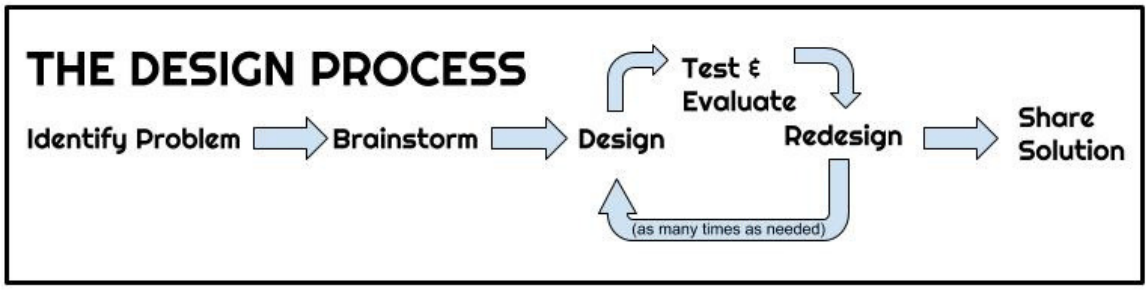
MAKE A WATER FILTER

Did you know millions of people around the world don't have access to clean water? Almost all the world's freshwater is in glaciers, leaving only a small amount for human use. Human pollution impacts our freshwater supply, which affects all life on Earth. But people can take action to help protect the Earth's resources. Using the design process, can you create a simple water filter out of household materials?

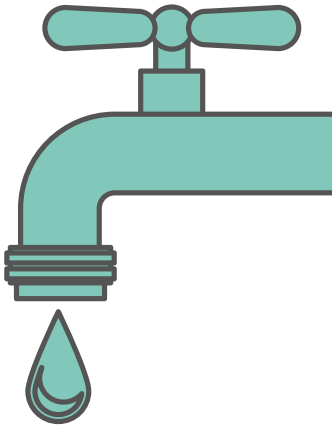


THE GOAL:

Design and create a water filter that will purify a polluted water sample so it's clear enough to read text through.

WHAT YOU NEED:

- 16 oz. plastic water bottle with the bottom cut off to use as filter (a wide neck funnel will also work)
- 2 clear plastic cups
- Pitcher or bucket of polluted water. Use muddy water with lots of sediment like dirt, sand, grass bits, pebbles, etc.
- Variety of materials to make a filter. Examples: coffee filter, paper towels, fabric, cotton balls, aquarium charcoal, marbles, etc.
- Magazine, newspaper, or book that contains text of varying sizes
- Rubber bands or tape (optional)
- Paper and pencil



CAUTION: Do not drink the water you have filtered through your water filter. You might filter out the larger particles, but microbes could still exist in the water sample that could make you sick. Only drink water you know to be clean and safe.

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MAKING A WATER FILTER

IDENTIFY THE PROBLEM

- Do you know how much of Earth's freshwater is polluted or how many people get sick from water pollution each year? Do some research!
- Set your requirements. How effective do you want your water filter to be? What size text do you want to be able to read through your filtered sample?

DID YOU KNOW?

Only .007% of the planet's water is available to fuel and feed its 6.8 billion people!

The challenge: To filter your water, you are going to hold the water bottle upside down like a funnel. Then you will hold it over a cup and pour water through the funnel. Use your materials to modify the funnel so that it traps the dirty stuff and keeps it out of the cup.

BRAINSTORM

- Think about real-life examples of water filtration. Water can be filtered naturally when it goes into the Earth. Humans use water treatment plants to make water suitable for drinking. What kind of materials do you think are used in these systems to filter water?
- Look over the materials you have and think about how you might use them. Then sketch ideas for your water filter. Try to come up with more than one.

DESIGN

- Build your water filter!

TEST & EVALUATE

- Pour some of the polluted water through the filter into the clear cup. Did the filter work as expected?
- After filtering the polluted water, what size text are you able to read through the cup?

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REDESIGN

- Make changes to your design so it filters even better and you can read even smaller text through the cup.

The Test, Evaluate, and Redesign portion of the Design Process can happen many, many times. Even when a product is completed and shared with the world, redesign and improvements continue to happen - think about how many times you've had to update your phone's operating system to improve its performance! Most things are never "finished" - there's usually room for change and improvement!

SHARE YOUR RESULTS :

- Once scientists have developed a solution, they share what they've learned with others. Share your solution with friends and family. Tell them what you learned about water pollution.
- Invite a friend to create their own water filter and then compare your designs. What can you learn from each other?

MORE TO EXPLORE

- Learn more about the world's freshwater crisis from National Geographic. Visit https://www.nationalgeographic.com/environment/freshwater/freshwater-crisis/
- To find out how others are helping solve the water crisis, visit https://thewaterproject.org.

STANDARDS

This activity aligns with the following Oklahoma Academic Standards:

- 5th Grade Science 5-ESS2-2 Earth's Systems
- 5th Grade Science 5-ESS3-1 Earth and Human Activity

READ ALL ABOUT IT!

- **Running Dry: The Global Water Crisis** by Stuart A. Kallen
- **You Wouldn't Want to Live Without Clean Water** by Roger Canavan
- **Ryan and Jimmy: And the Well in Africa That Brought Them Together** by Herb Shoveller