Activity 1: Build a Contour

Overview Students will explore the concept of topographic maps and contours by creating a three-dimensional cardboard model from a topographic map.

Materials Each pair of students should have:

- 2 copies of the topographic map (next page)
- Clay
- Scissors, pencils, markers
- Large pieces of cardboard

Procedure

1. It is best to have students work in pairs so they can discuss their work. Pass out two copies of the map to each team. Discuss the details of the map — what the contour lines represent, location of streams and wetlands, etc. Can students tell from the lines where the ground is gently sloping or where it is steep? (The greater the distance between contour lines, the gentler the slope.)
2. Each pair should have materials ready. Cut one contour map along the 120' contour lines only. There should then be two contour pieces and one stream piece. Save all 3 pieces.
3. Lay one of the large cut pieces on the cardboard, trace it and label it 120'. Reduce the same map piece by cutting along the 140' line. Trace this onto another piece of cardboard and label it 140'. Continue cutting on the contour lines and then tracing and labeling pieces on cardboard. Repeat this procedure with the other large piece of the map. There should be twelve, finished, labeled pieces in all.
4. Using the second copy of the map as a guide, stack the cut pieces in two piles from lowest to highest elevations. As you stack, place three or four small balls of clay between each layer to add height. Lay the stream piece between the stacks.
5. Students should be able to see the *canyon* that the stream runs through. What type of wetland might be found here?

Adapted from *Science is Elementary*, the resource publication of MITS, Inc., the Museum Institute for Teaching Science. Geology, Oct./Nov. 1988.

Activity 1 Topographic Map

Activity 2: Contour Quiz

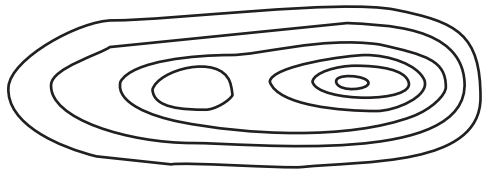
Objective Students gain experience in interpreting how contour lines on maps represent real-life landscape features by matching sample contours with their corresponding three-dimensional silhouettes.

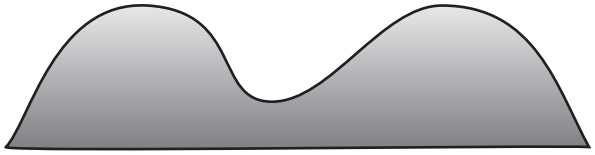
Materials Contour matching quiz worksheet.

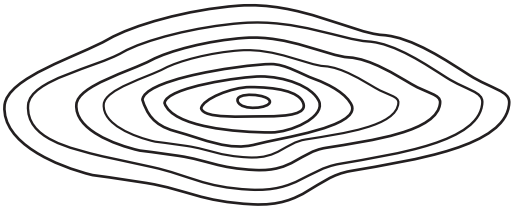
Procedure

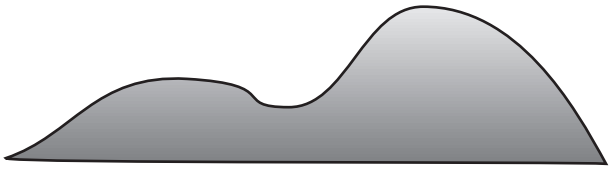
1. Review the concepts of contour lines on maps – how they represent areas of equal elevation in a landscape and where wetlands are most likely found on these maps in relation to them. Moving from one contour line to another represents a gain or loss of elevation.
2. Pass out the contour quiz worksheet and ask students to match the contours with their corresponding hill silhouette. Alternatively, you could provide the students with only the contour configurations, and ask them to draw how they think the corresponding hill silhouette should appear.
3. Break up the students into small groups. Assign each group to work on a different silhouette. Where would they expect to find wetlands on their silhouette (if at all) and why? Remind them that wetlands are often found in low-lying areas in the landscape.
4. Next, place an imaginary drop of water on each group's silhouette and have them determine which direction the water would flow from that point. Where would the raindrop flow and why? The direction of water flow can be determined by examining the contour lines (see illustration on page 86).
5. Ask each group to pick a representative to deliver its conclusions to the rest of the class.

