Naps & Noundains





Our Blue Marble: Maps & Mountains Activity 1: Create a Topographic Map

Objective: Students will create their own topographic map.

Materials Needed:

- ✓ Ruler 1 pack of 4
- ✓ Playdoh 1 case of 24
- ✓ Dental floss 1 pack of 5
- ✓ Pack of paper to be shared with Paper Mountains Activity
- ✓ Toothpicks 2 containers of 250
- ✓ Long pencils to be shared with *Sundials Activity*

Summary of Student Action:

Students will build a mountain out of Playdoh. Using the pencil, students should poke two holes into the top of mountain that extend all the way to the base of their mountain. Using the ruler, they will measure the height of their mountain and make evenly spaced marks down the side of the mountain to separate it into layers. At each mark, students will start at the top and hold the dental floss taut and use it to "cut" the mountain into slices. As each slice is cut off, students will set that mountain cross-section on the piece of paper and trace around it. It may be helpful for the students to line up the holes in the middle to ensure each paper layer is in the right position. Once all the pieces have been traced on the paper, the students can reassemble their Playdoh mountain. To assist in securing the layers, student should put toothpicks in the holes of the bottom piece and stack the mountain cross-section pieces using the toothpicks to line up the pieces.

Setup Instructions for a Single Activity:

- Set out a few containers of playdoh
- Set out the container of dental floss to start, cut a few 2ft. lengths of dental floss in advance
- Set out a few sheets of paper
- Set out the rulers
- Set out sharpened pencils



Our Blue Marble: Maps & Mountains Activity 1: Create a Topographic Map

Activate Your Knowledge:

Whose job is it to know how to make a map? Have you ever heard of a *cartographer* before? When it comes to creating maps, it is the cartographer's job. Today, you are going to be a cartographer and will be making a topographic map of a mountain. Topographic maps are used to show locations of changing elevation, such as hills and valleys, in two dimensions. However, before you can create this topographic map, you will need to build your mountain.

Materials You will need:

- ✓ Playdoh
- ✓ Ruler
- ✓ Dental floss (2ft length)
- ✓ Paper (1 sheet)
- ✓ 2 Toothpicks





Procedures:



- 1. Create your own mountain out of playdoh. It should be about the size of your fist.
- 2. Using your pencil, make two holes in the top of your mountain that go to the bottom of the mountain.
- Place the ruler next to the mountain, now use the pencil to make a small mark on the side of your mountain 1 inch (~2.5cm) from the top of the mountain. Continue making small marks at every inch until you reach the bottom of your mountain.



4.



- Hold the floss between your hands and stretch it so that it forms a straight line. For a firmer grasp, you can wrap the floss around your thumbs or fingers to help hold it in place (if you do this, be careful not to cut off your circulation by wrapping it too tightly). Line up the floss, still wrapped around your fingers, with the mark closest to the top. Now pull the floss through the playdoh to "cut" off the top layer of your mountain.
- 5. This detached piece of mountain is called a *cross section*. Except for your cross section, move the rest of your mountain off the paper. Place the cross section in the middle of the paper and then line up your cross section to the place where your mountain just was by aligning the holes with the marks on the paper. Once you lined up the cross section, use your pencil to trace around it on to the piece of paper.
- 6. In order to cut the remainder of your mountain, repeat steps 5 at each 1-inch mark of your Playdoh mountain and trace each cross section on the piece of paper. As you place each piece down to be traced, line up the two middle holes so you know it is in the proper position.
- 7. Once you have traced each piece, reassemble your mountain by stacking the pieces on top of one another. As you rebuild your mountain, you can use the toothpicks to hold the pieces in place.
- 8. Now, examine your rebuilt Playdoh mountain. Then, examine your newly created topographic map. How does your topographic map compare to your mountain? When the lines are close on the topographical map, what does it mean about the surface of the mountain?



Topographic Map Example 1

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Topographic Map Example 2



Our Blue Marble: Maps & Mountains

Activity 2: Maps & Mountains

Objective: Students will experiment with rain on a mountain range.

Materials Needed:

- ✓ Paper 5 reams of paper to be shared across activities
- ✓ Washable markers 5 packs of 8
- ✓ Squirt bottles 1 container of 6
- ✓ Plastic trays 1 set of 12 that will be shared with Seed Dissection Activity

Summary of Student Action:

Students will create their own paper mountain range by crumpling up a sheet of paper and then uncrumpling the paper. Students should not try to flatten the paper when they uncrumple it. Using a washable marker, students will trace the ridgeline of one of the highest mountain peaks on their paper. A ridgeline is the topmost edge of a mountain. With the water bottle, students will gently "rain" on their mountains by spraying a light mist and see how the water flows over a mountain when it rains.

Setup Instructions:

- Fill the squirt bottles with water and place to the side of the table.
- Set out pieces of paper and markers on the table.

Additional Notes:

- Have students place their sheets of paper on trays or in the grass before "raining" on the mountains.
- Students can repeat the experiment to see how different ridgelines affect the way the water moves.
- You can find topographic maps of areas close to your location that your students may be more familiar with here: <u>https://www.natgeomaps.com/trail-maps/pdf-quads/</u>.



Our Blue Marble: Maps & Mountains Activity 2: Maps & Mountains

Activate Your Knowledge: What happens when it rains in the mountains? Construct your own mountain range and experiment to find out!

Materials You Will Need:

- ✓ 1 sheet of paper
- ✓ 1 marker
- ✓ Squirt bottle

Procedures:

- 1. Take one sheet of paper and crumple it into a ball.
- 2. Gently unfold the paper so that it ends up with a lot of wrinkles and ridges. The wrinkles in the paper represent our mountainous terrain.
- 3. With a washable marker, trace along the ridgeline of one of the highest peaks in your mountain range. Predict where you think water will flow along the ridgeline that you marked.
- 4. Using a squirt bottle, slowly drop water onto your mountain along the ridgeline you just traced. This squirt bottle represents the rain that falls on mountaintops. What observations can you make about the rainfall on your mountain? When it rains, is water the only thing that moves over the mountains?