

Air Quality

Distance Learning – Elementary School Activity

Clair And Cam: Preventing Air Pollution by Saving Money and Driving Less

Brief Description: Students will make ads communicating specific ways of preventing air pollution. Depending on the availability of supplies, technology and time, students can produce ads by making posters, brochures or skits, google slides, PowerPoints, or anything the teach allows and can be submitted on your platform.

Specific Instructions: This activity includes a reading selection (How can I prevent air pollution) and then the students would create an advertisement for Clair and Cam and their message. The ad can be created online through a power point, google slide, through the creation of a song or a poem. Students could even consider drawing their ad and mailing it into you. The goal is for the students to create an ad that provides the reader of that ad a practical and helpful tip on how they could help reduce air pollution here in North Carolina.

The complete activity and background information is provided in this summary teachers pdf. The activity is free and can be modified anyway you like.

Standards Correlation:

Grade 3 Social Studies-3.C&G.2.2: Exemplify how citizens contribute to the well-being of the community's natural environment.

Grade 3 Healthful Living-3.PCH.1: Understand wellness, disease prevention, and recognition of symptoms.

Grade 4 Science-4.L.1.1, 4.L.1.3: Give examples of changes in an organism's environment that are beneficial to it and some that are harmful

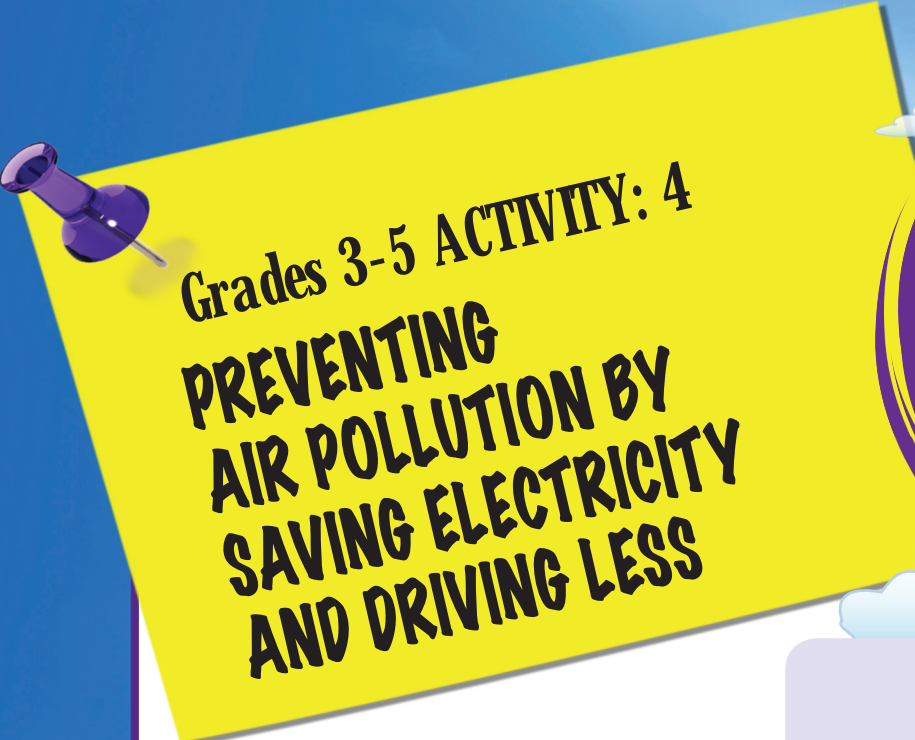
-Explain how humans can adapt their behavior to live in changing habitats (e.g., recycling wastes, establishing rain gardens, planting trees and shrubs to prevent flooding and erosion).

Grade 4 Social Studies-4.G.1.2: Explain the impact that human activity has on the availability of natural resources in North Carolina.

For More Information: The Division of Air Quality has many elementary activities all aligned to NC standards. For the full elementary Claire and Cam curriculum, click [here](#).

We'd love to hear from you! Give us feedback [here](#) so we can better serve you and your students.





Grades 3-5 ACTIVITY: 4
PREVENTING
AIR POLLUTION BY
SAVING ELECTRICITY
AND DRIVING LESS



SUMMARY

Students will make ads communicating specific ways of preventing air pollution. Depending on the availability of supplies, technology and time, students can produce ads by making posters, brochures or skits (which could be videotaped).