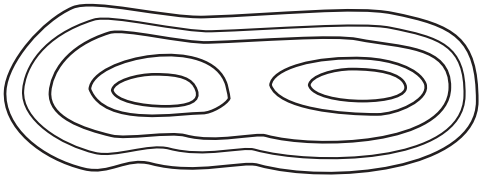
Contour Matching Worksheet

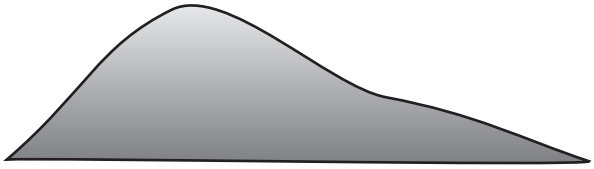


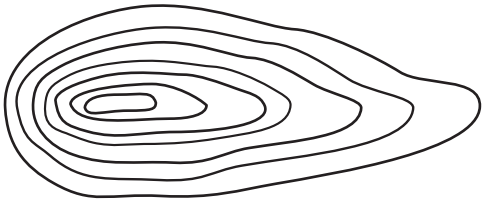


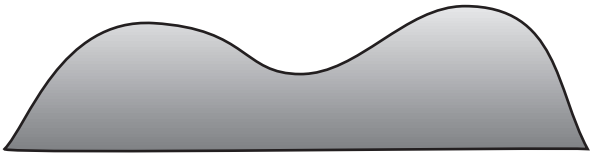


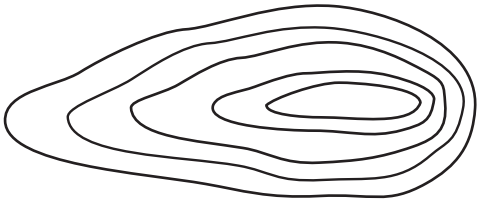


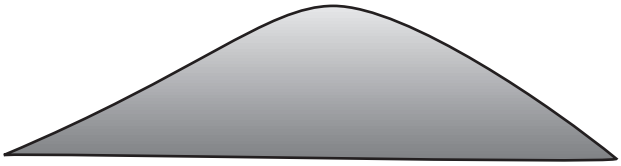


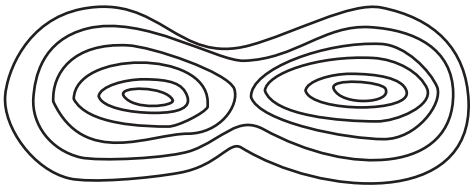










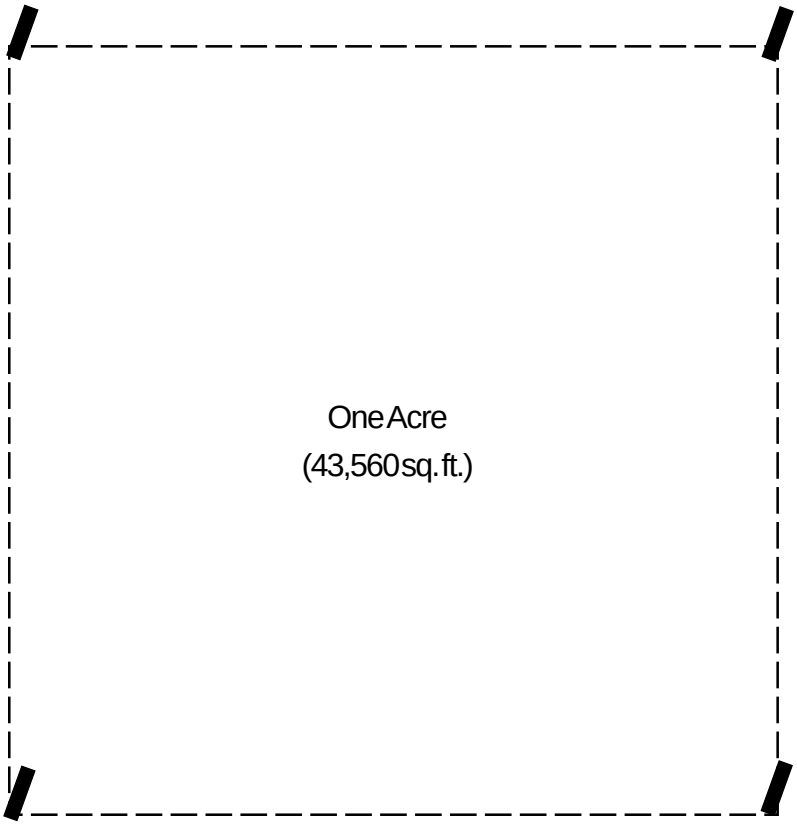


Activity 3: Visualizing an Acre

Overview Students stand along wooden stakes that form the four sides of an acre. This outdoor exercise allows them to visualize the actual dimensions of an acre.

