

# WATER FILTER CHALLENGE by Study.com

## Lesson Transcript

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Amanda has taught high school science for over 10 years. They have a Master's Degree in Cellular and Molecular Physiology from Tufts Medical School and a Master's of Teaching from Simmons College. They also are certified in secondary special education, biology, and physics in Massachusetts.

In this engineering project, you'll be designing a water filtration system. By combining different materials to create a filter, you'll be able to clean dirty water. By the end of this project you'll understand the importance of water filtration and how to filter dirty water.

## Project Introduction

Goal:	To create a water filtration system from common materials
Age:	Middle school and up
Safety concerns:	You'll need to cut a plastic bottle. Get an adult to help you, and use caution with scissors
Time:	2 hours

Picture running some tap water. In the United States, you can trust that the water is clean. But, in some parts of the world, they don't have access to clean, running water in their homes. Millions of people rely on river water or rain water for drinking, cooking and bathing. Cheap and convenient water filtration systems are needed for public health in these areas.

Today, you'll be using some common materials to create a water filtration system. By doing this project, you'll understand how materials are filtered out of water and what it takes to create a clean water source. Here, we'll suggest some materials you can use for your filter, but consider what else you might like to use. What materials will work best? What needs to be filtered out of the water?

## Troubleshooting

Make sure you pour your water slowly through the filter. Pouring it too quickly can disrupt the layers in your filter. Also, make sure the hole in the cap isn't too large. Again, it's important that the water flow slowly through your filter.

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## Project Materials

For this project, we'll need the following materials:

- 1 two liter soda bottle
- Scissors
- 0.5 cup sand
- 0.5 cup activated carbon
- 0.5 cup fine gravel
- 0.5 cup rocks or larger gravel
- Cup
- 1 cup water
- 1 teaspoon dirt
- 1 teaspoon oil
- 1 teaspoon crushed Styrofoam (optional)
- Running water to rinse gravel and sand

## Project Steps



Rocks  
Gravel  
Sand  
Charcoal

Safety Tip: Scissors are sharp. Get an adult to help you cut the bottle and cap.

1. Cut about 2" of the bottom of the water bottle off to create a funnel.
2. Punch a hole in the cap of the bottle for the water to run through using the scissors.
3. Rinse both types of gravel and sand with water to remove any impurities.
4. Now, set up your filter. Pour the activated charcoal into the bottom.
5. Next, add the sand, then the fine gravel, and then the large gravel or rocks.
6. Mix your dirty water by combining 1 cup water with the dirt and oil. Make observations about what the water looks like before filtering.
7. Place the cup underneath your bottle to catch the water.
8. Gently pour the water through the filter.
9. Mix your dirty water by combining 1 cup water with the dirt and oil. Make observations about what the water looks like before filtering.
10. Place the cup underneath your bottle to catch the water.
11. Gently pour the water through the filter.
12. Observe what the water in the cup looks like after filtration.