

**Kyle Casper**

**Grade 8th**

**Title: Local Topographic Features**

**GLEs Addressed:**

Science Content GLE [8] SD2.1

Students demonstrate an understanding of the forces that shape Earth by being able to interpret topographical maps to identify features (i.e., rivers, lakes, mountains, valleys, islands, and tundra).

Science Process GLE [8] SA1.1

Ask questions, predict, observe, describe, measure, classify, make generalizations, infer, and communicate to demonstrate an understanding of the processes of science

Writing GLE [8] W3.2.2

The student writes for a variety of purposes and audiences by writing in a variety of nonfiction forms (e.g. letter, report, biography and/or autobiography) to inform or describe or persuade.

Cultural Standard for Students E2

Culturally knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them. Students who meet this cultural standard are able to understand the ecology and geography of the bioregion they inhabit.

**Science Concept**

Topographic maps can be used to identify local geography.

**\*\*\*The scoring guide and assessment task are located at the end of the lesson. Please share them with your students before beginning the lesson.**

**Materials**

For each pair of students:

Paper

Pencils

Wax paper

2 softball size pieces of clay or soft dough

Several pieces of thread or dental floss

Science journal-one per student

Several topographical maps from the local area.

Several topographical maps from an area not local

**Vocabulary**

map scale - the ratio of a distance on the map to the corresponding distance on the ground

contour line - lines drawn on a map connecting points of equal elevation.

island- any piece of land that is surrounded by water.

lake- a body of water of considerable size that is surrounded by land

mountain- a large landform that stretches above the surrounding land in a limited area usually in the form of a peak.

valley- an elongated depression between hills, or mountains, esp. one following the course of a stream.

tundra - A treeless area between the icecap and the tree line of Arctic regions, having a permanently frozen subsoil and supporting low-growing vegetation such as lichens, mosses, and stunted shrubs.

topographic map- A large-scale map showing relief and man-made features of a portion of a land surface distinguished by portrayal of position, relation, size, shape, and elevation of the features.

topography- description or representation of an area or region

slope- land that is not vertical or horizontal

elevation- height above sea level.

### **Gear Up      Process Skills: Observing, describing, and communicating**

1. Ask the students what kind of features they see on a topographical map? (mountains, rivers, islands, valleys, islands, tundra, etc.) Have students record their answers in their science notebooks. Have each student share his or her response with the whole class.

2. Distribute local topographic maps.

3. Have students find the features discussed above on the maps. Ask what other information or features they found on the map. Students should record answers in their science notebooks.

### **Explore      Process Skills: Observing, describing, communicating**

1. Divide the students into pairs. Ask the students to create a mountain on the wax paper placed on a desk or table using one container of clay or soft dough.

2. Ask the students to mark the peak of the mountain with a dot.

3. Next instruct them to draw a straight line that passes through the dot while running from top to bottom of the mountain. Also ask them to draw a second line that is perpendicular to the first. The mountain should now appear to be divided into quadrants. These orientation lines will be important later.

4. Ask students to draw three rings around the center dot. One should be a quarter of the way down from the peak; the next should be halfway down; and the third should be three-quarters of the way down.

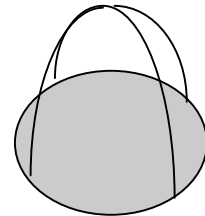
5. Next the students will use the string or dental floss to slice through the clay along the lines they have just drawn. They should have four layers.

6. Ask the students to place the bottom layer on a fresh sheet of paper and draw an outline of it with a pencil.

7. They should mark where the orientation lines meet the paper.

8. Next direct the students to remove the clay or soft dough from the paper. They need to center the next layer within the outline, using the orientation lines to make sure the clay is in the right position. Outline this layer. Then ask them to do the same thing with the remaining two layers.

9. Ask the students to remake their mountain by stacking the pieces. Ask the students for their mountains and hide them for later.



10. Students should trade their outline maps with another pair and create a mountain using the topographic map and other container of clay or soft dough. Have students compare the copy of the mountain to the original mountain that was created (one that was hidden). As a whole class discuss the difficulty or ease of creating the mountain using the outline maps.

11. Ask students to look at local topographic maps. Discuss the listed vocabulary and how line spacing indicates slope and how the “V” shaped contour lines in a valley can indicate the direction of stream flow, etc.

**Generalize    Process Skills: Observing, describing, communicating**

1. What is a contour line?
2. How would you construct the contour lines on a topographic map to show a steep slope?
3. How can you determine the elevation of a mountain or a valley?
4. How can you tell the direction of stream flow? .
5. How might you know how fast a stream is flowing?
6. If you were going to camp somewhere in the area depicted by the map, where you would you want to camp? Why?
7. What wildlife might be found where? Explain.
8. What are the benefits of using a topographic map?

**Apply            Process Skills: Describing, communicating**

Give each pair of students a topographic map from a region that is different than their local area. Ask students to list on a piece of paper all the features they observe on the topographic map. Then compare lists with another pair of students. Finally the groups should share their findings with the class.

### Scoring Guide

GLE/Standard	Below Proficient	Proficient	Above Proficient
Science Content GLE [8] SD2.1	The student identifies one or fewer features.	The student identifies two features on a local topo map.	The student identifies three or more features.
Science Process GLE [8] SA1.1	The student describes one or fewer features.	The student describes two features on a local top map.	The student describes three or more features.
Writing GLE [8] W3.2.2	The student writes a paragraph that has with six or more errors	The student writes a paragraph about the features of a local topo map that has three to five errors. Errors in spelling, grammar, or other?	The student writes a paragraph that has two or fewer errors.
Cultural Standard E.2	The student omits the route that they would take between the two points in their region, method of travel used, or omits the reason for taking that route.	The student includes the route that they would take between the two points in their region, the method of travel used, and includes 1 reason for taking that route.	The student includes the route that they would take between the two points in their region, the method of travel used, and includes 2 reasons explanation for taking that route.

### Assessment Task

Look at a topographic map of your local area. Mark two points of interest on your map. Now imagine you want to walk, snow machine, fly, or boat from one of the points to the other. Draw a line along the route you would take between the two points. Write a paragraph that describes and identifies two or more of the geographic features you see along the way. Include one or more reasons why you chose that route on the map and be sure to explain the methods of travel used. The paragraph should contain no more than five errors in spelling, grammar, or punctuation.