2. Working with Reference and Thematic Maps

Overview
Teachers and students will encounter many different types of maps in their lifetimes. Clarifying the differences between reference and thematic maps and how they are used opens up the exploration of many topics and increases map literacy.

Grade Levels: 3 – 8

Time: One 40 minute session.

Minnesota State Standards: Geography

GRADE 3
Benchmark: 3.3.1.1.2
Create and interpret simple maps of places around the world, local to global; incorporate the “TODALS” map basics, as well as points, lines and colored areas to display spatial information.

GRADE 4
Benchmark: 4.3.1.1.1
Create and use various kinds of maps, including overlaying thematic maps, of places in the United States, and also Canada or Mexico; incorporate the “TODALS” map basics, as well as points, lines and colored areas to display spatial information.

Benchmark: 4.3.1.2.1
Choose the most appropriate data from maps, charts, and graphs in an atlas to answer specific questions about geographic issues in the United States, and also Canada or Mexico.

GRADE 5
Benchmark: 5.3.1.1.1
Create and use various kinds of maps, including overlaying thematic maps, of places in the North American colonies; incorporate the “TODALS” map basics, as well as points, lines and colored areas to display spatial information.

GRADE 8
Benchmark: 8.3.1.1.1
Obtain and analyze geographic information from a variety of print and electronic sources to investigate places or answer specific geographic questions; provide rationale for its use.

Benchmark: 8.3.1.1.2
Create and use a various kinds of maps, including overlaying thematic maps, of places in the world; incorporate the “TODALLS” map basics, as well as points, lines and colored areas to display spatial information.

Benchmark: 8.3.1.2.1
Formulate questions about topics in geography; pose possible answers; use geospatial technology to analyze problems and make decisions within a spatial context.

Objectives
- To interpret map legends on both reference and thematic maps.
- To recognize the differences between reference and thematic maps.
Materials

- A variety of Food for Thought thematic maps (Maps 1-24 are suggested) from www.mda.state.mn.us/fft. Also:
  - MN Native Vegetation (Map 34)
  - Landforms of MN (Map 35)
  - MN Annual Precipitation (Map 36)
  - MN Annual Frost Free Days (Map 37)
  - Major Cities and Waterways (Map 40)
- Food for Thought Color Student Desk Map, one for each student (Order this free resource at http://www.mda.state.mn.us/fft)
- Wall Maps of Minnesota, the United States, and the World
- A variety of reference maps, including a state road map
- Student atlases (if available)

Key Words

- reference, thematic

Procedure

Reference Maps

The main purpose of a reference map is to show locations of many types of features (e.g., cities in relation to highways and rivers or campgrounds in relation to parks and highways). Reference maps often use conventional colors and symbols to represent a great variety of topics. Make several different types of maps available to the class during this lesson. These maps could include political maps of different places, road maps, physical maps that include political demarcations, etc.

1. As a class, look over the wall maps and the legends on reference maps.
   a. What are some of the colors or symbols that are the same on these maps? What do these colors and symbols stand for? Together, list these characteristics and discuss why we usually use the same colors and symbols on maps.
2. Working in pairs, provide the students with a variety of reference maps or use maps in the student atlases that are of different places. Pairs should create a list of the different features on their map, for example, roads, rivers, lakes, cities, towns, etc.

Thematic Maps

Unlike a reference map, a thematic map usually presents only one topic.

1. Display one of the maps from Food for Thought. Do not show the map title or legend. Discuss what the map is trying to show and list the student guesses.
   a. Why are there different shades of one color? What does the darker color stand for?
   b. Give the students hints – tell them that this map shows an agricultural product, production plant, or other topic related to agriculture in Minnesota; continue their guessing.
   c. Show the map title and legend. Discuss the use of shading. (Example: This type of map is a choropleth map.)
   d. Decide together why a map of this type might be used. Who would use it and for what purpose? Does this map give as much information as a reference map? What other kinds of maps similar to this one might be important?
2. Working in pairs, give a different thematic map to each pair in the classroom or refer to the student desk map. Students should make a list of five facts they have learned from the map. (Maps 1-24 are suggested)
3. Use thematic maps to explore causation. Display the map of Frost Free Days (Map 37) and ask students how the information on this map might be related to the information on the maps they have. Students should add the comparisons to their list of facts.
4. Optional: Repeat by using Landforms, Annual Precipitation, Native Vegetation, and the Major Cities and Water Features to compare to the crop maps. These maps are also on the Food for Thought Color Student Desk Map.
Assessments
1. List of five facts and comparison(s) to another map generated during the lesson.
2. Quiz showing different maps and deciding if they are reference or thematic maps.

Primary Teachers
Please read over these lessons and choose what information you feel your students will understand. Being introduced to the language of maps at an early age and consistent use of the language will help your students understand and use maps in the future.

Extensions
Using more than two maps, older and more advanced students should begin to draw relationships between three or more maps. For example: Students could examine the following maps: Landforms (Map 35), Native Vegetation (Map 34), Dairy Cows (Map 9), and the Minnesota Reference Map (on the color student desk map). How are the themes shown on these maps geographically similar? Are there regions defined by the subjects of these maps? How would you describe them? What do you suppose is the relationship between them? Hypothesize about the relationships found on the maps.

Other Examples
Corn for Grain (2012) (Map 4), Annual Frost Free Days (Map 37), Annual Precipitation (Map 36), Landforms (Map 35), Ethanol Production (Map 27)