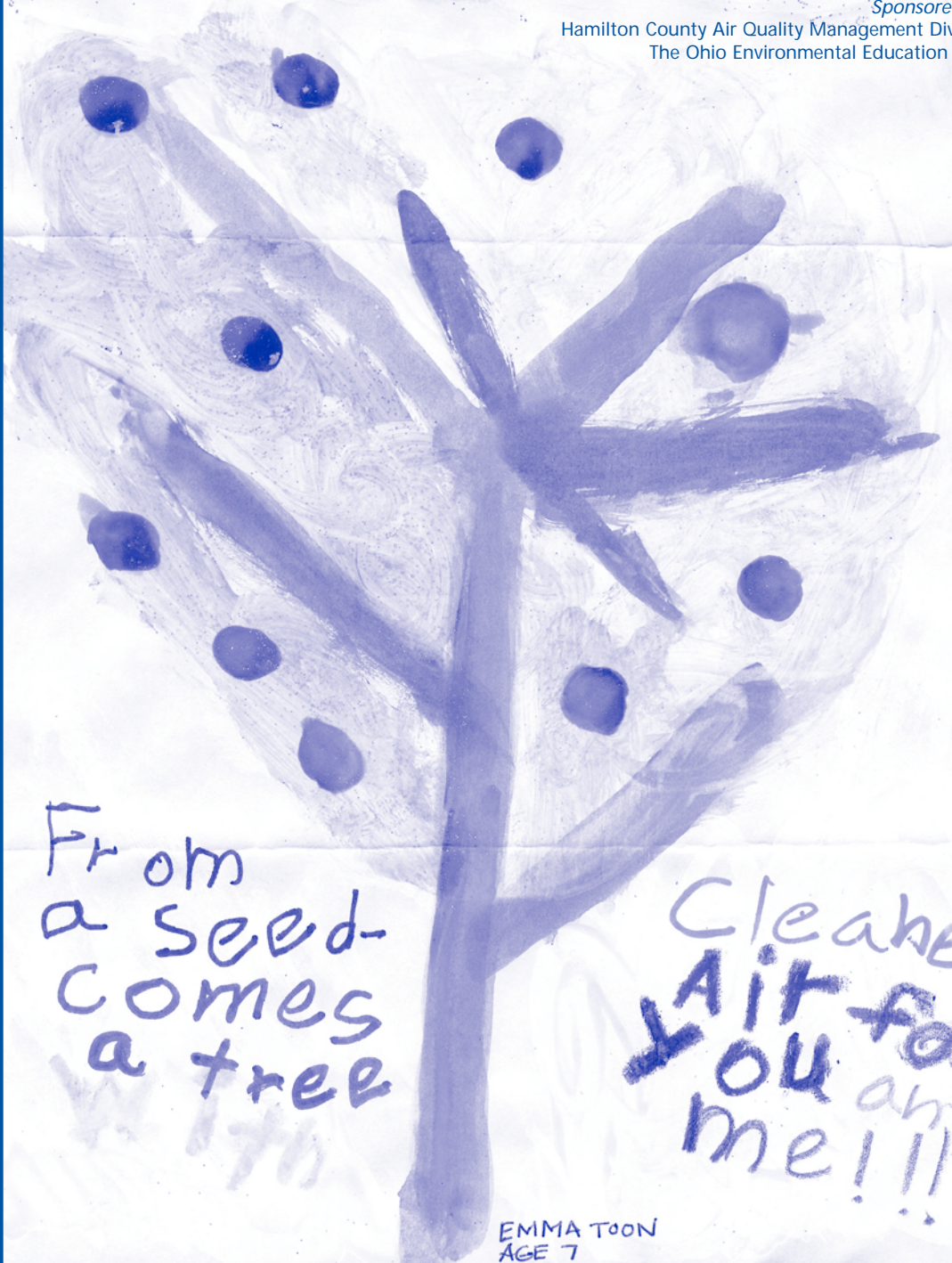


# Clean Air Kids

## Activity Book

Sponsored by:  
Hamilton County Air Quality Management Division  
The Ohio Environmental Education Fund



From  
a seed-  
comes  
a tree

Cleaner  
Air for  
you and  
me!!!

EMMA TOON  
AGE 7

Cover by: Emma Toon, Age 7, J.F. Dumont School

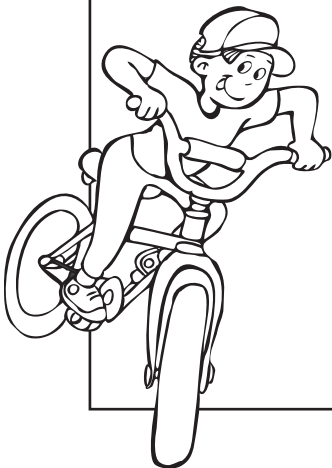
# What Causes Air Quality Problems?

