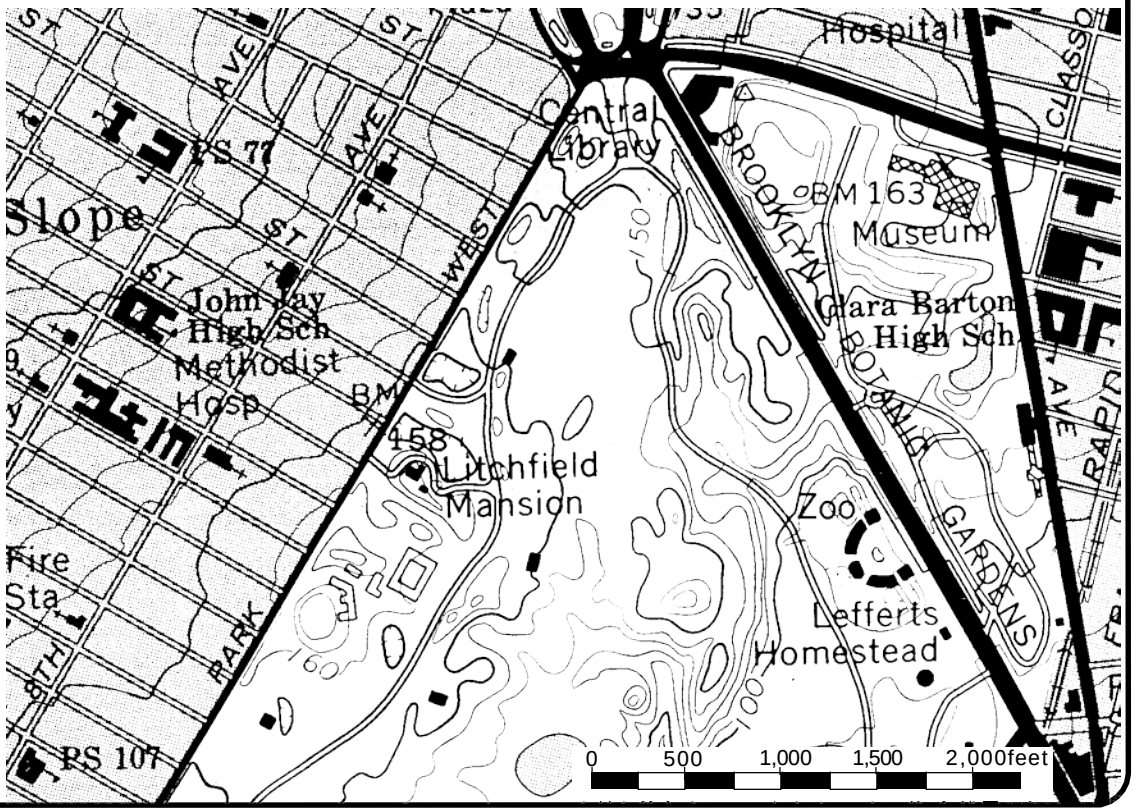
TOPOGRAPHIC MAPS Science Page

WHAT IS A TOPOGRAPHIC MAP?

A topographic map is a very accurate and detailed map of a region. It includes natural features, such as rivers, lakes, valleys, and hills, and human-made features, such as roads, bridges, and buildings.



Here is a topographic map of Prospect Park, Brooklyn, New York City.

COLORS AND SYMBOLS

To read a topographic map, you need to know what the colors and symbols represent. Vegetation, such as grass and trees, is green. Water, including lakes and rivers, is blue. Contour lines are brown. Towns and cities are pink or gray. Symbols are used to represent features, such as churches and schools. The meanings of symbols are explained in a key, which is sometimes called a legend.

Here are some symbols used on the map above:

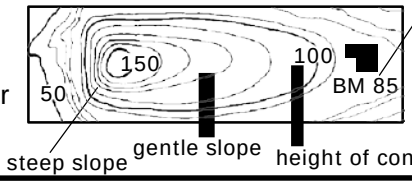
church school railroad

Can you find these symbols?

CONTOURS

Topographic maps show the shape or relief of land—where it goes up and down, as in hills or valleys. Contour lines join up places that are the same height—or elevation—above sea level.

The diagram below shows contour lines at every 10-foot change in elevation. Where spacing between contour lines is close, it means the land is steep. Where spacing is wide, the slope is gentle.



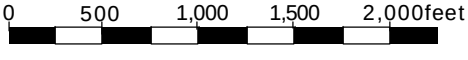
The letters BM followed by a number stands for benchmark. A benchmark on a building or post shows its exact height in feet above sea level.

On the topographic map of Prospect Park, there is a contour line at every 10-foot change in elevation. Numbers along the lines show actual elevation (for example, 150, 100).

SCALE

The scale of a map indicates how much actual features are shrunk or scaled down. The scale may be shown as a ratio such as 1:12,000. This means 1 unit of length on the map equals 12,000 units of distance on the ground. The scale may also be written in words or shown as a line:

1 inch represents 1,000 feet.



