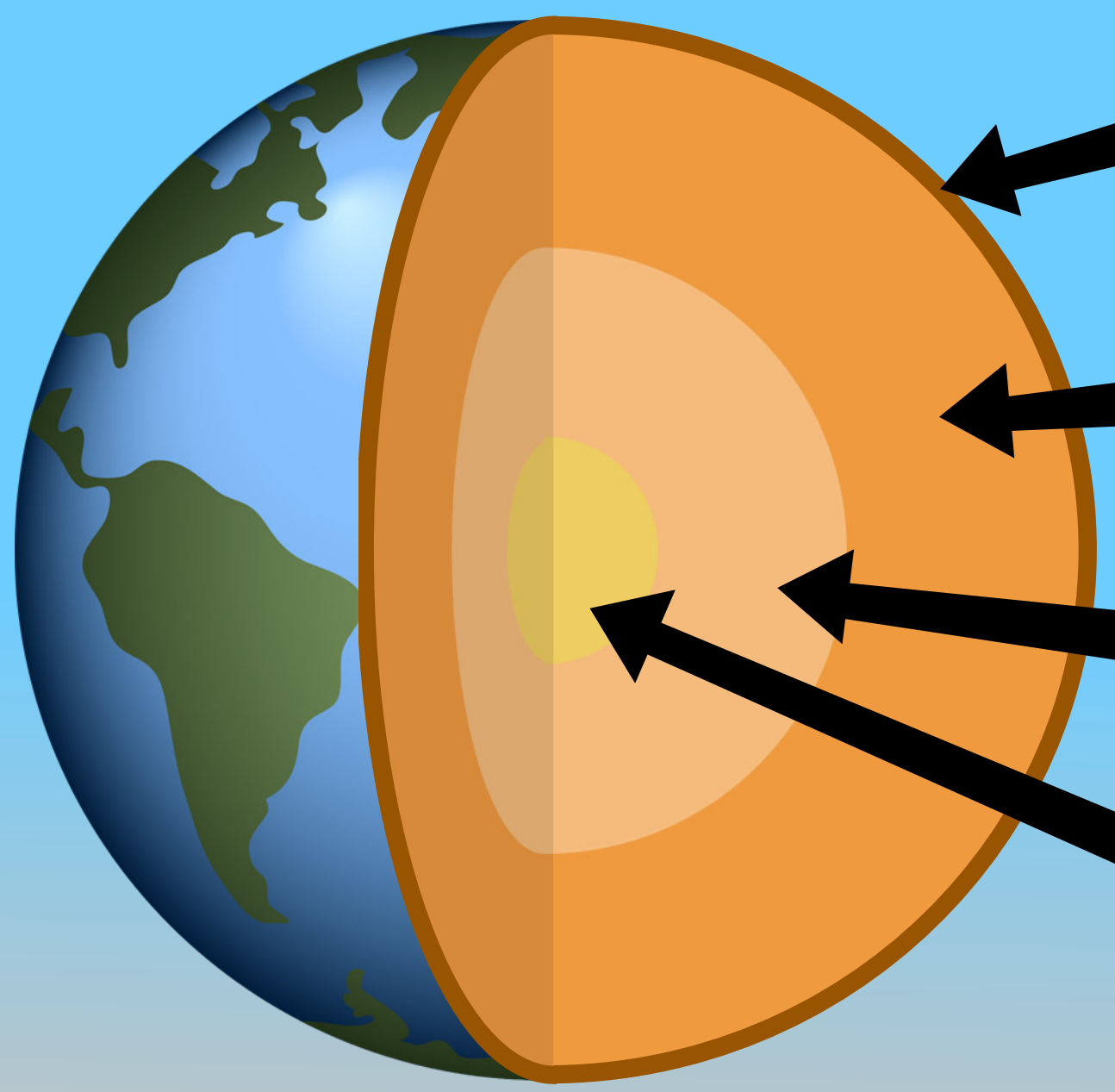


# PLATE TECTONICS

## STRUCTURE OF THE EARTH



**CRUST:** The thinnest and outermost layer of the Earth. The Earth's crust is made up of heavy **oceanic crust**, which forms the sea floor, and lighter **continental crust** which forms the land.

**MANTLE:** A 2900km thick layer of solid rock. It is cooler than the inner and outer core with temperatures between **500** and **4000°C**.

