



Lesson 6

Sooke Lake Watershed: Drinking Water Quality



Learning Standards & Assessment



Time



Resources



Activities



Handouts



Video





Social Studies

Big Ideas

- ▶ Local actions have global consequences, and global actions of local consequences.
- ▶ Individuals have rights and responsibilities as global citizens.

Content

- ▶ Relationships between people and the environment in different communities
- ▶ Rights and responsibilities of individuals regionally and globally



60-90 minutes



Educator's Kits, including hardcopy lesson plans and support materials, are available for loan through the CRD. For pickup locations, print-friendly materials and multimedia tools see www.crd.bc.ca/teacher or contact the CRD at 250.360.3133.

Lesson 6c:

Bottled Water Journey

Purpose

The Sooke Lake Watershed lessons provide an opportunity for student to learn about where our drinking water comes from, what makes it safe to drink and how it is delivered to our taps. They will also learn how it compares to bottled water.

In this lesson, students will use their mapping skills to determine how far bottled water travels compared to our municipal tap water. They will look at the energy and resource required to deliver the water as well as the cost.

Preparation

1. Prepare the computer and projector.
2. Load Chris Jordan's *Caps Seurat* in full screen mode, then minimize the window and maximize when ready.
www.chrisjordan.com/gallery/rtn/#caps-seurat
3. Make note of distance from Sooke Lake Reservoir to the School (calculated in lesson 6a).
4. Photocopy student handout "Bottled Water Journey".
5. Optional- 1 litre bottle, 300 pennies, 1 paper penny cut-out, 1 litre reusable bottle or cup.

Procedure

Warm Up- Chris Jordan's Caps

1. Display Chris Jordan's *Caps Seurat* and ask students if they recognize the artwork.¹
www.chrisjordan.com/gallery/rtn/#caps-seurat
2. Explain to students that this image is a copy of a painting by a Georges-Pierre Seurat- a French artist from the 1800's. The artist of this new image, Chris Jordan, did not use paint. "Can you guess what he used?"
3. Click on the image and watch the focus zoom-in to show plastic bottle caps.

¹ From the art collection *Running the Numbers: An American Self-Portrait*.



Student Resources

- ▶ Student Handout “My Drinking Water Journey”

Lesson Resources

- ▶ Chris Jordan *Caps Seurat* webpage.
- ▶ World map (or Google Map)
- ▶ Book- “E is for Environment: Bottled Up” by Ian James Corlett.
- ▶ KWL Chart
- ▶ Internet access, computer and projector

Optional

- ▶ 1 litre bottle
- ▶ 1 litre reusable bottle or cup
- ▶ 300 pennies (paper, plastic or real)
- ▶ 1 penny (paper)
- ▶ Scissors

4. It is estimated that we buy as many bottles of water in BC (400,000) per day as there are bottle caps in this picture.
5. “Whip around”- one by one point to each student who will say one word to describe their reaction to this statistic. This is a fast paced exercise.

Review- Local Drinking Water

Have students share what they know about their drinking water: where does it come from? Is it safe, healthy and clean to drink? Is most of the water pumped using electricity or is it mostly pulled along by gravity? What kind of packaging does it require? *Reusable water bottle or cup, none if from a drinking fountain.*

On the board write the distance that our drinking water travels from the reservoir to your school (Lesson 6c).

Transition: Where does bottled water come from? Allow for discussion.

Bottled Water

1. Display a world map. Explain that bottles of water sold in stores and vending machines are filled all over the world. They can be filled with spring water (streams or groundwater aquifers- wells) or municipal water (filtered tap water).
2. Distribute the student handout “Bottled Water Journey”. Have students measure the distance travelled by bottled water within BC and internationally. Review as a class. Note that bottled water isn’t delivered directly to your home like tap water. Which was closer? *Sooke Lake Reservoir*
3. How were the bottles transported? *Trucks, trains, boats, possibly planes.* What kind of energy does this use? *Lots of gas and oil, which are harmful to the environment; the burning of fossil fuels is the leading cause of climate change.*
4. What packaging is required to deliver the bottled water? *Bottle, cap, label, crates, plastic wrap, boxes.* Where do these materials come from? *The Earth*

