

Air Quality Index Kids Website

Teacher's Reference

Clean Air and Dirty Air

On a clear breezy day, the air smells fresh and clean. Clean air is air that has no pollutants (dirt and chemicals) in it. Clean air is good for people to breathe.

On a hot day with no wind, the air can feel heavy and have a bad smell. Once in a while, the air can even make your chest feel tight, or make you cough. Dirt and chemicals that get into the air make the air dirty or polluted. Dirty air is not good for people to breathe.



Dirty Air Can Make You Sick

When the air has some dust, soot or chemicals floating in it, people who are inside probably won't notice it. People who are outside might notice it.



Sometimes people with asthma, like me, feel bad when the air is very dirty.



People with asthma, a disease that can make it hard to breathe, and children who play outside a lot might feel a little strange. When you are active outdoors, for example, when you run and jump a lot, you breathe faster and take in more air. Any pollutants in the air go into your lungs.

When the air is very dirty, almost everyone will notice it. It would be good if we could stop breathing on those days, but of course we can't!

How Can I Tell if the Air is Clean or Dirty?

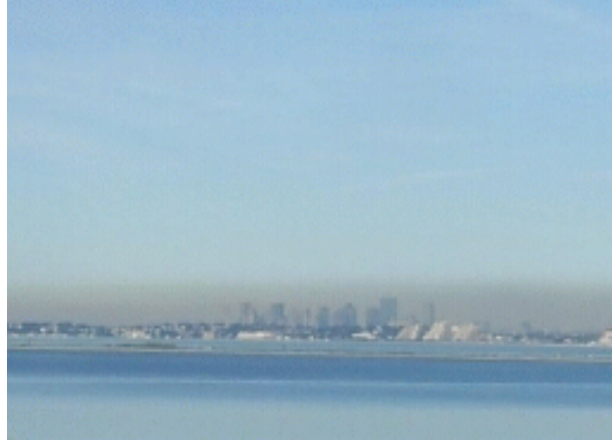
For information about visibility:
<http://www.epa.gov/air/visibility/>

Have you ever been stopped behind a truck or a bus at a traffic light? When it starts up, sometimes a puff of dark smoke comes out of the exhaust pipe.

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Clean Air



Dirty Air or Pollution

At times like that you can see dirty air - it looks hazy and brownish. If your window is open, you might be able to smell the pollution. But sometimes the air can be dirty and you can't see it or smell it. So you need another way to tell if the air is dirty. This is why EPA developed the Air Quality Index, which we will describe in the "What is the AQI?" section.

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For information about the United States Environmental Protection Agency: <http://www.epa.gov/>



The Environmental Protection Agency

The environment is everything around you - the air, the land, and the rivers and oceans. The Environmental Protection Agency (EPA) is a government office that works to keep the air, the land, and the water clean. Clean air, land, and water help keep us healthy. The EPA works with State environmental agencies to keep the air clean. State environmental agencies take samples of the air at more than 1000 places in the United States to see if the air is dirty or clean.

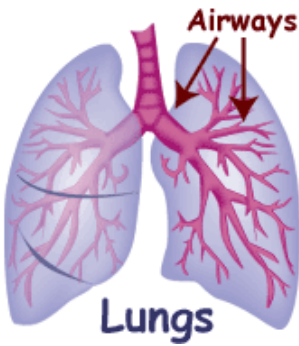
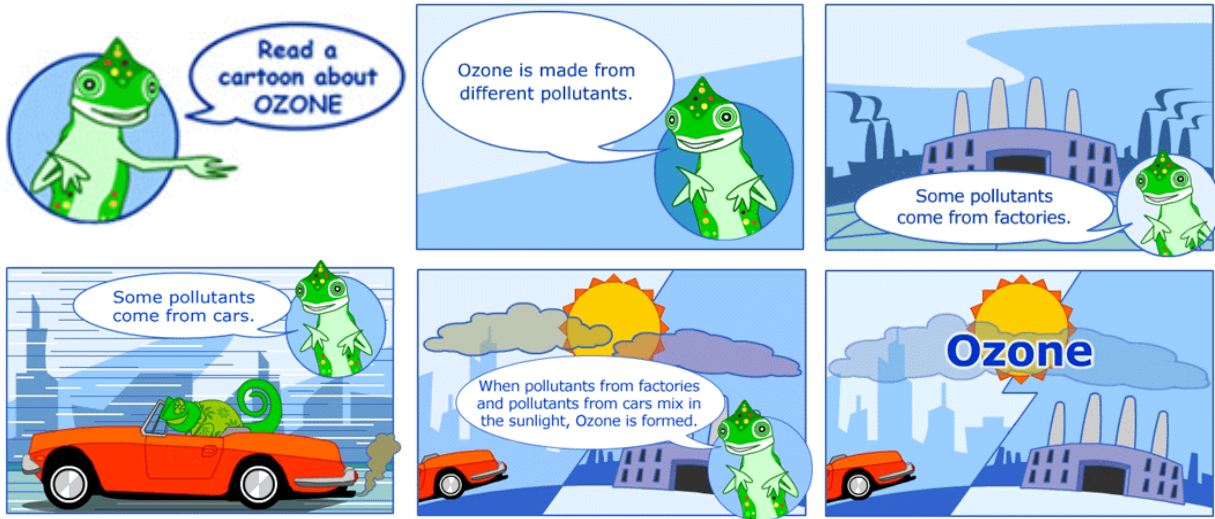
Pollutants