**OUTER CORE:** A layer of liquid iron and nickel metal between **4500** and **5500°C**. The outer core can flow and gives rise to the Earth's **magnetic field**.

**INNER CORE:** A huge solid ball of iron and nickel metal, with temperatures between **5000** and **6000°C**. These temperatures on land would be easily hot enough to melt metal but due to the immense pressure of the other layers above it, the inner core is completely solid.

## CONSERVATIVE BOUNDARY

Conservative plate boundaries occur at the edges of plates that are sliding past each other. **Earthquakes** are common here. As the plates grind past each other, they generate lots of **friction** and can become locked together. **Pressure** then builds up and suddenly the plates will jolt into a new position, releasing **energy** and causing an earthquake. The San Andreas Fault is the most famous example of a conservative plate boundary and runs along the boundary of the Pacific and North American plates.

FIND OUT MORE!

- ➔ [www.geolsoc.org.uk/plate-tectonics](http://www.geolsoc.org.uk/plate-tectonics)
- ➔ [www.geolsoc.org.uk/tectonicstories](http://www.geolsoc.org.uk/tectonicstories)

## CONSTRUCTIVE BOUNDARY

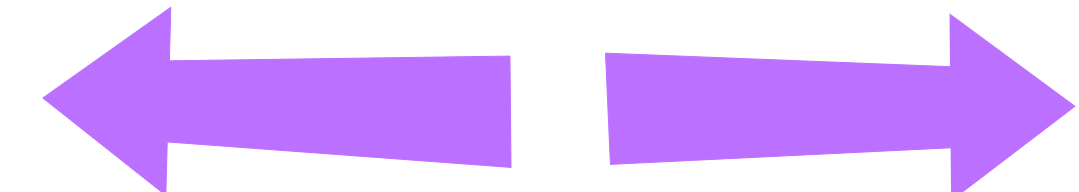
As two **oceanic plates** pull apart at a constructive boundary, hot **magma** rises up from the mantle and erupts on the sea floor creating new **oceanic crust** between the two plates. The Mid Atlantic Ridge, a huge chain of underwater volcanoes, is an example of a constructive plate boundary.

## WHAT IS A TECTONIC PLATE?

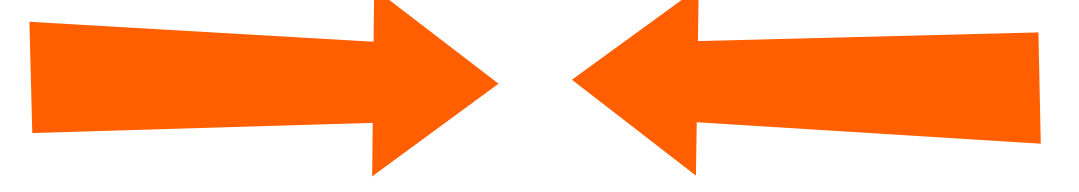
**Tectonic plates** are made from the Earth's crust and the upper part of the mantle. The Earth is broken up into a number of tectonic plates, which move at a rate of a few millimetres per year, but over millions of years they can move thousands of kilometres. The meeting points between tectonic plates are called **plate boundaries**. Most **volcanoes** and **earthquakes** on Earth occur at plate boundaries, in particular in a region called the **Pacific Ring of Fire** around the edge of the **Pacific Plate**.