Optional- Identify Vancouver and St. John’s Newfoundland on the map. The same amount of oil is required to make the water bottles sold in BC in one year as it would take to power 12,000 Ford Explorer SUVs from Vancouver to St. John’s Newfoundland. It also takes energy to:

- mine the fossil fuels from the Earth to make the plastic packaging, trees to create boxes.
- make the bottles, caps and labels
- transport the bottles to stores
- refrigerate the water in stores

Transition- *The planet pays for our drinking water by giving up resources such as oil for plastic and trees for cardboard. How much money does drinking water cost us?*

Cost of drinking water

1. Ask students: Is our water free?
No. Houses, apartments, buildings schools and offices have meters that measure how much water is used. Saving water means saving money.
2. Ask students if they know why we pay for drinking water.
Remind students of what they have already learned about water disinfection, building dams, the pipes that carry water to people's homes, etc. We pay for drinking water because it costs money to clean it and send it to people's houses through pipes. We also pay for the electricity that heats our hot tap water- so wasting hot water wastes money for the water and the electricity.
3. Explain that our tap water costs approximately \$0.16 for 100 litres. Bottled water costs \$300/100 litres (\$3.00/litre). For added effect, fill a 1 litre plastic bottle with 300 pennies. Show the class a paper penny and cut a sliver off the side, put this into a 1 litre reusable bottle or cup. Which would students prefer to pay for?
4. Have students complete their "My Drinking Water Journey" handouts. Questions 3-6 can also be completed orally.

Story - E is for Environment: Bottled Up

Read and use discussion questions provided in "E is for Environment: Bottled Up" by Ian James Corlett (usually at the end of each chapter).

KWL Chart

Revisit the KWL chart, and ask students to suggest additions and modifications based on what they learned from this lesson.

Assessment Opportunity

Questions 3-6 can also be completed in a conference approach or set up criteria and have student peers evaluate. Add the completed assessments to students' Water Portfolios. Review the student activity sheet as a class and/or have students place it in their Water Portfolio.

Curricular Competencies

Look for evidence that students are able to:

Social Studies

- ▶ Use Social Studies inquiry processes and skills to ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions
- ▶ Recognize causes and consequences of events, decisions, or developments (cause and consequence)

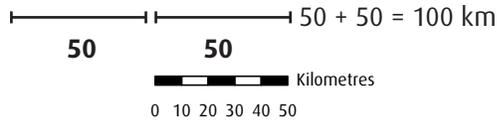


“My Drinking Water Journey”

