



# Build-a-Filter

The Service Authority cleans wastewater that comes from our customers' homes and businesses 24/7! One very important step in this process is passing the water through a filter made of sand. Using materials in your home, you can conduct your own water filter experiment!

## Hypothesis

You will create two filters, one using basic filter materials like sand and another using materials from your home. Write your hypothesis, or guess, about which filter will work better to clean dirty water and why.

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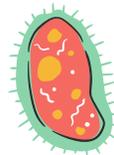
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## Materials

- Two paper or styrofoam cups
- Pen or pencil
- Two plastic cups or another item to catch water
- Another cup for your water mix
- Gravel or small rocks (Aquarium gravel works great!)
- Measuring cup or scoop
- Sand (kitty litter works here too!)
- Dirt or soil
- Spoons
- Paper towel or other paper product
- Any item from your home you think might make a good filter

## Experiment

### Build Your Basic Filter



1. Gather all of your materials.
2. Poke 10 small holes in the bottom of your paper or styrofoam cup using your pen or pencil.
3. Take your paper towel and fold it into a square, then place it on the bottom inside of your paper cup. Be sure to cover all of the holes made in step 2.
4. Layering the sand first and then the gravel, pour an equal amount of each into your paper cup on top of the paper towel.  
Make sure to leave at least an inch of space at the top of your cup!
5. Set this filter aside and build your experimental filter.

# Build-a-Filter

## Build Your Experimental Filter

1. Gather all of your materials.
2. Follow steps 2 and 3 from your basic filter.
3. In equal amounts, layer your experimental items into the cup in any order you choose, leaving one inch of space at the top of the cup to pour your water.

## Testing!

1. In a separate cup, mix one to two spoonfuls of dirt with one cup of water.
2. Hold your filters over the empty plastic cups, or other water-catching item.
3. Pour half of the dirty water over each filter and watch the water come through!
4. Repeat the experiment using as many possible materials for the filter as you want.
5. Record your observations about how clean (or dirty) the water is after it passes through each filter.



## Observations

Which filter worked better? How do you know it worked better?

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What kind of materials seem to create better filters?

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## Extra Fun: Be a Researcher!

Why is charcoal good at trapping small particles in the water?

Find 3 different ways people filter water around the world

1.

2.

3.