

# Lake Winnipeg Watershed Map Analysis

OVERVIEW & OBJECTIVES	GRADES
Students will analyze the Lake Winnipeg Watershed map by Observing, Reflecting, and Questioning. This lesson will help students analyze the map and become acquainted with its details. This lesson may also be applied to other lessons involving map reading and analysis, selecting one of the strategies depending on the age of the students and amount of time allowed.  <i>Students will be able to...</i> <ul style="list-style-type: none"><li>• Read a map identifying its details</li><li>• Make inferences about a map</li></ul>	4 <sup>th</sup> - 8 <sup>th</sup>
	TIME
	1 Class Period
	REQUIRED MATERIALS
	✓ Map: "Lake Winnipeg Watershed"

## MINNESOTA SOCIAL STUDIES STANDARDS & BENCHMARKS

**Standard 1.** People use geographic representations and geospatial technologies to acquire, process and report information within a spatial context.

4<sup>th</sup> Grade

**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.

5<sup>th</sup> Grade

**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.

6<sup>th</sup> Grade

**6.3.1.1.1** Create and use various kinds of maps, including overlaying thematic maps, of places in Minnesota; incorporate the "TODALSS" map basics, as well as points, lines and colored areas to display spatial information.

7<sup>th</sup> Grade

**7.3.1.1.1** Create and use various kinds of maps, including overlaying thematic maps, of places in the United States; incorporate the "TODALSS" map basics, as well as points, lines and colored areas to display spatial information.

8<sup>th</sup> Grade

**8.3.1.1.2** Create and use various kinds of maps, including overlaying thematic maps, of places in the world; incorporate the "TODALSS" map basics, as well as points, lines and colored areas to display spatial information.

## SUGGESTED PROCEDURE

### Suggested Procedure:

The teacher selects questions from the Lake Winnipeg Watershed Map Analysis to aid students' understanding of the map. For other map analysis lessons the teacher selects questions from one of the strategies based on students' grade level and time allowed for the lesson. All of the strategies focus on reading and analyzing the map by Observing, Reflecting, and Questioning.

- Observing means identifying the details you can see on the map.
- Reflecting means thinking about what you see on the map using your prior knowledge. You are making hypotheses or inferences.
- Questioning means asking questions about the map to generate further investigation or inquiry.

### **Lake Winnipeg Watershed Map Analysis**

Read and analyze the map by using Observation, Reflection and Questioning.

Observe by describing what you see (Use the cartographer's tools: TODALSS)

- What is the title? What is the map about? What 2 languages are found on the map?
- What types of information can be found in the legend? What colors and symbols are used?
- What are the source and date of the map? Find the compass rose; where is north?
- What is the scale of the map? Why is the scale only in kilometers? How would the map look if the scale were larger or smaller?
- Why were so many groups involved in the production of this map? Identify the organizations.
- The grid system can be seen on the map with white lines. Can you identify the degrees of latitude and longitude?
- What areas are shown on the map? Why are there 2 inset maps to show areas clearer?

Reflect by thinking about what you see on the map

- What Land Cover is found on over half of the watershed?
- What are the 3 Land Covers found in Minnesota? What is the only Land Cover found in North Dakota?
- Find the symbol for dams. Are most of the dams built to control flooding or for hydroelectricity?
- Identify the Minnesota city that has the most dams nearby. Identify the North Dakota city that has the most dams nearby.
- The map shows the Lake Winnipeg Watershed. What direction is the water flowing?
- The inset map shows the location of the watershed. What U.S. states are found within the watershed? What Canadian provinces are parts of the watershed?
- The other inset map shows the drainage basins with how many major rivers?
- Name the major rivers contributing to the Lake Winnipeg Watershed.
- Winnipeg is at the confluence of what 2 rivers?
- Approximately how much of Minnesota is part of the Lake Winnipeg Watershed?
- Name the largest Minnesota city labeled on the map. Name the largest North Dakota city labeled on the map.
- What are the 3 largest lakes in the watershed?
- Using the inset map, what are the 2 drainage basins found in Minnesota?
- What river has the greatest water flow into Lake Winnipeg?
- Why doesn't the Lake Winnipeg Watershed include all of Minnesota?
- What causes the rivers to flow north?
- One drainage basin has a different language. Locate that drainage basin and hypothesize why the language is not English.
- Why is the international border not highlighted?
- Why might Lake Winnipeg be named the 6<sup>th</sup> Great Lake?
- What are 3 facts about the Lake Winnipeg Watershed that you can identify using the map?
- This is a reference map that shows the locations of many types of features. Conventional symbols and colors are used to identify the various features. Explain how the shades of coloration represent the land cover well. Explain how the transportation symbols represent the several modes of transportation well.
- Notice the locations of reserves and their patterns. Where do First Nations reserves tend to be located?
- Why is the title of the map in two languages?
- What direction are most goods probably shipped? How do you know?

