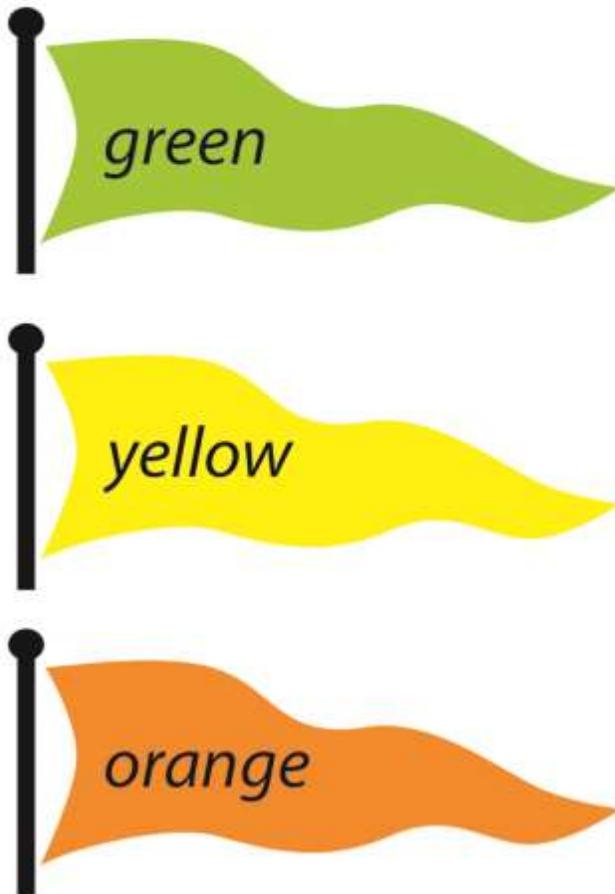


SCHOOL FLAG PROGRAM



Broward Air Quality Index (AQI) School Flag Program Coordinator Handbook



Brought to you by Broward County Environmental Engineering and Permitting Division (EEPD) in partnership with the Environmental Protection Agency (EPA)



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Overview of the Broward Air Quality Index (AQI) School Flag Program

The Broward Air Quality Index (AQI) School Flag Program helps children, parents, the community and school personnel become aware of daily outdoor air quality conditions using brightly colored flags. Each day, a flag is raised in front of participating schools that signal the level of air pollution for that day. The level of air pollution is also mentioned during the school's morning announcements. The flag colors correspond to the colors used in the Environmental Protection Agency's (EPA) Air Quality Index, which tells how clean or polluted the air is for that day. When members of the school and the surrounding community know what the daily air quality is, they can adjust their activities to reduce their exposure to air pollution. Regular physical activity – at least 60 minutes a day – promotes health and fitness. The purpose of the school flag program is to help children continue to exercise while protecting their health when the air quality is unhealthy.

Each day, participating schools raise a colored flag that corresponds to the local air quality forecast:

- Green flag – good air quality
- Yellow flag – moderate air quality
- Orange flag – unhealthy for sensitive groups (including all children and people with asthma)

Note: There is a fourth and fifth color – red and maroon respectively-- used in EPA's Air Quality Index. They indicate unhealthy (red) and very unhealthy (maroon) air quality. They are not included in the Broward County AQI School flag program because these conditions are rare in South Florida. In the event we do experience unhealthy or very unhealthy air quality, health advisories will be issued from the Environmental Engineering and Permitting Division (EPPD) in the local media.

Air quality can become unhealthy due to pollutants such as ground-level ozone and particle pollution. Ozone is especially damaging to the lungs of children and those who work and play outside. Particle pollution - especially fine particles such as those found in smoke, haze or dust - contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Children (including teenagers) are at greater risk from air pollution because their lungs are still developing and they breathe more air per pound of body weight than adults. People with asthma are also more likely to have symptoms when pollution is in the air. Children, including those with asthma, can continue to stay active even when air quality is unhealthy by modifying their activities or, in some cases, moving their activities indoors.

This handbook describes the four steps a School Flag Program Coordinator needs to take to implement a successful flag program:

1. Contact EEPD at airoutreach@broward.org to obtain the flags
2. Educate and inform the school and the community at the start of the program
3. Find out the daily air quality forecast and fly the corresponding flag
4. Know what actions to take when the air quality is unhealthy for sensitive groups

The School Flag Program can be a great way to teach people about their local air quality, how air pollution impacts our health, and what actions we can take to protect ourselves. You'll find more information about the School Flag Program, the AQI, ground-level ozone and particle pollution, and the health effects of air pollution in the Background Information and Resources sections of this handbook.