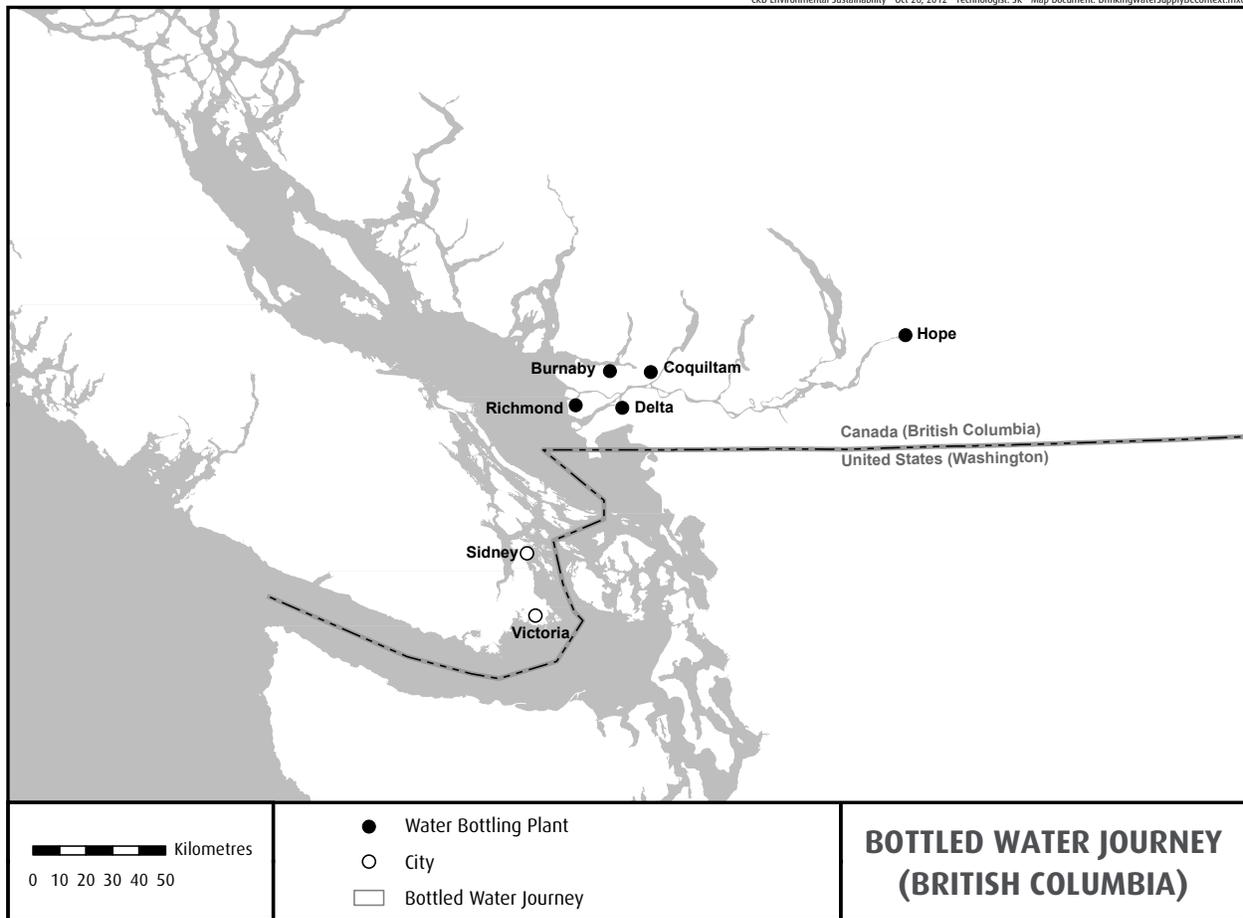
Name: _____ Date: _____

Use a piece of string to measure the distance bottled water travels between a bottling plant and a city. Measure the string along the scale, marking the string as you measure. Calculate the distance.

Eg. From Victoria to Burnaby



CRD Environmental Sustainability - Oct 26, 2012 - Technologist: SR - Map Document: DrinkingWaterSupplyBCContext.mxd