Here in Southwestern (SW) Ohio we have a pretty big problem that we would like you to help us clean up: that problem is air pollution. Air pollution comes from many different places, such as cars and trucks, factories, power plants, and even fires. Ok, so you can't drive a car, or work in a factory, but we all produce air pollution everyday. Even leaving the television or a light on uses electricity which is made in SW Ohio by burning coal, which produces air pollution.

When we go somewhere in the car that we could safely ride a bike or walk to, we create air pollution. When we buy things that we don't really need, we add even more air pollution. Making things in factories releases air pollution, and a factory needs electricity, which causes even more pollution. So you see, there are lots of things we all do that adds pollution to the air. The good news is there are lots of things that we can do to help keep our air clean! Can you think of something that you can do to clean the air?

## Working Together

We all have to do our share to clean the air. Industries help develop new products, like cars that run on alternative fuels. Government agencies help by passing laws to make sure individuals and businesses protect the environment. Individuals and community groups help by pushing businesses and government to help more. We all need to work as a team to make sure our air is clean. What can you do to help?



### A Special Thank You To Our Teacher Review Panel

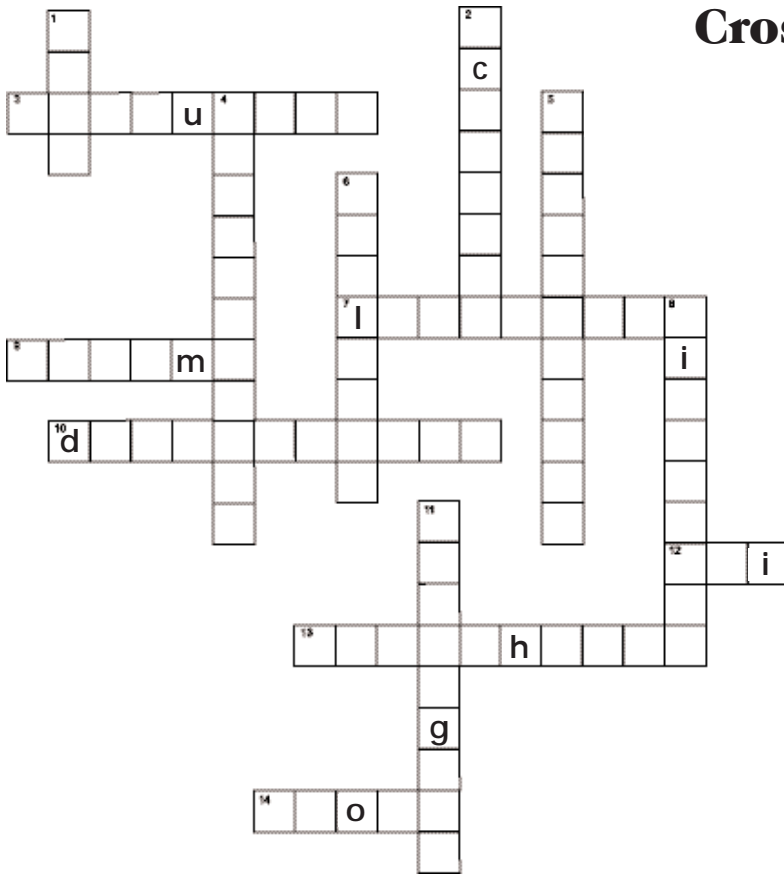
Molly Burke and  
Patricia Basinger  
*St. John the Evangelist School*

Christine Francus  
*Wilson Elementary*

Kamlesh Jindal  
*Bond Hill Academy*

Lori McDonough  
*Whitewater Valley  
Elementary*

Patricia Songer  
*St. Julie Billiart School*



## Across

3. This harms people and the environment.
7. Only use this to cut the grass after 6 p.m.
9. Many children and adults suffer from this disease.
10. By riding the bus or turning off a light, you can \_\_\_\_\_(3 words) for cleaner air.
12. This rainbow colored guide tells us about air quality.
13. These gases are thought to trap heat in our atmosphere.
14. CFCs, a kind of air pollution, have made a hole in the \_\_\_\_\_ layer.

