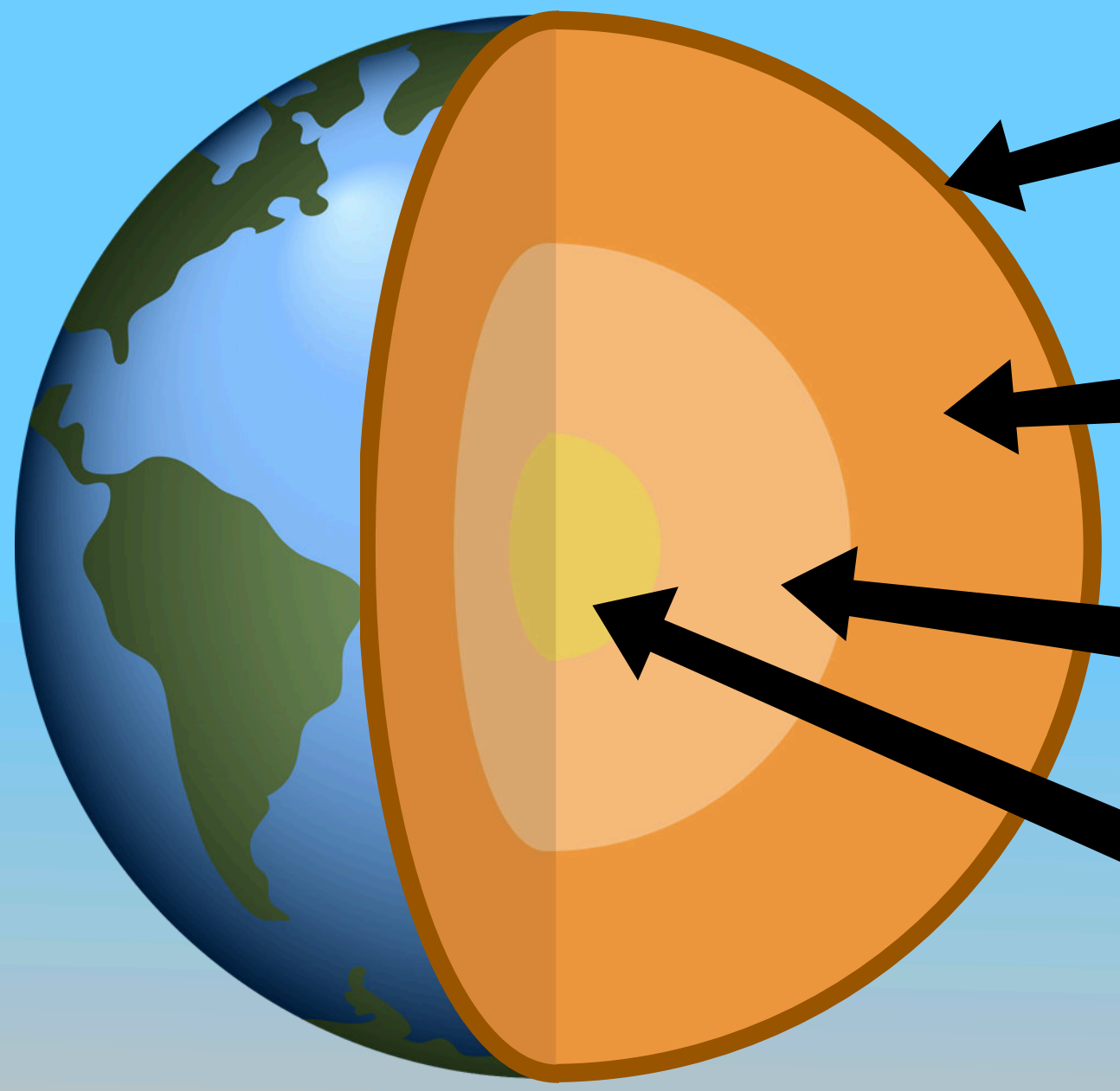


PLATE TECTONICS

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.

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?

