

# Swamp Muck Science Game Plan

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## eCamp Chemistry Lab

**Objective** This experiment will teach you about the different types of filtration as you turn your coffee back into clear water as well as the swamp muck from the back yard. You can test out other types of “swamp muck” by mixing together other liquids (water, orange juice, etc.) and solids (citrus pulp, dirt, etc.). Stay away from carrot juice, grape juice, and beets — they won’t work with this type of filter.

**About the Experiment** Ever wonder how the water draining down your sink gets clean again? Think about it: The water you use to clean your dishes is the same water that runs through the toilet. There is only one water pipe to the house, and that source provides water for the dishwasher, tub, sink, washing machine, toilet, fish tank, and water filter on the front of your fridge. And there’s only one drain from your house, too! How can you be sure what’s in the water you’re using?

In our live Science Camp Workshops during the summer, we let the kids bring in their own samples which usually includes a blenderized version of leftovers from dinner, plant trimmings, coffee grounds, and dirt. It’s quite a smelly class once everyone cracks open their samples!

**The How and Why Explanation** There are several steps to understand as we go along:

- Aeration: Aerate water to release the trapped gas. You do this in the experiment by pouring the water from one cup to another.
- Coagulation: Alum collects small dirt particles, forming larger, sticky particles called floc.
- Sedimentation: The larger floc particles settle to the bottom of the cup.
- Filtration: The smaller floc particles are trapped in the layer of sand and cotton.
- Disinfection: A small amount of disinfectant is added to kill the remaining bacteria. This is for informational purposes only — we won’t be doing it in this experiment.

**Questions to Ask** When you’ve worked through most of the experiments ask your kids these questions and see how they do:

1. What is the alum used for in the water filtration experiment? (a) to adjust the pH (b) to form floc (c) to float to the top (d) to purify the sample
2. What does the activated carbon do? (a) turns the cotton balls black (b) sinks the floc (c) adjusts the pH (d) adds to the filtering power of the cotton (e) none of the above (f) all of the above
3. Draw a sketch of your filter, labeling the different layers.