MATERIALS

Line drawings of Clair and CAM (provided)

Art supplies to make posters, OR

Supplies to make brochures (paper, colored pencils), OR

Equipment to make videos

ESSENTIAL QUESTIONS

1. Where does air pollution come from?
2. How can we help prevent air pollution?
3. Why should we prevent air pollution?

NC Essential Standards

Grade 3 Social Studies

3.C&G.2.2

Grade 3 Healthful Living

3.PCH.1

Grade 4 Science

4.L.1.1

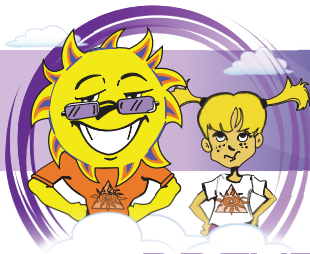
4.L.1.3

Grade 4 Social Studies

4.G.1.2

Time Needed

Varies depending on scope of activity.



PREVENTING AIR POLLUTION BY SAVING ELECTRICITY AND DRIVING LESS

USING “AIR QUALITY BASICS FOR TEACHERS,” DISCUSS WITH THE CLASS:

- ✓ Sources of air pollution
- ✓ Ways to prevent air pollution and
- ✓ Some of the health effects of air pollution.

Air Pollution Prevention Tips

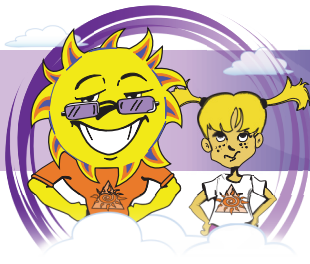
Drive less:

- Bike or walk, when it's safe to do so.
- Carpool.
- Ride the school bus, instead of driving.
- Turn off the car: park and go inside, instead of using the drive-through.

Save electricity at home and at school:

- Turn off lights, computers and TVs when not in use.
- Use compact fluorescent light bulbs (the ones that look like spirals) or LED bulbs, because they use less electricity and last longer.
- Recycle. (It takes less energy to make paper from paper than to make paper from trees.)
- Use less hot water.
- Don't overheat or overcool your house.





CFL bulbs contain a tiny amount of mercury—no more than the size of the tip of a ball point pen. Nonetheless, once burned out, CFL bulbs should be disposed of safely, not in the trash can. Most home improvement stores and some municipalities offer light bulb recycling programs, many of which require the bulbs not be broken.



CFL bulb
and LEDs

Don't make smoke!

- Don't burn leaves or trash. Burning trash is illegal in North Carolina. "If you can't grow it, you can't burn it." (To learn more visit: <http://www.ncair.org/enf/openburn/education>)
- Limit use of fireplaces and charcoal grills.

DESIGNING ADS WITH CLAIR AND CAM

Have students work individually or in small groups. Each individual or group should design an ad consisting of either a:

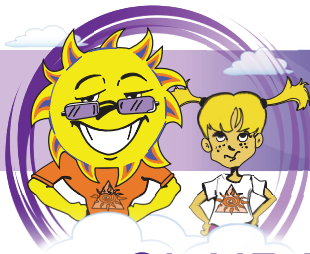
- Poster, plus a class presentation
- Brochure or
- Skit.

Encourage students to use the characters of Clair and CAM in the ads. Each ad should convey the following information:

- ✓ One or more specific tips for preventing pollution.
- ✓ Information about where air pollution comes from (focusing on cars and using electricity).
- ✓ Information about why we should prevent air pollution, focusing on the health problems it creates.

Posters are usually most effective when they aim to get across one simple idea. Students doing a poster should limit the information on the poster to ONE tip for preventing air pollution. They should cover the other information in the class presentation.

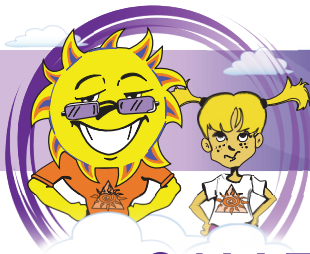




CLAIR THE CLEAN AIR EXPLORER

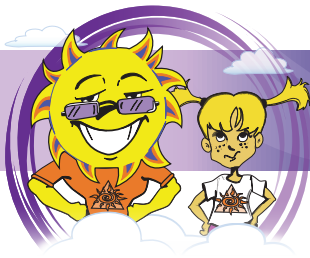


GO CLAIR
THE CLEAN AIR
EXPLORER



CAM THE CLEAN AIR EXPLORER





WHAT IS AIR POLLUTION?

