

Discovery Channel School Video Library for Scott Foresman-Addison Wesley Mathematics



SEGMENT 2: THE EARTH'S SURFACE

The forces within the Earth are powerful enough to twist, turn, and juggle the planet's crust including landmasses and the seafloor. The theory that explains just how Earth's forces move large segments of the crust around is called plate tectonics.

Under the Earth's crust is the mantle—a mass of hot, liquid material. As the mantle circulates, the crust, divided into enormous plates slides around. The crust moves in response to swirling masses of magma. Land is pulled apart, shoved together, and reshaped.

250 million years ago, the plates jammed together and formed a supercontinent called Pangaea, meaning all land. But this huge continent began to pull apart, and over millions of years it split. Some 65 million years ago, our modern continents began to take shape. One look at the shorelines of Africa and South America makes it easy to imagine these continental pieces as a whole.

Professor Michael Rampino takes a piece of hard volcanic basalt from Argentina across the Atlantic Ocean to the world's most ancient desert in the South African country of Namibia.

I've traveled more than 4,000 miles and the rocks are exactly the same. They're basalt and the age is 135 million years.

Like land, the ocean floor changes too. The Atlantic Ocean owes its very existence to a split between the modern continents of Africa and the Americas. The mid-Atlantic ridge, marking the boundary between two tectonic plates is pulling apart, and shoving the continents apart at a rate of about an inch a year.

But four miles beneath the surface of the Ocean, this geological hotspot goes largely unnoticed. On the surface, hot molten rock boiling up in the cracks between plates creates volcanoes.

The red dots on this modern map represent volcanic activity around the globe. Each volcanic line marks boundaries between tectonic plates.

In 1963 10 billion square feet of lava produced this island off the coast of Iceland in a matter of days.

When tectonic plates collide, mountains may be shoved up in the process. The Himalayas—Earth's youngest and tallest mountain range—grew from sea level to a height of 5 miles over 30 million years.

As a result of plate movements, world geography changes slowly, but constantly.