

# *Key Concept One* *The Okanagan Watershed*

## **Poster Panels, Activities and Essential Learnings for Key Concept One**

The Okanagan Watershed or Basin includes all the water within and the land surrounding the streams and lakes that ultimately drain into the six main lakes and the Okanagan River at the south end of the basin. Many small feeder lakes, wetlands and creeks in the hills contribute to the water in the six main lakes.

### **Poster Panel Reference**

Water, The Myth of Abundance  
What is the Okanagan Basin?  
From Highlands to Valley Floor

### **Activities**

1. Schoolyard Watershed.
2. Contours: Shapes and Curves
3. Watershed Sculpture

### **Essential Learnings**

- Water sources for main lakes; the concept of over 200 feeder lakes
- Watershed physical layout
- Water flow through the basin

# Key Concept One

## Water ~ The Myth of Abundance

### Background Information



photo: Benjamin Rondel

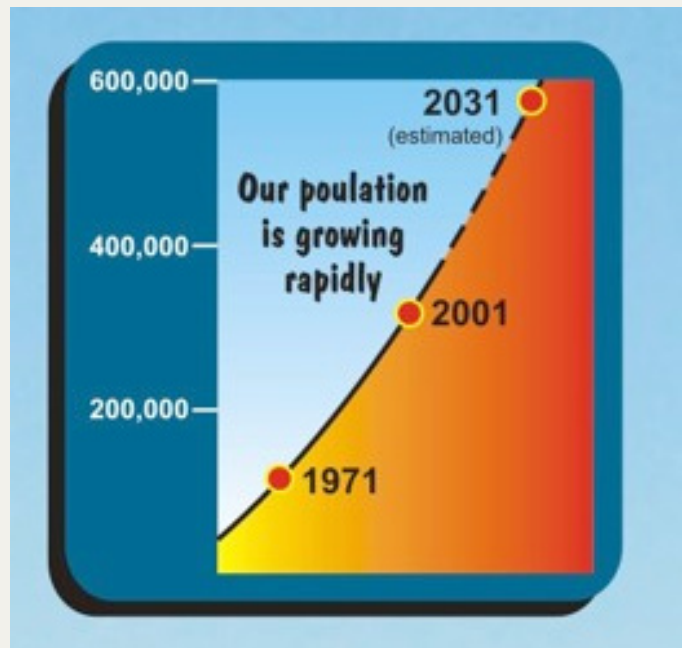
The Okanagan Basin, is our home—a very special place. It has been home to First Nations people for thousands of years, and to many others over the last century and a half.

Water has always been the basin's most valuable resource for both humans and nature. Today, our economy, agriculture, home use and recreation continue to share these waters with nature.

We live in a dry landscape. Our large lakes make water look abundant, but nature's yearly re-supply is small. As our population is growing rapidly, so is our demand for water. Climate is changing and our future water supplies are uncertain.

Will there be enough water for our children and grandchildren?

To meet the needs of humans and nature, we will have to rethink our water use and value it more highly.