- What types of goods would be more likely shipped? How do you know?
- What regions can you identify within the watershed?
- Why are the inset maps included on this map?
- Who do you think is the audience for this map?
- Why was this map made? What is its purpose?
- What is the bias or point of view of this map? Is data shown in a particular way?

Question by asking about patterns and inconsistencies

- How is land cover related to the amount of water flow?
- Why is Winnipeg situated in a good location?
- What city might be expected to have the greatest growth in population?
- Why would goods from the Winnipeg Watershed not be shipped to Hudson's Bay?
- What are the possible effects of draining Minnesota's wetlands into the Lake Winnipeg Watershed?
- What are the possible effects of the Red River flooding in the Lake Winnipeg Watershed?
- What effect would a drought have on the Lake Winnipeg Watershed?
- What river would have had the greatest influence on the economy of the region in the past?
- What river would have the greatest influence on the economy today?
- What effect does dam building have on the landscape?
- The Red River and the Rainy River are Minnesota rivers—one is found in forest and one is found in farmland. Why does one have clean water and the other polluted water?
- What seems to be missing from the map? What would you add to the map?
- What does this map make you curious about?
- How could you use this map?
- If you were the cartographer, how would you change the map?
- Why is the map important or significant?
- What questions do you have about the map?

### **Map Analysis: Strategy for Higher and Lower Grade Levels**

Read and analyze the map by Observing, Reflecting and Questioning

Observe by describing what you see (using TODALSS)

- What is the title of the map? What is the map about?
- What types of information can be found in the legend? What colors/symbols are used?
- What are the source and date of the map? Find the compass rose; where is north?
- What is the scale of the map? How would the map look if the scale were larger or smaller?
- Who produced this map? Identify the person and/or organization.
- Can you identify the degrees of latitude and longitude?
- What areas are shown? Are there any inset maps to show areas clearer?

Reflect by thinking about what you see on the map

- What are the human characteristics shown on the map?
- What are the physical characteristics shown on the map?
- Who do you think is the audience for this map?
- Why was this map made?
- Describe the spatial patterns shown on the map (movements, connections, relationships)
- What is the bias or point of view of this map? Is data shown in a particular way?

Question by asking about patterns and inconsistencies

- What seems to be missing from the map? What would you add to the map?
- What does this map make you curious about?
- How could you use this map?

- If you were the cartographer, how would you change the map?
- Why is the map important or significant?
- What questions do you have about the map?
- Ask: Who? What? When? Where? Why? How?

### **Map Analysis: Strategy for Lower Grade Levels**

Use the Five Themes of Geography (location, place, human-environment interaction, movement and regions) to analyze the map.

- Where are things located?
- What makes the place special?
- What are the relationships among people? Places?
- What are the patterns of movement of people, products, and information?
- How are the places divided into regions?

### **Map Analysis: Strategy for Higher Grade Levels**

The map analysis of Observe, Reflect and Question can be posed as follows:

1. Describe what the map shows. You will describe the distribution of data or information, including areas with high or low densities or extremes.
2. Based on your description, **infer** why the data or information is distributed this way. It might be helpful to refer to the Five Themes of Geography (location, place, human-environment interaction, movement and regions).
3. Ask questions: What trends or patterns do you notice within the map? Within the region? Between the regions?

### **Map Analysis Activities**

1. Students working as partners analyze a section of the map using the latitude and longitude lines, an open square, or a cut piece of the map. Students compare the section of the map analyzed with the section of the map that another twosome examined.
2. Compare the actual map with another map of the same location, such as a satellite map, Google map, or layers of thematic maps using ArcGIS.
3. Work with a partner to find a picture that shows a specific location on the map. Combine the photos to illustrate the map.

### **Assessment**

- Class discussions