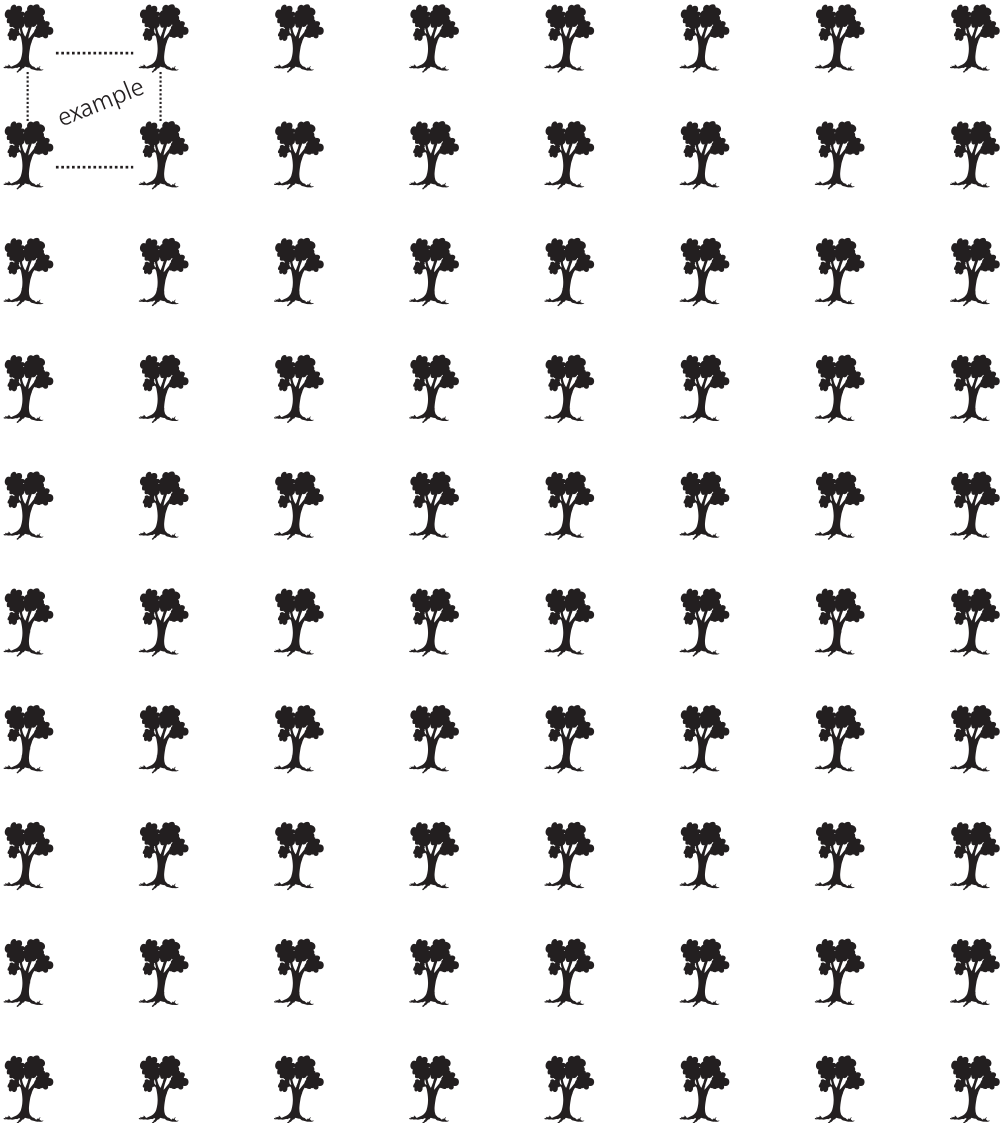
## Down Across

1. Watch the weather forecast to see if today is a \_\_\_\_\_ alert day.
2. This type of pollution can harm plants, effect rivers and lakes, and eat away at statues.
4. Global warming is an increase in \_\_\_\_\_ in the earth's atmosphere.
5. This is another name for car or vehicle.
6. This bakes pollution to make smog.
8. Another name for carpool.
11. Pollen and mold can cause this in many people.

# Tree Square

Find a friend and see who can plant the most trees. Each player takes a turn connecting two trees, either horizontally or vertically. The player drawing the last line forming a square puts his or her initials inside the square, and they have planted a tree! When all the trees are connected, the player with the most trees planted (squares) wins.

Trees and other green plants are nature's way of cleaning the air. Trees take in carbon dioxide, a type of pollution, and produce oxygen. This process is called photosynthesis.



# Find the Pollutants



Circle the pollution sources hidden in this picture. Some are used at home, some are used at work, school or around town. Think of some other sources and drawn them in! Can you think of a story to discuss why the town has so many sources of pollution?

# Word Search

Look for the air quality words listed. They might be forwards, backwards, horizontally, vertically or diagonally.



