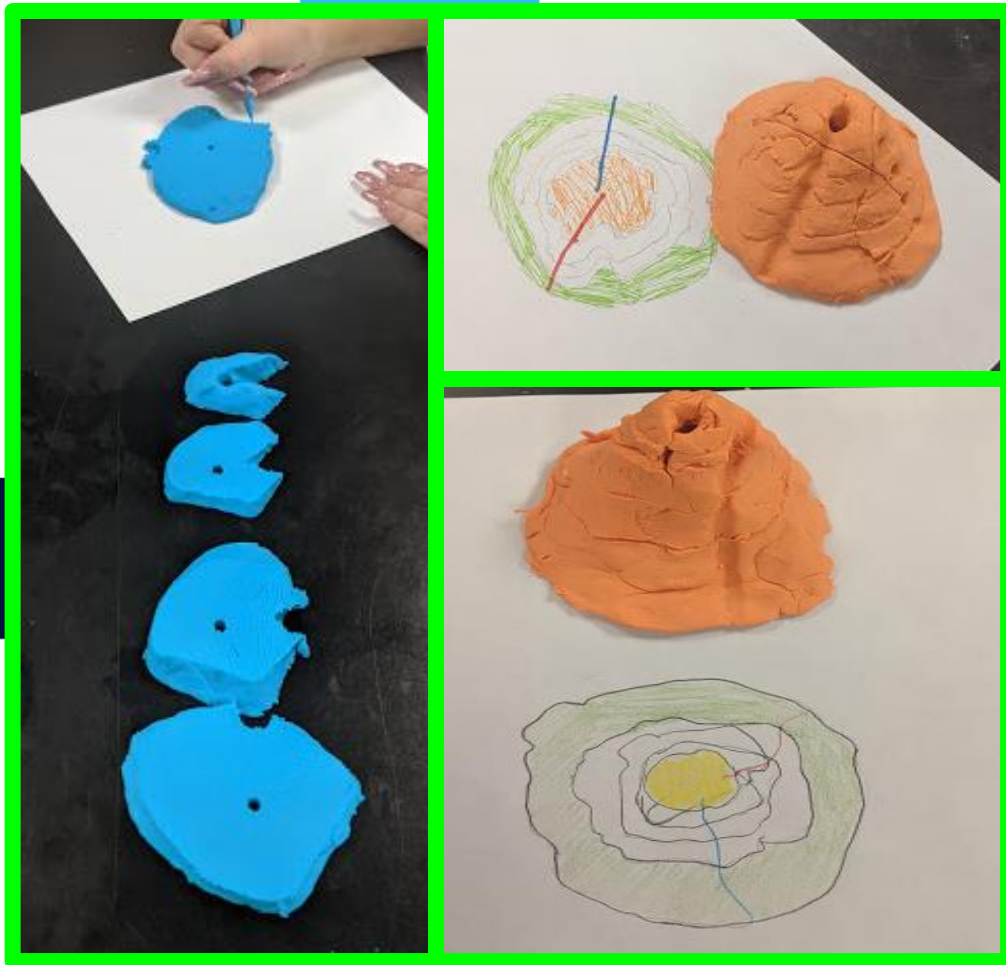


# Play Dough Topography

An Exploration of Topographic Maps



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## Play Dough Topography (Teacher Demonstration Notes)

### Materials:

- 1 container of play dough per student or about a cup of homemade play dough
- 1 foot piece of fishing line per pair
- Sharpened pencil

### optional:

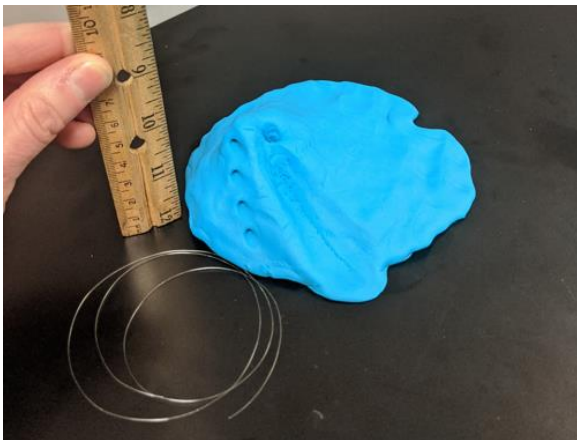
- spoons, toothpicks, other shaping tools



### PART 1:

Create your mountain. I do this as a demonstration/follow-me, as a whole class and work in pairs. About 1.5-2 cups of dough per pair is sufficient.

1. Open the container of play dough and mold it into the shape of a mountain.
  - a. Your mountain must have at least one steep side and one gradual side.
  - b. Carve out a deep groove on the gradual side of your mountain to represent a river bed that flows down the mountain.
  - c. Optional: You may also try to create multiple peaks or a depression in your mountain
2. Starting at the base of your mountain, use your ruler and your pencil to mark intervals on your dough for each 1 cm increase in elevation.
  - a. Mark these 1 cm altitude increases in altitude on the side of your mountain by making a small groove with your pencil.
  - b. Use your sharp pencil to poke a hole through your mountain from the peak to the base. You will use this hole to line up your pieces in a later step.