Pollutants are what make the air dirty and cause pollution. Five pollutants are used by the EPA to determine the Air Quality Index (AQI). Two of the pollutants, **Ozone** and **Particulate Matter**, make up most of the air pollution in this country.

Ozone: Ozone can be good or bad. It all depends on where it is. Ozone is good when it is high up in our atmosphere. It protects us from sunburn. Ozone is bad when it is near the ground where we can breathe it in. You can't see ozone in the air. Bad ozone is sometimes called smog. It is formed when chemicals coming out of cars and factories are cooked by the hot sun. Ozone is more of a problem in the summer.

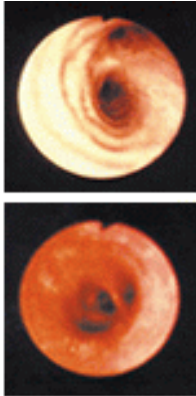
More information about ozone:
<http://www.epa.gov/air/urbanair/ozone/>

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Breathing in ground-level ozone can make you cough. It can also make it harder for you to breathe. Ozone might even make it hurt to take a breath of air. When you breathe in ozone, it can make the lining of your airways red and swollen, like your skin would get with a sunburn.

Information about the health effects of ozone can be found at:
<http://www.epa.gov/airnow/brochure.html>



Inside Airway
 Top: Normal
 Bottom: Red and Swollen

Particles in the Air - Particulate Matter: Have you ever noticed a sunbeam with lots of little specks of dust floating in it? That is particulate matter. Particulate matter is mostly dust and soot so small that it floats in the air. Soot comes from anybody burning anything. When you burn gasoline in your car engine or burn wood in a campfire, soot happens! Dust comes from lots of places, too. When a company's business is to grind things up very small or when someone drives down a dirt road, dust is thrown into the air. Soot and dust make the air look hazy.

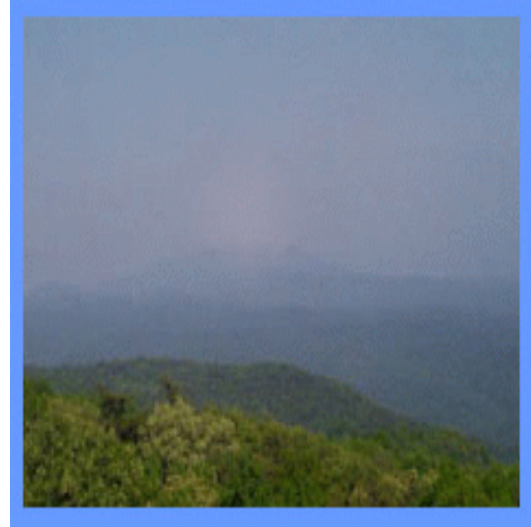
Information about particulate matter:
<http://www.epa.gov/air/urbanair/pm/>

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Soot and dust make the air look hazy!



Clear Day



Hazy Day

Some particles in the air are so small you can't see them. It is not good for you to breathe in too much of the tiny particulate matter. Particles in the air can make you cough. Particulate matter can also make it hard for you to take a deep breath and you might get more colds. If you already have asthma or problems with your heart, particulate matter could make you sick enough to go to the hospital. To reduce exposure to particulate matter when the AQI is orange or worse, don't play near streets with heavy traffic. Heavy traffic areas are highways and busy streets where there are a lot of cars, buses, and trucks.