How does the Broward AQI School Flag Program work?

- Schools interested in participating in the Broward AQI School Flag Program can email the Broward County Environmental Engineering and Permitting Division (EEPD) at airoutreach@broward.org
- EEPD will select 3 schools each school year to participate in the flag program.
- Selection is based up the school's level of interest, location in Broward County (north, central, south), and length of school year (standard school year vs year around school year).
- Once selected, EEPD will register your school on [EPA's school flag website](#).
- EPA will add your school to the online table of participating schools and will send you an official participation certificate for display.
- EEPD will provide the selected schools with all the materials needed to implement the program, including Green, Yellow and Orange flags, an Air Quality Information Board, and other informational material. All materials are FREE of charge.
- The program will require each participating school to:
 - Select a School Flag Program Coordinator (Preferably a science teacher or Health/Physical Education teacher)
 - Have the School Flag Program Coordinator work closely with EEPD staff to help establish the program
 - Check the air quality each morning via one of the following options:
 - ✓ Opening the [Broward County AQI School Flag Program](#) webpage
 - ✓ Viewing the [AirNow](#) website
 - ✓ Subscribing to [EnviroFlash](#) which allows anyone to get the daily air quality forecast sent to your email, cell phone or Twitter
 - ✓ Using the Air Now Mobile Application (available on the Android and Apple)
 - ✓ Receiving notifications from EEPD staff when the AQI goes out of the good (green) range.
 - Coordinate with their science club or school patrols to hang the corresponding flag that represents that particular day's air quality early each morning.
 - Include an air quality message about the outdoor air quality during the morning announcements (as a part of the weather forecast or any other appropriate portion).
 - Perform at least two air quality activities from the Air Quality Activity Booklet, provided by EEPD, in the classrooms within the first school year the program is implemented.
 - Post the Air Quality Information Board, provided by EEPD, either in the school office or some other high traffic area to educate the students, parents, and other school faculty about the School Flag Program.

Why is participating in the Broward AQI School Flag Program so important?

The School Flag Program creates public awareness of outdoor air quality conditions. Children can continue to get plenty of physical activity, while still protecting their health from poor air quality. Children (including teenagers) are at greater risk from air pollution because their lungs are still developing and they breathe more air per pound of body weight than adults. Children are particularly susceptible to air pollution, which can harm their lungs and trigger asthma attacks. When air quality is unhealthy for sensitive groups, it is important to modify outdoor activities which could include shortening exercise or moving exercise indoors when necessary to protect the health of our students.

Where can I get more information on the Broward AQI School Flag Program?

Visit the [Broward County AQI School Flag Program](#) webpage.

Steps for a Successful School Flag Program

Step 1: Contact EEPD to obtain the flags

You can email airoutreach@broward.org letting EEPD know of your interest in participating in the program. If approved, you will receive three flags: green, yellow, orange. The red and purple flags are not provided because Broward historically has rarely reached those air pollution levels. The flags are rectangle style and the dimensions are 2'x 3'.

Step 2: Educate and inform the school and the community at the start of the program

Choose a date to begin flying your flags, and then educate and inform your school and the surrounding community. EEPD will register your program on [EPA's school flag website](#) under "School Flag Program Registration Form". EPA will add your school to the online table of participating schools and will send you an official participation certificate for display. Train school personnel about the Air Quality Index and the Flag Program so they can help administer the program and teach the students. You can request help with this training from EEPD by calling 954-519-1483. Encourage teachers to take advantage of the many resources available on the [Broward Air Quality School Flag Program website](#). Make announcements to the community through newsletters, emails, and flyers posted throughout the school.

Template to Introduce the New Flag Program

How much pollution is in the air outside today? Soon, our entire school community will have a simple way to find out....just look up! Starting [insert date], we'll be flying a brightly colored flag below our American flag that will show how clean or polluted the air is. This new flag program will help us continue to promote exercise while protecting health.

Each colored flag corresponds to an air quality level:

- Green – good air quality
- Yellow – moderate air quality
- Orange – unhealthy for sensitive groups, including all children and those with asthma or other respiratory issues

On green and yellow days, teachers and coaches will encourage students to get outside and get moving! When air quality is orange or red, it is still OK to play outside, but we will encourage kids to take breaks and cut back on activities that involve lots of running. In addition to helping us plan for exercise, the flags will help students and staffs with asthma get to know whether their symptoms get worse when air quality is poor and whether they need to take extra steps to protect their health.

