

RESOURCE LIBRARY
ACTIVITY : 50 MINS

Make a Contour Map

Students create three-dimensional clay mountains and then use them to make contour maps.

GRADES

6 - 8

SUBJECTS

Geography

CONTENTS

3 Images, 1 Link

OVERVIEW

Students create three-dimensional clay mountains and then use them to make contour maps.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/make-contour-map/>

DIRECTIONS

1. Show students map images and introduce the activity.

Display the images of topographic, or contour, maps. Make sure students understand that contour maps, though 2-dimensional, use contour lines to show elevation above sea level. Point out the flattest and steepest areas on the Crater Lake map. Ask students to describe how the map uses contour lines to show which terrain is steep and which is flat. Then tell students that they are going to make their own contour maps with DOGSTAILS. Divide students into pairs. Provide each pair with the following supplies: two sheets of drawing paper, a ball of clay, markers of different colors, several feet of fishing line, and a pencil.

2. Have pairs draw orientation lines on the drawing paper.

Have pairs draw orientation lines on the drawing paper. Tell students to draw a straight vertical line and then a straight horizontal line intersecting it to create four equal quadrants. Explain that the peak of the mountain will line up with the intersection, so that each mountain appears to be divided into four quadrants.

3. Have pairs of students work together to make clay mountains.

Have pairs shape their clay into a mountain on the drawing paper and mark its peak with a dot. Ask students to line up the dot with the intersection of the two lines, and draw the lines across the mountain so the clay mountain is clearly divided into the four quadrants.

4. Have pairs cut layers out of the mountains.

Next, have pairs use their pencils to mark three rings on their clay mountains to indicate different elevations. The first ring 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. Then have students hold the fishing line very taut and use it to slice all the way through the clay along the rings. When they finish, each student should have four separate layers.

5. Have pairs use the clay layers to draw contour lines.

Have pairs re-draw orientation lines on the second sheet of drawing paper. Ask pairs to put the bottom layer of clay on the second piece of drawing paper and outline it. Then have students remove the bottom layer of clay and place the next largest layer of clay within the first outline. Have students outline this layer and repeat the process with the top two layers. Make sure students realize they have drawn contour lines for a topographic map.

6. Have pairs complete the contour maps with DOGSTAILS.

Tell pairs to assume that the base of the mountain is at sea level, or 0 feet of elevation. Have students label the base of the mountain on the contour map with 0 feet and then assign consistent elevations to the other levels using an elevation range of 100 feet per line. Tell students they will color each layer—the space between each contour line—a different color, and create a map key to show what elevations each color represents. Explain that they can use any color but blue, because blue represents water on contour maps. Have students color and create their keys. Finally, have students add any missing DOGSTAILS information:

Date: when the map was made

Orientation: direction (north arrow or compass rose)

Grid: lines that cross to form squares

Scale: map distance

Title: what, where, and when

Author: who made the map

Index: the part of the grid where specific information can be located

Legend: what the symbols mean

Sources: who provided information for the map

7. Have a whole-class discussion about the images of contour maps from Step 1.

As a class, revisit the contour map images. Have students look at the elevations and details.

Ask students to describe the differences in elevation that they see in the map images.

Address any questions they may have about topographic maps.

Informal Assessment

Ask students to explain how the contour map shows the elevation of the clay model.

Extending the Learning

Use Nat Geo's TOPO! Explorer to find and analyze topographic maps of your local area.

OBJECTIVES

Subjects & Disciplines

Geography

Learning Objectives

Students will:

- make a contour map based on a clay model
- color-code the layers and create a map key
- label the map with DOGSTAILS information

- explain what information the contour map conveys

Teaching Approach

- Learning-for-use

Teaching Methods

- Hands-on learning
- Visual instruction

Skills Summary

This activity targets the following skills:

- Critical Thinking Skills
 - Applying
 - Remembering
 - Understanding
- Geographic Skills
 - Analyzing Geographic Information
 - Organizing Geographic Information

National Standards, Principles, and Practices

NATIONAL GEOGRAPHY STANDARDS

- Standard 1:

How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Balls of clay (3" in diameter)
- Drawing paper
- Fishing line
- Markers
- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Optional
- Tech Setup: 1 computer per classroom, Projector

PHYSICAL SPACE

- Classroom

GROUPING

- Small-group instruction

BACKGROUND & VOCABULARY

Background Information

Earth's surface has many different kinds of landforms that vary widely in shape and elevation. Contour maps show the elevations of these surface features, which allows you to look at a 2-dimensional map to visualize the Earth in three dimensions.

Prior Knowledge

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Recommended Prior Activities

- [Introduction to Contour Maps](#)

Vocabulary

Term	Part of Speech	Definition
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Term	Part of Speech	Definition
contour map	<i>noun</i>	representation of an area's elevation points or slopes.
elevation	<i>noun</i>	height above or below sea level.
landform	<i>noun</i>	specific natural feature on the Earth's surface.
quadrant	<i>noun</i>	one of four parts of a grid. Quadrants are divided into northwest, northeast, southeast and southwest.
relief	<i>noun</i>	the difference in elevation between areas of a specific region.
terrain	<i>noun</i>	topographic features of an area.
topographic map	<i>noun</i>	map showing natural and human-made features of the land, and marked by contour lines showing elevation.

For Further Exploration

Websites

- [USGS: The National Map](#)

