Natural Hazards Engineering Research Infrastructure

Tectonic Plate Movement
2023 NHERI REU Largescale Mobile Shakers
University of Texas at Austin

- **Summary**
  - In this lesson students will learn, demonstrate, and discuss how tectonic plates move and the effects they have depending on the type of boundary line it is.
- **Engineering Connection**
  - Our lesson is connected to engineering because in some place's structures must be built in accordance with the shifting of tectonic plates. That means it is important to understand how they move, and the potential effects of their movements in an area.
- **Audience**
  - 6-8(Middle school/Junior High)
- **Lesson Objectives**
  - To be able to let the students understand the concept of earthquakes and tectonic plate movements
- **Educational Standards**
  - What are tectonic plates?
  - How do tectonic plates move?
  - What happens when the plates interact?
  - What geological features are formed by the movement of tectonic plates?
  - How do tectonic plates cause natural disasters like earthquakes and volcanic eruptions?
- **Material List**
  - Graham crackers and Frosting, parchment paper, water, and knife
- **Introduction**
  - Have you ever wondered why earthquakes, volcanic eruptions, and the formation of mountains occur? Today, we will explore the fascinating world of tectonic plates using graham crackers and frosting, which are responsible for shaping our planet's dynamic surface. In this lesson we will learn how tectonic plates move, collide, and interact with each other.
- **Procedure**
  - Background knowledge

        - This lab explores divergent, convergent, and transform plate boundaries. Divergent zones occur on the ocean floor where plates spread apart. As the plates separate, magma oozes up, cools and hardens to make new crust. Convergent boundaries are when two plates collide and their edges crumble together creating mountain ranges and volcanoes. Lastly, transform boundaries are when plates slide past one another and get caught on one another. When they break free, an earthquake happens.
    - Before the activity
        - Purchase graham crackers, plastic knives, frosting, and parchment paper.
    - During the activity
        - Rip off pieces of parchment paper and put in different sections.
        - Divergent Boundaries:
            - Spread ½ inch layer of frosting on the parchment paper, and place two graham crackers next to one another. For divergent boundaries push the two crackers away from one another.
        - Transform Boundaries:
            - Again, spread ½ inch layer of frosting on the parchment paper and put the two crackers side by side and slide on forward (away from you), and one backward (toward you).
        - Convergent Boundaries:
            - Spread ½ inch layer of frosting on the paper and put two crackers side by side. Wet the edge of one of the crackers with some water. Slowly push them together and watch as they crumble upward.
    - After the activity
        - The students will take a short quiz to ensure that they did the activity as said in the wrap-up and will be asked for feedback and questions regarding the activity.
- **Assessment**
    - The students will achieve these learning goals by engaging in various activities, discussions, and experiments. They will have the opportunity to work individually, in pairs, and in small groups, fostering collaborative learning and critical thinking skills. They are encouraged to ask questions and share their ideas with the class. At the end of the lesson, they will write one take away from the experiment, such as, a specific way the plates more, or what could happen when they interact with one another. They will then share that takeaway with the class.
- **Wrap-up**

- To ensure the students retain the main takeaways from the lesson it will be followed by a short quiz.