

Air Quality and Lung Health – Introduction to AQI

Lesson Overview

The purpose of this lesson is to introduce students in Grades K-6 (ages 5-12) to air pollution, the air quality index (AQI), and how air pollution affects your health and lungs through visual activities, discussion, and games.

Note: this lesson plan was developed when working with an Atlanta community-based youth club where students aged 5-12 participated in an environment club lesson for 1 hour after school. Please adapt this lesson plan for your context (e.g., the ages and duration).

Full Materials List

- | | | |
|--|---|---|
| <input type="checkbox"/> 2 large pictures of Atlanta or city of choice (1 with clean air, 1 with poor air quality) | <input type="checkbox"/> Large sticky notes/pad | <input type="checkbox"/> Markers |
| <input type="checkbox"/> Air pollution visual Cause & Effect picture cards | <input type="checkbox"/> AQI Handouts | <input type="checkbox"/> Green, yellow, and red notecards |
| <input type="checkbox"/> PE dodgeballs and/or ping pong balls | <input type="checkbox"/> Brush or Comb | <input type="checkbox"/> Lung and cilia diagram |

Handout/Print Sheets and Picture Links

- | | | |
|--|--|--|
| <input type="checkbox"/> Clean Air and Poor Air quality in Atlanta Images + Lung & Cilia Diagram | <input type="checkbox"/> Air Pollution Visual cards Cause and Effect | <input type="checkbox"/> EPA AQI Coloring Page |
| | | <input type="checkbox"/> Air Quality Handout |

Set-Up for Lesson – Opening Activity

Set-Up for Lesson – Opening Activity	Time	Materials Needed
<p>Today we are going to focus on the air we breathe:</p> <ol style="list-style-type: none"> Let's start off by looking at 2 pictures of Atlanta! (<i>Show the clean air quality picture first!</i>) Discussion: What do you notice about the first picture of the city? <i>Next, show the bad air quality picture.</i> Discussion: How is this picture different? 	10 mins	<input type="checkbox"/> 2 pictures of Atlanta or city of choice (1 with clean air, 1 depicting pollution/smog) <input type="checkbox"/> Big Sticky Notes/ writing pad <input type="checkbox"/> Markers

<p>5. <i>On a big sticky note, write causes on one side and health effects on the other.</i></p> <p>6. Discussion: What could be causing the air to look like this?</p> <p>a. <i>Write their responses under “causes” on the big sticky note</i> [for example: Cars, factories/power plants, natural fires, wildfires, planes, other forms of transportation]</p> <p>7. Discussion: How could this possibly impact our health?</p> <p>a. <i>Write their responses under “health effects” on the big sticky note</i> [for example: Hard to breathe, asthma, damage to our lungs (especially small particles we cannot see that can get deep into our lungs), damage to our hearts, cough, etc.]</p>		<p><input type="checkbox"/> Air Pollution Visual Cause and Effect cards for examples</p>
Introduction to AQI Lesson	Time	Materials Needed
<p>1. Sometimes it is hard to tell whether the air quality is good or bad to breathe in. The air might not look as bad as our picture, but it could still not be great to breathe in.</p> <p>2. How are we able to tell? There is a warning system with specific colors that help us to know when it is safe to play outside! This is called the Air Quality Index</p> <p>3. Green means the air is safe to breathe! Yellow is still safe for most people, unless you have a specific lung or heart problem. Orange means okay but not great—older people and children shouldn’t spend much time outside. Red & purple means it is not great so maybe consider staying inside or only being outside for a short amount of time. And sometimes air quality is so bad that they’ve added maroon! This might be caused by wildfires or another emergency, and it is best to stay inside.</p> <p>4. Discussion: Do red, yellow, and green remind you of anything else?</p> <p>5. <i>Pass out handouts and reemphasize the colors and what they mean! You can find the color for the day online or through the weather app on a phone or iPad. *Show students how to find this through the weather app on a printed handout or iPad*</i></p>	<p>10 mins</p>	<p><input type="checkbox"/> EPA AQI Coloring Page</p> <p><input type="checkbox"/> Air Quality Handout</p> <p><input type="checkbox"/> Tablet, phone, or other device connected to the internet with a weather app installed</p>