Be **VERY PRECISE** and **CAREFUL** with the next step. I show this step to my class before letting them do it.

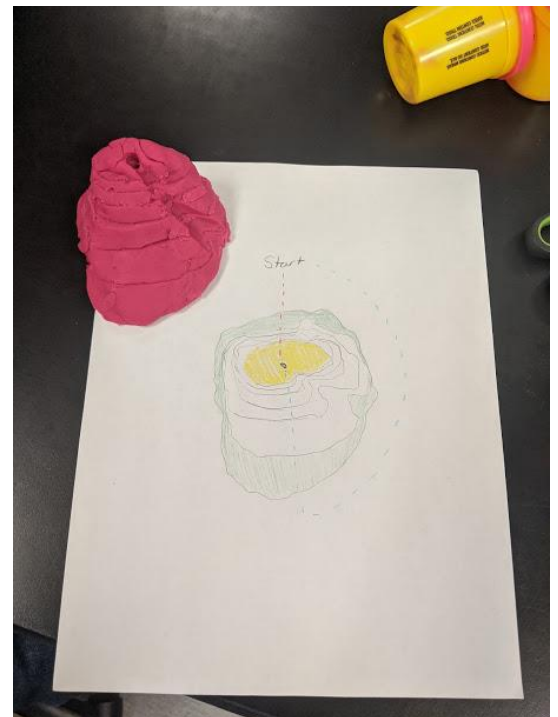
1. Line up your string of fishing line with the top altitude mark. Pull the line tight and use it to slice a flat layer off the top of your mountain.
2. Place the top layer off to the side. Line up your fishing line with the next altitude mark and slice another layer off. Place it next to the first slice. Continue creating slices of your mountain in this manner until you reach the base. Line up the slices in the order that they are created, so you can easily reassemble your mountain in the correct order. Each slice should be 1 cm thick when you are finished.

**\*\*Do not smash, destroy, or change the shape of your layers. Be very careful when handling them.**

## PART 2:

Create the topographic map of your mountain. I demonstrate this to the class after I finish showing them how to slice the layers.

1. On lab sheet, lay your bottom layer (the largest layer). Center it on the page. Be sure this layer is top-side up.
2. Place a pencil inside the pencil hole of the dough layer and make a dot on the paper. You will use this dot to line up the following layers.
3. Carefully trace around the outside of this layer, paying attention to indentations and other shapes.
4. Remove the bottom layer from the paper.
5. Place the second layer, top-side up on the paper. Line up the pencil hole with the dot. Carefully trace this layer.
6. Remove the 2<sup>nd</sup> layer and continue this process with the remaining layers. Be careful to always line up your pieces as close as possible to your original mountain placement.
7. Reassemble your mountain when finished. Do not mess up the slice lines. Look at your mountain and map from the top to compare.



## Play Dough Topography

After slicing your play dough mountain into layers, draw your topographic map in the space below by tracing each layer from bottom to top. Be sure to line up your pieces with the pencil hole and in the correct direction. Use the back if you need more space.

Label your map.

1. Using the scale that 1 cm of elevation is equivalent to a contour interval of 1,000 meters, label the contour lines on your map.
2. Add a compass rose to a corner of the page indicating direction.
3. Convert the elevation of your mountain from centimeters to meters. How tall is your mountain at its peak? (1 cm = 1,000 meters)
4. Use your map. With a RED writing utensil, draw the shortest route to hike up your mountain. Is this hike steep or gradual? How do you know?
5. Use your map. With a BLUE writing utensil, draw the most gradual route to hike up your mountain. How does this distance of the BLUE route compare to the RED route? Explain this difference.
6. Shade the highest elevation layer of your mountain YELLOW. Shade the lowest elevation layer of your mountain GREEN.

## Play Dough Topography

After slicing your play dough mountain into layers, draw your topographic map in the space below by tracing each layer from bottom to top. Be sure to line up your pieces with the pencil hole and in the correct direction. Use the back if you need more space.

**All answers will vary depending on individual dough mountains. Mountains that do not fit in this white space can be drawn on the back.**

Label your map.

1. Using the scale that 1 cm of elevation is equivalent to a contour interval of 1,000 meters, label the contour lines on your map.
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## Homemade Play Dough Recipe

2 C. Flour

½ C. Corn Starch

1 Tbs. Powdered Alum

2 C. Water

1 C. Salt

1 Tbs. Salad Oil

Place all ingredients in a saucepan, stir constantly over low heat until the mixture thickens into a dough consistency. Remove from heat and cool until it can be handled. Place on foil or wax paper and knead like bread until smooth. Add food coloring if desired. Store in an airtight container. This keeps for months and is safe and non-toxic.

