

Date: _____

Name: _____

Design a Water Filter

Create a water filtration system using only household items!

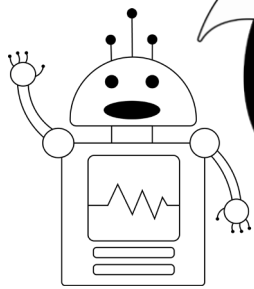
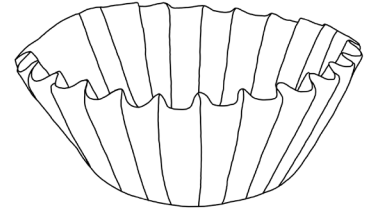
This activity was created by Sophia.

FILTER MATERIALS (SUGGESTIONS)

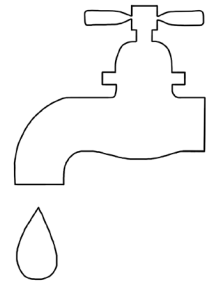
- Coffee filters
- Sponges
- Cheesecloth or thin fabric
- Sand
- Rocks

WATER MATERIALS

- 2 large cups or jars
- Water
- Food colouring
- Dirt / mud from outside



For this experiment, think of your filtration system like a program that converts dirty water to clean water. In this case, your **input** is dirty water, and the desired **output** is clean water. Your task is to create "**program**" in between - a series of functions that will filter the water. Then, you will **evaluate** how well it filters out the dirt.



- 1 Fill your first cup or jar 3/4 full with water.
- 2 Add in a scoop of dirt / mud.
- 3 Add in two drops of food colouring.
- 4 Stir the water together until everything is well mixed. The colour should be distributed throughout the water.
- 5 **Now it's time to design!**
Using materials you have available (take a look at our suggested filter materials), try designing and building a filter that will clean the water! Try layering different materials or incorporating other ideas outside of the suggestions. The idea is to end up with a water filter that water can be poured through.
- 6 Test out your filter by pouring your dirty water through it (more than once if needed).
- 7 Evaluate your filter's effectiveness using the questions on the next page.

Draw a diagram of how your filtration system will look



Date: _____

Name: _____

Did your system look the way you envisioned it? Or did you have to make adjustments? (if you did, what adjustments did you make?)

Did you get perfectly clean water?

What was the most difficult thing to remove?

If you didn't get it all out, what do you think you could've done to remove the rest?

Was there anything you didn't have that you would've liked to use in your filtration system? (if so, what? And what would you have used it for?)

Filtration in the real world

Think of the food colouring as biological or chemical contamination, such as bacteria, viruses, or pollutants. These are things too small to be stopped by large filters. This is why in industrial filtration systems they use much more than just household items. Most filtration systems will use chemical or physical means to disinfect, like chlorine or UV heat.