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Destructive plate boundary diagram

What? There is a destructive limit of plates where one ocean and continental plate moves towards the other. The heaviest and densest ocean plate is forced under the continental plate. As it sinks below the continental plate, the ocean plate melts due to friction in the subduction zone. The bark becomes melted called magma. This can be forced to the surface of the earth causing a volcanic eruption. Figure 1. Cross section of a margin of destructive plates (source: Wikipedia) The motion of the ocean plate is not smooth. Due to friction, the plate gets stuck. The pressure then builds up. The plate will eventually slip sometimes causing an earthquake. The continental plate is crushed by pressure and forms folding mountains. Where? The destructive margins of the plates occur when one ocean and continental plate moves towards the other. Examples below include the Pacific Plate and the Eurasian Plate and the Nazca Plate and the South American Plate. There are three types of plate tectonic boundaries: divergent, converging and transformation plate boundaries. This image shows the three main types of plate boundaries: divergent, converging and transformer. Image courtesy of the U.S. Geological Survey. Download image (jpg, 76 KB). Earth's lithosphere, which includes the crust and upper mantle, is formed by a series of pieces, or tectonic plates, that move slowly over time. A divergent limit occurs when two tectonic plates move away from each other. Along these boundaries, earthquakes are common and magma (molten rock) rises from the Earth's mantle to the surface, solidifying to create a new oceanic crust. The Mid-Atlantic Ridge and the Pacific Ring of Fire are two examples of divergent plate boundaries. When two plates come together, it is known as a convergent boundary. The impact of colliding plates can cause the edges of one or both plates to climb into a mountain range or one of the plates can be bent into a deep seabed trench. A chain of volcanoes often forms parallel to the converging boundaries of plates and powerful earthquakes are common along these boundaries. On the converging boundaries of the plates, the oceanic crust is often forced towards the mantle where it begins to melt. Magma rises to and through the other dish, solidifying in granite, the rock that forms the continents. Thus, in the converging boundaries, the continental crust is created and the oceanic crust is destroyed. Two plates sliding on top of each other form a transformation plate boundary. One of the most famous transformation plate boundaries occurs in the San Andreas fault zone, which extends underwater. Natural or human structures that cross a transformation boundary are are divided into pieces and taken in opposite directions. Rocks that line the boundary pulverize as the plates grind along, creating a linear fault valley or underwater cannon. Earthquakes are common along these faults. In contrast to the and the boundaries divergent, the bark cracks and breaks on the margins of transformation, but is not created or destroyed. There are three main types of plate boundary. They are convergent (destructive), divergent (constructive) and conservative. The direction of plate movement dictates the characteristics and processes associated with each tectonic plate boundary. A map to show the main tectonic plates and their direction of movement Convergent (destructive) margins of oceanic and continental plates can be found in one of three ways: oceanic-continental oceanic-oceanic-continental oceanic-continental. Oceanic-continental Where oceanic and continental plates meet sinking oceanic crust, or subducts, below the less dense and lighter continental crust. Subduction leads to the formation of an ocean trench. These trenches can be up to 11,000m deep. They mark the point where the ocean plate enters the antenna. As it does so, the buckles of the continental crust form the trench. As an ocean plate converges on a continental plate, the sedimentary rock formed at the top of the oceanic crust folds upward along the front edge of the continental plate. In addition to this, the continental crust also lifts and buckles and magma is injected from the antenosphere. This process forms folding mountains of which the Andes and Rockies are examples. As the oceanic crust subduces the continental crust melts. The magma rises as it is less dined than the material around it. Large magma intrusions create elevation, further contributing to the formation of folding mountains. Volcanoes form where magma reaches the Earth's surface. Oceanic-oceanic Where two oceanic plates converge the densest crust subdues the other. This creates a trench. As the ocean plate descends it melts, and the magma rises forming a chain of volcanic islands, known as an island arch. The Northwest Pacific Ring of Fire has a number of island arches including the Aleutian Islands. Continental-continental Where two continental plates are found there is usually no subduction. Folding mountains, such as the Alps and himalayas. The constructive margins of the plates involve two plates moving away from one another. Where this happens magma rises through the antennae on the Earth's surface. This typically occurs along a medium oceanic ridge, such as the mid-Atlantic crack that extends from the north to the southern Atlantic Ocean. Long chains of mountains form along these ridges. Due to the variable amount and rate of magma released average oceanic ridges vary in shape. Eruptions along the constructive margins of the plates occur mainly water. Pillow lavas form as the lava cools rapidly on the seabed. In the North Atlantic the magma extrusion has been so great that it created the world's largest volcanic island, Iceland. As magma rises the rocks above often form a dome. The lithosphere is put under great stress and and fractures along faults. This forms the underwater valleys of cracks found along the middle oceanic ridges. Rift rift areas also occur on the ground and help explain how continents break down. The continental crust must be thin to crack. One of the best examples is the valley of the crack of Iceland, þingvellir. This is where the North American plate and the Eurasian plate are separated. A valley of graben or sunken has formed where the bark has been stretched, causing