The flag program is used in many U.S. cities and we're proud to be the first school in [city] to adopt it. Thanks to the Broward Environmental Engineering and Permitting Division for providing us with the flags! In addition to the new flags, we will have in-class activities [include when] to learn more about air pollution, how it affects us, and what we can do to make the air cleaner.

We will post more information about this exciting new program and our [date] flag raising event on our school website.

Step 3: Find out the daily air quality forecast and fly the corresponding flag

Like the weather, air quality changes from day to day. Your local or state air quality agency makes a daily air quality forecast that predicts the AQI color for both ozone and particle pollution. The forecast appears in the early afternoon and predicts the air quality for the next day.

In many cities you can get the daily air quality forecast sent to you by email if you subscribe to [EnviroFlash](#). Be sure to sign up your school. This provides alerts when there are unusual air quality events such as wildfires.

You can also check the air quality each morning via one of the following options:

- Opening the [Broward County AQI School Flag Program](#) webpage
- Viewing the [AirNow website](#)
- Using the Air Now Mobile Application (available on the Android and Apple)
- Receiving notifications from EEPD staff when the AQI goes out of the good (green) range.

Each morning, assign someone at your school to raise the flag that shows the current day's AQI color. It is a good idea for the assigned person to check the air quality forecast in the morning before the flag is raised. Some state and local air quality agencies will update the current day's forecast to a different color if pollution is worse than originally expected. If you subscribe to [EnviroFlash](#) emails, you can choose to be notified via email of forecast updates. Such updates will also be posted on [airnow.gov](#).

Fly only the flag showing the current day's forecast. For example, if you receive tomorrow's forecast in the late afternoon, do not change the flag to show tomorrow's color.

Some ideas to involve students and teachers in the flag program:

- Encourage everyone with an email account to sign up for [EnviroFlash](#).
- Establish student teams (science club and/or school patrols) to be in charge of checking the forecast and raising the flag each morning.
- Have each classroom teacher assign a rotating student to post the day's air quality color in the classroom.
- Add a message about the day's air quality color to the daily morning announcements.
- Get the current AQI forecast added to your school's website. You can do this by providing the following link to the person responsible for your school's website: www.airupdate.info

Step 4: Know what actions to take when the air quality is unhealthy

General Actions When Ozone or Particle Pollution Levels are Unhealthy

Ozone and particle pollution are the most widespread air pollutants. When either ozone or particle pollution is at an unhealthy level, the chances of being affected increase the longer a person is active outdoors and the more strenuous the activity. Since exercise is good for your health, it's important to stay active and know when to make changes.

Children (including teenagers) and those with asthma are two groups EPA considers "sensitive" because they have more health effects at lower pollution levels. For a complete list of sensitive groups, see page 8 (for ozone) and page 9 (for particle pollution) in the Background Information section of this handbook.)

Actions:

- As ozone or particle pollution levels become unhealthy, the general advice is to reduce how hard you exercise, and the length of time you exercise. For example, on code orange days, it is still o.k. for children to play outside, but they should reduce activities that involve running and they should take more frequent breaks.
- Sensitive groups, including children and people with asthma, should start taking it easier at code orange alert levels.
- When ozone or particle pollution is in the air, adults and children with asthma are more likely to have symptoms such as coughing or shortness of breath. Be alert for symptoms and follow the child's asthma action plan. If a child has a quick relief inhaler, be sure it is always handy. Even students who do not have asthma could experience symptoms when exposed to unhealthy levels of air pollution.

Specific Actions When Ozone Pollution is at an Unhealthy Level

Ozone is formed when pollutants emitted by industrial facilities and power plants, motor vehicle exhaust, and other sources react in the presence of heat and sunlight. Since heat and sunlight drive ozone formation, warm sunny days have more ozone than cool or cloudy days. Ozone levels are generally much lower in the mornings.

Actions:

- When unhealthy levels of ozone are expected, you can reduce exposure by playing and exercising outdoors before noon.
- For specific recommendations on how to modify outdoor school activities such as recess, physical education (P.E.) class, or sporting events when ozone pollution is elevated, see the chart called Air Quality and Outdoor Activities: Recommendations for Schools (the last page of this handbook).