1. Approximately how far does bottled water travel from:

a. Hope to Victoria _____

b. Richmond to Victoria _____



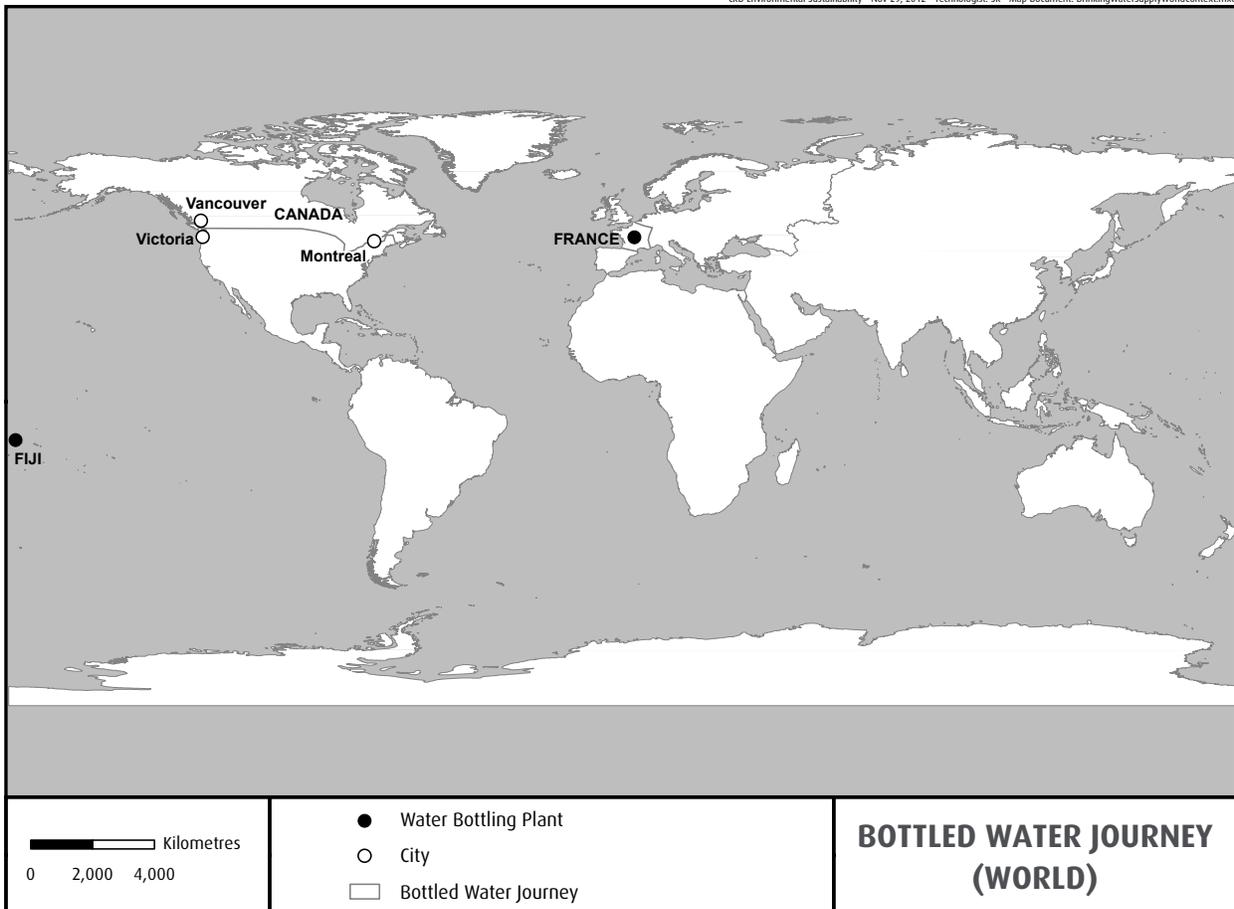
“My Drinking Water Journey”

2. How far does bottled water travel if it comes from:

a. France _____

b. Fiji _____

CRD Environmental Sustainability - Nov 29, 2012 - Technologist: SR - Map Document: DrinkingWaterSupplyWorldContext.mxd



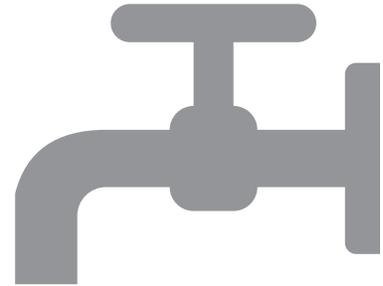


“My Drinking Water Journey”

3. Compare packaging and energy needed to deliver drinking water.

What packaging is used?

How does it travel?



What packaging is used?

How does it travel?

