

CONTOURING SPUD PEAK

STANDARDS

See summary of National Science Education Standards.

Original: <http://books.nap.edu/readingroom/books/nse/>

Standard concept	General Standard	Specific Standard	General Standard	Specific Standard	General Standard	Specific Standard
Grade Level		K-4		5-8		9-12
Science as inquiry (A)	Abilities ... to do ... inquiry	A.1.4.1	Abilities ... to do ... inquiry	A.1.8.4		
		A.1.4.3				
		A.1.4.5				
	Understandings about ... inquiry	A.2.4.2	Understandings about ... inquiry	A.2.8.1		
Earth and Space Science (D)			Structure of Earth system	D.1.8.3		
Science and Technology (E)	Understanding about science and technology	E.2.4.2				
		E.2.4.5				
Science in ... social perspectives (F)			Science and technology in society	F.5.8.3		



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INTRODUCTION

The Earth's surface is routinely represented by maps. Maps are used for many different purposes such as to show roads, land use, or topography, the shape of the land. However, a map is a flat representation of a surface that is not flat in the details of hills or in the general shape of a sphere. So, symbols on the map must make it possible for the user to interpret the map as needed.

PURPOSE:

The student will learn what contour lines represent and how to read contour lines on a topographic map.

MATERIALS:

- 1/2 of a large potato
- 1 paring knife
- pencils
- 2 different colored permanent marking pens
- graph paper
- sample topographic maps

INSTRUCTIONS:

- 1) Divide students into groups of 3 or 4. Give each group the materials listed above.
- 2) Have a student in each group draw a North to South vertical line and an East to West horizontal line on the graph paper in 2 different colors.
- 3) With the potato half standing on its flat side, draw a line over the top of the potato to represent its N-S orientation and another line perpendicular to it for E-W in the colors corresponding to those on the paper.
- 4) Someone in each group should cut the potato in 1/4 inch slices parallel to the flat side. (Slices may be dried off on a paper towel).
- 5) One person in each group should trace the outline of each potato slice onto the paper, making sure that N-S and E-W line segments on the potato slice coincide with N-S and E-W lines on the graph paper. This works best if slices are traced from smallest to largest. Another student can reassemble the slices back into the original "mountain" shape.
- 6) The pattern of concentric lines students have drawn is a contour map of "Spud Peak".

QUESTIONS FOR FURTHER UNDERSTANDING:

- 1) What do the contour lines represent? (*Each contour line connects points of equal elevation above (or below) sea level*). If each contour line represented 1000 feet in elevation, how high would Spud Peak be? Have students label the elevation of each contour line with the outer line at zero (base of peak is at sea level!) and moving inward.
- 2) Ask students what other three dimensional landform besides a mountain might be



represented by concentric circles? Hint: suggest they think of dirty water draining out of a tub and leaving rings on the sides. (*Answer - A basin or round valley*).

- 3) Show students a real topographic map. Have students find areas on the topographic map that are similar to Spud Peak. Compare and contrast Spud Peak and the areas on the topographic map.
- 4) Have students find any places on the topographic map where the contour lines are roughly concentric and determine if this represents a hill or a basin.
- 5) Who would use topographic maps and especially the contour lines on the map? (*engineers, geologists, hikers, general public, etc*). How would these lines be helpful?
- 6) What does it mean when contour lines on a map are very close together? (*Steep hillside*)
 - i) Far apart? (*Flatter ground*). Find examples of each on a real topographic map.