Specific Actions to Reduce Exposure to Particle Pollution

In some locations (such as the western United States) where wood is burned for heat, particle pollution levels can be especially high. In south Florida, we see higher levels of particle pollution when there are wildfires and when there is burning of sugarcane fields to our north.

Actions:

- Choose areas away from busy streets for children to walk, exercise and play.
- Make sure children avoid standing or playing near vehicles that are idling.
- Implement policies and education programs to limit idling by school buses and personal vehicles (parent drop off/pickup) on school grounds.
- If it looks or smells smoky outside, it is better not to exercise or play outside.

Use Your Judgment

Based on the recommended actions listed school staff should use their judgment to decide how to modify planned outdoor activities when air quality is unhealthy.

Background Information

What is Ozone?

Ozone is a colorless gas found in the air we breathe. Naturally occurring ozone high above the earth's surface protects our planet from solar radiation. When ozone is created near the ground it is unhealthy to breathe and can also damage trees and crops.

Ozone is created at ground level by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and power plants, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC. Because ground-level ozone needs sunlight to form, it is usually highest during the hot, sunny days of summer, spring, and fall.

Health Effects of Ground-level Ozone

- Constriction of airways forcing the respiratory system to work harder to provide oxygen
- Coughing, pain when taking a deep breath, wheezing and inflammation of the airways including the deep portions of the lungs
- Increased fatigue
- Reduced athletic performance
- Aggravated lung disease

People with lung disease, children, older adults, and people who are active outdoors are considered sensitive and therefore at greater risk.

What is Particle Pollution?

Particles in the air are a mixture of solids and liquid droplets that vary in size and are often referred to as “particulate matter.” Some particles - those less than 10 micrometers in diameter - pose the greatest health concern because they can pass through the nose and throat and get deep into the lungs. Ten micrometers in diameter is just a fraction of the diameter of a single human hair. Particles larger than 10 micrometers do not usually reach your lungs, but they can irritate your eyes, nose and throat. Particle pollution, unlike ground-level ozone, can occur year-round.

Very small particles with diameters less than 2.5 micrometers are called “fine” particles. They are produced any time fuels such as coal, oil, diesel or wood are burned. Fine particles come from fuel used in everything from power plants to motor vehicles (e.g., cars, trucks, buses and marine engines). These particles are even produced by construction equipment, agricultural burning, trash and brush burning, and forest fires. In fact, forest fires (wildfires) are responsible for some of the worst particle pollution events.

“Coarse” dust particles range in size from 2.5 to 10 micrometers in diameter. Particles of this size are produced during crushing or grinding and from vehicles traveling on paved or unpaved roads.

Health Effects of Particle Pollution

- Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing
- Decreased lung function
- Aggravated asthma
- Development of chronic bronchitis
- Irregular heartbeat
- Heart attacks
- Premature death in people with heart or lung disease

People with heart or lung disease, older adults, and children are considered sensitive and therefore at greater risk.

What is the Air Quality Index (AQI)?

The Air Quality Index (AQI) is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air.

How Does the AQI Work?

The higher the AQI value, the greater the level of air pollution and the greater the health concerns. For example, an AQI level of 40 represents good air quality with little potential to affect public health, while an AQI value over 201 represents very unhealthy air quality.

An AQI value of 100 generally corresponds to the National Ambient Air Quality Standard (NAAQS) for the pollutant, which is the level EPA has set to protect public health. AQI values below 100 are generally thought of as satisfactory. When AQI levels are above 100, air quality is considered to be unhealthy – at first for certain sensitive groups of people, then for everyone as AQI values get higher.

The purpose of the AQI is to help you understand what local air quality means to your health. To make it easier to understand, the AQI is divided into categories. Each category corresponds to a different level of health concern. The levels of health concern and what they mean are:

	HEALTH CATEGORIES	OZONE	FINE PARTICLES
300	VERY UNHEALTHY	Active children and adults, and people with respiratory disease such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.	People with respiratory or heart disease, the elderly and children should avoid any outdoor activity; everyone else should avoid prolonged exertion.
200	UNHEALTHY	Active children and adults, and people with respiratory disease such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.	People with respiratory or heart disease, the elderly and children should avoid prolonged exertion; everyone else should limit prolonged exertion.
150	UNHEALTHY FOR SENSITIVE GROUPS	Active children and adults, and people with respiratory disease such as asthma, should limit prolonged outdoor exertion.	People with respiratory or heart disease, the elderly and children should limit prolonged exertion.
100	MODERATE	Unusually sensitive people should consider limiting prolonged outdoor exertion.	None
50	GOOD	None	None

