

Start with a Book: River Rangers

Make a Water Filter



Introduction

Help kids understand how water from lakes, rivers, and groundwater that ends up in their cup gets cleaned and ready to drink when they engineer a water filter.

Supplies

- Clear 2-liter plastic bottles cut into two pieces, about a 1/3 of the way down the bottle
- Thick paper towels
- Gravel
- Sand
- Dirt
- Items to “pollute” water such as dirt, grass, twigs, bits of plastic, cooking oil, food coloring, etc.
- Water
- Containers for mixing polluted water

Let’s get started!

Talk with kids about the importance of water in our daily lives. Get them thinking and talking about how many times today they have used water. **ASK THE KIDS:** What would you do if you turned on the faucet and no water came out? Where else could you find water? Is that water good to drink? What if you couldn’t buy bottled water or get water from a faucet? What would you do?

Together brainstorm water sources in your community. Have kids identify local bodies of water and ask, Does it look clean? Would you drink that water? Use it to cook or wash or brush your teeth? Even if it looks clean, is it okay to drink it?

Talk about what kids know about filters. Ask, Have you seen a filter before? What does a filter do? Come up with examples kids may have encountered such as coffee filters or aquarium filters and talk about how a filter works. **ASK THE KIDS:** Can you think of how a filter could help get water clean?





Start with a Book: River Rangers

Make a Water Filter

Put some of those ideas to the test. First, pour water into several containers and give kids materials to “pollute” it. Have them make notes about what goes into each container.

Now that there is dirty water ready to be cleaned, it’s time to make a water filter! Have kids turn the part of the 2-liter bottle with the neck upside down and fit it into the bottom half of the bottle. Let kids engineer their filter as they see fit, but have them start by putting a layer of paper towels into the bottle right above the neck. Encourage them to layer gravel, sand, dirt, etc. **ASK THE KIDS:** What do you think will happen when the polluted water is poured through these layers?



Photo © Three Little Rascals

Have them make predictions for each of the polluted waters they’ve created and note their results. To avoid flooding the filter — and to get a good look at the filtered water — empty the bottom of the bottle after each test.

Kids may want to redesign their filters after testing. Remind kids that even though water that went through their filter looks “clean” it will still have invisible items, such as bacteria or other contaminants, that need to be removed. Talk about how an additional chemical process is necessary to remove those impurities.

More water filter activities

WALTER FILTER SCIENCE PROJECT (VIDEO)

youtube.com/watch?v=tPP_Yn2w2Sk

FILTRATION INVESTIGATION (TRY ENGINEERING)

tryengineering.org/lessons/filtration.pdf

MAKE A WALTER FILTRATION PLANT MODEL (U.S. ENVIRONMENTAL PROTECTION AGENCY)

epa.gov/safewater/kids/flash/flash_filtration.html





Start with a Book: River Rangers

Make a Water Filter

Steps in Water Treatment



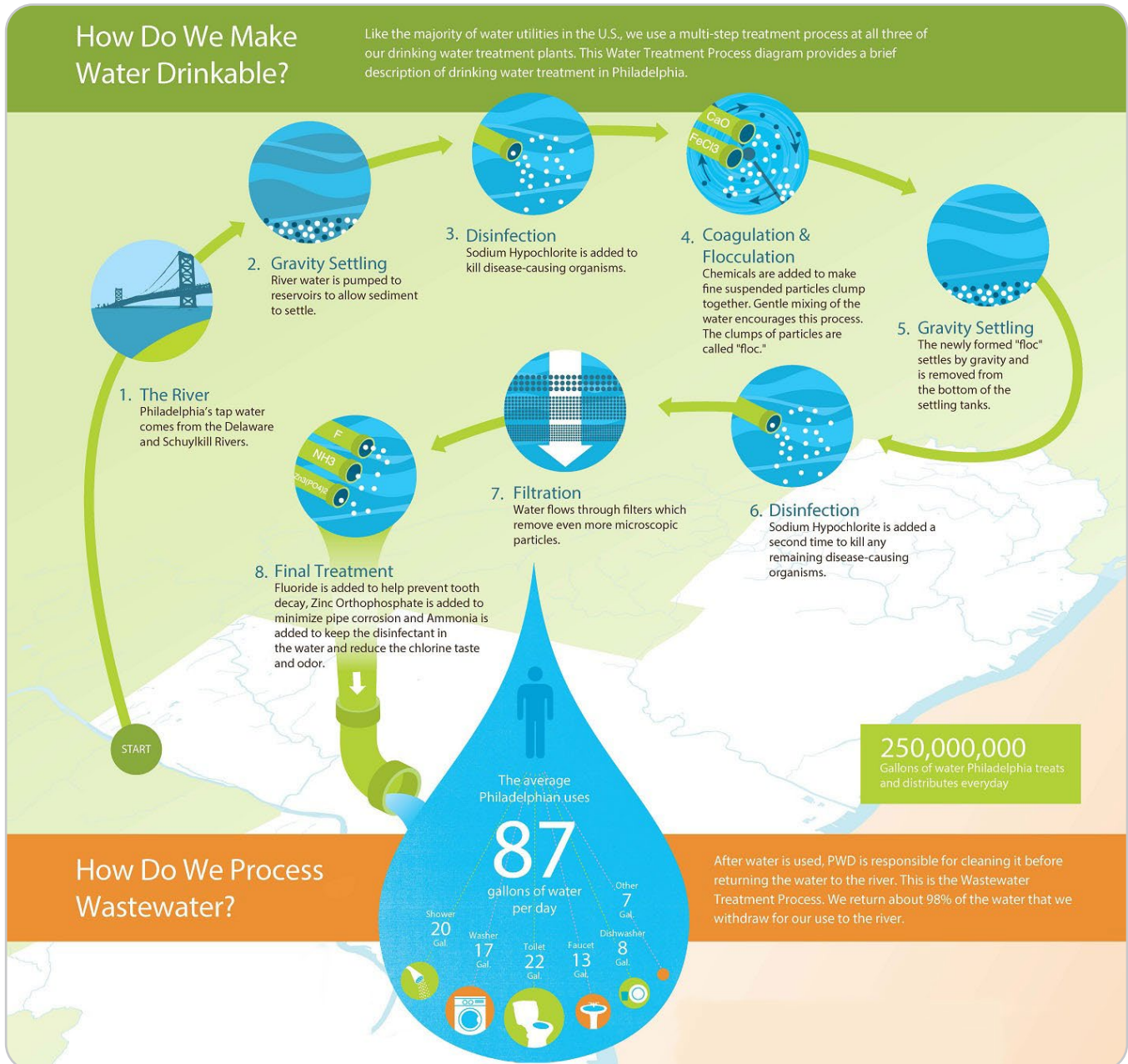
Diagram from Willamette Water Supply, Oregon.





Start with a Book: River Rangers Make a Water Filter

Steps in Water Treatment



Philadelphia's Drinking Water Treatment Process © Fairmount Water Works