DIVERGENT BOUNDARY Plates are moving **away from** each other

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

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

TRANSFORM BOUNDARY

Transform 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 transform plate boundary and runs along the boundary of the Pacific and North American plates.

FIND OUT MORE! → www.geolsoc.org.uk/plate-tectonics
 → www.geolsoc.org.uk/tectonicstories

DIVERGENT 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 divergent plate boundary.

CONVERGENT BOUNDARY (CONTINENTAL COLLISION)

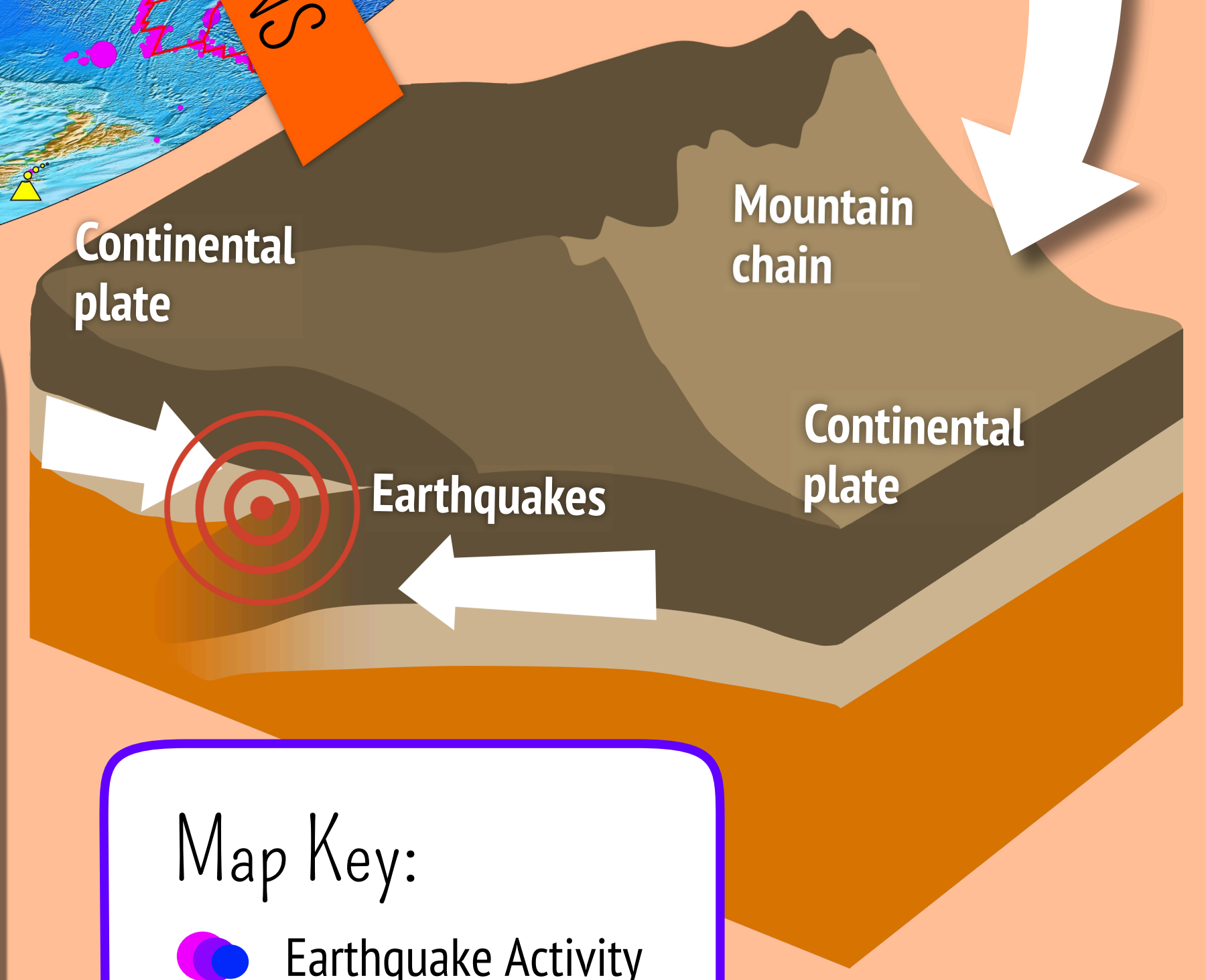
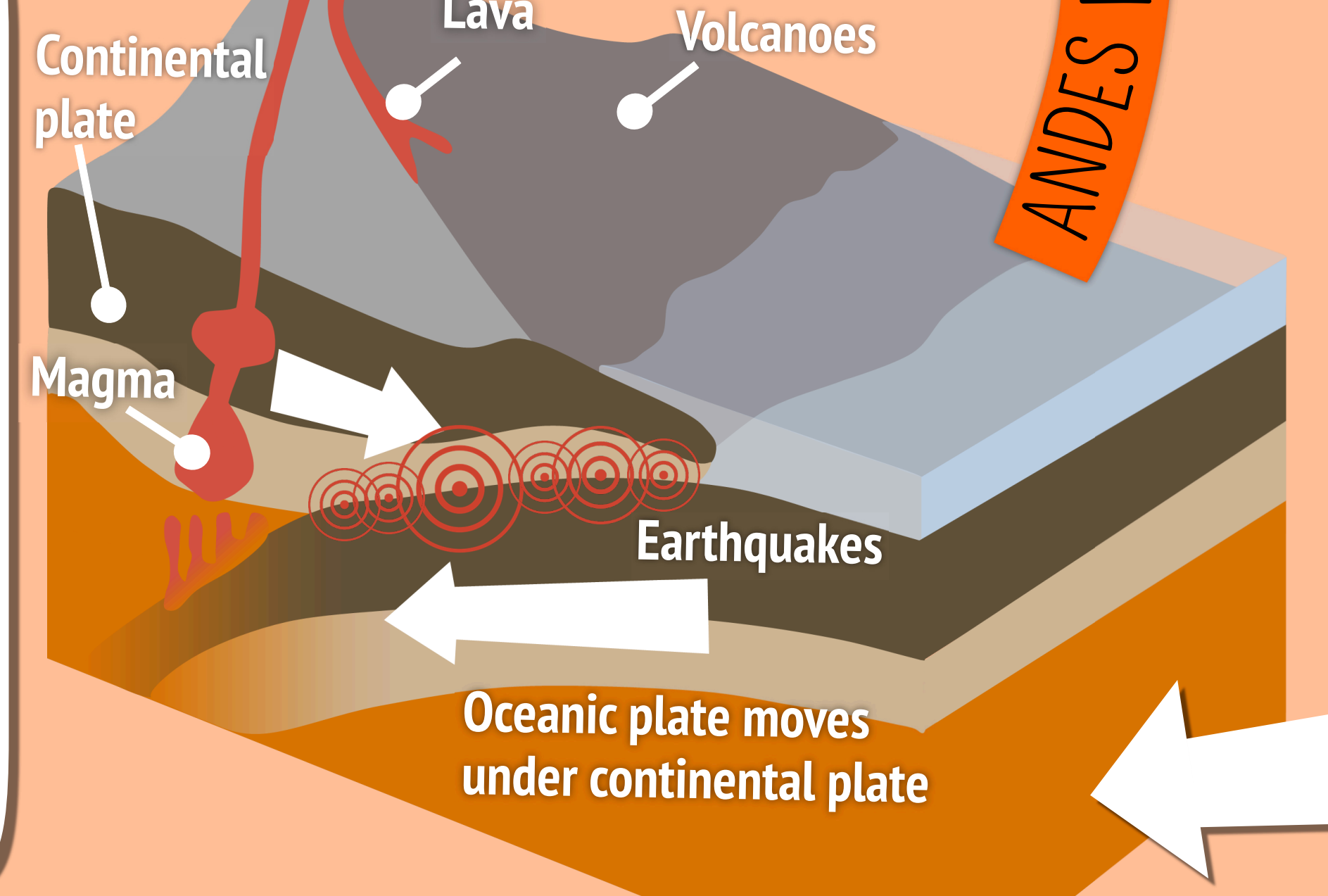