4. Which uses more energy and packaging, bottled water or tap water? Why?

5. Which costs more money, bottled water or tap water?

6. The choice is yours. What kind of water will you drink- bottled or tap? Why?

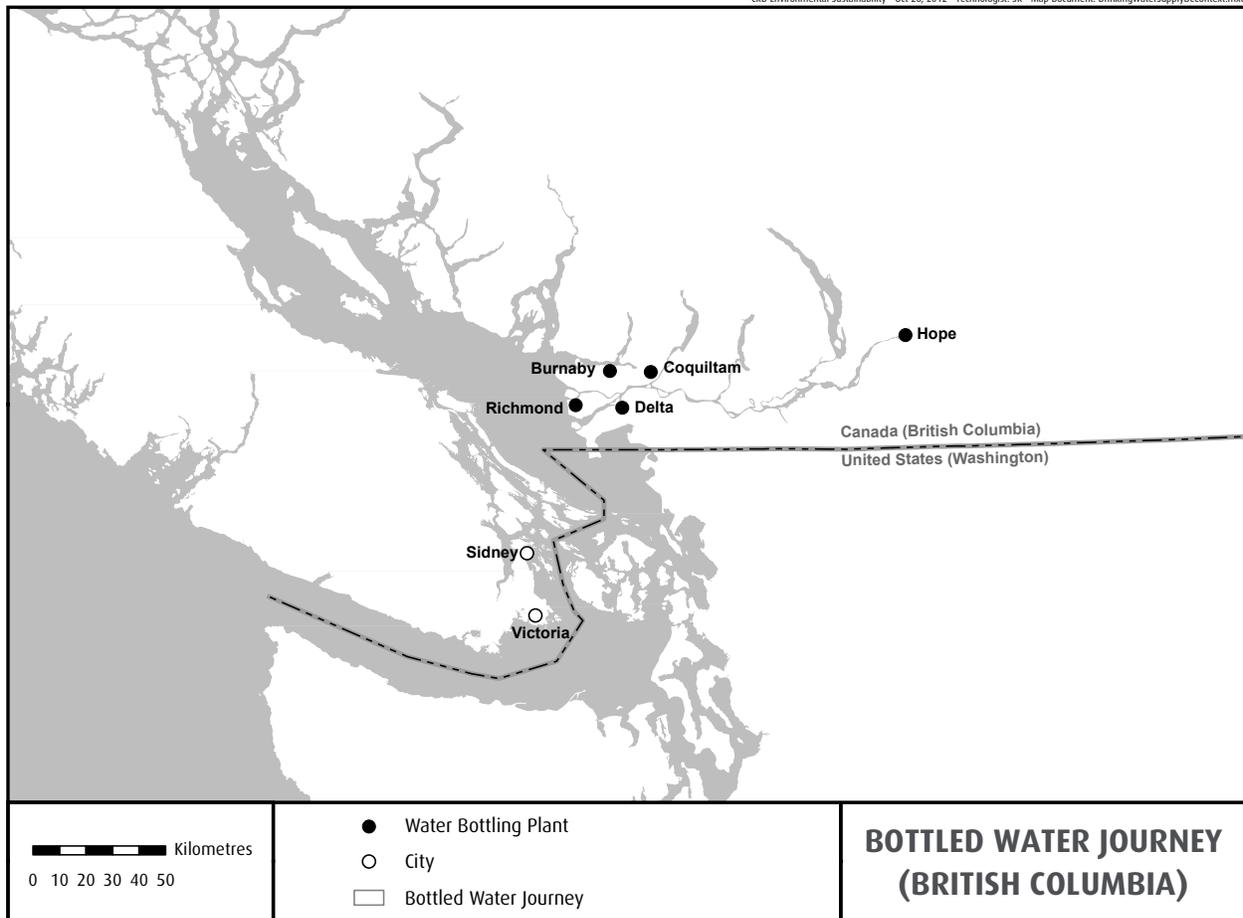
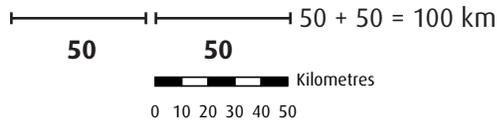


"My Drinking Water Journey"

Name: _____ Date: _____

Use a piece of string to measure the distance bottled water travels between a bottling plant and a city. Measure the string along the scale, marking the string as you measure. Calculate the distance.

