

Make a Water Filter

Estimated Time: 60 minutes

SUMMARY

In this activity, kids learn how to make water safe and clean by making a water filter. The filter's layers mimic those found in natural water cycles. This parallel both makes the filter work and helps kids understand how water is cleaned.

WHAT YOU'LL LEARN

- How different materials act to remove impurities in water
- How to make a simple water filter
- How the water cycle works

Materials Used	Resources Used
<ul style="list-style-type: none"> • Scissors • A glass • A plastic bottle (preferably clear) • Cotton balls or coffee filter • Gravel or small rocks • Sand • Activated charcoal (from other filters if possible) • Dirt, glitter, food coloring, dish soap, etc. for making unclean water • Water 	<ul style="list-style-type: none"> • Water Cycle Video - https://www.youtube.com/watch?v=al-do-HGulk

WHAT TO DO

1. Begin by cleaning sand, gravel, and broken up pieces of charcoal with water to clean them. Dirty materials will make a dirty filter.
2. We will make our filter with a plastic bottle to hold the filtering materials. The size of the bottle doesn't matter. Begin by cutting the bottom of the bottle off, but leave as much of the bottle as possible.
3. Flip the bottle over so the original opening for the bottom now is facing down and put it into a glass or bowl that leaves it suspended above. The glass or bowl will be catching the filtered water.
4. The bottom layer of your filter will be the cotton balls or coffee filter. These will serve to hold the other materials in the filter and filter the smallest particles.
5. A 1 inch thick layer of activated charcoal is the next layer, if this material is available. This layer will also filter incredibly small particles, but it is not absolutely necessary.
 - a. Charcoal that you'd use to grill is often too soft and will dissolve into the water, but you can try it.
6. Add about two inches of clean gravel or small stones as the third layer.

7. The next layer is a 3 or 4 inch layer of sand that mimics sandstone in the natural water cycle.
8. Add another gravel layer at the top. Leave a little space at the top to prevent water from overflowing as you pour it into the filter.
9. To test your filter, add your impurities to a container of water and thoroughly stir it up. Pour the dirty water into the filter, being careful to not overflow the filter.
 - a. What particles make it through the filters?
 - b. What color is the water after it has been through the filter?
 - c. How does the water smell? Do you think it's clean?

TIPS

- To test for detergent, soap, or other pollutants that are difficult to see, try testing the pH of the water. You can use the method of making pH indicator with red cabbage found here: <https://www.thoughtco.com/making-red-cabbage-ph-indicator-603650>
- An extension of this activity involves testing each filter material on its own with the same water and comparing them. Because adding cotton balls or a coffee filter would skew the results, you'll need to use funnels that will hold the materials instead. These can be made pretty easily from a plastic cup.