

Mapping the Bronx River Watershed

Objective: Students will become acquainted with topographical maps and gain a better understanding of their local geography and topography through a mapping exercise.

Materials: USGS topographical maps, colored pens and tape, aerial photograph of the Bronx River Valley.

ACTIVITY SUMMARY:

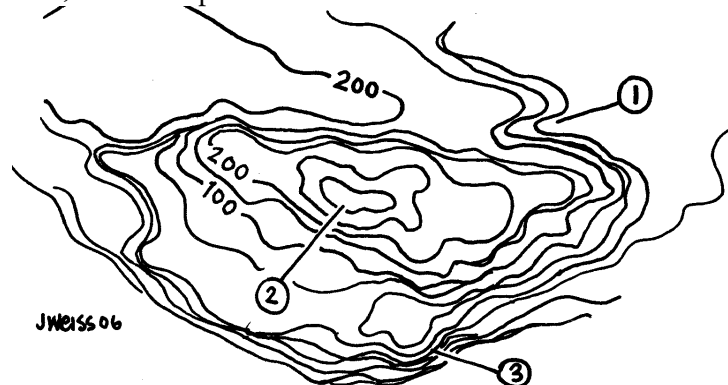
Students will learn what topographic maps are, how they are created and how to read them. Using local “topo” maps, students will identify the boundaries of the Bronx River Watershed, the river’s source and its mouth. Students will recognize the impact of urbanization and development. Advanced students may investigate point and non-point pollution issues, runoff management and the Bronx River “Sewershed.”

BACKGROUND INFORMATION:

Topographic (or “topo”) maps show the contours or topography of the land. On the maps, contour lines curve to connect contiguous points of the same altitude. All points along the curve marked 200 feet are 200 feet above mean sea level. (See illustration on next page.)

Things to look for on a topographic map:

1. Sharp pointed “V” shapes usually indicate the drainage channel made by a stream.
2. “O” shapes and closed loops indicate a hill or rise that slopes on either side. Sometimes this may indicate a depression, so it is important to check the altitude numbers.



3. Contour lines that are spaced close together indicate a steep slope; distant contours – a shallow slope. Two or more contour lines merging indicate a cliff.

EVERYBODY

IN THE CLASSROOM

Skills:

Reading/Writing, Using Scientific Tools, Critical Thinking, Observe/Compare.

Subject/Discipline:
Science, Math.

Science Standards:
S3, S4, S5, S6, S7

Time:
Prep + 1 or 2 class meetings.

The Inside Track:

Contact the Bronx River Alliance (718-430-4665) for an aerial photograph of the area.

To view maps of the Bronx River Watershed visit www.bronxriver.org/plans

Resources for topographic maps:
<http://topomaps.usgs.gov>, then click on "Finding and ordering USGS topographic maps." Or you can call 1.800.USA.MAPS

Topo maps may also show bodies of water, forested areas, developed areas, large buildings and other significant features.

Older topographic maps were prepared using traditional surveying instruments.

Contemporary topo maps are derived from aerial photography that has been interpreted using photogrammetry. This is a measurement technology in which the three-dimensional coordinates of points of an object are determined by measurements made in two or more photographic images taken from different positions.

PROCEDURE:

Copies of topo maps that include the Bronx River can be requested or ordered. Go to <http://topomaps.usgs.gov>, then click on "Finding and ordering USGS topographic maps." Or you can call 1.800.USA.MAPS.



1. Introduce topographic maps to students and explain their use.
2. Photocopy the parts of the topo maps that show the Bronx River and tape the photocopies together to form one large map.
3. Mark with colored markers the source and mouth of the river, confluences (meeting points) with any tributaries, wetlands, connected ponds or lakes and any dams.
4. Figure out which way the river is flowing on the topo map. Use the elevation numbers on those contour lines that cross your stream. Draw directional arrows on the stream to show which way the water flows.
5. Trace the watershed boundaries of the Bronx River. Follow the river to its source, and then continue uphill on either side of the river until elevation numbers indicate that the land begins sloping downward. This ridge is the "height of land" separating the river's watershed from neighboring watersheds. Try to draw the boundaries of the river's watershed.

Discuss:

Looking at the colors and symbols on the map, what is the majority of land in the Bronx River watershed classified as?

How do you think this affects the water quality of the Bronx River?

EXTENSIONS:

To learn more about the sewershed boundaries, get a map of the sewer system from the New York City Department of Environmental Protection or go to the Bronx River Ecological Restoration and Management Plan for a sewershed map: www.bronxriver.org/plans. Use this map to discuss the effect of stormwater runoff and Combined Sewer Outflows on the watershed's health.

Other questions to investigate:

How is the sewershed different from the watershed?

Where are the boundaries of the sewershed as compared to the watershed?

Where are the combined sewer overflows?

How would a combined sewer overflow affect Bronx River water quality?

What are the different ways land is used in the Bronx River Watershed?

How do these uses affect runoff?

Compare the topo map and the sewershed map.

Can you infer the impact of the sewershed on the Bronx River Watershed?

What species are affected by polluted runoff?



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