Materials
- Wooden stakes (available at lumber or hardware stores)
- Measuring tape

Procedure
1. Stake out an area the size of one acre on a playing field outside the school (1 acre = 43,560 square feet). If your school is located in an urban setting with limited grounds, try staking out a smaller area – 1/2 acre or 1/4 acre.
2. Before going outside, ask the students if they can guess how large an acre actually is. Is it the size of the school parking lot, gymnasium, or the size of the classroom? Take a survey of the class to see how many think it is larger or smaller.
3. Once outside, ask the students to stand around the stakes facing towards the center, forming four sides of an acre. Remind them how large they originally thought an acre was. Also remind them of the wetland acreage lost in the U.S. (100 million) and in their particular state. Will they feel different about the loss of just a few acres of wetlands being filled for development now that they know the actual size of an acre?



Adapted with permission from Carol Johnson & Associates, Cambridge, Massachusetts.

Activity 4: Investigating Topographic Maps

Overview Using a topographic map, students will locate common natural and man-made features on topo maps and become familiar with the relationship between contour lines and elevation.

Materials

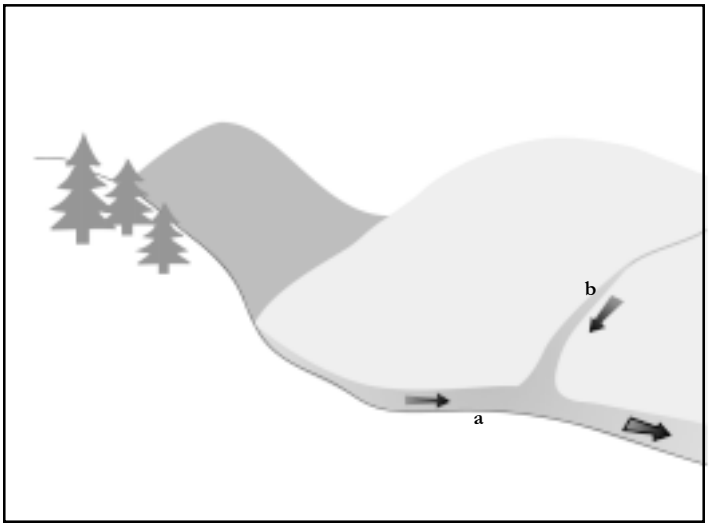
- Topographic map or community base map
- Crayons (black, brown, green, & blue)

Procedure

1. Divide the class into groups, preferably with no more than four or five students per group.
2. Pass out copies of the topographic map to each group. Using a topo map of your own community instead of the one in this guide will be more meaningful to students. Review briefly what contour lines are and how to read them (see diagram below).
3. Place three different points on the map and ask students to identify the elevation of each point.
4. Discuss the difference between uplands (higher elevations) and lowlands (lower elevations) and how wetlands are often found in low-lying areas. Ask the students to locate upland and lowland areas on the map. Have them find the highest and lowest points on the map.

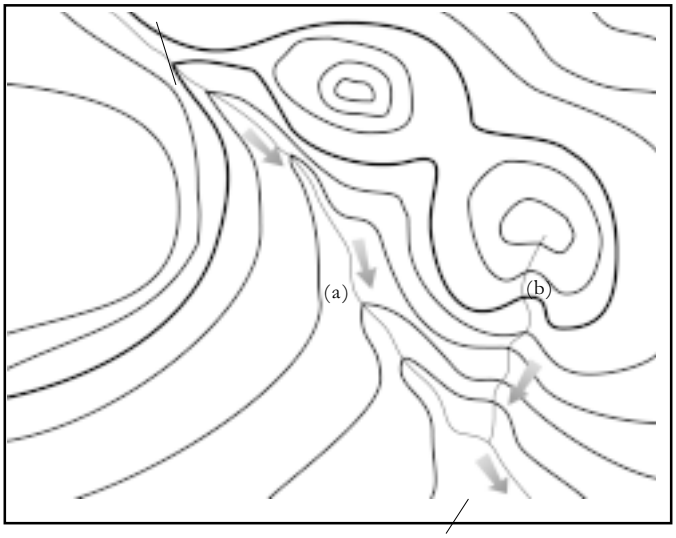
   Point out the symbol for wetlands ( ). Can they locate any wetlands? Color these green.
5. Identify other features on the map, both man-made and natural – buildings, waterways, etc. (see map symbols on page 80). Ask students to find their school and neighborhood on the map (if you're using a community base map). Do they notice any wetland symbols or waterways located near their school or home? Color the wetlands green and the waterways blue. Have any students seen or explored these areas? Does water flowing through the wetlands enter into streams or reservoirs?
6. Have students trace the path of a drop of water on this real-life map. Where does it flow? Does it flow through any wetlands?

Tracing the path of a drop of water



Stream (b) flows into river (a).

closed end of "vee" patterns in contours points upstream



direction of water flow

Sample USGS Topographic Map