BROWARD COUNTY FLORIDA



Morning Announcements Script

Check the Daily Air Quality from one of the following locations:

- The [Broward County AQI School Flag Program](#) webpage
- The [AirNow](#) website
- Subscribe to [EnviroFlash](#) which allows anyone to get the daily air quality forecast sent to your email, cell phone or Twitter
- Use the Air Now Mobile Application (available on the Android and Apple)

Recommended Script (can modify to best suite your needs):

(Include the following message during the weather forecast or after any mention of planned recess activities)

<p>If the Outdoor Air Quality is determined to be in the Good (Green) Range</p> <p>Today's Air Quality is in the good range. That's why there is a green flag outside today. Everyone can continue outdoor activities as planned. If you are going to exercise outdoors, please be sure to stay hydrated (drink a lot of water).</p>	
	<p>If the Outdoor Air Quality is determined to be in the Moderate (Yellow) Range</p> <p>Today's Outdoor Air Quality is Moderate. That's why there is a yellow flag outside today. Unusually sensitive people should consider limiting prolonged outdoor exertion (exercise). If you are going to exercise outdoors, please be sure to stay hydrated (drink a lot of water).</p>
<p>If the Outdoor Air Quality is determined to be in the Unhealthy for Sensitive Groups (Orange) Range</p> <p>Today's Outdoor Air Quality is Unhealthy for Sensitive Groups. That's why there is an orange flag outside today. Active Children and adults, and people with respiratory disease such as asthma, should limit prolonged outdoor exertion (exercise). If you are going to exercise outdoors, please be sure to stay hydrated (drink a lot of water).</p>	

Questions and Answers

How long can students stay outside when the air quality is unhealthy?

There is no exact amount of time. The worse the air quality, the more important it is to take breaks, do less intense activities, and watch for symptoms. Remember that students with asthma will be more sensitive to unhealthy air.

Why should students take breaks and do less intense activities when air quality is unhealthy?

Students breathe harder when they are active for a longer period of time or when they do more intense activities. More pollution enters the lungs when a person is breathing harder. It helps to:

- reduce the amount of time students are breathing hard (e.g., take breaks; rotate players frequently)
- reduce the intensity of activities so students are not breathing so hard (e.g., walk instead of run)

Are there times when air pollution is expected to be worse?

- **Ozone pollution** is often worse on hot sunny days, especially during the afternoon and early evening. Plan outdoor activities in the morning, when air quality is better and it is not as hot.
- **Particle pollution** can be high any time of day. Since vehicle exhaust contains particle pollution, limit activity near idling cars and buses and near busy roads, especially during rush hours. Also, limit outdoor activity when there is smoke in the air.

How can I find out the daily air quality?

Go to [the AirNow website](#). Many cities have an Air Quality Index *forecast* that tells you what the local air quality will be later today or tomorrow, and a *current* AQI that tells you what the local air quality is now. The AirNow website also tells you whether the pollutant of concern is ozone or particle pollution. Sign up for emails, download the free AirNow app, or install the free AirNow widget on your website. You can local information at the [Broward AQI School Flag Program](#).

If students stay inside because of unhealthy outdoor air quality, can they still be active?

It depends on which pollutant is causing the problem:

- **Ozone pollution:** If windows are closed, the amount of ozone should be much lower indoors, so it is OK to keep students moving.
- **Particle pollution:** If the building has a forced air heating or cooling system that filters out particles then the amount of particle pollution should be lower indoors, and it is OK to keep students moving. It is important that the particle filtration system is installed properly and well maintained.

What physical activities can students do inside?

Encourage indoor activities that keep all students moving. Plan activities that include aerobic exercise, as well as muscle and bone strengthening such as jumping, skipping, sit-ups, and pushups. If a gymnasium or open space is accessible, promote activities that use equipment, such as cones, hula hoops, and sports balls. If restricted to the classroom, encourage students to come up with fun ways to get everyone moving (e.g., act out action words from a story). Teachers and recess supervisors can work with PE teachers to identify additional indoor activities.

What is an asthma action plan?

An asthma action plan is a written plan developed with a student's doctor for daily management of asthma. It includes medication plans, control of triggers, and how to recognize and manage worsening asthma symptoms. See the [Centers for Disease Control & Prevention](#) for a link to sample asthma action plans. When asthma is well managed and well controlled, students should be able to participate fully in all activities.