Curiosity Guide #208
Plate Tectonics

Accompanies Curious Crew, Season 2, Episode 8 (#208)

Cool Whip and Graham Cracker Tectonics

Investigation #7

Description

Please don't eat the tectonics! Instead, try modeling what happens to the earth when its tectonic plates are on the move!

Materials

- 5 plastic plates
- Spoons
- Frosting or whipped cream
- Box of graham crackers
- Fruit roll-ups, blue if possible
- Food-safe scissors
- Red food coloring
- Bowl
- Wide dish with a bit of water

Procedure: Preparing the plates

1) Stir red food coloring into a large bowl of whipped cream. This represents magma.
2) Spread a bed of whipped cream on four plates. Leave one plate empty.

Procedure: Plate #1

1) Cut two small rectangular sections of fruit roll-up, about 3 by 3 inches. These fruit roll-up sections will simulate the thin, dense ocean crust.

2) Place the fruit roll-up sections right next to each other, on top of the whipped cream.
3) Carefully slide the two fruit roll-ups apart while pushing down. This model simulates a divergent boundary.
4) Can you see the whipped cream press up in the center?

Procedure: Plate #2

1) Lay two graham crackers beside each other to represent continental plates.
2) Gently slide the crackers apart without pressing down.
3) What do you notice?

Procedure: Plate #3

1) On the bed of whipped cream, place one fruit roll-up and one graham cracker. Do this lightly so that the graham cracker is floating high on the cream.
2) Press the two items toward one another, pushing down more on the fruit than on the graham cracker.
3) Did the graham cracker go over the top of the fruit?

Procedure: Plate #4

1) Dip the edges of two graham crackers in the pan of water for several seconds to get them soggy.
2) On the plate with no whipped cream, place the soggy sides of the graham crackers side by side. Begin to press them towards one another.
3) Do the crackers crumble and rise up at the boundary?

Procedure: Plate #5

1) On the last cream bed, lay two graham crackers. Place the crackers together so that one slides the long way along the other.
2) What happens?

My Results

Explanation

Plate #1: The dense ocean crust in a **divergent boundary** sinks into the asthenosphere, which is what we call the mantle layer of the earth. This movement forces magma up in between the two crustal plates. These divergent plate boundaries are found on the ocean floor. An example of a divergent plate boundary is the mid-Atlantic ridge.

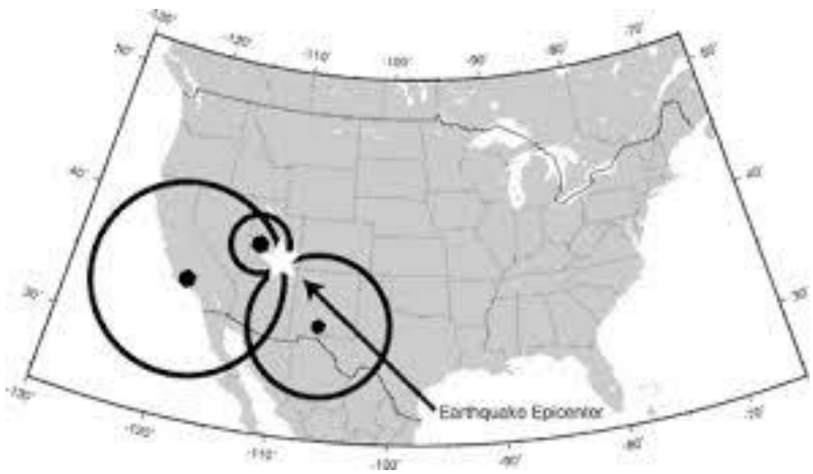
Plate #2: When the action happens on continents, as with the graham crackers, the whipped cream is revealed without being forced up because the continents are less dense. When these plates move, they can stretch out to form lower-level **rift valleys**.

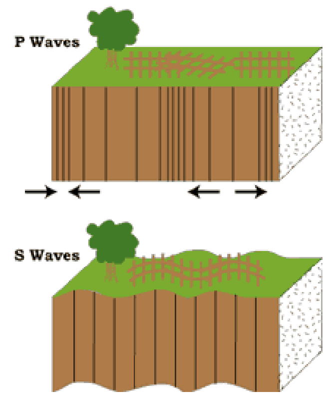
Plate #3: Moving the fruit and the graham cracker toward each other represents an oceanic continental-plate collision. The lighter graham cracker rides above the oceanic fruit, which is subducted below the land plate. **Subduction zones** are often at oceanfront with high cliffs.

Plate #4: Forcing the two soggy graham crackers together simulates a **convergent boundary** that results in mountains.

Plate #5: Finally, in the last example, the graham crackers slide along the boundary and represent a **transform**, or **strike slip** fault, like the one on the San Andreas fault in California, which results in many earthquakes.

Something more to think about: Take a look at this graphic of how seismographs can find the epicenter of an earthquake through triangulation!





A seismograph is a device that scientists use to measure the shaking of the earth during an earthquake. The seismograph measures the P-waves that arrive first, and then the S –waves. The time difference between the P-waves and the S-waves tells us how far away the earthquake was. But to find the exact epicenter of the earthquake, scientists need information from three or more seismographs in different locations to triangulate the exact spot. Those squiggly lines on the seismograph tell us the magnitude, or how big the earthquake was and how long it lasted. Wow! That was a big one!

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