Mapping Symbology

In addition to geographic coordinates, most maps carry information about properties of geographic objects. Typically these properties are encoded using different points, lines, shapes, colors, and/or special symbols.

Explorer's Guide

Before You Start

When working in pairs, draw in any order seven symbols indicating: 1) a playground, 2) a school, 3) an airport, 4) a restaurant, 5) a train station, 6) a hospital, and 7) a geographic object of your choice. Share your symbols with your partner and see if he/she can name your symbols correctly. How did you decide on each symbol? Did you use different colors?

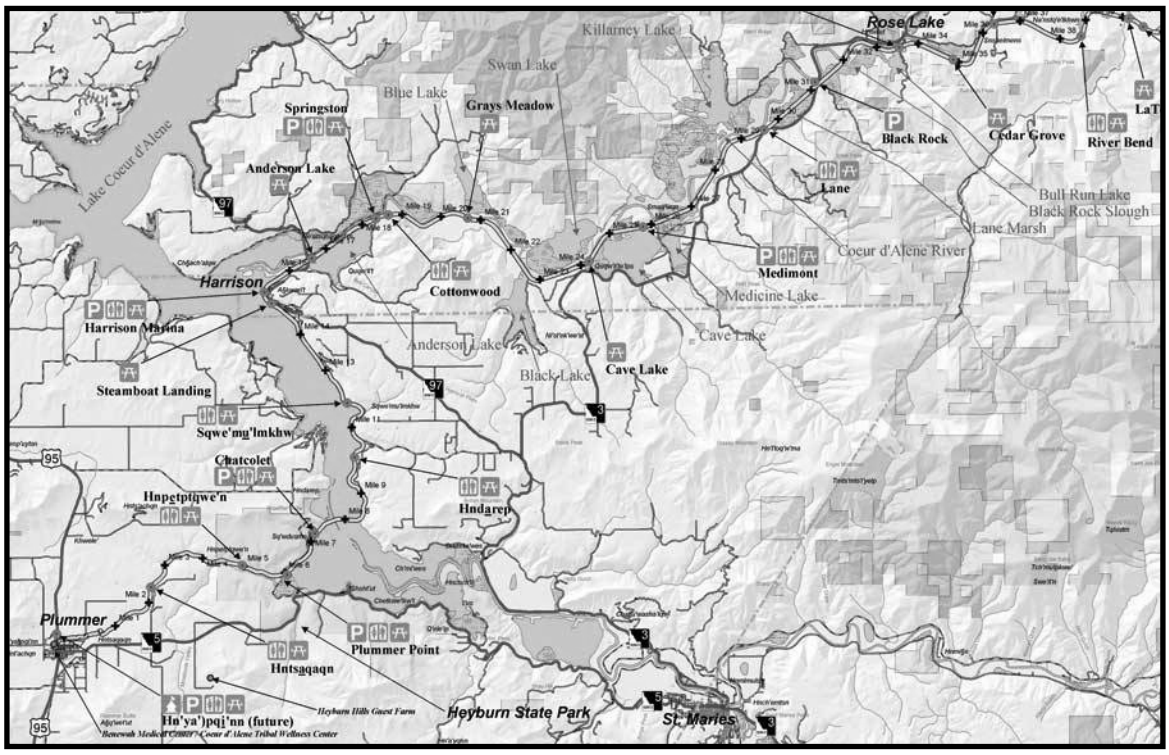
Learning by Doing

1. In each of the three maps provided, identify three different examples of map symbology. Identify the method of differentiation among different geographic features of the same type.

Map ID	Map element	Method of differentiation
1		
1		
1		
2		
2		
2		
3		
3		
3		

For example, in the following map for the trail of Coeur d'Alenes, the following would apply:

Map ID	Map element	Method of differentiation
4	Land designation (e.g., water, woods, etc.)	Area color (grayscale)
4	Elevation	Shades
4	Roads and trail	Lines (trail is a thick line)
4	Trail stops	Points (black crosses and green dots)
4	Trail stop services	Information icons
4	Names of towns and other objects	Word labels



2. Given below is a list of symbols used in a National park map. Match these symbols with their meanings (place appropriate letters in empty boxes).

A	
B	
C	
D	
E	
F	
G	
H	
I	
J	

	Picnic Area
	Fuel
	Telephone
	Airport
	Toilets
	Campsite
	Fishing
	Hotel/Motel
	Gravel Road
	Information

How Does It Work

The quality of a map's design affects reader's ability to extract information. Cartographic symbology has been deployed in an effort to portray graphical information understandable to others. Legend printed along with a map provide the key to understand the most important aspects of a given map. Because there are many similarities among geographic maps, some information is well-understood even without reading the legend. See figure below to observe a variety of symbology elements frequently used. It can be noted that all geographic objects can be represented by one of the following three feature types:

Point features could be stars, flags, circles, dots, etc. They can be used to represent city centers, buildings, trees, bus stops, etc. Color and/or size can be used to distinguish different categories of the objects represented (e.g., size of the dot can be related to the population of given towns).

Line features could be straight, curved, solid, dashed, dotted, or hybrid lines of different thickness and color. Lines of the same color usually indicate similar classes of information: topographic contours lines (brown), hydrographic features (blue), important roads (red), or railroads (black).

Area features could be enclosed color areas (possibly with a shading pattern) that represent forests, parks, natural reservoirs, wetlands, agricultural fields, etc. For example, in a topographic map, vegetation is usually shown in green, water in blue and populated areas in red.

