



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.

TREATMENT OPTIONS:

5. CERAMIC FILTERS

Locally manufactured ceramic filters have traditionally been used throughout the world to treat water. Currently, the most widely implemented household water treatment system involving a ceramic filter is the Potters for Peace design, which is flowerpot-shaped, holds between eight and 10 liters of water, and sits inside a plastic or ceramic receptacle.

These filters are produced locally at ceramics facilities, then impregnated with colloidal silver to ensure complete removal of bacteria in treated water and prevent bacteria growth inside the filter. Numerous other locally made and commercial ceramic filters are widely available in developed and developing countries.

Most ceramic filter systems are based on a filter/receptacle model. To use the ceramic filters, families fill the top receptacle or the ceramic filter itself with water, which flows through the ceramic filter or filters into a storage receptacle. The treated water flows out through a spigot embedded within the water storage receptacle.

The effectiveness of ceramic filters in removing bacteria, viruses, and protozoa depends on the quality of the filter. Most are effective at removing most larger protozoal and bacterial organisms, but not at removing smaller viral organisms.

Locally manufactured ceramic filters cost from \$7.50 to \$30 each. Distribution, education, and community motivation can add significantly to program costs.

Ceramic filtration programs have been implemented in more than 20 countries and Potters for Peace has helped establish filter-making factories in 17 countries.

Benefits, Drawbacks, and Appropriateness

The benefits of ceramic filtration are:

- Proven reduction of bacteria and protozoa in water.
- Simple to use, so widely accepted.
- Proven reduction of diarrheal disease incidence in users.
- Long life if the filter remains unbroken.
- A relatively low one-time cost.



The drawbacks of ceramic filtration are:

- Lower effectiveness against viruses.
- Lack of post-filtering protection that can lead to recontamination if water is stored unsafely.
- Potential lack of quality control in locally produced filters.
- Filter breakage over time, and need for spare parts.
- The need to regularly clean the filter and receptacle, especially when using muddy/silty water.
- A low flow rate of 1 to 3 liters per hour.

Ceramic filtration is most appropriate in areas where there is capacity for quality ceramic filter production, a distribution network for replacing broken parts, and user training on how to maintain and use the filter.

Suggested activities

- Have groups of students research, assemble and operate ceramic filters, then demonstrate them in class.

Source: U.S. Centers for Disease Control