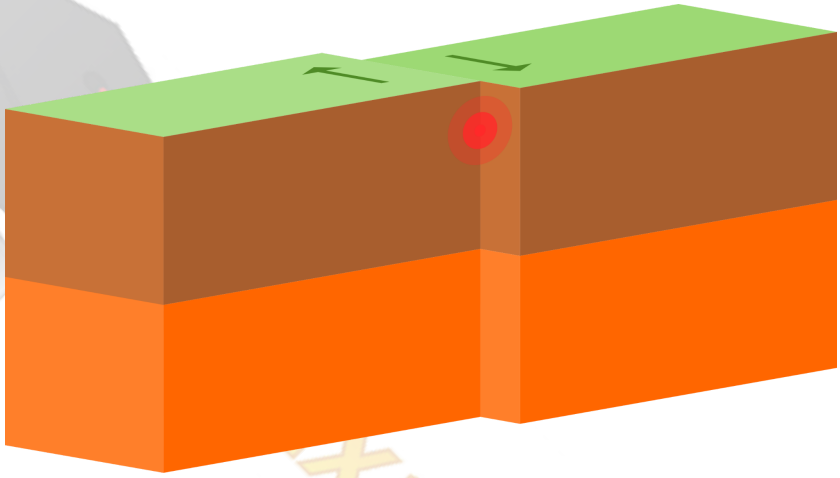
C3. Transformation of Tectonic Plates

Transformation of Tectonic Plates

Have you ever wondered what causes earthquakes, volcanic eruptions, and the formation of mountains? The answer lies in the movement of tectonic plates! Tectonic plates are large pieces of Earth's crust that fit together like a giant puzzle. Let's learn about the fascinating transformations of these tectonic plates.



What Are Tectonic Plates?
Imagine Earth's outer layer, the crust, divided into several large pieces. These pieces are called tectonic plates. There are seven major plates and many smaller ones that make up the Earth's surface.

Plate Boundaries
Tectonic plates are constantly moving, albeit very slowly. They interact with each other at their boundaries, where three main types of interactions occur:

1. **Divergent Boundaries**
   At divergent boundaries, two tectonic plates move away from each other. Magma from the Earth's mantle rises to fill the gap, creating new crust. These boundaries can be found at mid-ocean ridges.

2. **Convergent Boundaries**
   Convergent boundaries are formed when two tectonic plates collide. The heavier plate is forced down into the mantle in a process called subduction. This can lead to volcanic eruptions and the formation of mountains.

3. **Transform Boundaries**
   At transform boundaries, two tectonic plates slide past each other horizontally. The friction between the plates can cause earthquakes.

Earthquakes

Earthquakes occur when there is a sudden release of energy at a fault line, which is a crack in the Earth's crust. This happens when tectonic plates get stuck due to friction, and then suddenly shift to release the accumulated energy. The point beneath the Earth's surface where the earthquake originates is called the focus, while the point directly above it on the surface is the epicenter.

Volcanic Eruptions
Volcanoes are often found at convergent boundaries and hotspots, where there is a lot of volcanic activity. When a tectonic plate is forced under another plate during subduction, the intense heat and pressure cause the rock to melt and form magma. The magma rises through the Earth's crust, leading to a volcanic eruption.

Formation of Mountains
The collision of tectonic plates at convergent boundaries can also lead to the formation of mountains. When two plates collide, the rock at the edges crumples and folds, pushing the Earth's crust upward to form mountain ranges.

Plate Movement
The movement of tectonic plates is incredibly slow, usually just a few centimeters per year. But over millions of years, these movements can have a significant impact on the Earth's surface, shaping its landscapes and causing geological events.

1. What are tectonic plates
    A) Large pieces of Earth's inner core
    B) Large pieces of Earth's mantle
    C) Large pieces of Earth's crust
    D) Large pieces of Earth's atmosphere

2. What happens at divergent boundaries?
    A) Tectonic plates move away from each other.
    B) Tectonic plates collide with each other.
    C) Tectonic plates slide past each other horizontally.
    D) Tectonic plates sink into the mantle.

3. What is formed when two tectonic plates collide at convergent boundaries?
    A) Volcanoes
    B) Earthquakes
    C) Mid-ocean ridges
    D) Mountains

4. What is a crack in the Earth's crust called?
    A) Boundary
    B) Subduction
    C) Epicenter
    D) Fault line

5. What causes earthquakes?
    A) The movement of tectonic plates
    B) The formation of mountains
    C) The rising of magma from the mantle
    D) The collision of two tectonic plates

6. What is the point beneath the Earth's surface where an earthquake originates called?
    A) Subduction
    B) Epicenter
    C) Fault line
    D) Focus

7. Where are volcanoes often found?
    A) Divergent boundaries
    B) Transform boundaries
    C) Convergent boundaries
    D) Mid-ocean ridges

8. What causes volcanic eruptions?
    A) The collision of tectonic plates
    B) The sliding of tectonic plates past each other
    C) The rising of magma from the mantle
    D) The movement of tectonic plates away from each other

9. What happens when two tectonic plates collide at convergent boundaries?
    A) Earthquakes
    B) Volcanic eruptions
    C) Mountains form
    D) New crust is created

10. How fast do tectonic plates move on average?
    A) A few meters per year
    B) A few centimeters per year
    C) A few kilometers per year
    D) A few millimeters per year

ANSWERS & EXPLANATIONS

1. C - Large pieces of Earth's crust.
    - Tectonic plates are large pieces of Earth's crust that fit together like a giant puzzle.

2. A - Tectonic plates move away from each other.
    - At divergent boundaries, two tectonic plates move away from each other, creating new crust.

3. D - Mountains.
    - When two tectonic plates collide at convergent boundaries, the edges of the plates crumple and fold, pushing the Earth's crust upward to form mountains.

4. D - Fault line.
    - A crack in the Earth's crust is called a fault line.

5. A - The movement of tectonic plates.
    - Earthquakes are caused by the sudden release of energy when tectonic plates shift due to friction at fault lines.

6. D - Focus.
    - The point beneath the Earth's surface where an earthquake originates is called the focus.

7. C - Convergent boundaries.
    - Volcanoes are often found at convergent boundaries and hotspots, where there is a lot of volcanic activity.

8. C - The rising of magma from the mantle.
    - Volcanic eruptions are caused by the rising of magma from the mantle to the Earth's surface.

9. C - Mountains form.
    - When two tectonic plates collide at convergent boundaries, the edges of the plates crumple and fold, pushing the Earth's crust upward to form mountains.

10. B - A few centimeters per year.
    - Tectonic plates move very slowly, usually just a few centimeters per year.