**Water Treatment**

**Treating Drinking Water** – Teacher Guide and Answer Key

People need clean drinking water to be healthy. In Ontario all drinking water is usually safe to drink because it is tested regularly. We rely on our municipal government to treat fresh water at a water treatment plant and to pump it through pipes to our homes, schools and businesses. Read the poster, *“****How is lake water turned into drinking water?***” and answer these questions.

1. What part of your water filter was the screening system?

*The cheesecloth was the screening step.*

2. Explain what was removed from your dirty water during screening.

*Large items like leaves and twigs are removed by screening.*

3. Explain how the alum works to form floc at a city water treatment plant.

*Alum makes small dirt particles like silt stick together and form larger particles called floc.*

4. What step of your water filter was like the settling basin?

*The cup of dirty water when we let the water sit so large particles sank to the bottom is like the settling basin.*

5. What was removed from your dirty water during settling?

*Large particles of dirt and floc that sank to the bottom of the cup were removed during settling.*

6. What part of your water filter was the filtration step?

*Pouring the water through the gravel and sand was the filtering step.*

7. What was removed from your dirty water by the gravel?

*Some medium sized particles of dirt were removed by the gravel.*

8. List four things removed from lake water by the sand at a city water treatment plant.

*Small particles of dirt, floc, algae, silt and some bacteria.*

9. What does the activated carbon do in the city water treatment plant?

*Carbon removes taste and odour producing chemicals.*

10. What part of your water filter was the storage tank?

*The clean water cup was the storage tank.*

11. Why was chlorine added here?

*Chlorine was added to kill bacteria.*

12. Why is fluoride added to drinking water?

*Fluoride is added to drinking water to prevent cavities in your teeth.*

13. What required step was missing from your water filter to make the water safe to drink?

*The testing step that ensures quality was missing from our water filter.*

14. How could you change your water filter to increase the rate of flow of clean water?

*We could pour more water into the filter faster. Or we could build a bigger filter. We could use energy to push the water through the filter under pressure.*

Read the poster, “***Protecting Our Water****”,* and answer the following questions.

1. What three things are saved if you take shorter showers?

*Taking shorter showers saves water, saves money and saves time.*

2. If all the water leaking from a dripping faucet is collected for a year, what will it fill?

*Water leaking from one faucet for a year could fill a small swimming pool.*

3. What are three ways you can conserve water at home?

*To conserve water I can turn off the tap while brushing my teeth, only run a dishwasher when it is full of dishes or only wash a full load of laundry instead of just a few shirts.*

4. Explain the importance of making sinks a pollution free zone.

*Pouring pollutants like oil or unused paint down a drain will pollute our drinking water. These substances* ***cannot*** *be removed by drinking water treatment.*

5. If people pollute water with substances that **cannot** be removed during drinking water treatment, what will happen in the future?

*If we add pollutants to the drinking water, the total amount of pollutants increases and could make our drinking water harder to clean or more expensive to clean. Maybe we will pollute the water so that aquatic plants and animals die.*

Look at the poster, “***We are connected to water****”.* Choose one way you feel connected to water and draw a graphic and label that could be added to this poster.

*Various correct answers but all should include a recognizable diagram with a clear connection to water. The written message should connect to the diagram.*

**Extensions and background information**

a) Ontario Ministry of the Environment – **Where does my drinking water come from**? interactive website. You can select your municipality and the website tells you where your water comes from, links to water quality reports for most recent full year of available data and links to who is responsible for treating your water. The website also describes if a source drinking water protection plan is being set up and who is responsible. See <http://www.ene.gov.on.ca/environment/dwo/en/mapping/index.htm>

b) Online interactive web site at the U.S. Environmental Protection Agency can be used for consolidation <http://water.epa.gov/learn/kids/runoff/kids_index.cfm>

c) MOE poster 6080e We are All Connected to Water

- examine possible forms of water contamination caused by human activity

- explore ways we protect our water from contamination

- discuss the **gaps between contamination and protection which then leads to pollution**

- explore Ontario’s new initiative to Protect Drinking Water Sources at <http://www.ene.gov.on.ca/environment/en/subject/protection/index.htm> (Note: Ontarians are worldwide leaders in this area)