TOPOGRAPHIC MAPS

Now you have seen how topographic maps can be generated to present the elevation of a terrain. Let’s look at some topographic maps and learn how to interpret them.

Activity 1: Topographic Map Investigation I: More Than a Road Map

This activity will give you a chance to learn about a "topo" map by using one. The map you will use shows what is called the Laurel Quadrangle (because the map is 4-sided).

To do this activity you need the topographic map and the pamphlet on topographic map symbols.

**DO NOT MAKE ANY MARKS ON THE MAPS, PLEASE!**

1. Maps are smaller scale representations of the Earth. On each map it tells you what the scale is. On some maps 1 inch equals 1 mile. What is the scale of this topographic map and what does it mean?

________________________________________________________________________

How many feet on the ground would 2 inches on the map equal?

________________________________________________________________________

Measure the distance between Beaverdam Road and Powder Mill Road on the Baltimore-Washington Parkway. How many feet is it?

________________________________________________________________________

2. When was the map published? __________________________________________

When was it last revised? ________________________________________________

3. Who did the mapping? ________________________________________________

Who published the map? ________________________________________________

4. What do the purple areas show? ________________________________________
5. Using the topographic map and the pamphlet with the symbols, locate each of the following features on the map:

- stream
- woodlands
- marsh
- lake or pond
- railroad tracks
- sand or gravel pit

6. Locate:
   - Bowie State University
   - Goddard Space Flight Center-NASA
   - Your home or your school (if you live or work in this area)

7. What is the contour interval on this map? ____________________________

   Find the highest point on the map. Where is it? __________________________

   How high is it? ______________________________________________________

   Find the lowest point. Where is it? __________________________

   How low is it? ______________________________________________________

8. In which direction does the Patuxent River flow? __________________________

   How can you tell?

   Find the first observation tower north of the intersection of Trainfire and South Roads in the Fort Meade complex. Does rain water that falls here flow to the Patuxent River or the Little Patuxent River?

   How do you know?
Activity 2:  Topographic Map Investigation II:  Water Features and Flow

Use the Beltsville, MD quadrangle for this activity.

1. Locate Little Paint Branch on the topographic map.
   a. In which direction does the water flow in the creek?

   b. Locate the headwater of the creek. The headwater is the point of origin and has
      the highest elevation for the creek. In which direction is it located (NW, S,
      ENE...)? What is the elevation at the headwaters?

   c. Locate the lowest point of the creek on this map. Determine its location and
      elevation. The point where a stream or creek empties into another body of water
      is called the mouth. (The mouth of the creek is not on this quadrangle.)

   d. Determine the approximate length of the stream in this quadrangle in miles. The
      length is considered the distance from the headwaters to the mouth (or lowest
      point displayed on the map).

   e. Using the information from b-d, calculate the *average stream gradient* from
      headwaters to mouth. The gradient is calculated from the following formula:

      \[
      \frac{\text{change in stream elevation (feet)}}{\text{length of stream (miles)}} = \text{average stream gradient (ft/mi)}
      \]
2. Locate the highest and lowest elevations on the map. The **relief** is the difference between the highest and lowest elevations. Calculate the relief in feet. (In Prince George's County the relief will typically be less than 400 feet.)

3. What is the elevation of the water level in Greenbelt Lake?  
To where does the overflow from the lake drain?

4. Look at the contour lines where they cross a stream. Find a section of stream with 3-5 contour lines crossing it. What is the name of the stream?

On the "idealized" channel below, sketch the contour lines crossing the stream as seen on the one you selected.

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[Diagram of contour lines with labeled water]
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From the difference in elevation, which way is the water flowing? Indicate the flow direction on the diagram above with an arrow and explain how you arrived at your answer.

5. Look at the pattern of a tributary stream (channel that feed into a larger channel) meeting a larger stream. Locate and observe several more tributary intersections. How can the pattern at the intersection indicate the flow direction?
Activity 3: Topographic Map Investigations III: Visiting Western Maryland

Use the Frostburg Quadrangle to answer the questions below.

1. What states are represented on this quadrangle?

2. What is the contour interval on this map? ________________________________

3. Look at the region just east of the segment labeled Dans Mountain. Locate the series of streams in this region. In which general direction do the streams flow? Explain based on the contours.

   Is this region flat or steep? Explain how you determined this.

4. Locate Fort Hill at the bottom of the quadrangle. Is this region steeper or less steep than the visible region of Horseshoe Mountain? Explain.

5. Describe the general pattern of flow of the Potomac River.

   Why do you think the Baltimore and Ohio railroad run along the path of the Potomac River?
Topographic Map Information

Topographic maps provide an excellent medium for teaching map skills and understanding how three-dimensional surfaces are represented in two dimensions. Here are a few notes that will help you when you are working with topographic maps.

- U.S. land masses are divided into "quadrangles" which are usually 7.5 minutes on a side. There are sixty (60) minutes in one degree of longitude or latitude. Each quadrangle has a name that represents a feature in that area.
- Be sure you have a legend (symbols pamphlet for USGS maps) to interpret the markings on the map. Topographic maps generally do not have complete legends printed on them.
- Look for water when trying to locate lowest elevations. Water always flows from higher to lower elevations. This can help you determine the watershed area for a particular body of water (stream, lake...).

A topographic map of each quadrangle is available from the U.S. Geological Survey (USGS). To obtain a catalog or information about topographic or other maps contact the USGS:

http://geography.usgs.gov/esic/to_order.html