

Topographic Maps and Modeling 3-D Land Features

Purpose: To correlate topographic maps to the 3-D land features that they represent.

Materials: Clay (Play-dough), Fishing Line, Ruler, Pencil

Procedures:

1. Knead an **asymmetrical** mountain out of clay (play-dough) onto the clean sheet of paper provided. Be sure there is **one steep slope** and **one gentle slope** opposite one another. Ensure the **maximum** height of your mountain is **two-and-three-quarter (2 ¾) inches tall**.
2. Place your constructed mountain in the **center** of the box provided below. Then with your fingernail, **draw a vertical line** down one side of your mountain. **Mark** with a pencil on your lab paper where this line meets the paper. This line/side will be the **“North” side** of the mountain, and will be used later on to line up/position layers of the mountain correctly.
3. **Trace** around the **entire** base of the mountain onto the **center** of the box provided below. This is the **1st contour line**. *Give mountain to your partner to also trace the contour.*
4. Using a ruler, **measure** and **mark one-quarter (¼) inch** increments up the mountain from the bottom of on **ALL** four sides. When completed, there should be a total of **ten (10) increment** marks on each side. **NOTE:** It is very important that these **(1/4 in)** marks are as **accurate** as possible on **ALL** sides.
5. Very carefully and accurately **wrap fishing line** around **entire** mountain at all of the **(¼ in)** marks (like a belt). **Cross** the ends of the fishing line and **pull the ends slowly**, slicing through the clay (play-dough) at **each (¼ in)** mark.
6. **Remove** the bottom slice of the mountain (*set it aside for later*), and **replace the upper portion** in the same spot, **lining up the “North” side** of the mountain to the

“North” line drawn on your lab paper. *It should fit inside the 1st contour line.*

7. **Trace** the replaced upper mountain onto the paper. Now, there should be **two contour lines**, one inside the other. *Give mountain to your partner to also trace the contour.*

8. **Repeat steps 5-7**, ¼ inch at a time, until **ten (10) contour lines** have been drawn. When you have done so, you should have several concentric loops inside each other. You have just created a topographic map of your mountain!

NOTE: Ensure you **AND** your partner have the mountain traced

9. Once all contour lines are drawn, **re-stack** your mountain so that it looks like it did prior to the first slicing, using **“North” to line up** all the pieces. Place your mountain next to your map and **compare** the two.

Analysis and Conclusions:

1. Compare the steepest side of the mountain to its portion on the traced topographic map. Do the same for the gentlest slope. What do you notice about the **spacing** of the contour lines with respect to the steepness of the slopes?
2. Mark with a **STAR** on the topographic map above the side of the mountain that is the **steepest**.
3. What is the **contour interval (C.I.)** for your map?
4. Determine the **total relief** for your topographic map. **Show your calculation.**
5. Give a real-life example of when it would be **helpful** to use a topographic map.

