

6. Adventures in Climate and Health: Nature's Air Guardians: Outdoor Adventures in Air Quality

Student Objectives:

- The students will be able to explain the concept of air quality and its impact on health and the environment.
- The students will be able to use their senses to predict the outdoor air quality.
- The students will create an air quality chart to document and monitor changes in air quality over time.

Materials Required:

Poster strips to make an air quality chart (blue, yellow, orange, red, purple), markers, check off sheet for informal outdoor air quality assessment, the book *Why Is Coco Orange?*

Key Vocabulary:

Asthma: a chronic condition that affects the airways in the lungs

Asthma action plan: a plan developed with your doctor to help control your asthma

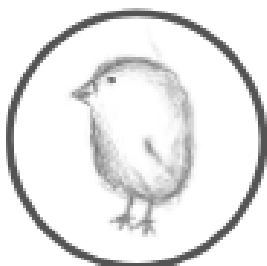
Camouflage: to hide or disguise a person, animal, or object

Communicate: Sending and receiving messages

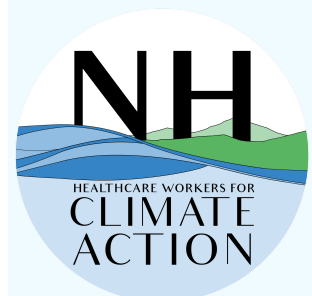
Inhaler: a device that gets medicine directly into a persons' lungs

Ozone: a gas in Earth's atmosphere

pollutant: a substance that pollutes the environment



**Climate and Health Initiative
for Children
in Kearsarge & Sunapee**



Background Information:

General Recommendations for Children: Actions to Take on Poor Air Quality Days Regular exercise is good for kids. Keep them active but know when to make simple changes. Check the AQI forecast each day when you are planning children's outdoor activities. When the forecast is "orange" or "red," adjust when and how kids exercise. In general, short periods outside, such as recess, present less risk for children.

EPA calculates the AQI for five major air pollutants: ground level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country.

When talking to children about air quality and health, use easy to understand words and messaging that is informative and not frightening. You could say something to the effect of, air quality refers to how clean or dirty the air around us is. It is important to breathe in clean air because the air we breathe can affect our health. When the air is polluted, it means that there are harmful substances in it. These substances can come from things like busses, smoke, dust or pollen. Breathing in polluted air can cause problems for our bodies. It can make it harder to breathe, give us coughs or sore throats, and even make us sick. Some people, like those with asthma or allergies, are more sensitive to bad air quality and can have even more serious health problems. Knowing what the quality of the air is will help us know what we should do to make sure we aren't breathing in dirty air.

For outdoor activities:

- Have kids take it a little easier when the air is polluted, so they breathe less pollution. For example, reduce activities that involve running or take more frequent breaks.
- If there is flexibility in scheduling an outdoor activity, change it to a time when air quality is better. In some areas, air quality is better early in the day.
- For children with asthma, follow their asthma action plan. If the child has a quick relief inhaler, be sure it is always handy.
- Make indoor space available, as needed, for children who complain of difficulty breathing, or who have heart or lung disease (such as asthma).

Additional recommendations for sporting events and athletic practice and training:

- Increase rest breaks and substitutions to lower breathing rates.
- In athletic practices, include activities that involve walking rather than running. Always decrease other exposures to unhealthy air:
- Choose areas away from busy streets for children to walk, exercise or play.
- Make sure children avoid standing near vehicles that are idling.



Resources:

School Flag Program:

The Air Quality Flag Program helps children, parents, school personnel and the community be aware of daily air quality conditions using colored flags. Each day, a flag is raised in front of participating schools that signals the level of air pollution for that day. By checking local school flagpoles and comparing the colored flags to the Air Quality Index (AQI), members of the school and the surrounding community can tell what the daily air quality is, and adjust their activities to reduce their exposure to air pollution. The flags are color-coded according to the official AQI. Green indicates good air quality, yellow is moderate, orange means unhealthy for sensitive groups (like children and those with asthma), red signals unhealthy air for everyone, and purple is very unhealthy for everyone. More information about the Air Quality Flag Program can be found at www.airnow.gov/flag.

Asthma Resources for Schools:

EPA's guide *Managing Asthma in the School Environment* includes information to help parents and school staff identify and reduce environmental asthma triggers commonly found in schools. Visit www.epa.gov/iaq-schools/managing-asthma-school-environment. Every member of the school team has a role to play to assist students with asthma. *Managing Asthma: A Guide for Schools* can help you develop an asthma-friendly program in your school. You will be able to brief school staff including teachers and coaches on their special role in making your school asthma-friendly. Visit <https://www.nhlbi.nih.gov/health-topics/publications-and-resources> to find the guide and more school asthma resources.