Eg. From Victoria to Burnaby



1. Approximately how far does bottled water travel from:

a. Hope to Victoria _____ *170 km* _____

b. Richmond to Victoria _____ *90 km* _____



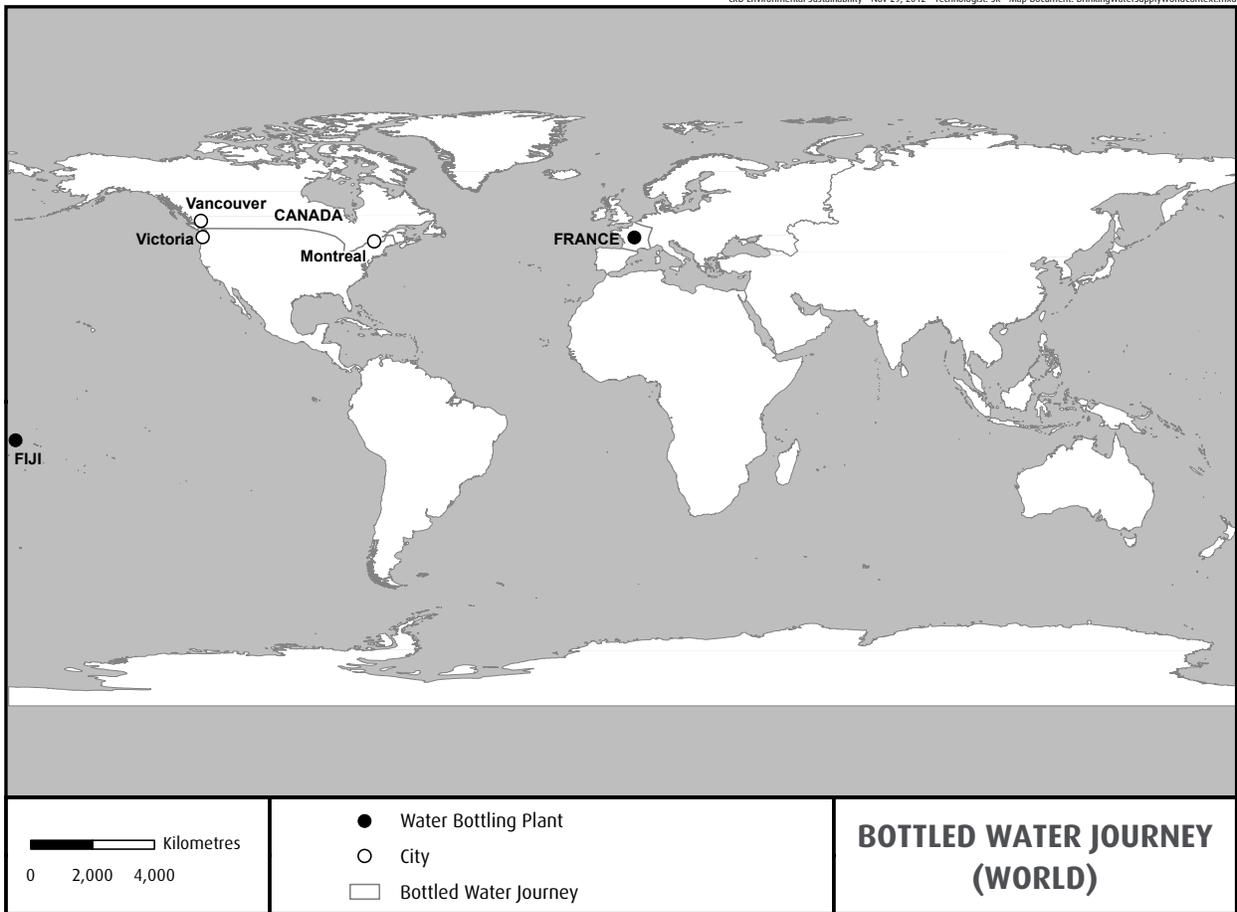
“My Drinking Water Journey- Answer Key”

