Tectonic Forces

National Aeronautics and Space Administration

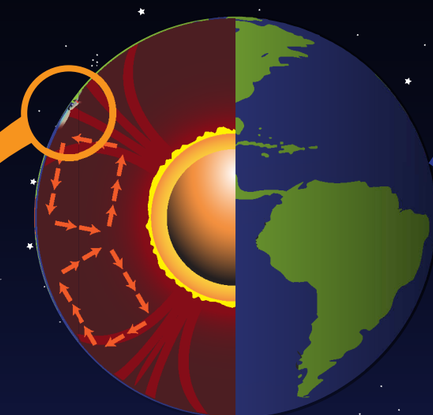
There was once a time when you could take a stroll from North or South America to Africa no problem. There was no ocean to get in the way, because all of Earth's continents were stuck together in one massive supercontinent called Pangea.

But around 180 million years ago, a rift began to form, and since then, the Americas and Africa have been drifting apart, forming the Atlantic Ocean in the process. That's because Earth's surface is constantly shifting and drifting—thanks to something called plate tectonics.

180 Million Years Ago → **Today**

Earth's crust isn't a single shell. It's got big slabs of crust called tectonic plates that float on an ocean of slowly flowing rubbery molten rock.

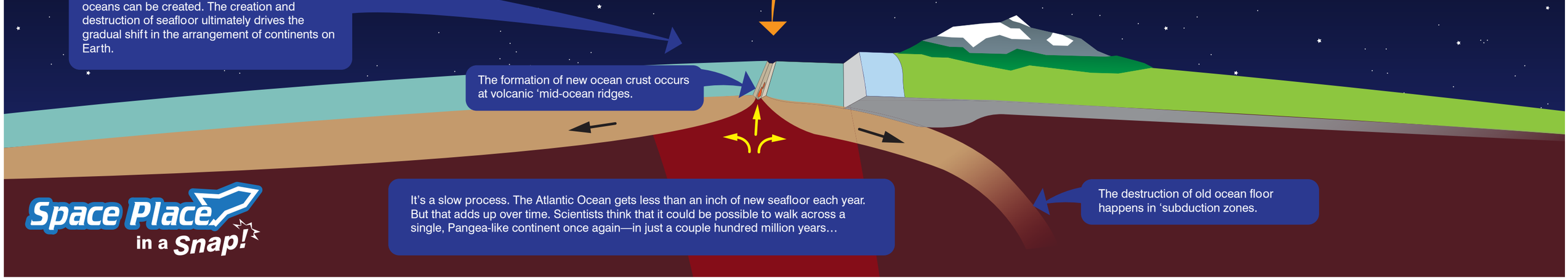
These plates are pushed and pulled by slowly flowing rubbery magma deep below the crust.



The magma moves because of heat from Earth's radioactive core. Closer to the core, the magma is heated, where it becomes less dense, rises toward the surface, cools, and returns—a process called convection.

Like a slowly moving conveyor belt, this rising and sinking heat and molten rock pushes or pulls the plates together or apart.

Through collisions, these plates can raise great mountains or send ocean floor to the depths of Earth's molten interior. When they move apart, new crust is formed, and with it, entirely new oceans can be created. The creation and destruction of seafloor ultimately drives the gradual shift in the arrangement of continents on Earth.



The formation of new ocean crust occurs at volcanic 'mid-ocean ridges.

It's a slow process. The Atlantic Ocean gets less than an inch of new seafloor each year. But that adds up over time. Scientists think that it could be possible to walk across a single, Pangea-like continent once again—in just a couple hundred million years…

The destruction of old ocean floor happens in 'subduction zones.

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