Geological Survey Canada





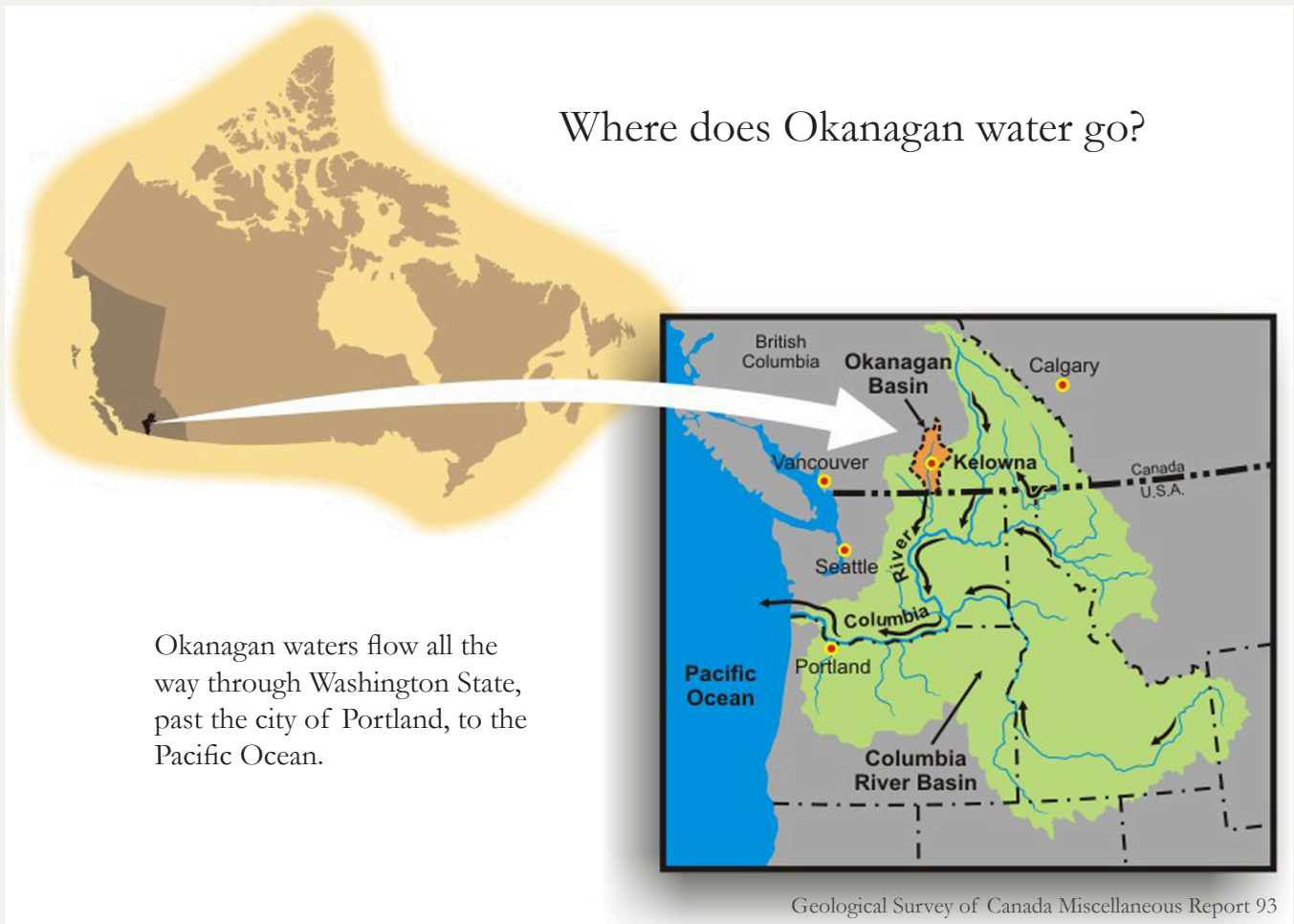
# *Key Concept One*

## *What is the Okanagan Basin?*

### Background Information

A river basin or watershed is high at its edges and low in the centre where the waters flow. The Okanagan Basin includes all the land that feeds water to our big lakes and the Okanagan River. Highland streams from east and west flow into the valley, and the waters flow south down the valley through the chain of lakes to feed into the Columbia River System. The Okanagan Valley is a trough that extends from Armstrong in the north to Osoyoos Lake in the south. The valley is the part of the basin we know best, but it is just a small part of the overall basin. The Okanagan Basin and valley continues south across the international border into Washington State.

Where does Okanagan water go?



