**Cost of Water**

**Answer Key**

These charts are really about comparing a command economic system and a market economic system. Producing tap water in Ontario is a not for profit government system and producing bottled water is a for profit system that spends a lot on advertising and marketing of the product. The other crucial concept is the idea of want versus need. We all need safe tap water. We can be convinced that we want bottled water over safe tap water. It is important to raise the issue of bias in both videos. Interestingly enough the bias expressed in both videos has been supported by all the major faith organizations in Canada, who see this as an ethical issue.

**Minds On – The Story of Bottled Water**

Chart 1 – Costs of Tap Water

- purchase price

- energy to treat water and pump it to our homes and businesses

- waste cost of greenhouse gases to treat the water

- renewable resource if used at a rate that nature can replace

- cost of a refillable water bottle

- energy to treat waste water

- other student answers

Chart 2 – Costs of Bottled Water

- purchase price

- energy to make plastic

- water to make plastic

- cost to refilter or distill the tap water used or to extract spring water or aquifer water

- energy to transport the water to the store and home

- energy for the garbage trucks

- cost to pick up the garbage

- cost to recycle or dispose of plastic bottles

- renewable resource if used at a rate that nature can replace

- environmental costs if too much water withdrawn from aquifer

- waste cost of greenhouse gases generated at various stages in the materials economy

- effects of plastic waste on the environment

- more jobs in manufacturing, pay for the labour of the workers

- marketing and advertising costs

- other answers from students

**Action! Expert Group Challenges**

Volume of classroom



V = L x W x H

V = 10 m x 6 m x 4 m

V = 240 m3

Litres in classroom = V x 1000 L/ m3

Litres in classroom = 240 m3 x 1000 L/ m3

Litres in classroom = 240 000 L

1. How much would it cost to fill our classroom with tap water compared to bottled water?

 Cost to fill classroom with bottled water = cost bottle water x litres in classroom

 Cost bottled water = $1.10/L x 240 000 L /classroom

 Cost bottled water = $264, 000

 Cost to fill classroom with tap water = cost tap water x litres in classroom

 Cost tap water = $0.0025/L x 240 000 L /classroom

 Cost of tap water = $600

2. How many classrooms full of oil are required to make the plastic for the bottled water Canadians drink every year?

Volume of oil required = L of oil/bottle x Canada population x bottles of water per Canadian

Volume oil = 0.33 L oil/bottle x 35,000,000 Canadians x 66 bottles/person

Volume of oil = 762 300 000 L

# of classrooms full of oil = Volume of oil ÷ Volume of classroom

# of classrooms full of oil = 762 300 000 L ÷ 240 000 L /classroom

# of classrooms full of oil = 3176 classrooms

3. How many classrooms full of water is Nestle Ltd. allowed to extract from the aquifer near Aberfoyle, Ontario every week?

Volume of water extracted in 1 week = volume of water extracted per day x 7 days per week

Volume of water extracted in 1 week = 3 600 000 L/day x 7 day/week

Volume of water extracted in 1 week = 25 200 000 L

Classrooms of water extracted in one week = 25 200 000 L ÷ 240 000 L /classroom

Classrooms of water extracted in one week = 105 classrooms

4. How many classrooms full of water would be required to make the bottled water drunk by the families of students in our school every year?

# bottles of water drunk by families every year = # students x family size x average bottles water

# bottles of water drunk by families every year = 400 students x 3 people/student x 66 L/person

# bottles of water drunk by families every year = 79 200 L

# classrooms full of water = volume of water drunk by families ÷ volume of classroom

# classrooms full of water = 79 200 L ÷ 240 000 L /classroom

# classrooms full of water = 0.33 classrooms

5. How many classrooms would be required to hold the empty 1 L water bottles thrown away by Ontarians every year? Assume a bottle occupies the same volume as 1 L of water.

Volume of bottled water drunk by Ontarians a year = population Ontario x average bottles water

Volume of bottled water drunk by Ontarians a year = 13 000 000 people x 66 L/person

Volume of bottled water drunk by Ontarians a year = 858 000 000 L

# classrooms full of water = volume of water drunk by Ontarians ÷ Volume of classroom

# classrooms full of water = 858 000 000 L ÷ 240 000 L /classroom

# classrooms full of water = 3575 classrooms

Bonus

How many days would it take for Nestle to extract the water required to fill 1 L water bottles consumed by Canadians every year?

Volume of bottled water a year = Canada population x bottles of water per Canadian

Volume of bottled water a year = 35,000,000 Canadians x 66 L/person

Volume of bottled water a year = 2 310 000 000 L

Days of water extraction = 2 310 000 000 L ÷ 35 000 000 L/day

Days of water extraction = 66 days