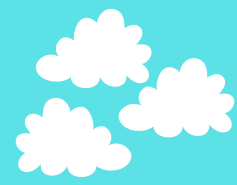


Crud Catchers



This activity is a fun way to introduce citizen science to kids, by allowing them to set up their own experiment to monitor air quality around their home. Crud catchers are simply plates that have a thin layer of petroleum jelly (Vaseline) on them. The jelly will act as a glue and trap particles to the plate. More particles equals dirtier air.

A note about air quality education:

Air pollution is linked to serious environmental and human health effects. It's important to educate kids about these topics without scaring them. For younger students, when we talk about air pollution we normally say that it can make you sneeze or cough, or it can make it hard for people with asthma to breathe. For older kids, you may feel more comfortable telling them that air pollution is linked to cancer, respiratory disease, and heart disease.

Supplies:

- Sturdy paper plates
- String
- Scissors
- Vaseline/petroleum jelly

Step 1: Introduce Particulate Matter

Have you ever seen a beam of light shine into a dark room and noticed little bits of stuff floating around in the air? Particulate matter, or PM, is a type of air pollutant common to southwestern PA. Essentially PM is any solid or liquid that is floating in the air. This can come from natural sources, like pollen, mold, or soot, or human made sources like vehicles, factories, and anywhere else fossil fuels are burned.

- When we breathe, larger particles get stuck in our nose hairs and mucus, and we sneeze or cough them out.
- Smaller particles can travel deeper into our lungs and even enter our bloodstream.
- PM is linked to negative health effects such as asthma (as well as cancers, birth defects, and heart disease).

Step 2: Design the Experiment

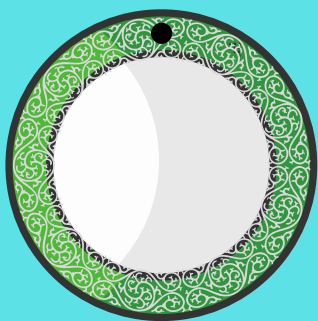
Making crud catchers is a way to test the air around you to see how many of the larger particles you can collect (and smaller ones too, but you'd need a microscope to see them). The more particles collected, the dirtier the air is around your home.

Think about your house. Do you live near a busy road? Do you have a dusty driveway? Do you have an old carpet? Find a few spots that you think will have the most particles, and a few spots that you think will have the least particles. Make a numbered list and rank your spots from cleanest to dirtiest.

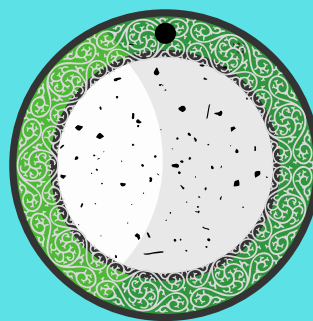
Step 3: Make the Crud Catchers

- Number your plates so that you have the same amount as the list you've made. You'll want to hang the plate that's labeled #1 in the spot that's ranked #1, etc, so that you'll know where each plate came from later.
- To make a crud catcher, poke a hole near the edge of a plate. Smear a light coating of Vaseline onto the plate. Use the string to tie it to a sign post, tree, or whatever you find available at each location.
- Leave the crud catchers out for a few days. The longer you leave them out, the more crud you will collect. They work best if they don't get rained on, as it may wash away some of the particles.

Before



After



Step 4: Collecting the Crud Catchers

- After a few days, go around and collect your crud catchers. Try to carry them in such a way that the area where the Vaseline is untouched.
- Lay them on a flat surface so that the number on the back doesn't show. Mix them up so that you don't know which plate came from which location.
- Arrange the plates from cleanest to dirtiest. You may need to have a debate until everyone agrees with your ranking.
- One by one flip the plates over. If your original guess was correct, the plates will be in numerical order.

Step 5: Discuss the Results

Try to answer some of the following questions:

- Was your original ranking correct?
- If your observed ranking did not match up with your original guess, what factors may have played a role that you didn't think about before?
- Were there any locations that were surprisingly clean or dirty?
- If you did this experiment again, what other locations might you try?