# Key Concept One

## From Highlands to Valley Floor

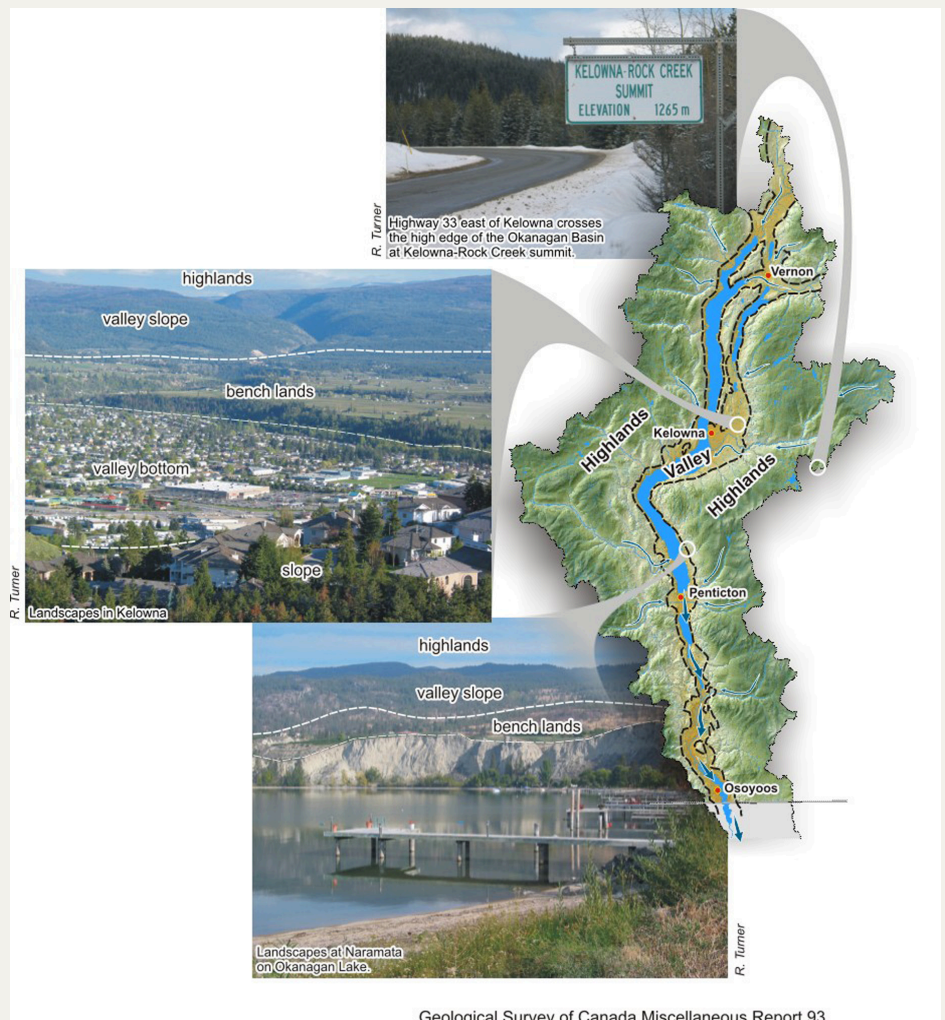
### Background Information

#### The Highlands

The Okanagan Valley is a great trough that cuts across the highlands of southern British Columbia. These forested highlands are the largest part of the basin and are the source of most of our water. Along with outdoor recreation, forestry and cattle grazing are important in the highlands.

#### The valley is a busy place!

The Okanagan Valley consists of the main lakes, valley bottom, bench lands and surrounding slopes. Most of us live down on the valley bottom or surrounding bench lands in Kelowna, Vernon, Penticton and other major centers. The valley contains our lakes, agriculture and wineries, tourist facilities and golf courses, industries as well as wetland ecosystems, species at risk and endangered habitat. With all these competing uses, we need to plan our growth carefully.





# Activity 1 ~ School Yard Watershed Model

## Curriculum Connections

Grades 4 and 5: Science, Social Studies

## Time

2-3 hours

## Objectives

- Construct a 3 dimensional model of a watershed and use it to explore drainage basins and water pathways.
- Define the concept of a drainage basin and watershed.
- Manipulate the model to illustrate how a watershed can change.
- Give examples of how their model relates to the real world.

## Materials

- Large sheets of strong plastic (4m x 2m)
- Assortment of rocks, sticks, crumpled paper, crushed cans
- Coloured drink crystals or food colouring
- Water source (hose or buckets of water)
- Golf tees
- Spray bottle
- Sponge

## Key Vocabulary

- drainage basin
- riparian zone
- watershed
- reservoir
- tributary
- pollutants
- head-waters
- point and non-point source pollutants



photo: Jennifer French



# Activity 1~ School Yard Watershed Model cont'd

## ACTIVITY

1. Divide students into groups of 3-4.
2. Give each group a sheet of plastic, a plastic pail and a handful of golf tees.
3. In the schoolyard (preferably in an area close to a water source and with a slope) have each group collect rocks, sticks, crumpled paper etc...(this can be collected before the class by the students).
4. Have students arrange the objects to create an un-even landscape. The tall objects will become the mountains, shorter objects may become lakes, hills, etc. Cover the entire area with the plastic sheet and tack down the outside edges with golf tees.
5. Gently mould the plastic around the objects.
6. Predict what will happen when it 'rains' on their model.
7. Using the spray bottle have the students spray water, starting at the top of the landscape. Continue raining until streams, rivers and lakes begin to form.
8. Have students choose a site in the watershed to build their homes, school, etc.
9. Have students experiment with their river by rearranging the landforms, building dams and changing the rate of water flow:
  - a.) Have students plant a 'forest' (place the large flat sponge for the forest, it will soak up water like soil and vegetation) What happens if you remove the forest (sponge)?
  - b.) What happens if your river/creek water is diverted for irrigation (make canals to take the water away from the river/creeks).
  - c.) Have students sprinkle coloured drink crystals on a sponge and place beside a river/creek, then spray (rain) water over the crystals (non-point source pollutants). Place a drop of liquid detergent in a river on the model (point source pollutant). What happens along the river? Have students observe, discuss and record their observations.
10. Have students share and discuss the activity in a large group.
11. Record all questions generated from discussion.

