**STUDENT WORKSHEET**

**Modeling Crustal Folds**

**Materials List**

* Three or more colors of playdough
* Plastic knife
* Colored pencils

**Representing Crustal Deformation and Faults**

In this activity, you will make four models of different crustal deformations arising from stress on the Earth’s crust paired with erosion over time. This erosion exposes different layers as wind and water cut through the crust, giving us a picture of the layers deep beneath our feet.

For each model, take at least three colors of playdough and form them into thin rectangles, roughly 0.5-1 cm thick and 5-6 cm wide. Stack each of the colored layers on top of eachother and trim or square off the edges to form a uniform block.

1. **Syncline and Anticline:** Take your block and apply pressure evenly from the sides to create a uniform wave. Trim a thin, 1 centimeter layer off the top of your block horizontally to represent erosion, which exposes hidden layers in the rock. Draw your block in the space below, including the layers on each side. Draw a dotted line to indicate where the center axis, or "hinge line," is for your syncline and anticline. Knowing that the oldest rock is deposited first and younger layers are on top, can you tell where the oldest rock is exposed?



1. **Plunging Synclines and Anticlines:** Cut another centimeter off your block, this time vertically from the top to the bottom at an angle, shaving off the forward-facing side of your model. Notice that the newly exposed layers are no longer on the same plane. Because you cut at an angle, there's a plunge in the block where the rock is exposed at different angles. Draw this perspective of your block below.



1. **Asymmetrical Folds:** In the real world, the compression of Earth’s crust rarely makes nice, even folds. Represent a more realistic fold by preparing a fresh block with your playdough. Compress your layers from the sides as before, but this time, make the folds lean more to one side. As before, “erode” away the top centimeter horizontally with your knife. How does this block differ from steps 1 and 2 above? How could you tell from looking at the top of your block that there was an asymmetrical fold hidden beneath?



1. **Faults:** Lastly, cut your block in half from top to bottom at an angle of your choosing. Reattach the two sides with one side sliding lower than the other. You’ve just simulated a type of earthquake! As before, use your knife to “erode” the top centimeter of the block. Draw your block below. From your observations, how does erosion tell us about the presence of faults?

