

Make Your Own Water Filter

GOAL: To explore water filtration and design a water filter.

Water needs to be cleaned of dirt and other contaminants before people can use it. When spring water travels through layers of dirt and sediment, it is actually being cleaned! It may seem strange that dirt can clean up water, but it's true. Follow these steps to build your own water filter and prove it for yourself. Just remember that a water filter sounds more impressively scientific if you call it a "water filtration device."

- 1.** Collect the materials you'll need to build your water filter: scissors, a pitcher of water, dirt, sand, gravel, cotton (e.g., cotton balls, a bandana, or an old sock or T-shirt), and two plastic cups.
- 2.** Add some dirt to the pitcher of water (make it really yucky!). Use the scissors or a needle or nail to make about four to six small holes in the bottom of one of the plastic cups. Be careful not to hurt yourself or break the cup. Don't make holes in the other one, or you'll make a big mess!
- 3.** How well will gravel, sand, and cotton filter water by themselves? Before making your observations, make a prediction for each material and record them on the "Science Log" on the next page. Which material will filter the most dirt out of the dirty water?
- 4.** Test how well the different materials filter water. Put some gravel in the cup with the holes in it (the "filter cup"). Then pour some of the dirty water into the filter cup over top of the other cup so that the filtered water collects in it. Observe the filtered water. Is it clean, cloudy, dirty, or gritty? What colour is it? Be specific, and don't forget to make some notes and draw pictures on the science log. Think about why the material worked the way it did.
- 5.** After you've seen how gravel filters the water, dump the gravel and clean the cups. Then put the sand in the filter cup, repeating the process with sand. Then, take out the sand, clean the cups, and repeat the process with cotton. Record your observations for each material on the science log.
- 6.** How did each material work? Did they filter the water in different ways? Use what you've learned from observing how each material filters the water, and use your brain power to design a more complex water filter. How can you combine the materials in the filter cup? What order should you put them in to make an über filter? Use the "Designing an Über Filter" section of the science log to plan your construction project.
- 7.** Once you've designed your über filter, build it! Then try it out and see how it works. Can you improve your design? Challenge your friends to design and build a filter of their own.






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Science Log

Exploring Water Filtration and Designing a Water Filter

Question: What combination of materials in what order will filter dirty water the best?

Exploring the materials:

GRAVEL	SAND	COTTON
Prediction: 	Prediction: 	Prediction:
Observations: 	Observations: 	Observations:
Illustration: 	Illustration: 	Illustration: 

Designing an Über Filter:

My über filter will have _____ layers of materials (draw horizontal lines on the blank picture of the adjacent filter cup to show the layers).

The materials will be in this order:

_____ .

My über filter will look like this →

