

Curriculum topics

- Earthquakes
- Earth Systems
- Natural Hazards
- Plate Tectonics

Subjects

- Earth & Space Science

Grade range: 4 – 8

Who we are: Resource Area for Teaching (RAFT) helps transform the learning experience by inspiring joy through hands-on learning.

FOAM FAULTS

A simple model of a dynamic Earth process!

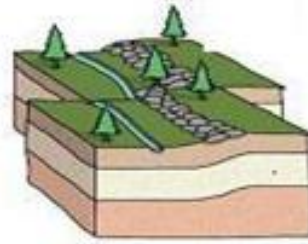


Plate tectonics is the scientific theory that the Earth's outer shell, the lithosphere, is broken into large, rigid plates that move slowly over the hotter, more fluid mantle below. This movement is driven by convection currents in the mantle and causes major geological events like earthquakes, volcanoes, and the formation of mountain ranges at the boundaries where the plates interact. Plate movement is also responsible for the long-term drift of continents. In this activity, students make models that demonstrate the relative movement of tectonic plates at three types of plate boundaries (faults) to understand how the movement causes earthquakes and can change the features on Earth's surface (see cracked street image below as an example).



Share Your feedback!

<http://bit.ly/RAFTkitsurvey>

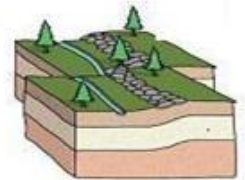
Materials

Materials in the kit may vary but generally, this kit contains the following:

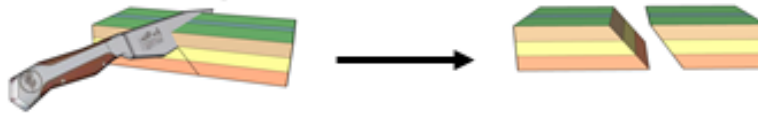
- Foam block, light color (1)
- Serrated knife, plastic (1)
- **Not included:** Black marker, colored markers

To Do and Notice

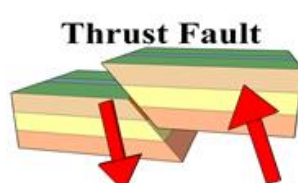
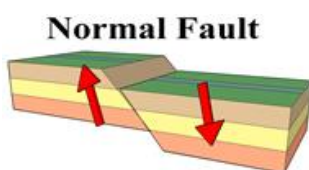
1. **Assembly:** Use markers to draw a small town with a river and/or roads onto the top of the foam block (see example at right).
2. Draw lines representing at least 3 distinct ground layers around all sides of the block.
3. Cut the foam block into 2 pieces with the serrated knife as shown below. Make an angled cut at 45°-60° with respect to the tabletop.



Cut at an angle



4. Place the foam pieces so the cut surfaces are back together.
5. **Investigate:** Model **normal fault** movement by sliding the pieces as shown below. Notice the relative positions of the horizontal lines on the sides of each piece of foam. What might this do to features (roads, homes, etc.) on the surface?
6. Place the pieces back together as in step 4. Model **thrust fault** movement by sliding the piece as shown below. Notice the relationship of the horizontal lines on each block and consider effects as above.
7. Turn the pieces around so that the angled edges face outward and put the vertical sides together. Model **strike-slip (aka transform) fault** movement by sliding one piece horizontally along the other as shown. Notice the positions of the features drawn on top of the foam.
8. **Class Discussion:** How might each type of fault affect the features drawn on the foam? How do you think this could affect the amount of damage experienced at each type of fault? Which type(s) of fault(s) can reveal the older ground layers in the Earth's crust? What advice would you give people who live near each type of fault? How could you help them prepare for an earthquake? What could *you* do to prepare?
9. **Share** your learning with RAFT! Submit photos/video via email at education@raft.net or on social media ([Facebook](#), [Twitter](#), [Instagram](#)).



Core Content Skills:

Science & Engineering (NGSS)

Constructing Explanations and Designing Solutions, Planning and Conducting Investigations, Analyzing and Interpreting Data, Developing and Using Models, Earth Materials and Systems, Plate Tectonics and Large-Scale System Interactions, Natural Hazards, The History of Planet Earth, Systems and System Models, Cause and Effect, Patterns

Social Emotional Learning

- Self-awareness
- Self-management
- Responsible decision-making

The Science Behind the Activity

Earth is a layered planet with a dense, metallic core, a layer of hot liquid rock (mantle), and a cold brittle surface (crust, lithosphere). The crust is broken up into many huge pieces called **tectonic plates**. Convection currents in the liquid mantle pull a plate into, away from, or along another plate. Most earthquakes and volcanoes occur where two or more plates meet (plate boundaries). The forces and pressures exerted as one plate moves under, along, or away from another plate cause large deformations/cracks called **faults** to form at various locations near the plate boundary. Significant ground movement along a fault causes earthquakes, landslides, and other types of natural hazards.



There are three main types of faults that form at plate boundaries. A **normal fault** is one in which the ground on one side of the fault line (fault plane) slides down the slanted face of the ground on the other side of the fault plane. At a **thrust fault** the ground that is above the fault plane rises in relation to the ground below it (slides vertically up the plane). Thrust faults are sometimes referred to as reverse faults depending on the angle the fault plane makes with respect to the surface. A **strike-slip fault** is one where the ground moves horizontally on opposite sides of the fault.

A well-known example of a strike-slip (transform) fault is the **San Andreas Fault**, which runs through California. Along this fault, the North American and Pacific plates slide past each other in southwest-northwest directions respectively. The **Sierra Nevada Fault** is a normal fault located in the Sierra Nevada Mountains. The Main Central Thrust is a fault where India and Nepal meet and is responsible for the formation of the Himalayas, home to Mt. Everest (tallest mountain in the world).

Reuse

This kit uses 100% reusable materials designed for other uses. To continue making a positive impact in reducing waste, reuse these materials in other projects. Additionally, any unused materials can be collected and delivered back to RAFT.

Feedback

Please comment on this kit by taking this short survey: <http://bit.ly/RAFTkitsurvey>. Inform us about any material concerns and any ideas for improvement.

Visit <https://raft.net> to view related activities!

- Brace Yourself | Motorized Shake Table | Your Room in an Earthquake

Resources

- What is an Earthquake? (video, 3:42) - <https://tinyurl.com/trsfr3er>
- NGSS Earthquakes for Kids - <https://tinyurl.com/mpt74zju>