failures. þingvellir, Iceland – where the North American and Eurasian plate separates the margins from conservative plates On the margins of conservative plates, tectonic plates slide against each other. There is no volcanic activity associated with conservative plates, although earthquakes can often occur. This is because the plates do not pass each other smoothly; friction causes resistance. As pressure builds the crust can fracture the release of energy such as earthquakes. A conservative plate margin It is possible to see the border between plates along a conservative margin. An example of this is the San Andreas fault in California. This is where the North American and Pacific plates slide into each other. Earthquakes and volcanic eruptions affect people around the world. They are caused by the movement of tectonic plates. Tectonic risks can destroy buildings, infrastructure and cause deaths. Tectonic plates are pieces of earth's rocky outer layer known as the crust. These plates move constantly, and volcanoes and earthquakes lie at the boundaries of plates. Plate margins / boundaries Types of plates and bark plate margins Find more Tube Plates and plate margins The Earth's crust is divided into pieces of solid rock called tectonic plates. vary in size and the Earth's surface can be compared to that of a boiled egg that has cracked. Major plates include the Pacific, Eurasia, Africa, Antarctica, North and South America, and the Indo-Australian. However, there are other smaller plates, such as the Philippines and coconut plates. The plates are made up of different materials, and there are 2 large types: the continental crust is thicker, older and lighter, and consists mainly of granite. It is 35 km thick on average and less dense than the oceanic crust, which represents its average surface elevation of about 4.8 km above that of the ocean floor. The continental crust is more complex than the oceanic crust in its structure and origin and is mainly formed in subduction zones on the margins of destructive plates The oceanic crust is younger and heavier, and consists mainly of basalt and Gabbro. It is mainly formed on constructive margins or spreading ridges Medium. The analysis of seismic waves passing through the Earth's crust has revealed it to us. You can watch pangea break here, and see the planned futures movements of Earth plates here. Back to The upper margin types of Volcano plates and earthquakes occur mainly along the boundaries of plates where magma can escape the Earth's mantle or where tensions accumulate between 2 plates rubbing together. An exception to this includes Hawaii, which sits in the middle of the Pacific Plate over a hot spot. Examples of plate margin types are linked to the map. Constructive or divergent margins In this type of plate margins two plates move separately (DIVERGE) from each other in opposite directions. Convection currents moving in opposite directions (caused by the intense heat inside the Earth) on the mantle move two plates apart. As these plates move apart from this it leaves cracks and fissures, lines of weakness, which allows the mantle magma to escape the planet's highly pressurous interior. This magma fills the void and eventually bursts into the surface and cools as new land. This can create huge ridges of underwater mountains and volcanoes such as the Mid-Atlantic Ridge, and where these mountains sneak above sea island level. Both earthquakes and volcanoes can result in these margins, earthquakes caused by the movement of magma through the crust. A very good example of this is the average Atlantic ridge, where the Eurasian plate moves away from the North American plate at a rate of about 4cm per year. Iceland owes its existence to this ridge. See here an animation of this process. Destructive or converging margins In these margins move 2 plates or CONVERGE together and the destruction of some of the results of the Earth's crust. A (denser) ocean plate is pushed towards a (less dense) continental plate by convection currents deep inside the Earth. The ocean plate is subjected (pushed under) the continental plate in what is called a subduction zone, creating a deep ocean trench. It is the oceanic crust that sinks into the mantle because it is denser (heavier). As friction drops, the increased pressure and heat of the mantle melt the plate. Some of this melted material can work its way through the continental crust through fissures and cracks in the crust to pick up in the magma chambers. It is often some distance from the margin where magma can re-emerge on the surface to create a range of mountains. The movement of the plates that grind to each other can create earthquakes, when one plate finally passes past each other releasing seismic energy. There are several really good examples of destructive plate margins, including along the west coast of America and Japan, where the Philippine sea plate is pushed under the Eurasian plate. See here an animation of this process. Collisions In these 2 plates of similar density are forced towards each other. None of the plates descend to the mantle due to the similar density of the plates. Plates. the 2 plates sink into each other and bend upwards into folding mountains. On these margins we manage to fold mountains and seismic activity, and a fantastic example of this are the Himalayan mountains. Here, the Australian Indo plate is colliding with the Eurasian plate and has done so for millions of years. Originally, there was a sea called the Tethys Sea between India and Asia, but over time India has collapsed in Eurasia creating huge folding mountains rich in marine fossils (marine) ! See an animation of India on a conservative margin of collisional margin No mountains of conservative margins are made, volcanic eruptions do not happen and the crust is not destroyed. Instead, 2 dishes either slide in opposite directions, or 2 plates slide into each other at different speeds. As they move into each other the stress energy builds up as the plates stick and grind to each other. When this stress energy is released it eventually sends shockwaves through the Earth's crust. We know these shock waves as earthquakes, and a good example of this is the San Andreas Fault in California, where the Pacific Plate is moving NW at a faster rate than the North American plate. Back to top

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