

**Duration: 120 minutes**

### MATERIALS

Chart Paper  
Graph Paper  
Markers, pencil crayons  
LCD projector or SMART Board

### RESOURCES

Statistics Canada, 1996, Percentage of Population Reliant on Groundwater

Blueprint For Life/Work Designs – The Quick Reference Guide

### INSTRUCTIONAL METHODS

Direct Instruction  
Indirect Instruction  
Discussion  
Small Group Discussion  
Small Group Work



### LESSON OBJECTIVES

- ✓ Students will explore the skills, knowledge and attitudes needed in specific work sectors (BP 4.2.7)
- ✓ Students will understand the role of a Hydro geologist in management of water resources
- ✓ Students will demonstrate an understanding of many to one correspondence by creating bar graphs and pictographs using many-to-one correspondence (SP4.1).

### BACKGROUND INFORMATION

Our drinking water comes from two major sources: groundwater and surface water. Groundwater means subsurface water that lies beneath the water table in soil and rock formations. Surface water is water in lakes, rivers, and streams.

It is estimated that, excluding polar ice caps and glaciers, groundwater makes up over 98% of our freshwater resources. In fact, over one quarter of all Canadians, and nearly one half of all Saskatchewan people depend on groundwater for drinking.

Each source of water has its own set of pollutants. Water constantly moves between surface water and groundwater sources, sharing contaminants.

A Hydro geologist is a type of geoscientist who finds sources of groundwater, and studies its movement. Hydro geologists play an important role in developing and maintaining healthy water supplies for communities and industries.

Hydro geologists help protect the environment by preventing contamination of ground water supplies, or they may help protect workers by controlling groundwater seepage in mines and other industries.

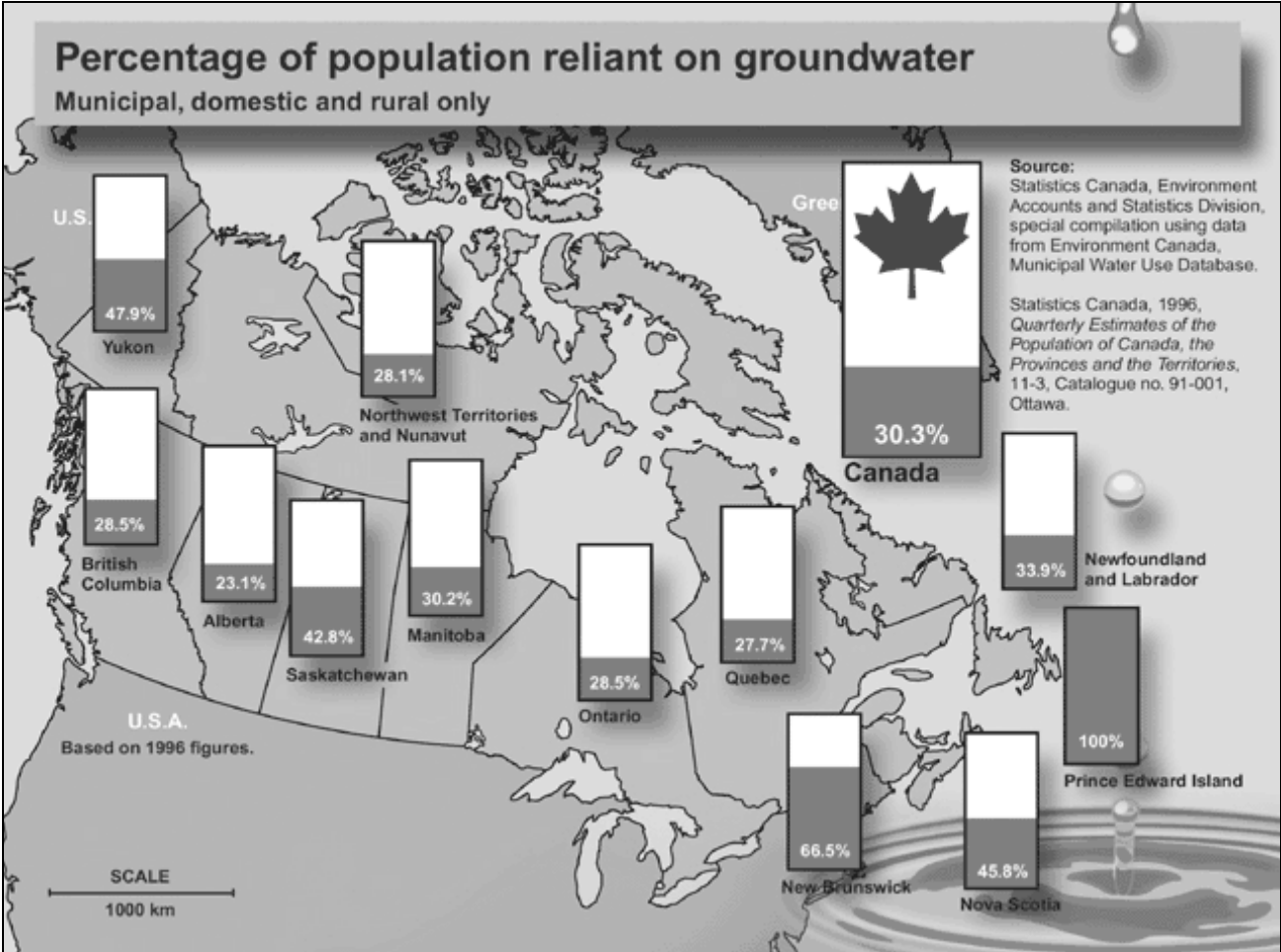
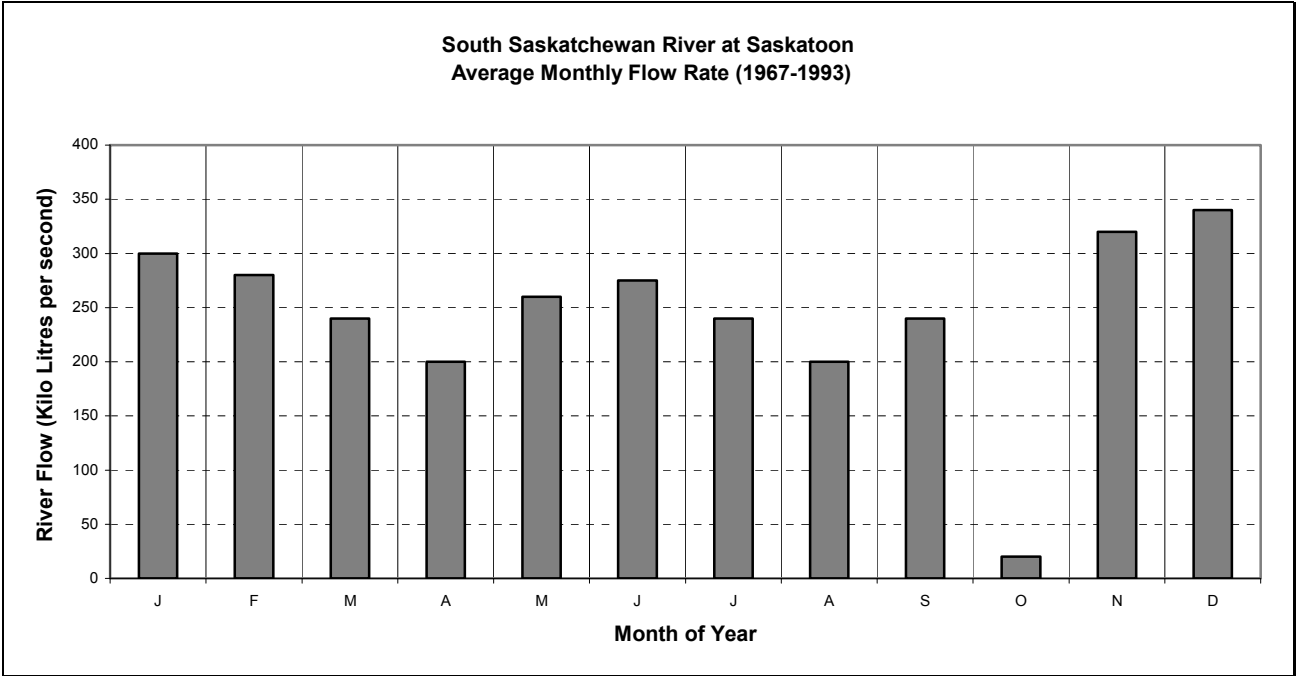
---