Air pollution refers to substances in the air (visible or invisible particles or gas) that cause health problems for people, animals and plants. It can reduce the yield of crops, discolor and damage buildings and outdoor sculptures and reduce visibility, impairing, for example, the view from scenic overlooks.

There are six air pollutants that have been designated as “criteria pollutants” by the US Environmental Protection Agency (EPA) including: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The EPA sets standards to protect health and welfare for each of these pollutants and require states to monitor for adherence. Two of the most problematic air pollutants in North Carolina are ozone and particulate matter (PM), also referred to as particle pollution. Ozone occurs both in the Earth's upper atmosphere and at ground level. Ozone can be good or bad, depending on where it is found:

- Good Ozone: Ozone occurs naturally in the Earth's upper atmosphere, 6 to 30 miles above the Earth's surface, where it forms a protective layer that shields us from the sun's harmful ultraviolet rays.
- Bad Ozone. In the Earth's lower atmosphere, near ground level (“ground level ozone”). Ozone is the by-product of a chemical reaction between nitrogen oxide (NO_x) and volatile organic compounds (VOCs) that occurs in the presence of sunlight.

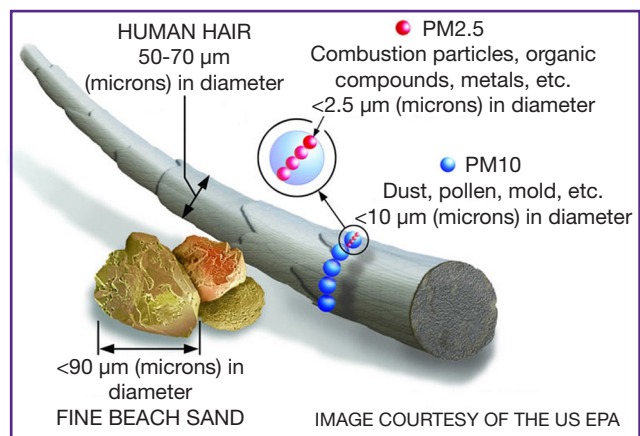
Remember, “Good up high, bad nearby.”

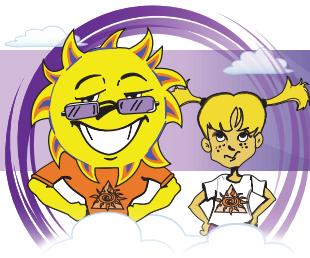
Sources of ground level ozone include: cars and trucks, power plants, industrial boilers, refineries, chemical plants and other sources.

- Particulate matter is a combination of solids and liquid droplets. Those less than 10 micrometers in diameter (PM₁₀) are so small that they can get into the lungs, potentially causing serious health problems. Ten micrometers is smaller than the width of a single human hair.
- Fine particles (PM_{2.5}): Particles less than 2.5 micrometers in diameter are called “fine” particles. These particles are so small they can be detected only with an electron microscope.
- Coarse dust particles: Particles between 2.5 and 10 micrometers in diameter are referred to as “coarse.”

Sources of PM_{2.5} include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning and some industrial processes. Sources of coarse particles include crushing or grinding operations and dust stirred up by vehicles traveling on roads.

[Source, EPA]





WHAT HEALTH PROBLEMS DOES AIR POLLUTION CAUSE?

Below is a list of some of the symptoms that appear in humans as a result of ozone and particle pollution. The majority of the symptoms affect the respiratory system.

- Burning eyes
- Coughing
- Throat irritation
- Tightness in the chest
- Rapid, shallow breathing
- Worsening of asthma
- Worsening of emphysema
- Bronchitis

Prolonged exposure to air pollution may result in:

- Permanent lung damage
- Increased susceptibility to respiratory infections
- Heart attacks, strokes or arrhythmia among people with heart disease

Children ages birth-18 (whose lungs are still developing) and older adults are at higher risk for health problems when exposed to air pollution, as are people who already have lung conditions, such as asthma, emphysema or chronic bronchitis or heart disease.

