Cookies and Whipped Cream Plate Tectonics Lab - Grade 8

Connections to the Grade 8 Science BC Curriculum:

Content:

Plate Tectonic Movement:

- Types of plate movements.
- Plate boundaries.
- Earthquakes and volcanoes.

Competencies:

Questioning and predicting:

- Make observations aimed at identifying their own questions about the natural world.
- Make predictions about the findings of their inquiry.

Processing and analyzing data and information:

- Experience and interpret the local environment.
- Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information.
- Use scientific understandings to identify relationships and draw conclusions.

Evaluating:

- Exercise a healthy, informed skepticism and use scientific knowledge and findings from their own investigations to evaluate claims in secondary sources.
- Consider social, ethical, and environmental implications of the findings from their own and others' investigations.

Communicating:

- Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate.
- Express and reflect on a variety of experiences and perspectives of place.

Lab Introduction:

Plate tectonics is a scientific theory that explains how major landforms are created due to the Earth's subterranean movements, involving convention currents that causes hot molten rock within the Earth's mantle to interact with the Earth's crust, shifting it in different patterns that develop a variety of landforms. Some of the landforms that may develop during these interactions can be ocean trenches, mountain ranges, and volcanoes.

To showcase plate tectonics in a physical model, flat cookies represent the Earth's crust, and whipping cream represents the mantle. Your target is to replicate plate tectonic movements by using cookies and whipped cream to model divergent, convergent, and transform boundaries. Then your task is to describe what landforms are developed as a result of specific tectonic plate interactions.

Assessment:

Assessments will be done on a formative scale; this will consist of the accuracy of models that represent specific plate tectonic movements, and how well students can communicate the interaction that is being made on these different movements. The goal of this lab is to strengthen the students understanding of plate tectonic movements in a stress-free manner and be able to describe plate tectonic processes after completing it. This lab should follow a lesson on tectonic movements, solidifying understanding through physical representations. Students will demonstrate their proficiency throughout group discussions and teacher-student discussions.

Materials Needed:

Minimum 6 cookies (2 for each type of tectonic movement)

Whipping cream

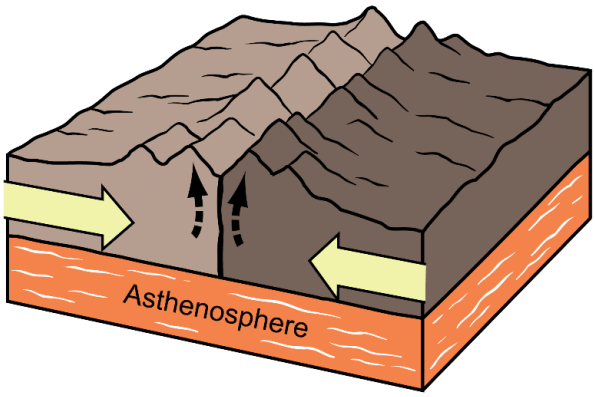
3 Paper Plates (for each different boundary)

1 cup of water (for convergent boundary)

Steps:

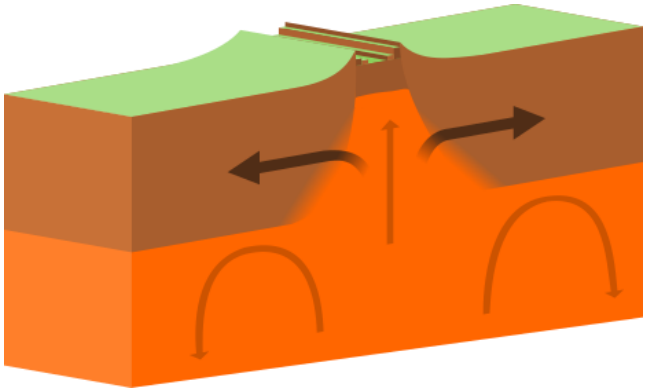
1) **Convergent Boundary**

On the first plate. Spread whipped cream onto your paper plate. Dip the ends of both cookies into water, letting them soak until soft. Place the cookies on the whipped cream. Then, gently push the cookies towards each other to simulate a convergent boundary. Record what happens when the cookies push into each other. Once done, discuss how this represents the formation of whichever landform that was developed when the crust/cookies pushed into each other.



2) **Divergent Boundary**

On another plate, place two cookies side by side on the whipped cream, touching other. Then slowly pull the cookies apart to simulate the process of seafloor spreading at divergent boundaries. Record the formation of the "gap" and how the whipped cream rises to fill it, then discuss what landform is being created when a divergent boundary occurs.



3) Transform Boundary

Using your third plate, place whipped cream and cookies in a similar fashion as before. Once this has been done, slide the cookies past each other horizontally to simulate a transform boundary. Place extra force on the cookies, creating friction between them. Enough pressure should be placed to make one of the cookies crack or crumble. Record any changes in the cookies, then discuss what may occur on the Earth's surface due to the friction created between the plates.