## Guiding Questions

1. Where is the source or headwater of the lake?
2. Where does the water flow?
3. Why does it follow that path?
4. Where does the water pool? What things on the landscape determine the river basin?
5. What determines the boundaries of the water-shed?
6. Who might use your watershed and how?
7. How can nature or people change a watershed?
8. How might (point and non-point source) pollutants enter a watershed?





## Activity 2 ~ Contours, Shapes and Curves

### Curriculum Connections

Grade 4: Social Studies

### Time

2-3 Hours

### Objectives

- Students construct a relief map of the Okanagan Water Basin

### Materials: (for each student)

- 3 cups salt
- 1 cup flour
- Water
- Heavy cardboard
- Tempura paints
- Brushes
- Water containers
- Map/poster of Okanagan Basin

### Key Vocabulary

- relief map

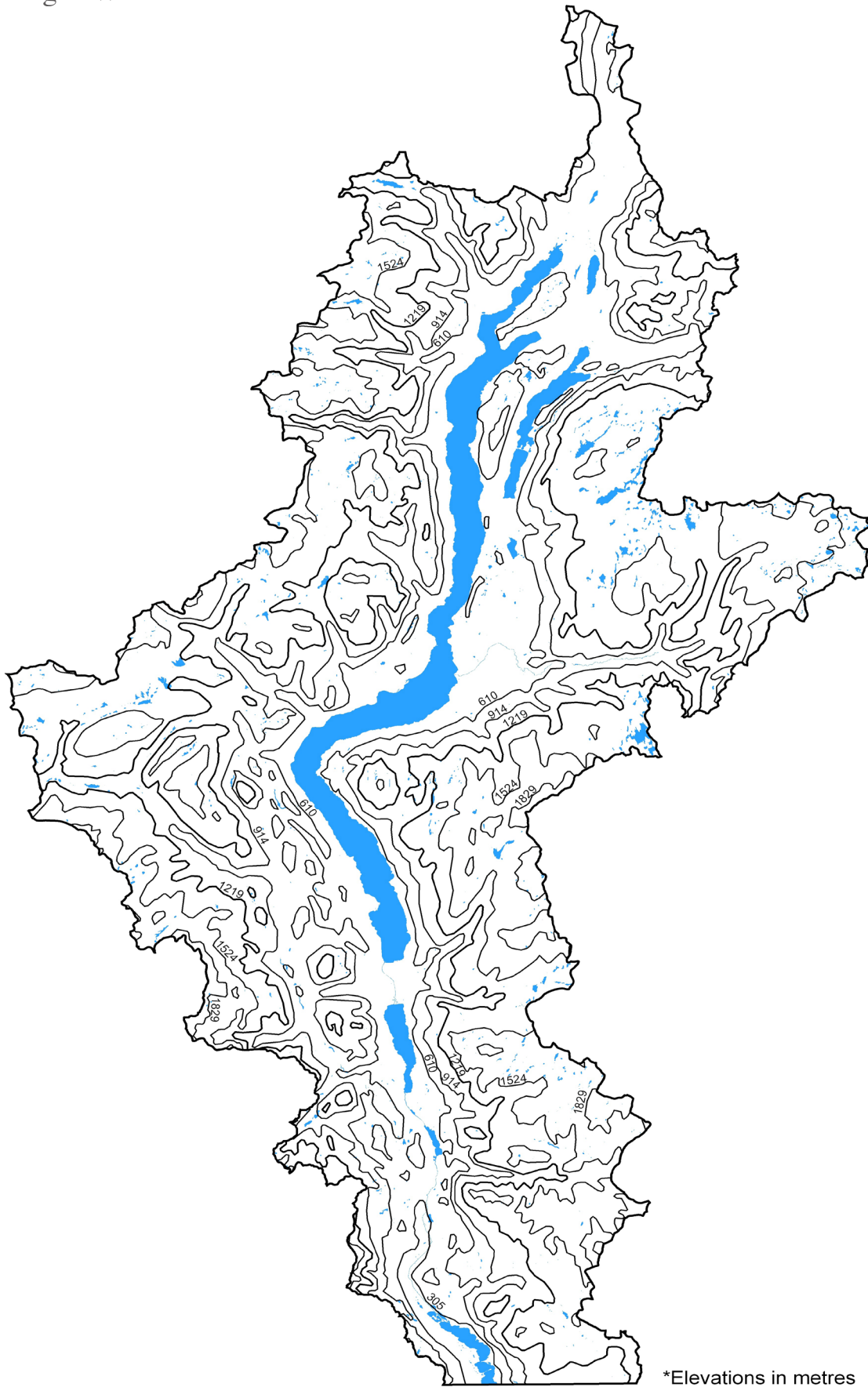
### ACTIVITY

1. For this project, you may want students to create the relief map of the entire basin as portrayed on the poster or a portion of it.
2. Mix the salt and flour together in a large pail (ice cream buckets work well). Add enough water to bring the solution to a consistency of dough. This should be suitable for sculptural modeling. The thickness will be determined by each group of students.
3. Have students in divided groups and give each group their dough to work with along with a heavy piece of cardboard.
4. Tell students to cover the cardboard with a thin film of dough.
5. Keeping their design in mind. Create a semi-round relief the size of the basin. Have them look closely at the poster. Have them build up masses of dough to represent mountains, hills, alleys, creeks and the lake. Additional designs and textures may be added by pressing objects into the relief map to create patterns and textures.
6. When the modelling is done, let dry completely. Have students paint with tempera paints and add additional details such as toothpicks for trees, pebbles, etc. to create realism.

### Extensions

Have student groups host a “talk Show” that incorporates interviewing a panel of (1) environmental expert (2) a developer (3) city official, all with their own plans for developing or preserving a section of the watershed. Have the panel refer to the relief map when explaining their positions.

## Contour Map of the Okanagan Water Basin







# Activity 3 ~ Watershed Sculpture

## Curriculum Connections

Grades 4 and 5: Social Studies

## Time

2–3 class periods

## Objectives

- Students will build a model of the entire Okanagan Basin to show the direction of water flow and the unique shape it has.