## WHAT ARE THE DIFFERENT TYPES OF PLATE BOUNDARY?

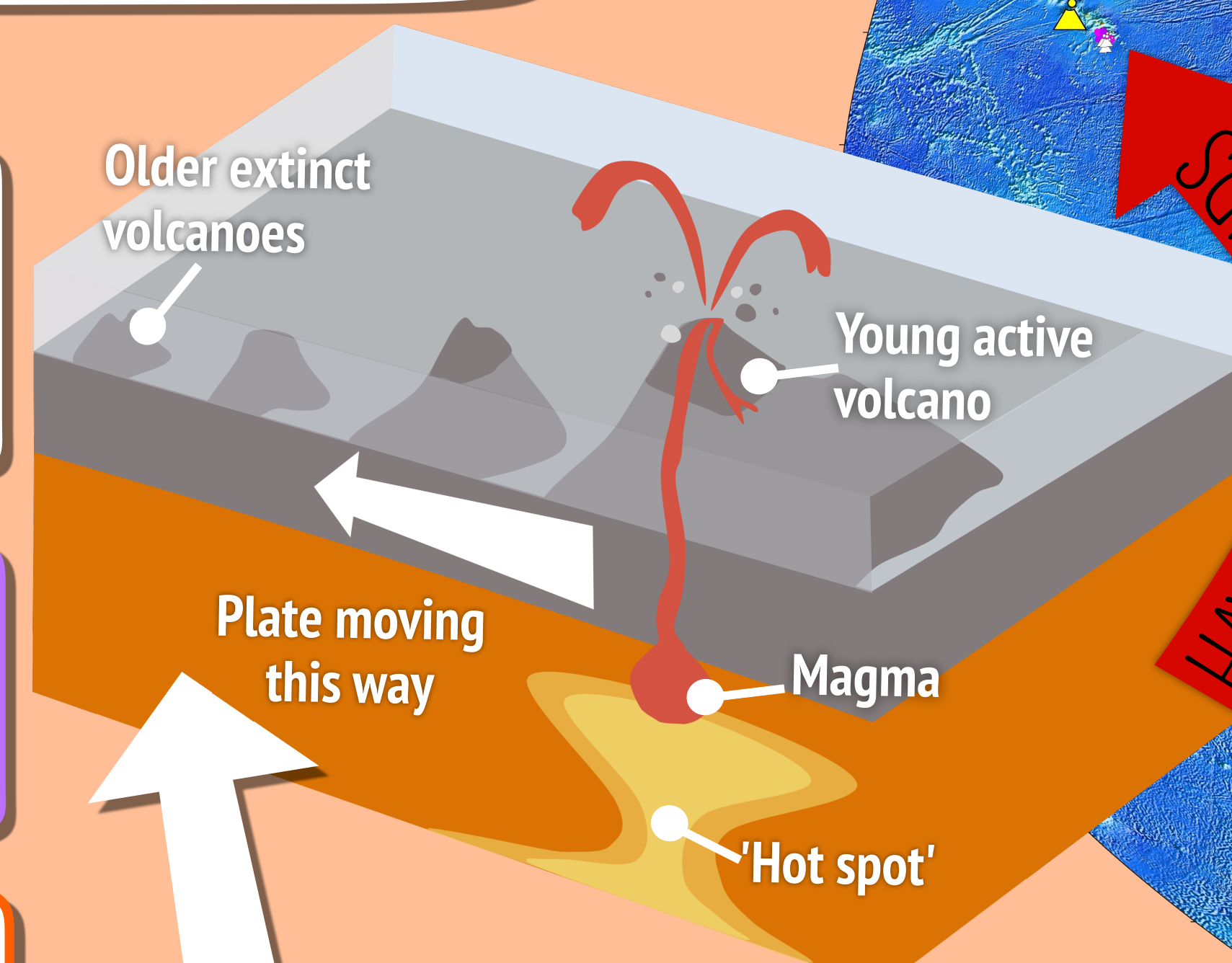
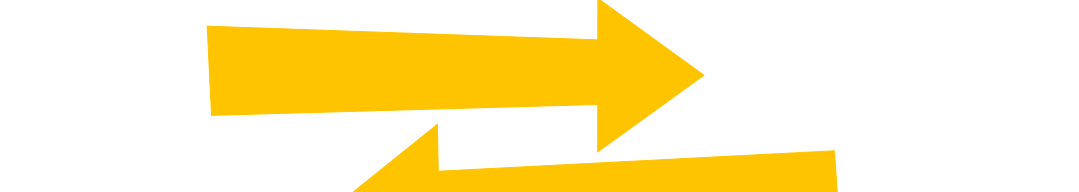
**CONSTRUCTIVE BOUNDARY:** Plates are moving **away from** each other