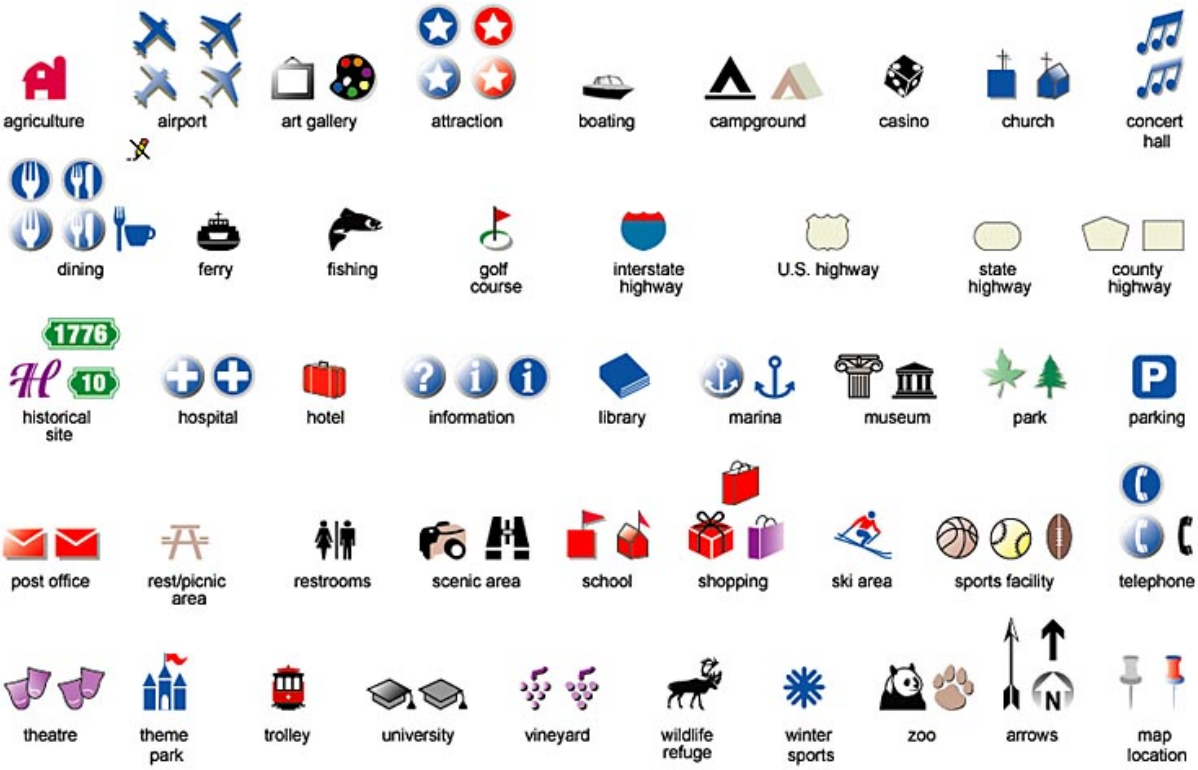
Labels are an inherent part of map symbology. They indicate names of geographic objects and provide other supplementary information. Size and style of letters frequently differentiate among categories of features represented (e.g., bold names of cities may indicate capital cities).

Most maps fall into two categories: general reference maps and thematic maps. In general reference maps, color and other symbols are typically related to physical geographic objects familiar to the generic public. In thematic maps, key information is related to information associated with given property of a data layer. For example, a thematic map of land ownership may have public land shown in yellow and private land in brown. Thematic maps are maps used to represent a particular theme. For example population density, income, voting patterns, or disease – from those that depict geographic features such as roads, rivers, and so forth. Thematic maps are powerful research tools as they illustrate spatial patterns and trends.

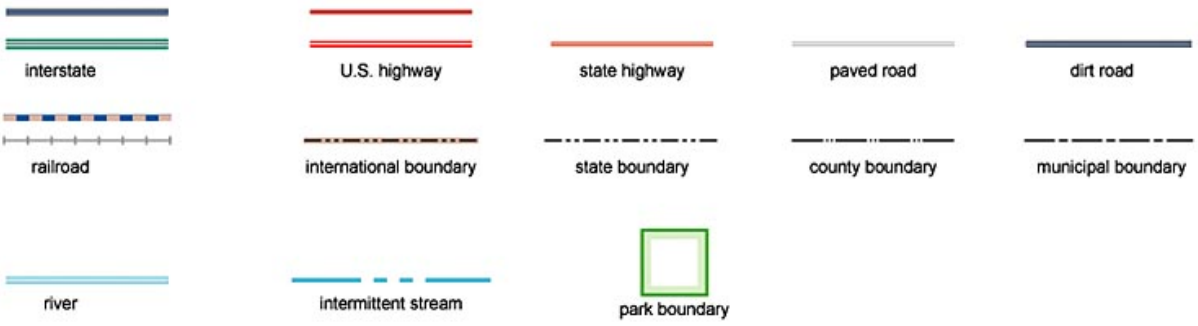
Additional Challenge

In a library or a book store, look through several different maps and count the number of symbols whose meaning you understand without the legend and for which you need to read the legend. What cues did you use?

Point Symbols



Line Symbols



Area Symbols

http://www.map-symbol.com/sym_lib.htm

Vocabulary

Symbols *are graphical objects, characters, or other concrete representations of ideas, concepts, or other abstractions.*
Thematic maps *are those maps that display displays spatial patterns of certain attributes (population density, precipitation, etc.).*
Contour lines *are lines representing the same value (e.g., same elevation above sea level).*
Cartography *includes design, compilation, drafting and reproduction of maps.*

Interesting to Know

The Lewis and Clark Expedition (1804-1806), headed by Meriwether Lewis and William Clark, was the first American overland expedition to the Pacific coast and back. William Clark was the primary cartographer of the expedition and he used several instruments to map out the places they visited. William Clark observed and recorded the landmarks they passed, relying largely on his keen sense of observation, as well as the information that he gained from navigational tools to make maps of his journey.

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