- Identify how topography determines the flow of water through the environment.
- Identify and learn about the unique shape of the Okanagan Basin watershed's unique shape.
- Identify which communities share the Okanagan Basin.
- Identify the shared responsibility each citizen has to conserve and protect this resource.

## Materials (enough for 1 model)

Okanagan Basin Waterscape poster  
(central image)

Hot glue gun (caution, teacher supervision)  
and glue gun sticks (4)

Cookie sheet or aluminum oven sheet (large)

Washed gravel (assorted) or other materials  
available

Sharpie markers (red, blue, black)

Heavy duty aluminum foil (large roll)

Brown or black shoe polish and soft cloth/  
paper towel (optional)

Cup with water

## ACTIVITY

1. Give each group an aluminum oven sheet. Using a pencil, draw the outline of the watershed, referring to the poster's image or the map on the following pages. Draw the basin as large as possible. Outline the watershed in black permanent marker.  
  
Mark the north, south, east and west directions on the model. Also mark the location of Vernon, Kelowna and Penticton or other communities or location of interest.
2. Next, gather a variety of materials (stones of varying sizes) and sort according to size. Line the entire edge of the basin with the gravel, placing larger pieces closer to the headwaters (all around the outline of the watershed with smaller and smaller pieces progressively to the middle).
3. Carefully apply hot glue (glue gun) to the bottom of the pebbles and lay them carefully back in place.
4. Observe the main tributaries of the Okanagan Basin on the poster image. Choose a few main tributaries and use pebbles to define where these rivers are on the model. Again, carefully apply hot glue (glue to the bottom of the pebbles and lay them carefully back in place. Remember, pebbles define the high areas, not the rivers themselves; therefore, two rows of pebbles with a groove in between defines a river.
5. Give each group a piece of heavy-duty aluminum foil large enough to cover the entire model. Students will carefully press and shape the foil onto their model, taking extra care around the edge of the basin and in shaping the rivers.

# *Watershed Sculpture cont'd*

## ACTIVITY cont'd

6. Using a black permanent marker, outline the outer shape of the Okanagan Basin, taking care not to break through the aluminum foil. Students can outline the shape of Kelowna, Vernon or Penticton, and any other locations of interest in red permanent marker.

