



Every 20 seconds, a person in the developing world – usually a child – dies from diseases caused by polluted drinking water. But this heart-breaking issue extends even to rich countries like Canada, where water contaminated by animal waste has been a problem.

Through basic information and challenging activities, these junior high (grade 7-9) science resources are intended to teach students principles around water stewardship and water treatment, while adhering to government education guidelines. Learn about Samaritan's Purse's work helping families get safe water and involve your students in thinking about world water issues and how to solve them.

SOME WATER TREATMENT OPTIONS – QUICK OVERVIEW

- 1. BioSand Water Filters** are most appropriate where people don't have access to wells, pumps, or piped water. Built with concrete, sand, gravel, and plastic piping, they are particularly good when people rely on open, unprotected water (rivers, ponds, mud puddles, etc.) and where the water is visibly polluted. In these situations, BioSand Water Filters dramatically improve water quality. The filters – built and installed in tens of thousands of homes in the developing world by Samaritan's Purse Canada – are heavy and should not be moved, so they are not good for a nomadic population.
- 2. SODIS** (Solar Disinfection, using clear plastic bottles) is best in places where the water is clear but polluted, and where there is intense sunlight, since the required UV rays will not penetrate sufficiently and kill bacteria if the water is cloudy. This treatment requires little technology, but the maximum effective bottle size is two liters, so many bottles must be constantly kept in use by each household to produce enough water for all needs.
- 3. Chlorination** can be used anywhere, but silt or mud can interfere in the process. If people use silty or muddy water, they must filter it or let the dirt settle before chlorinating it. Users must buy chlorine on an ongoing basis – resulting in an affordability issue – and the product must be reliably available.
- 4. The PUR water packet** is used in water with some silt or mud. It is a powdered mixture developed by Proctor & Gamble that is available in small packets. People stir the mixture into their water until micro-organisms and suspended matter clump together into “flocs” which can then be filtered off of the water before drinking. PUR is not always reliably available and represents an ongoing cost, so there can be affordability issues. PUR is a very good product in emergency situations, because it works quickly and in silty, muddy water. Relief organizations often supply PUR during emergencies.
- 5. Ceramic filters** are very effective in filtering out the same harmful contaminants as the BioSand Water Filter. The advantage of the ceramic filter is that it is portable, so it may be more appropriate for people who move around. The disadvantage is the pots used in filtering can break and often aren't replaced. Ceramic filters can be locally made and many people already bake ceramic pots. The filter pot requires a few minor adjustments in the production process.
- 6. Rainwater harvesting** can be implemented quickly. The basic system consists of a tank to capture rainwater falling on the roof and guttering to bring it to the tank. But it is costly to build, and not suited to being used as a stand-alone water supply solution, because the increase in tank capacity needed to bridge a long dry season can be very expensive.

Source: Samaritan's Purse Canada, www.turnonthetap.ca