4th & 5th Grade NWCAA Presentation

(1 hour)

Outline:
• Introduction
• What do we know about air already?
• Pollution

Props: socks, air filters, candle and plate, acid rain pictures, Prescription for Air Care video, Jeopardy game (4th), Bingo (5th)

SCRIPT

Introduction:
Hello, my name is _______________. I am here today on behalf of the Northwest Clean Air Agency. NWCAA helps protect and improve the quality of air for people living in our area. (Optional: How many of you have heard of the Environmental Protection Agency? You may have heard it called the EPA. Well, that organization is responsible for creating environmental laws for the entire country.) NWCAA is in charge of the air quality in Skagit, Whatcom and Island Counties. With NWCAA I get to speak with students all over our area about what we can all do to help keep the air clean.

Most of the time our air looks like it is clean. Take a look outside. What is in the air? The air is made up of the following components: (Useful information, but sometimes too confusing, I don't usually mention unless someone asks)
• 78% Nitrogen
• 21% Oxygen
• 1% mixture of argon, carbon dioxide and small amounts of other gases
What do we need from the air? We breathe oxygen and breathe out carbon dioxide. Trees do the opposite. They absorb carbon dioxide and replenish oxygen.

What is pollution? Can you see it? Sometimes you can, if you see smoke coming from a truck, a factory, or a chimney. Or if it is in the sky in the form of smog. Can you smell it? Let's brainstorm a list of what makes pollution. (Cars, buses, fires, factories, burn barrels, lawnmowers, trains, airplanes, volcanoes, forest fires) Good, and all those things are around us. How many of you think automobiles and buses make the most pollution? (Continue taking a poll of the level of pollution from each of the sources. Once students have cast their votes, show them the pie graph of the sources of pollution in Washington State.) Many people think that factories make the most pollution, why don't they make the most pollution anymore? In the old days they used to be able to make as much pollution as they wanted to. But today there are laws to help factories keep clean. NWCAA works with factories to put filters on their smokestacks and find other ways to reduce their pollution. Sometimes if a
factory releases too much pollution then they have to pay a fine. NWCAA enforces other laws too, for example, the law that says we can't burn garbage. Why do you think that law is enforced? Imagine if everyone in a city burned their garbage, would you want to live there? It is now also illegal to burn in burn barrels.

Let's take a look at the other pollutants made by humans because they are the ones that we can do something about. Many of you told me that you can't always see pollution and that is true. Let’s try something. You’ve probably all seen a candle burning. Do you think there is anything other than the flame coming out of the candle once it’s lit? (No, Yes) Presenter lights candle and then holds a white, flame-proof plate over it to demonstrate that there is actually smoke coming from the candle. The plate will turn black as evidence.

As you can see, there is more pollution than you may have thought. Your nose is able to filter out some of that pollution before it reaches your lungs. But if the air is too polluted what will happen? Air pollution can effect humans the same way that allergies do. They can make your eyes, nose and throat itchy. Raise your hand if you know anyone with asthma. Asthma makes it hard for a person to breathe, especially during activity or exercise. A lot more people have asthma today than ever before. Air pollution has similar long-term effects to those of smoking cigarettes. What can cigarette smoking do to a healthy person? Yep, it can cause lung cancer, heart disease, emphysema and other breathing disorders. In some cities that are known for air pollution just living in the city, and breathing the polluted air, is the same as smoking a pack of cigarettes a day. What cities are famous for their air pollution? Seattle, Los Angeles, New York, Mexico City, Beijing. Los Angeles has a layer of brown smog that hangs over the city. It is because the city is in a valley. What do you think would help clean out the air? We have a lot of this in Washington. Yep, rain and wind. If students are interested show Acid Rain pictures.

Another thing that NWCAA does is to test the air to see how it's doing, is it good/bad/or just okay? Now you know that you can see the smoke from a fireplace or the exhaust from a car. But do those things just disappear as they rise up into the air? We saw with the candle that that is not true. So if this pollution is in the air is it possible that we may be breathing it in? NWCAA tests the air by using large machines that are placed on top of buildings. These machines are able to draw air in, like a vacuum, and take a sample of it. The machines have filters like these (Show sample filter) Now the air will pass through because it is a gas, but what about the solids like the smoke from the candle? Will they pass through the filter? (No) This is a filter that was in place for 24 hours on a typical day in ___________. (Show 2nd filter sample) This is pollution from all those sources we discussed earlier. This is a filter (Show 3rd filter sample) after 24 hours on a day that there was a heavy amount of pollution. The black that you see on this filter is called fine particulate matter. It is made up of very small pieces of ash, and dust from smoke and exhaust. This substance is so small that you wouldn’t be able to see a single speck with out using a microscope. The pieces are about 10x smaller than the width of a human hair. It is hard to imagine something that small. So if it so little, why
do you think NWCAA spends so much time finding how much of it is in the air? (Students usually have a good idea of why this is important.) Because fine particulate pollution is so small it can enter our lungs and become lodged very deeply down. Why would the filter from Seattle be so much darker? More people, more cars, more pollution. Why would two filters in two different locations in Bellingham collect different amounts of pollution? It depends on where they are near the highway, near a factory, etc.

**Video:** “Prescription for Air Care”. Let’s take a look at a kind of kooky video about air pollution so we can start talking about solutions to keep our air clean. I show this video in 4th grade and sometimes in 5th. After the movie discuss the solutions. Brainstorm a list. Have each student come up with one thing. Be creative!

**Games:** Now that you all know so much about air pollution and different ways to help prevent it, let’s put your knowledge to the test.
- Jeopardy game (4th grade)
- Bingo game (5th grade)

**Experiment (This activity can be used effectively in grades 3-5):** Do our choices about air pollution affect other people? We need one brave volunteer to come up and make some pollution. We’ll pretend that this spray bottle is the pollution. Don't worry it is totally safe, it just smells like (oranges or vanilla). Let's pretend that this is someone burning garbage. If you burn garbage will it make smoke? Yes! (You can talk about why burning garbage is against the law, but go easy on this topic. Sometimes it’s a bit scary for 2nd graders. Someone will probably say "But my grandma burns her garbage, will she go to jail?)

Everyone is to stay seated until they can smell the spray and then they can stand up at their desk. Have the volunteer spray, count to 10, and spray again. The people closest to the "burning garbage" smell it first. Does air just stay in one place? What moves the air around outside? Wind, you got it! Let’s pretend we are the wind. Use your arms to make wind. Have the volunteer spray again. Pretty soon everyone in the class will be standing. Wow, so everyone is affected by our choices. We can make a big difference when we make the right choices to keep our air clean.

**Conclusion & Packet:** Show take home materials. You can show these to your families and share what you have learned today about keeping our air clean. If you ever have a question about air quality who ya gonna call? NWCAA!