## MOTIVATIONAL SET

Introduce the concepts of fresh water and drinking water. Ask students where our drinking water comes from, where it is found, and how they know if it is safe to drink? Ask students if there should be a type of career that helps to keep our water safe for drinking, and to make sure there is enough for everyone?

## PROCEDURE / TIMELINE

1. Introduce the importance of fresh water (you may need to discuss the concept of fresh water – what it is, where it is found, etc). Students may not consider the idea of water being “underground” – you may need to discuss wells, caves, aqueducts, etc.
  - a. Have students get together in small groups, and have:
    - i. One half of the groups brainstorm a list of uses for water.
    - ii. One half of the groups brainstorm a list of threats to fresh water.
  - b. Once a list has been generated, have students rank the Uses and Threats of water in order of importance (on chart paper).
  - c. Ask students to consider if there should be some career that monitors and protects water?
  - d. Introduce the career of a Hydro geologist. Refer to some of the uses and threats of water and discuss where the role of a Hydro geologist would be useful (perhaps highlight with colored markers).
2. Reading bar graphs: Flow of the surface water in rivers.
  - a. Discuss the Saskatchewan River, or any of the rivers near your community (additional bar graphs are included with the lesson plan that can be downloaded from the APEGS website, at [www.apegs.sk.ca](http://www.apegs.sk.ca)):
    - i. Is the flow of the river constant?
    - ii. Have you noticed times when it is higher/lower? Why might this be?
  - b. Hand out or display bar graphs showing the flow of surface water in rivers, and discuss:
    - i. What do the higher/lower bars mean?
    - ii. Would this be easier to read than a chart of numbers? Why or why not?
    - iii. What labelling do they have?-title, axes labels
    - iv. Why is the information presented in a graph form?
    - v. Why do we use bar graphs?



- 
3. Hand out the “Percentage of Population Reliant on Groundwater” chart, and explain to students that they are to do a bar graph that will display the data, making sure they have all the necessary components of a bar graph.
    - i. What will be on the bottom (x axis)? - province
    - ii. What will be on the side (y axis)? – percentage to 100

#### DEBRIEF

1. Discuss what students can do to preserve water resources (essay, discussion or concept map).
2. Have students create a hydrogeology report that includes their bar graph and recommendations.
3. What subjects might a Hydro geologist need to be good at in order to be successful?
4. Can you name other workers that help protect our water resources?

#### ASSESSMENT / INDICATORS

1. A simple rubric may be prepared ahead of time with the students to assess the bar graph assignment.
2. The indicator that the teacher will be looking is that students are able to create and label (with axes and title) a bar graph to display a set of data using a many-to-one correspondence, and justify the choice of correspondence used.

This lesson plan is available for download at [www.apegs.sk.ca](http://www.apegs.sk.ca) (click "About Us", "Youth Programs").