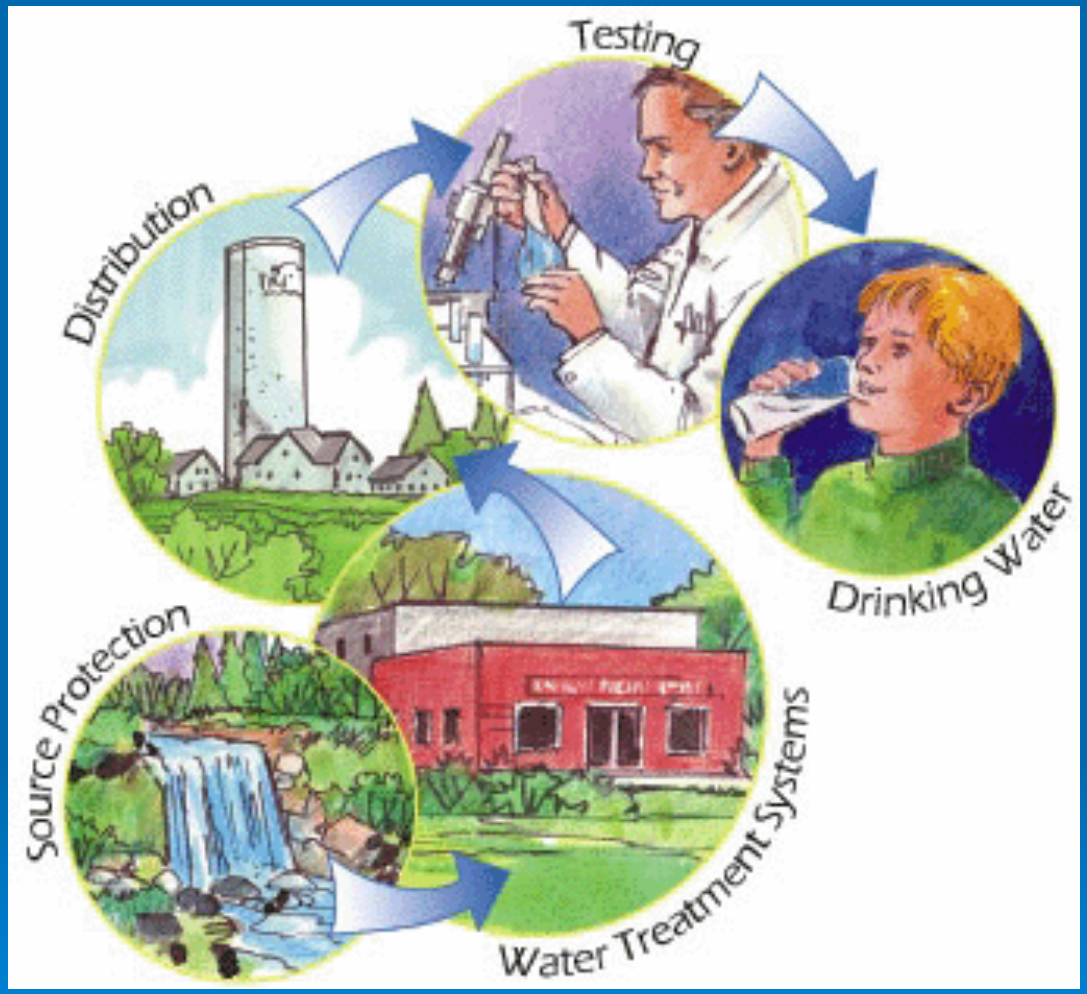
April 2021

PowerPoint - What is in My Drinking Water? A Primer on Potable Water Treatment

Center for Urban Resilience

WHAT IS IN MY DRINKING WATER?