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The Air Quality Index

The EPA and your State environmental agency measure pollution in the air. Then they use the Air Quality Index, or AQI, to tell the people about the air. An index can be a quick way to tell people how good or bad something is.



The AQI uses colors, and numbers, and words to tell you about the air.

Information about the Air Quality Index is available at:
<http://www.epa.gov/airnow/aqibroch/>

AQI Colors

These are the AQI colors. Each day the AQI is one of these colors. The colors tell you how healthy the air is to breathe that day. The colors go from Green to Yellow to Orange to Red to Purple to Maroon, each color telling you that the air is less clean than the color before. Green is the best air quality.



When the AQI is **green**, the air is clean!

We see a lot of Yellow, Orange, and Red AQI colors in the summer when air quality often isn't at its best. Purple and Maroon are the worst air quality! Luckily we hardly ever see the AQI get to Purple. Because of people working to clean up the air, the AQI has not reached Maroon in many years! This is why Maroon is usually not shown with the AQI.

AQI Numbers

An index with numbers can be a quick way to tell people how good or bad something is. For example, you might say your school lunch is a 1 (very good) or a 5 (yucky). The Air Quality Index uses numbers from 0 to 500. These numbers are used to decide the AQI color. On days measuring less than 100, the air is clean. If the air is dirtier, the numbers get bigger. On days measuring more than 100, the air can be bad for you to breathe.

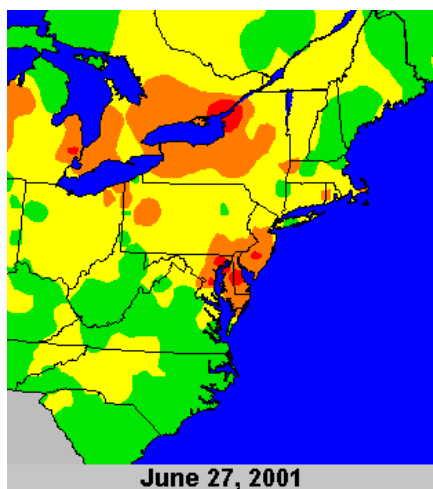
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Here is how the AQI numbers match up with the AQI colors:

AQI Numbers	Colors
0 to 50	Green
51 to 100	Yellow
101 to 150	Orange
151 to 200	Red
201 to 300	Purple
301 to 500	Maroon (usually not shown)

Where is the AQI?

You can find the AQI in several places. If you have a computer connected to the Internet, go to



www.epa.gov/AIRNOW, and click with your mouse on "[Where I Live.](#)" When you see the map of the United States, click on your state. Then you will see a chart with a list of cities. The AQI for many, but not all, large cities can be found there. Look for your city and you will see if the air in your city today is clean or not.



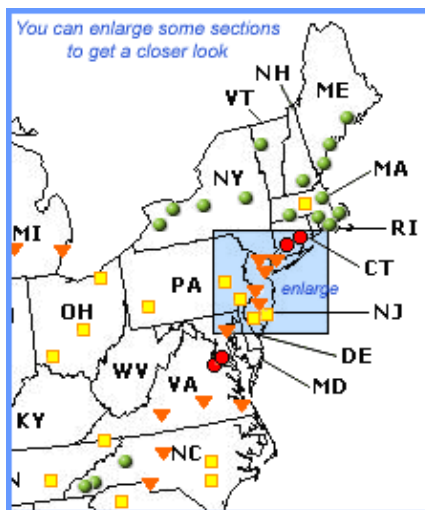
You can see an AQI Ozone Map for many areas in the United States. Here is an example. It looks like a weather map, except this shows ozone. This shows the AQI colors for ozone going from green (good) to red (unhealthy) in the eastern part of the United States.

If you would like to see an AQI Ozone Map for your state, go to www.epa.gov/AIRNOW, then click on [Ozone Maps](#). You can also see an AQI Forecast Map of the United States. Here is an example of the air quality forecast for the eastern part of the United States.

