when the quake struck.

The table below illustrates all 4 boundaries, plate movements and hazards.

Boundary	Direction of plate movement	Earthquake	Volcano
Divergent Constructive		Yes – usually small	Yes – usually not explosive
Convergent Destructive		Yes – often very large	Yes – often explosive
Convergent Collision		Yes – can be very large	No
Conservative Transform		Yes – can be very large	No

Multiple Choice Questions

1. At a collision boundary the plates are...
 - a) moving apart and both continental
 - b) moving along side each other
 - c) moving together and both continental
 - d) moving together with one sinking into the mantle?

2. The Himalaya mountains used to be...
 - a) desert land
 - b) an ancient sea bed which rose when ice-sheets melted
 - c) forest
 - d) an ancient sea bed which has been pushed up by plates colliding?

3. Only one of the sentences below is true; which is it...
 - a) at the collision boundary there are large volcanic eruptions
 - b) at the collision boundary there are no volcanic eruptions
 - c) at the collision boundary there are volcanic eruptions and earthquakes
 - d) at the collision boundary there are no earthquakes?

4. At the transform boundary the plates are...
 - a) moving along side each other
 - b) moving together and both continental

- c) moving apart and both continental
 - d) moving together with one sinking into the mantle?
5. There are no volcanoes at the transform boundary because...
- a) there are no mountains
 - b) the crust is too thick
 - c) the mantle is not hot enough
 - d) no source of magma is made as the plates are not being melted?
6. Earthquakes occur at the transform boundary because...
- a) the plates shake as they move
 - b) magma is moving around under the surface
 - c) friction builds up between the plates and is suddenly released
 - d) when volcanoes erupt it makes the ground shake?
7. A good example of a transform boundary is...
- a) the Himalaya Mountains.
 - b) the San Andreas fault
 - c) the Mid Atlantic Ridge
 - d) the Pacific plate
8. One plate is melted at the...
- a) transform boundary
 - b) destructive margin

c) constructive margin

d) collision margin

9. Large volcanoes are found at the...

a) conservative margin

b) collision margin

c) destructive margin

d) transform boundary?

10. The two types of boundary without volcanoes are...

a) collision and conservative

b) collision and destructive

c) constructive and collision

d) conservative and constructive

Answers

1 = c, 2 = d, 3 = b, 4 = a, 5 = d, 6 = c, 7 = b, 8 = b, 9 = c, 10 = a.