A primer on potable water treatment



Standard Water Treatment Process in Developed Country (like the United States)

Open Canal Systems
(Kenya)

Rain water capture
(China)

Community Well Water
(Tanzania)

Water Sources in Developing Countries

River Water

(Dominican Republic)

Ground Water

(India)

Community Filter

River Water

(Haiti)

Water Sources in Developing Countries

Common Water Contaminants Include:

- Include *E.Coli* and *salmonella* and can cause an infection that can feel like food poisioning.
- Sources of bacterial contamination include human and animal wastes coming from runoff or direct contact.
- People who bathe in contaminated water can also develop bacterial skin infections, especially around their mouth.

- Are single-celled parasites that are in its' cystic form, so it can survive outside of a host's body.
- Causes major stomach and intestinal pain. The most common form is called Dysentery and is caused by the amoebic protozoa.
- Protozoan contamination, like bacteria, come directly from human and animal fecal matter.
- Protozoa can last a longer time in water than bacteria because of the hard-shelled cyst they develop.

- Can be from industrial sources, herbicides, pesticides, and fertilizers
- Can become built up in the human body, especially in the tissues and fat cells.
- Fertilizers also can create the perfect environment for deadly algal blooms in water systems.

- Any solid item object that cannot dissolve in water.
- The majority do not cause health issues but are usually indigestible, such as pebbles and little tree branches
- Can negatively affect the de-contamination processes by clogging filters and/or blocking chemical interactions.

challenge

make an effective water filter

filter design rules

- Your team must come up with a team name
- Your team's filter must produce a minimum of 200 ml of "potable" water
- You must design, construct and produce the final quantity of water in the time limit of 2 classes
- Your team must supply a detailed, labeled drawing of your filter
- Your team may use some or all of the materials given, but cannot use anything not listed or any additional materials.
- The water sample can be passed through the team's filter as many times as the team chooses.

materials

One mortar and pestle
One plastic pipette
250 ml graduated cylinder
250 ml of coarse sand
250 ml of fine sand
250 ml of activated charcoal
250 ml of “contaminated” water
1 foot of one inch PVC pipe
1 sq foot of cheesecloth
2 small coffee filters
3 rubber bands
1 sq. foot of nylon netting
2 large cotton balls
2 iodine tablets or drops
1 funnel
1 storage container

REMINDER
Your team may use some or all of the materials given, but cannot use anything not listed or any additional materials.

Water Test Results

(sample)

Test	Pre-Filtering	Post-Filtering
Temperature (°Celsius)		
Turbidity		
pH		
Dissolved O_2		
Nitrates		
Phosphates		
BOD (Biochemical Oxygen Demand)		
Coliform Bacteria		
Filter Time (100 ml)		

Team	Team One	Team Two	Team Three	Team Four	Team Five	Team Six	Team Seven
Temperature (°Celsius)							
Turbidity							
pH							
Dissolved O_2							
Nitrates							
Phosphates							
BOD (Biochemical Oxygen Demand)							
Coliform Bacteria							
Filter Time (100 ml)							

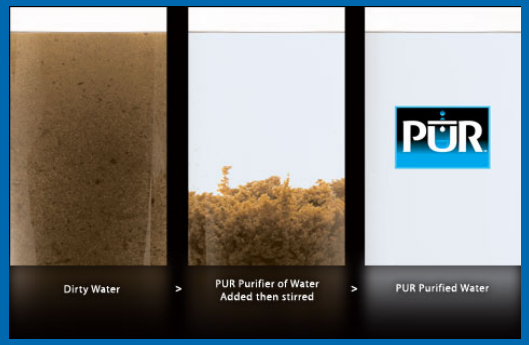
common treatments

	BOILING	HALOGENS	UV LIGHT	SOLAR DISTILING	FILTRATION
	✓	✓	✓	✓	✗
	✓	✗	✓	✓	✗
	NO	NO	NO	✓	✓
	NO	NO	NO	✓	✓

new innovations

LIFESTRAW: A reusable straw that filters as you drink

www.lifestraw.com



PUR (purifier of water): a chemical package that separates out particulates and is anti-bacterial

www.purpurifierofwater.com

Watercone: Using the sun to do the work

www.watercone.com