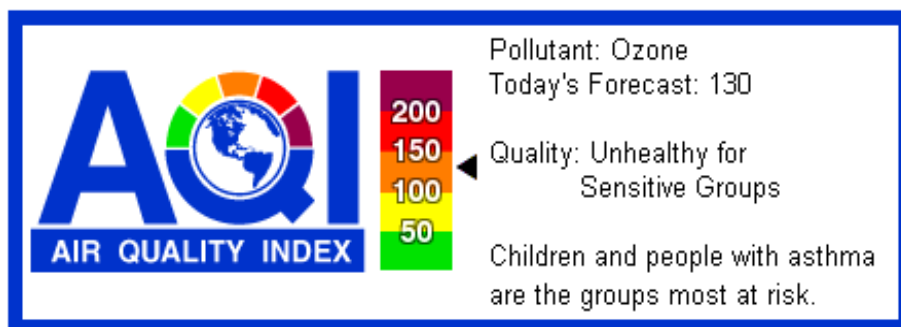
This shows the AQI forecast from green (good) to red (unhealthy) for many cities in the eastern part of the United States.

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If you would like to see an AQI Forecast Map for the United States, go to www.epa.gov/AIRNOW, then click on [Air Quality Forecast](#).



You can find the AQI in the newspaper, often in the weather section. It might look something like this:



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Air Pollution and Health

One thing the AQI does is help you understand what the air quality around you means to your health. Each of the AQI colors has a word or phrase to go with it that tells you something about health. These are the colors and the health words that go with them.

Two brochures explaining the health effects of ozone are available:
<http://www.epa.gov/airnow/brochure.html>
<http://www.epa.gov/airnow/health/>

AQI Colors	Health Word(s)
Green	Good
Yellow	Moderate
Orange	Unhealthy for Sensitive Groups
Red	Unhealthy
Purple	Very Unhealthy
Maroon (usually not shown)	Hazardous

Sometimes the weatherperson on TV or the radio will talk about the AQI for today and may also tell you what tomorrow's AQI will be...



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What is a Sensitive Group?

Some people are more sensitive to air pollution than other people. Different people can be sensitive to different air pollutants. For example, ozone might make you cough. Particulate matter may not bother you, but it may make your grandmother cough and need to rest.

One sensitive group is people with asthma. Asthma is a disease that can make it hard to breathe. If people who have asthma are careful and do what the doctor tells them to do, they may never have trouble breathing.



© 2000, Photos To Go
Sometimes people with asthma need help breathing.



Children active outdoors can be sensitive to some air pollutants.

Another sensitive group is children. Why are you part of a sensitive group? Because you're young, and that means your body is still growing, and your lungs are still developing. Also, you tend to play outside more, where the air pollution is. Does this mean you must stay inside when the air is dirty? Not really! Check out what the AQI colors and health words tell you to do:

How can I tell if air pollution is affecting me?

If you are playing hard outside when the AQI is orange or worse you may cough, feel some discomfort when you breathe, or your chest may feel tight. If you do, you should tell your parents or teachers. People with asthma may wheeze the day after pollution levels are high. If you have asthma, be sure and follow your doctor's advice when pollution levels are high.

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AQI for Ozone

Color & Health Word(s)	What To Do?
GREEN is Good	Just enjoy the clean air!
YELLOW is Moderate	Air quality is fine for most people, including children like you. However, if you know you are extra sensitive to pollution, you might want to limit the time you spend playing outside.
ORANGE is Unhealthy for Sensitive Groups	People with lung disease, such as asthma, and active kids and grown-ups should limit how long or how hard they play or are active outside. Remember, it's important to think about how the air quality is making you feel! If you don't feel so great, take it a little easier.
RED is Unhealthy	People with lung disease, such as asthma, and active kids and grown-ups should not spend a long time playing or being active outdoors. Everybody else should limit how long they are active outside.
PURPLE is Very Unhealthy	People with lung disease, such as asthma, and active kids and grown-ups should not spend any time playing or being active outdoors. Everybody else should limit outdoor activities.
MAROON is Hazardous (usually not shown)	No one should play or be active outside.

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So if the AQI is orange, red, or worse, do I have to stay in all day?

No, you can go out and play. Outdoor exercise and play make your body stronger. It is just that when the AQI is orange or worse there is some risk that if you go outside and play, you may feel some of the health effects described here.

What is risk?