Parent Information - Help Your Child Have Fewer Asthma Episodes:

- Work with your child's doctor to identify your child's asthma triggers.
- Take steps to reduce your child's exposure to asthma triggers.
- Work with your child's doctor to come up with a written action plan for managing your child's asthma.
- Follow the asthma action plan. Keep a quick relief inhaler close by...at home, at school, everywhere.
- Share copies of your child's asthma action plan with your child's school, teachers, babysitters, and family members.
- Talk about your child's asthma action plan with people in your child's life so that, in case of an asthma episode, they will know what to do.
- Notice how often your child has asthma symptoms like coughing, chest tightness, wheezing and trouble breathing. Ask for reports of asthma symptoms at school or child care.
- Remind your children to wash their hands to reduce the spread of colds.

For more information on managing your child's asthma, visit www.epa.gov/asthma or www.noattacks.org.

Procedure:

1. Fill out the K and W on the KWL chart.
2. Talk with the students about the air they breathe and its impact on their health. Ask questions like:
 - a. “What do you think air quality means?”
 - b. “What do you think would impact air quality?”
 - c. “What do you think air quality does to our health?”d. Then tell the students that the next activity requires them to listen to the story, "Why Is Coco Orange?": https://www.airnow.gov/sites/default/files/2020-01/why-is-coco-orange-november-2019_1.pdf
 - e. After the story they will play 10 question freeze.
3. Hold up the book so students can see the pages as you read them the story. As you read the story, point out different things for the students to focus on, such as, “How does Coco look now and why?” Once you have finished reading the story, ask the students the following questions and while they walk in place. Ask them to freeze when they hear the correct response. Provide three options to each question and include some silly responses, see the examples below. The first answer after the question is the correct answer, mix it up when you present them to the students.
 - a. No one should play outside when the air quality color is: Purple, teal, blush.
 - b. If the air quality color is orange, red, or worse, do you have to stay inside all day?
No, but take more breaks, yes, and watch cartoons, yes, and eat hotdogs.
 - c. If the air quality word for the day is “very clean” what is the air quality color? Green, banana, grassy
 - d. The air quality color red means the air outside is: Dirty, fabulous, wet
 - e. Asthma makes it hard to: a) Breathe, eat ice-cream, do homework.
 - f. What time of day would there probably be less ozone? Morning, tea time, nap time.
 - g. What time of day would there probably be the most ozone? Afternoon, time for pizza, time for daydreaming.
 - h. If you’re playing outside when the air quality color is orange or red and you find it hard to breathe you should: Stop and tell your parents or teachers. Find Coco and ask him what to do. Use your magic wand to change the air quality to blue.
 - i. Can you see dirty air? Sometimes, but not always. Air can be dirty even when it looks clean. For example, you cannot see ozone. Yes, I have a superpower and can see everything. No, I don’t see anything dirty, not even my room.
 - j. Why is it more of a problem for children to breathe dirty air? Your bodies and lungs are still growing, because they don’t like it, because they don’t want to

Review the correct answers before going on to the next activity.

3. Air quality impacts our health, and sometimes our senses will give us an idea of what the air quality is. For this activity, we are going to use our senses to informally assess the outdoor air quality. Give each student a marker and check off sheet for sight, smell, sound, and touch. Ask students to:

Look around and check off sight if they see any visible changes, such as haze, smoke, or dust and note what they see.

Take a deep breath and try to identify any unusual or strong odors in the air. If they do, check off smell and note what they smell.

Listen for any sounds related to air quality, such as car exhaust or construction noises. If they hear any, check off sound and note what they heard.

Pay attention to how the air feels on their skin- warm, cool, humid, or dry, and their body's reaction to the environment (itchy, sneezy, watery eyes, cough.) If they feel or react in any way, they should check off touch and make note of what they felt.

Students will report back and use their results to predict what color the air quality is on the air quality chart. The Air Quality Index will be checked and compared to their prediction. Is their predication accurate? Why or why not? What else is factored into the air quality index that isn't captured by our senses?

<https://www.airnow.gov/aqi/aqi-basics/>

4. Using strips of colored poster paper, students and you will create an Air Quality Chart that can be changed by moving the colors to reflect the current rating. While they are creating their own air quality chart, review what each color means and the importance of monitoring and understanding air quality as a guide to their outdoor activities. Give your Air Quality Chart to the class, and ask a teacher to use it to display the Air Quality of the day using the AQI app. Suggest a student volunteer could adjust the chart to reflect the air quality and display it for the class.