2. How far does bottled water travel if it comes from:

a. France 13,000 km $4,000 + 4,000 + 4,000 + 1,000 = 13,000 \text{ km}$

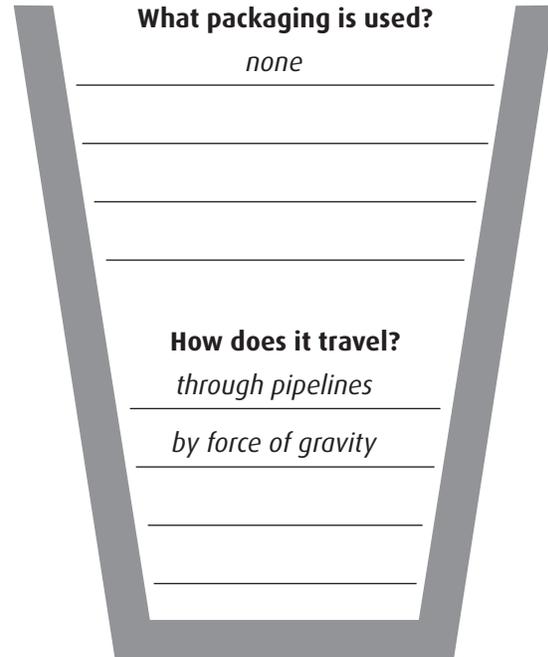
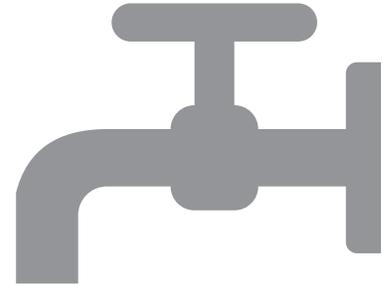
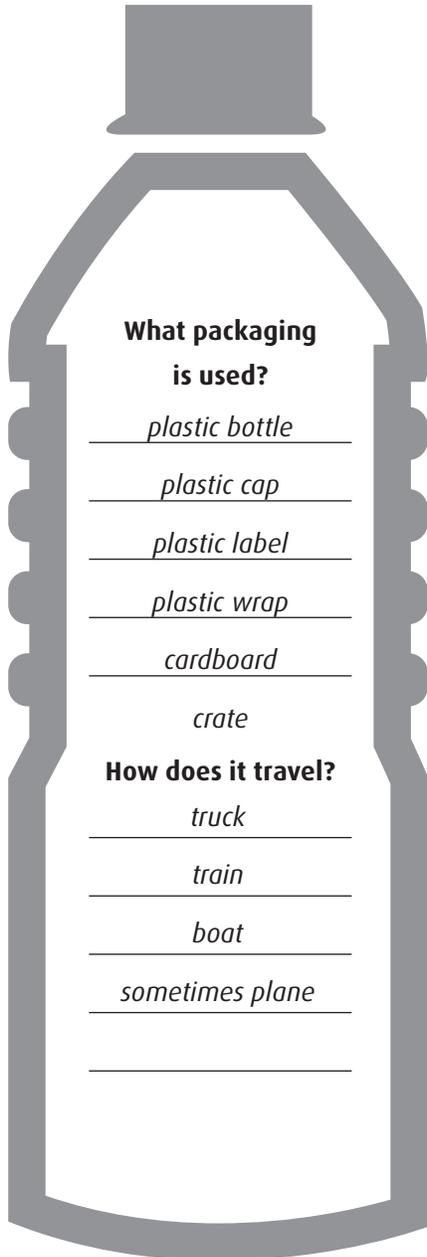
b. Fiji 9,000 km $4,000 + 4,000 + 1,000 = 9,000 \text{ km}$

GRD Environmental Sustainability - Nov 29, 2012 - Technologist: SR - Map Document: DrinkingWaterSupplyWorldContext.mxd





3. Compare packaging and energy needed to deliver drinking water.



4. Which uses more energy and packaging, bottled water or tap water? Why?

In greater Victoria, bottled water uses more energy and packaging. Fuel for transportation. Plastic for packaging

5. Which costs more money, bottled water or tap water?

Bottle water

6. The choice is yours. What kind of water will you drink- bottled or tap? Why?