The scale of the map above is 1:12,000. One inch on the map equals 12,000 inches, or 1,000 feet, on the ground. Or 1 cm on the map equals 12,000 cm, or 120 m on the ground.

USING MAPS

Many different people use topographic maps. Scientists use topographic maps to study the environment. City planners use the maps to help locate suitable places for buildings, roads, or parks. Aircraft pilots need topographic information for flight planning and navigation. Topographic maps are also used by hikers.

Using the scale and contour lines on a map, you can not only measure how far you have to travel to get from one place to another, but also how far up and down hill you have to go to get there.

WORD SEARCH

All of these things can be found on topographic maps. Can you find them in this word search?
hills, valleys, contours, forests, lakes, rivers, cities, parks, roads, houses, railroads, schools

T	S	N	V	B	J	L	H	S	S	S
S	Y	E	K	A	R	O	R	E	C	L
G	D	G	S	I	L	U	A	K	H	K
R	I	A	V	U	O	L	X	A	O	Y
X	F	E	O	T	O	S	E	L	O	P
R	R	V	N	R	L	H	P	Y	L	O
S	O	O	S	L	L	J	K	V	S	B
G	C	A	I	S	E	I	T	I	C	J
P	C	H	D	C	F	P	A	R	K	S
F	O	R	E	S	T	S	O	R	T	I
K	M	R	M	V	P	B	B	J	S	R

TRY THIS

STUDYING TOPOGRAPHIC MAPS

How good a map detective are you? Use the map on the front of this page to find the answers to the questions below. Write your answers on a separate sheet of paper.

1. Where is the steepest slope? Is it (a) in Brooklyn Botanic Gardens, (b) left (to the west) of Lefferts Homestead, or (c) left (to the west) of Central Library?
2. Where is the railroad? Is it (a) at the top (north end) of the map, (b) on the right (east) side of the map, or (c) near the bottom (south end) of the map?
3. How many churches are on 8th Avenue?
4. How many blocks is it from Methodist Hospital to P.S. (Public School)107?
5. How many blocks is it from John Jay High School to P.S. (Public School) 77?
6. What is the elevation of Litchfield Mansion?

To find the answers to questions 7-9 you have to measure distance using the map and scale. Here's what to do.

(a) Measure the distance on the map in centimeters.

(b) Look at the scale of the map to see what one unit on the map represents in actual distance. For example, in the Prospect Park map, 1 unit equals 12,000. So 1 cm equals 12,000 cm (120 meters) in distance on the ground.

(c) Multiply the distance on the map by the distance one unit represents to find the actual distance. For example, 3 centimeters on the Prospect Park map equals 3 x 120 meters = 360 meters in actual distance.

7. How far is it from the Central Library to the Museum?
8. How far is it from Litchfield Mansion to the zoo?
9. What is the length of the Brooklyn Botanic Gardens?

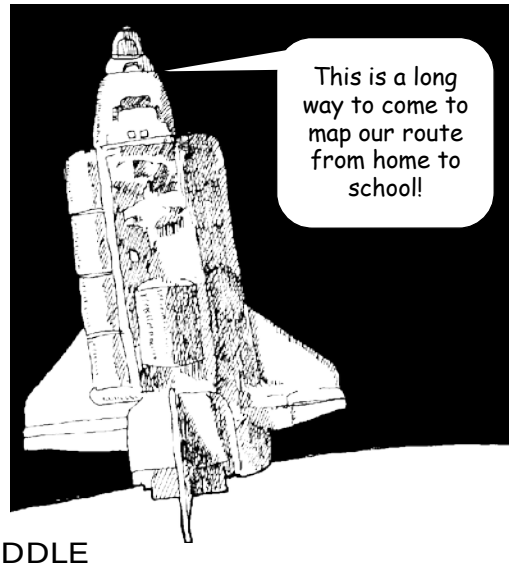
SPOTLIGHT ON RESEARCH

The Space Shuttle Endeavor helps make accurate topographic maps

In February 2000, the Shuttle Radar Topographic Mission (SRTM) was launched into space on board the Space Shuttle Endeavor. During a ten-day mission, SRTM gathered data on the height and shape of land over four-fifths of the Earth's land surface. These data will result in the most accurate and complete topographic maps of the Earth's surface that have ever been made.

Before SRTM, topographic maps of various parts of the world did not exist or were not accurate. For example, many mountains, deserts, and dense rain forests were unmapped, simply because of the difficulty in getting to these locations. The data collected by SRTM are now being processed to create topographic maps. As the maps are completed, they are being made available to the public. Check out this website for more information: www.jpl.nasa.gov/srtm.

Source: NASA. (2003). NASA's Shuttle Radar Topographic Mission (SRTM). <http://www.jpl.nasa.gove/srtm>



RIDDLE

What part of a map is in the school band?

Answer: the symbols (cymbals)