CURIOSITY AT HOME
FILTRATION STATION

Humans need clean drinking water to be healthy. Water can contain debris (loose material), chemicals, and many other materials that could hurt your health. Luckily there are many natural and human-made systems that help improve water quality, which in turn helps improve human health. Take some time to design and test your own water filtration system.

MATERIALS

· 2 (or more) disposable plastic water bottles
· Scissors
· Rubber bands
· Cheesecloth (used to cover the mouth of your water bottle. You can substitute linen, coffee filter, medical gauze, or paper towel)
· Wastewater (these are some options to create wastewater with)
    – Yellow food color
    – Sand
    – Dust from sweeping the floor
    – Hair from a hair brush

· Filtering materials (any mixture of these items can create a filtering system)
    – Coffee filter
    – Paper towel
    – Aquarium rocks
    – Play sand
    – Uncooked macaroni
    – Cotton balls
· Science notebook or paper
· Something to write with

PROCEDURE

· Ask an adult to help cut the bottom inch off of your plastic water bottles (make sure you keep the cap end intact).

· Keep the lid on one bottle. This bottle will be how you collect the filtered water.

· Take the cap off the other water bottle. This will become your filter for the wastewater.

· Use your cheesecloth (paper towel/gauze/coffee filter) to cover the smaller capless end of your filter. Use a rubber band to secure it.

· Add a mixture of the filtering materials into your filter.

· Place your filter into the filtered water collecting bottle, small end first. The filter should reach about half way down the other bottle.

· Mix a pitcher of waste water by adding dust (swept from your floor), a couple drops of yellow food dye, sand, and/or hair from a hair brush. Mix well.

- Pour a small amount of wastewater into the filter slowly. You may need to hold your filter upright while adding wastewater to keep it steady. Keep adding water until you have about two inches of filtered water.
- Observe filtered water at the end of the process.

NOTE: Even after filtration do not drink this water!

EXPLORE MORE

If you have more water bottles, try different materials to filter your wastewater, or clean out your used filter and try a new filter design. Consider using different materials, different amounts of material, or placing the filter materials in a different order. Which filter design filtered the water the best? How could you design your filter to improve it even further?

DID YOU KNOW?

Water can be filtered to different degrees. The filter you made today is good enough to remove visible debris, but not microscopic particles and microbes. Some filtration and water processing systems are powerful enough to take wastewater from the sink and toilet and make it clean enough to drink. **Do not try this for yourself, though.** These are some highly specialized filtration systems. Where does your drinking water come from? What filtering process does your drinking water go through?
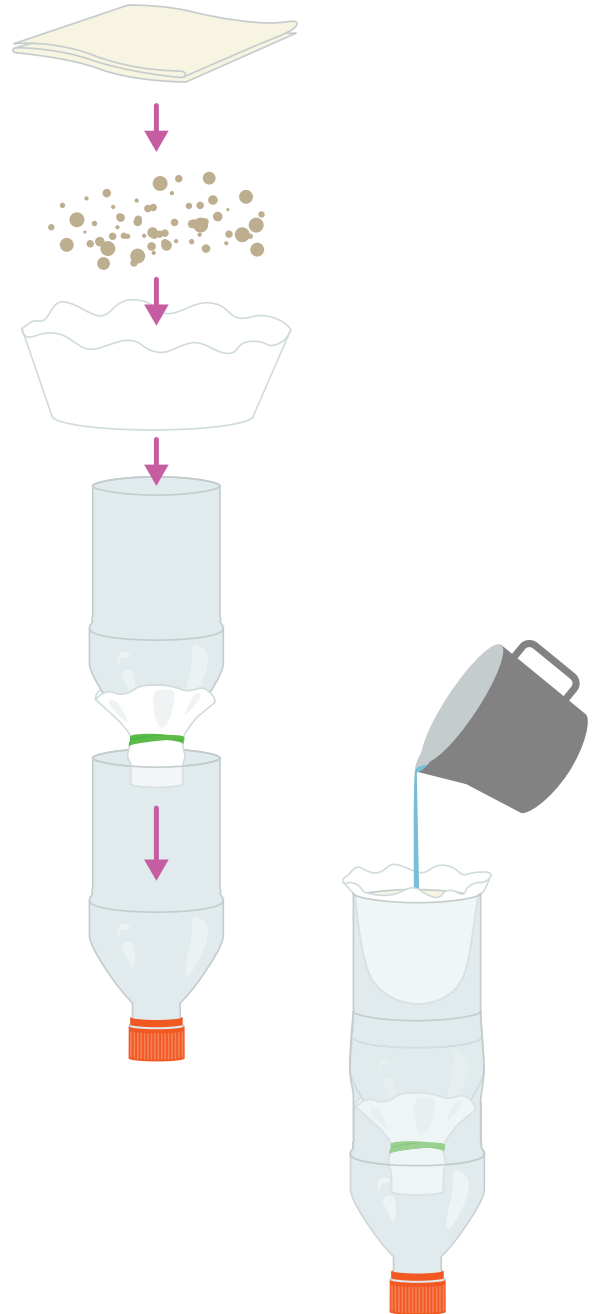
 @pacsci

Show us how you're being curious! Share your results with us.

PACIFIC SCIENCE CENTER

3–5 GRADE EXPLORATION

Explore the following questions and write your responses in your science notebook.

· What did you notice about the water after it had been filtered? Was there any debris or leftover waste in your water?

· What about your filtration system worked well? What would you like to change?

· What criteria would you use to grade how good a water filter is? For example, do you want a filter that can filter a lot of water, one that's portable, one that works quickly, or one that's cheap to make?

· If you had the resources, how would you make a better water filter? Draw out what you would do in your science note book and explain your materials. If you have them available to you, test your new design!

@pacsci

Show us how you're being curious! Share your results with us.

PACIFIC SCIENCE CENTER