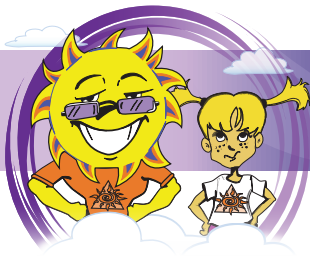
WHAT IS THE AIR QUALITY COLOR CODE?

Air pollution is often, though not always, invisible. For this reason, there is a color-coded air quality forecast each day to let the public know what sort of air quality to expect.

Air Quality Index (AQI Values) <i>When the AQI is in this range:</i>	Levels of Health Concern <i>...air quality conditions are:</i>	Colors <i>..as symbolized by this color:</i>
0 - 50	Good	Green
51 - 100	Moderate	Yellow
101 - 150	Unhealthy for Sensitive Groups	Orange
151 - 200	Unhealthy	Red
201 - 300	Very Unhealthy	Purple

[Source: airnow.gov]

Fortunately, Code Purple days are very rare. However, many parts of the United States experience one or more Code Red days per year.



HOW DO I USE THE AIR QUALITY FORECAST?

Use the air quality forecast to determine the following:

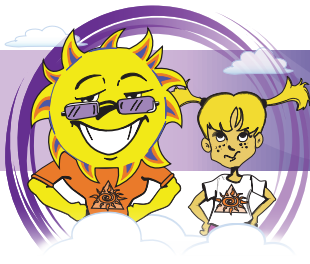
- If it's safe to play outside, or if playing games or exercising indoors is the safer choice.
- How long to play outside.
- What time of day to play outside.
- What kinds of activity to engage in outside.
- What level of intensity of play is safe to engage in outside.
- If special considerations need to be given to students with asthma or other respiratory problems.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	No health effects expected.
Moderate	51 to 100	Unusually sensitive people: consider limiting prolonged or heavy exertion outdoors.
Unhealthy for Sensitive Groups	101 to 150	Children, active people, older adults, and those with heart or lung disease (like asthma): limit prolonged or heavy exertion outdoors.
Unhealthy	151 to 200	Children, active people, older adults, and those with heart or lung disease (like asthma): avoid prolonged or heavy exertion. Everyone else: limit prolonged or heavy exertion outdoors.
Very Unhealthy	201 to 300	Everyone: avoid all exertion outdoors.

[Source: airnow.gov]

WHERE CAN I FIND THE AIR QUALITY FORECAST?

- Triangle Air Awareness: www.triangleairawareness.org
- NC Division of Air Quality's air quality forecasts page: www.ncair.org
- EPA: www.airnow.gov
- EnviroFlash: www.enviroflash.net Receive daily air quality forecasts or alerts (Code Orange forecasts or higher) by e-mail.
- TV: Local meteorologists include the air quality forecast in their weather reports.
- Newspapers: Newspapers publish the air quality forecast on their weather page.



HOW CAN I PREVENT AIR POLLUTION?

1. Drive less.

Cars and trucks are among the largest sources of air pollution in North Carolina. One way to lower the amount of emissions from these vehicles is to drive less. Below are some suggestions for curbing air pollution from your families' car or truck:

- ✓ Use alternative transportation. Walk, run, bike, carpool, vanpool or use mass transit.
- ✓ Turn off your engine when your car is stopped. Idling, or leaving your engine running when your car is stopped, wastes fuel and is harmful to your car. For every two minutes a car is idling, it uses about the same amount of fuel it takes to go about one mile. When you idle, you get zero miles per gallon.

2. Save electricity at home and at school.

The biggest source of electricity in North Carolina is power plants. Many power plants burn fossil fuels, which release a variety of pollutants into the air, including NOx and VOCs.

- ✓ Turn off lights, TVs and computers when not in use.
- ✓ Replace incandescent bulbs with compact fluorescents.
- ✓ Recycle.
- ✓ Take shorter showers to save the energy used to heat water.
- ✓ Set your thermostat a few degrees higher than normal in summer and a few degrees lower in winter.

3. Don't burn outdoors.

Smoke contains particle pollution that worsens air quality.

- ✓ Don't burn leaves or trash.
- ✓ Limit your use of fireplaces and charcoal grills.

4. Spread the word!

You're already doing your part to prevent air pollution by incorporating this curriculum into your lessons. We encourage you and your students to take the lessons you learn through the activities in this book and share them with parents and friends so that we may all take action to prevent air pollution!