Using a blue permanent marker, students can find and draw all the visible headwater lakes, the main tributaries, and the Okanagan water course from north to south

7. Optional: to make the aluminum less reflective and the model look more realistic, students can take small amounts of shoe polish (brown/black) and run the polish over the aluminum into the creases. The model will take on a weathered look.
8. The model can be slightly raised on the west side, with books. Then a student can carefully pour water on the northern most part of the model (headwaters) and students can watch the water collect from the various tributaries into the Okanagan Basin south down the main trench and into Osoyoos Lake.
9. Follow-up with some questions: What communities lie upstream from Osoyoos, from Penticton, or from Kelowna. How does the shape of the watershed control the flow of water?

## Extensions

- Research how many people live within and depend upon the Okanagan Basin Watershed. The watershed extends over a large area; how is it used? Refer to the poster.
- What would happen if a toxic spill occurred upstream from our communities? How would this affect the drinking supply? What measures could be taken to protect the watershed from further damage?



## Building a Model of the Okanagan Watershed

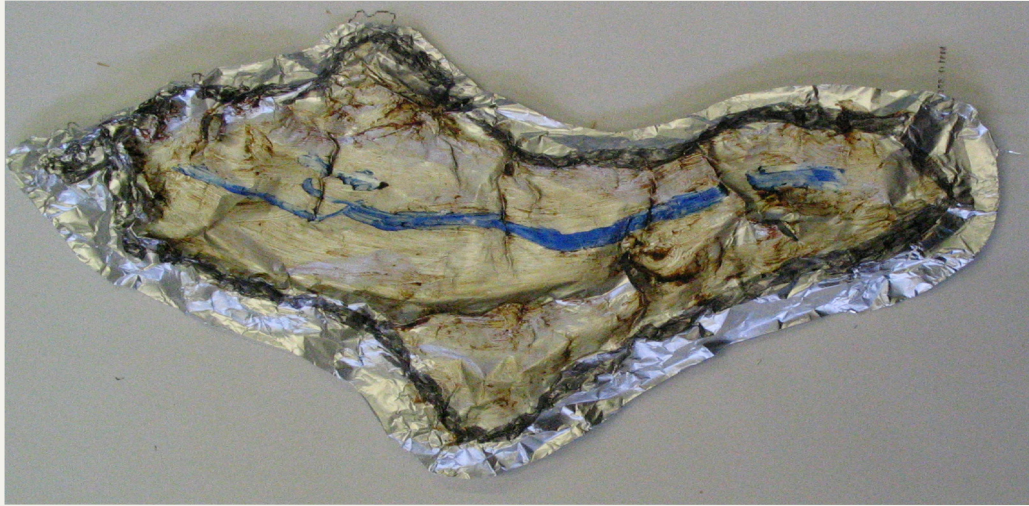


Fig. 3 Foiling Your Sculpture



Fig. 2 Pebbling Your Contours

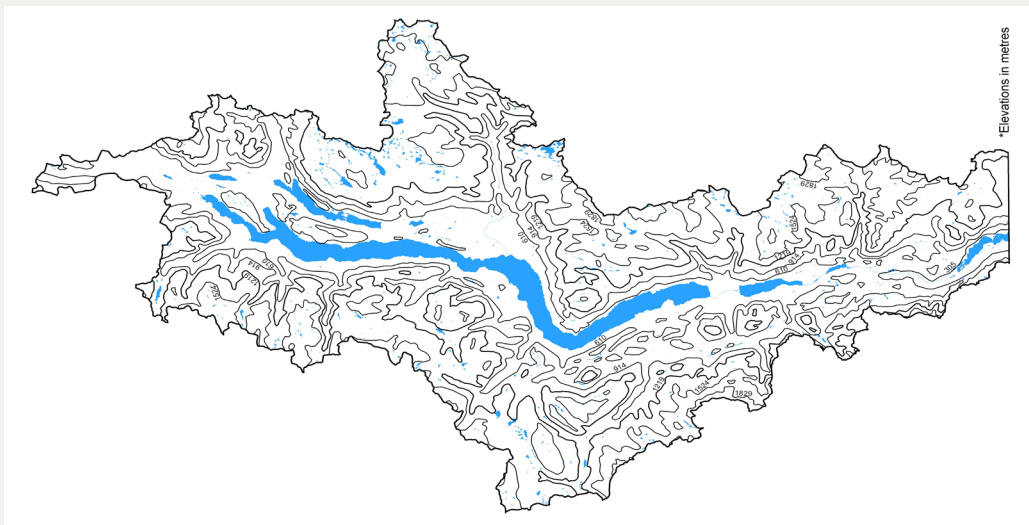


Fig. 1 Contour Map

Source: Geological Survey of Canada, Natural Resources Canada

photos: Figures 2 and 3 Jennifer French