Activity #1 – AQI Level Cards	Time	Materials Needed
<p>1. Let’s practice and learn our air quality colors! We are going to focus on three colors: Green— good to go outside, Orange—try not to go outside as much, Red – consider playing indoors instead.</p> <p>2. Directions: If I hold up a green notecard you can stand up and dance in place since this is good air quality! If I hold up an Orange notecard stand in place since the air quality is okay but not the best! Lastly, if I hold up a red notecard, sit down in your seat. This means that the air is not safe to breathe in and it’s best to stay indoors.</p> <p><i>Do this for a few rounds until it seems like they are getting the hang of it.</i></p>	10 mins	<input type="checkbox"/> Green, Orange, and Red notecards
Activity #2 – Cilia Tunnel Time!	Time	Materials Needed
<p>Now that we all understand what the AQI colors mean, let’s talk about how different levels can affect our lungs.</p> <ol style="list-style-type: none"> Discussion: Who can tell me how we breathe in air? We breathe air in through our nose and mouth. Inside our airways are tiny hairs called cilia. <i>*Show picture of diagram & point while explaining this!</i> Cilia help protect our lungs by stopping bad particles in the air before they reach the lungs. <i>*Show brush and say this is what cilia are like but even smaller</i> For the next activity, you are all going to act as the cilia and try to keep pollution out of the lungs! <p>Setup</p> <ol style="list-style-type: none"> Have the kids sit in two lines facing each other, forming a “tunnel”. Explain that the tunnel represents the throat, and the space at the end represents the lungs. Teachers and volunteers will stand at the start of the tunnel (this is where air enters the nose or the mouth) and hold the dodge balls which represent air pollution. Another teacher or volunteer will stand at the back of the tunnel to represent the lungs. <p>Directions</p> <ol style="list-style-type: none"> Kids can use their hands only to try to stop the pollution. They must stay seated and cannot move from a crisscross position. 	20 mins	<input type="checkbox"/> Lung and cilia diagram (page 3 here) <input type="checkbox"/> Brush or Comb <input type="checkbox"/> PE dodge balls <input type="checkbox"/> Ping pong balls or an alternative for the maroon index

<p>9. Volunteers will roll balls through the tunnel based on the AQI level called out (see below).</p> <p>10. If all the balls are stopped, the cilia protected the lungs. If balls reach the end of the tunnel, the pollution makes it to the lungs.</p> <p>AQI Levels</p> <p>11. Call out an AQI level and roll the corresponding number of balls:</p> <ul style="list-style-type: none"> • Green: 1 (or 0–1) • Yellow: 2 • Orange: 3 • Red: 4 • Purple: 5 • Maroon: 6 (can also use ping pong balls) <i>(Adjust the number if it is too easy or too difficult.)</i> <p>Asthma Modification</p> <p>18. Explain that for people with asthma, cilia do not work as well and have to work harder.</p> <p>19. Now pretend the lungs have asthma. Students may use ONLY ONE arm.</p> <p>Repeat a few rounds with different AQI levels.</p>		
<p>Closing</p>	<p>Time</p>	<p>Materials Needed</p>
<p>1. Discussion: Ask students what they noticed about how many balls reached the lungs.</p> <p>2. Explain that worse air quality means more pollution particles, which can make it harder for cilia to protect lungs—especially lungs with asthma—to breathe.</p> <p>This is why it is important to know the AQI and how to protect your lungs.</p>	<p>5 mins</p>	<p><input type="checkbox"/> N/A</p>
<p>Resources</p>		
<p>Morteza. (n.d.). <i>Editable Daily Lesson Plan Template Google Docs, Word & PDF</i>. TPT. https://www.teacherspayteachers.com/Product/Editable-Daily-Lesson-Plan-Template-Google-Docs-Word-PDF-14246850</p> <p>Suggestions for Classroom Discussion on Air Quality</p> <p>epa_general_coloring_book_final.pdf</p>		

[Air Quality and Outdoor Activity Guidance for Schools, EPA-456/F-14-003, August 2014](#)

[Particle Pollution Activity - Paper Wad Game](#)

[Asthma and Outdoor Air Pollution, EPA-452-F-04-002](#)

[Environmental triggers for Asthma](#)

[reducing-asthma-triggers.pdf](#)