**DESTRUCTIVE BOUNDARY:** Plates are moving **towards** each other

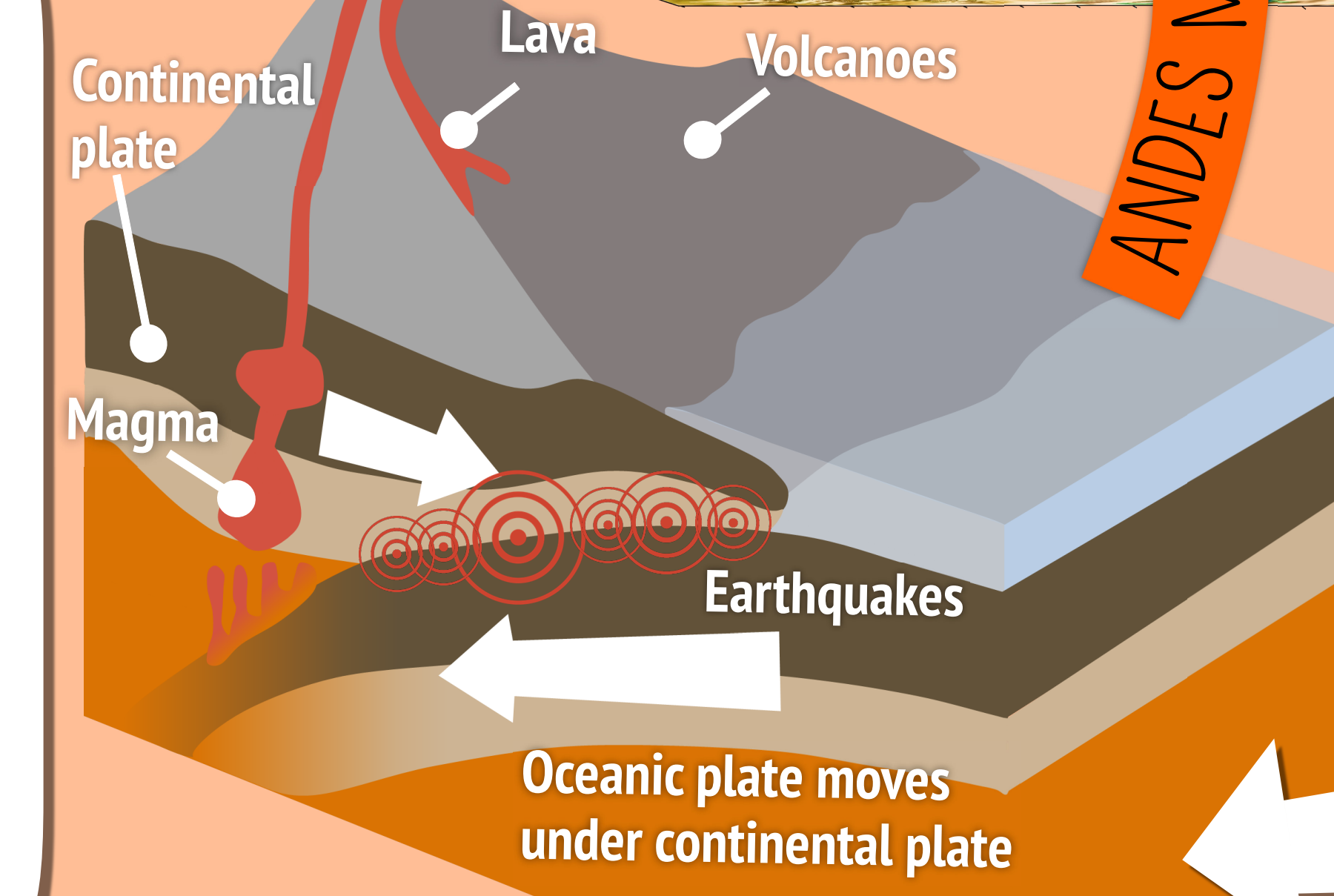


**CONSERVATIVE BOUNDARY:** Plates are moving **past** each other



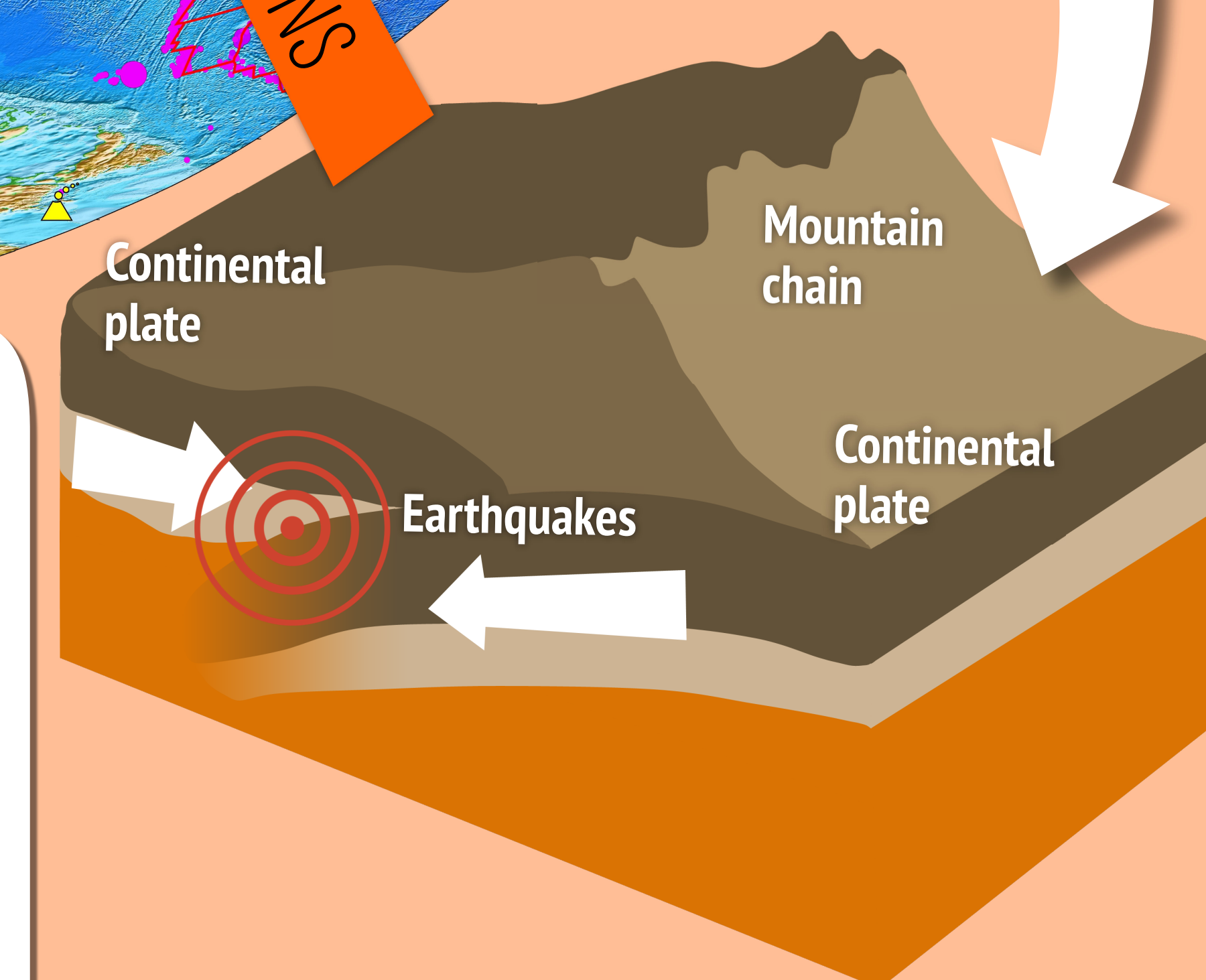
## HOT SPOTS

Most volcanic activity occurs at plate boundaries; however sometimes volcanoes can form in the middle of plates far away from any plate boundary. These volcanoes are known as **intraplate volcanoes**. Geologists think that intraplate volcanoes form over **'hot spots'**, areas of super-heated rocks in the Earth's mantle, which cause magma to rise and erupt as lava on the ocean floor, creating underwater **volcanoes**. Over millions of years, plates move like conveyor belts above the stationary mantle hot spots creating chains of volcanic islands like the Hawaiian Islands.



## DESTRUCTIVE BOUNDARY (SUBDUCTION ZONE)

When an **oceanic plate** is moving towards a **continental plate** (or two oceanic plates are moving towards each other) a **subduction zone** forms. This is a place where the cold, old, oceanic plate is pulled down into the Earth's mantle where it melts to form **magma** (molten rock). This magma then rises and **erupts** explosively on land as **lava** and forms **volcanoes**. The Andes mountain chain in South America is formed from a chain of volcanoes above a subduction zone. As well as having lots of volcanic activity, **earthquakes** are also very common at subduction zones, generated by the two plates grinding against each other.



## DESTRUCTIVE BOUNDARY (CONTINENTAL COLLISION)

When two **continental plates** collide at a destructive boundary the plates are not subducted downward into the mantle but instead forced to buckle upwards to form huge **mountains**. The force of the plates colliding causes rocks to crumple and become very thick, and also triggers **earthquakes**. The Himalayan Mountains are a huge mountain belt formed by the collision of the Indian plate moving northwards into the Eurasian plate.