Risk is the chance that something bad will happen, and it is a normal part of everyday life. There are bigger risks and smaller risks. If you were to play on a busy street, your risk of being injured would be big. We can compare the risk from air pollution to other kinds of risk you know about, such as eating "junk food." Junk food is bad for kids, too, but most kids won't be hurt eating a little bit of it once in a while. Likewise, even though dirty air is bad for kids, most kids won't be hurt by playing outside, once in a while, when the air is dirty.

Often, you can lower the risk by being smart, for example by wearing a bike helmet when you ride your bike. To lower your risk from air pollution, you can play outdoors at the times of day when air pollution levels are lower. In the summer, this is often in the morning or in the evening. Another good way to lower your risk is by taking it easier if you do play outdoors when air pollution levels are high. Also, if you do play outside when the AQI is orange, red, or worse, pay attention to how you feel. Does your chest feel strange? Is it hard to breathe? Do you feel tired? If you can answer "yes" to any of those questions, stop playing outside, and tell your parents or teachers.

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What Can I Do?

What can I do to lower my risk from air pollution?

If pollution levels are forecast to be high:

- ✓ Play outside at the time of day when levels will be lower

If you know pollution levels are high:

- ✓ Playing outside is okay, just take it easier

Pay attention to symptoms like coughing, pain when taking a deep breath, chest tightness or wheezing. If you have any of these symptoms, stop playing and tell your parents or teachers.

Information about what you can do to help lower air pollution can be found at:
<http://www.epa.gov/air/actions/>

What can I do to lower pollution?

- ✓ Conserve energy

<http://www.epa.gov/globalwarming/actions/efficiency/>

- ✓ Carpool, ride your bike, walk, take the bus
- ✓ Don't make trips you don't need to make
- ✓ Ask your Mom and Dad to help (by keeping cars tuned, filling up early or late in the day, inflating tires, etc.)
- ✓ Visit other kids' Web sites to learn about recycling, global warming, etc.

Waste & Recycling
EPA Explorers Club
Global Warming
Recycle City

<http://www.epa.gov/students/waste&.htm>
<http://www.epa.gov/kids/garbage.htm>
<http://www.epa.gov/globalwarming/kids/>
<http://www.epa.gov/recyclecity/>

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Air Quality Index Dictionary

Asthma: Asthma is a disease that can make it hard to breathe.

Atmosphere: Our atmosphere is the air and gases surrounding the earth.

Chemical: Chemicals are everywhere. There are chemicals inside your body, and there are chemicals in the ground, in the water, and in the air. You can see most chemicals, but not all chemicals. Some are clear or so small we can't see them. Some chemicals are good, like the medicine the doctor gives you when you are sick. Some chemicals are useful, but dangerous, like gasoline. Gasoline makes cars run, but you wouldn't want to drink it, because it would make you very sick. Some chemicals make the air dirty and cause pollution, like Ozone.



Disease: A disease is a type of illness. A disease is something that makes you sick.

Global: Global means the whole world.

Hazardous: Hazardous means dangerous.

Haze: Soot and dust make the air look hazy!

Ozone: Ozone can be good or bad. It all depends on where it is. Ozone is good when it is high up in our atmosphere. It protects us from sunburn. Ozone is bad when it is near the ground where we can breathe it in. You can't see ozone in the air. Bad ozone is sometimes called smog. It is formed when chemicals coming out of cars and factories are cooked by the hot sun. Ozone is more of a problem in the summer.

Particulate Matter: Have you ever noticed a sunbeam with lots of little specks of dust floating in it? That is particulate matter. Particulate matter is mostly dust and soot so small that it floats in the air. Soot comes from anybody burning anything. When you burn gasoline in your car engine or burn wood in a campfire, soot happens! Dust comes from lots of places, too. When a company's business is to grind things up very small or when someone drives down a dirt road, dust is thrown into the air. Soot and dust make the air look hazy.

Pollutant: Pollutants are what make the air dirty and cause pollution. Sometimes you can see pollutants and sometimes you can't. Ozone is a pollutant that you can't see. Dust and soot are

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pollutants that you can see. Dust and soot are also called Particulate Matter.

Smog: Bad ozone is sometimes called smog.

Soot: Soot comes from burning something. When you burn gasoline in your car engine or burn wood in a campfire, soot happens! You may have noticed the walls on the fireplace after a fire has burned. The walls are covered in a black powder. That is soot.

Stagnant: When air is still and not moving, and smells musty or stale, it is called stagnant. Water that is not moving also is called stagnant.