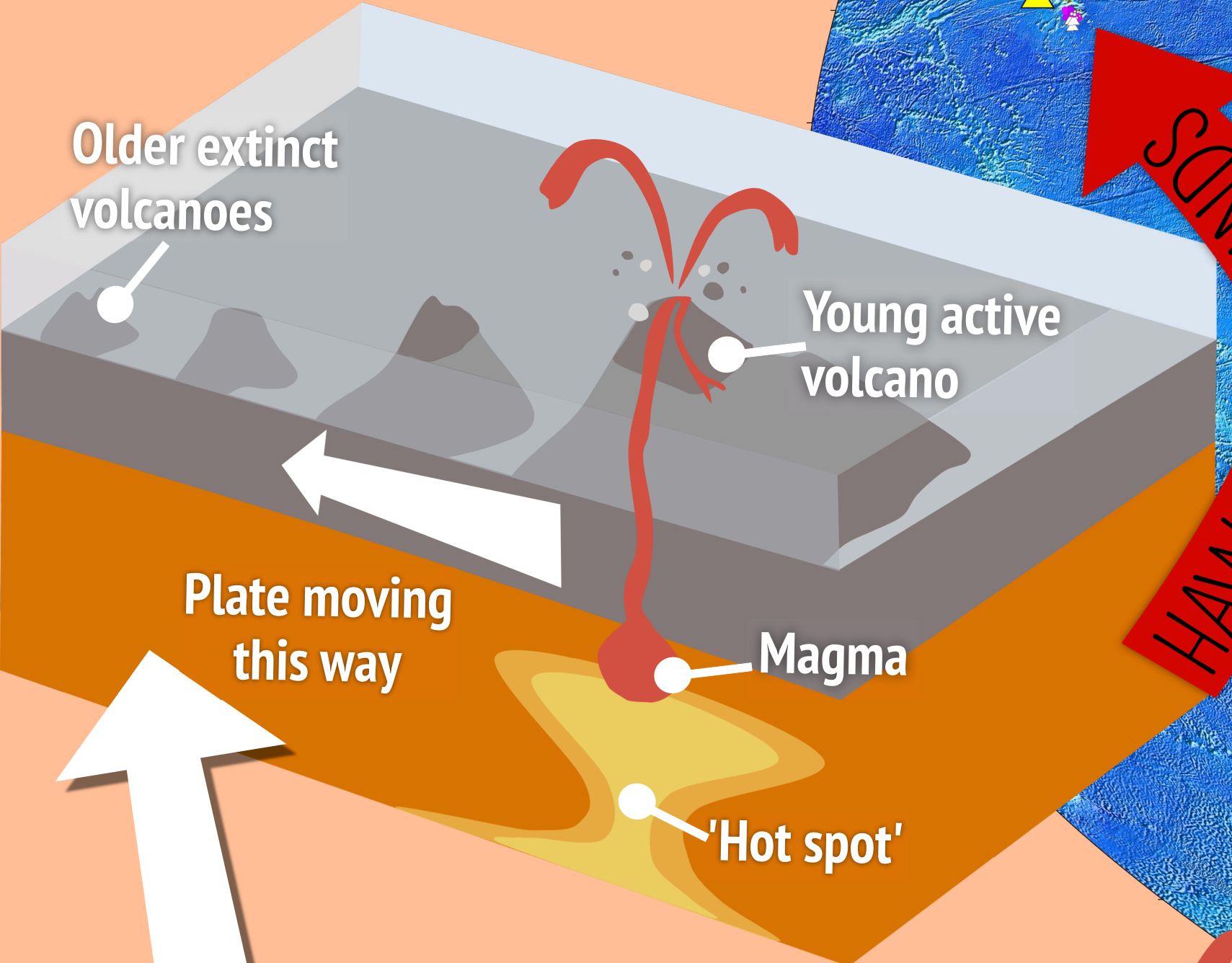
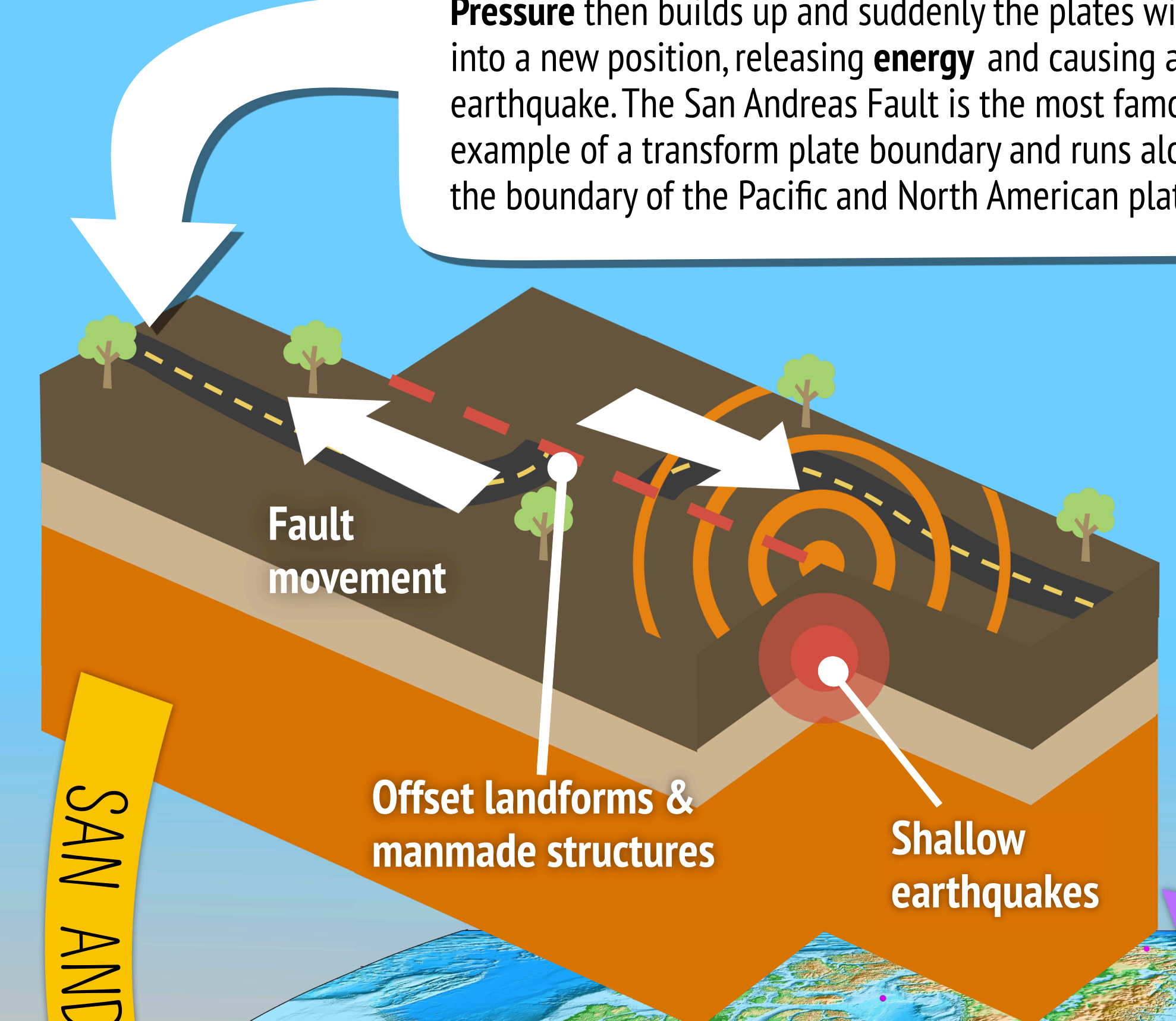
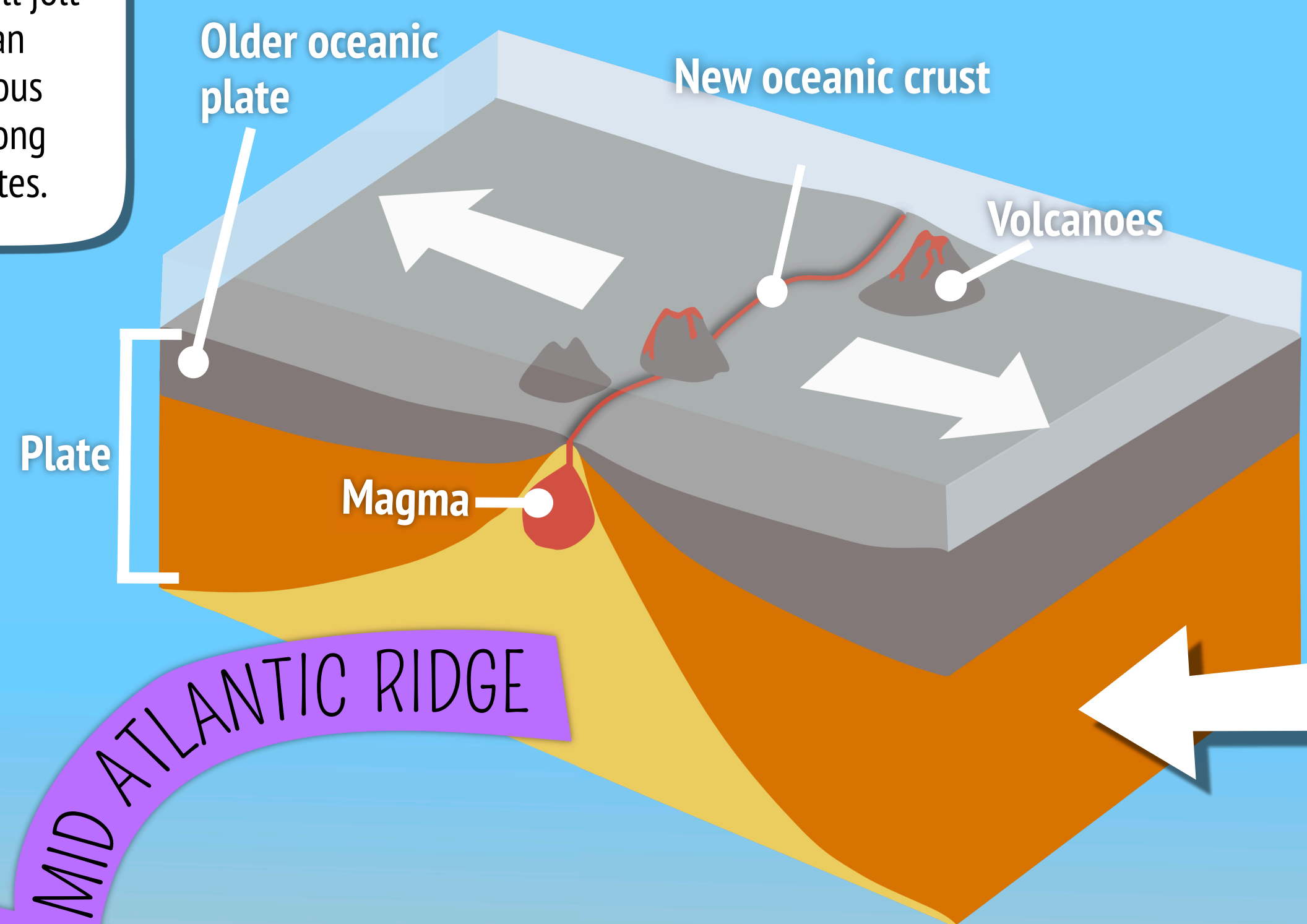
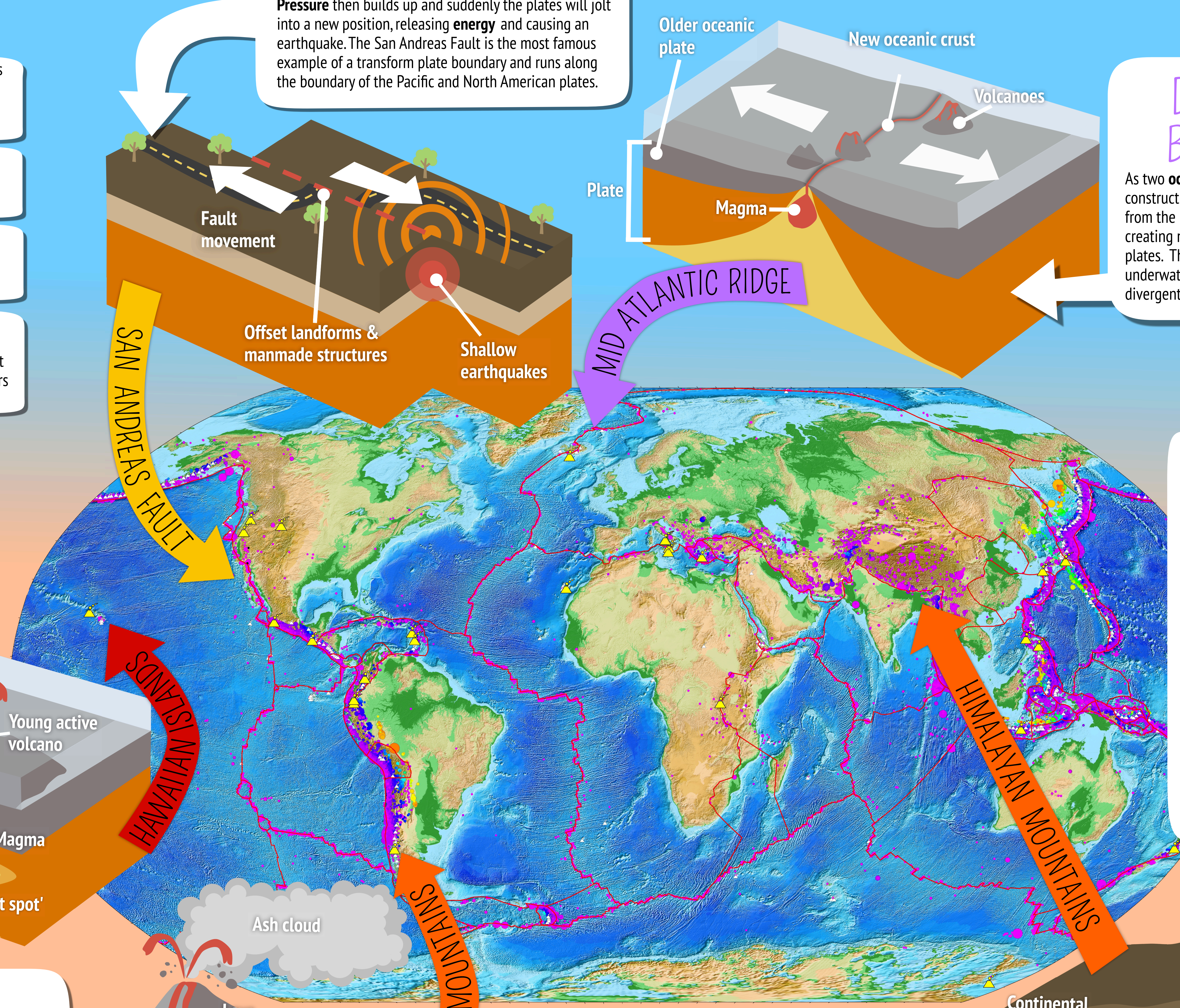
When two **continental plates** collide at a convergent boundary the plates are not subducted downward into the mantle but instead forced to buckle upwards to form huge **mountains**. The force of the plates colliding causes rocks to crumple and become very thick, and also triggers **earthquakes**. The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

CONVERGENT 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.

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.



Map Key:
 Earthquake Activity
 Volcano