## Health Issues

allergy  
elderly  
health  
heart  
lung  
young  
asthma

## Tips

bike  
carpool  
conserve  
recycle  
rideshare  
run  
tree  
walk  
alternative

## Pollution Problems

acidrain  
greenhouse  
mold  
ozone  
pollen  
pollution  
smog  
smoke

## Sources

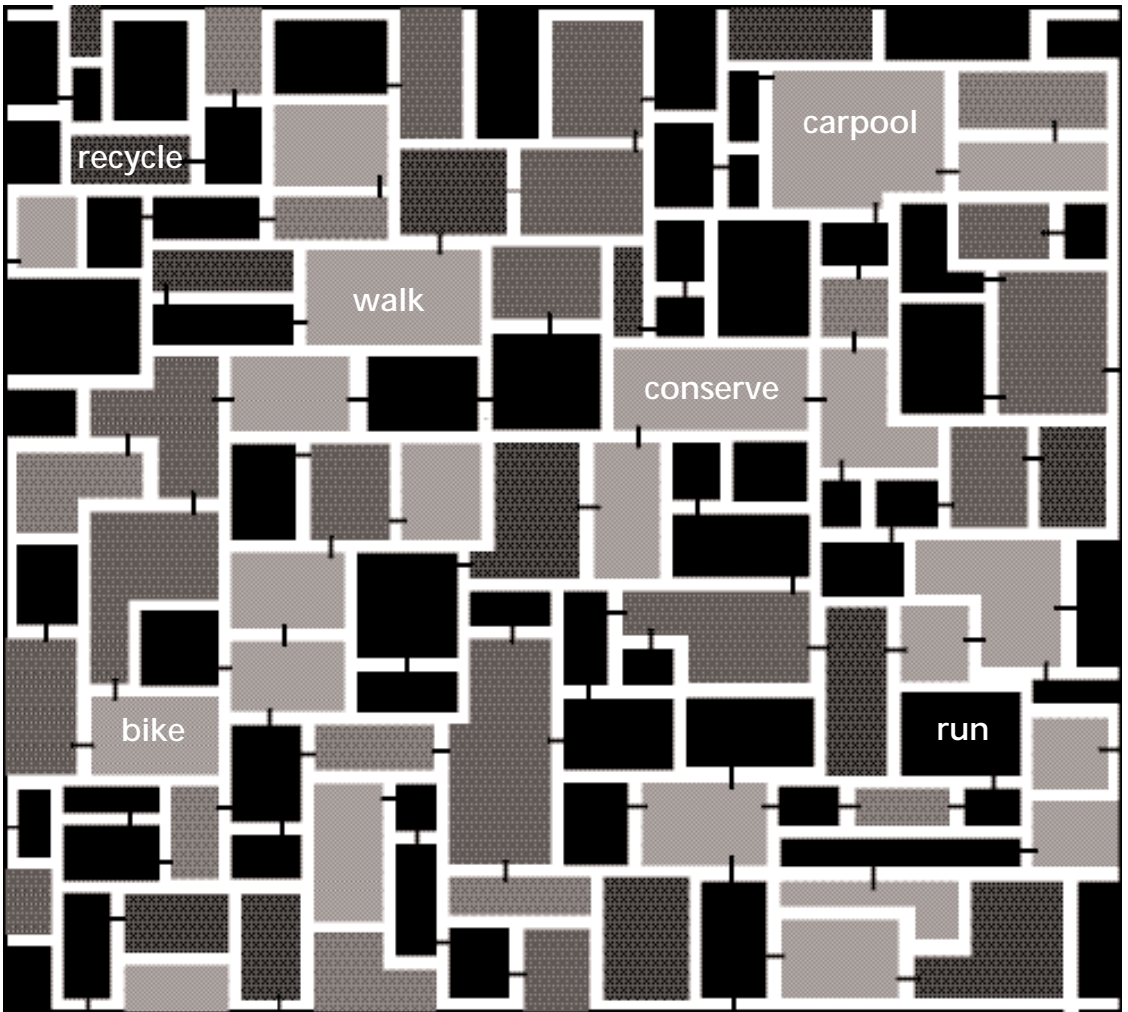
vehicle  
powerplant  
factory

## Holey Ozone Health Tip

Ground level ozone is made from pollution and can hurt people, plants, and animals. So, is the hole in the ozone layer a good thing? No, this natural layer of ozone is way up high (30,000-50,000 feet above the earth) where nobody is trying to breathe. In fact, it protects us from the sun's harmful ultraviolet (U/V) rays that can cause skin cancer. Chlorofluorocarbons (CFCs) and other chemicals have thinned this protective layer. One CFC molecule can destroy 100,000 ozone molecules.

Enter

Maze



Exit



Sometimes trying to work out air quality problems can be as complicated as a maze. With any problem, we should look at all of the options and take the clearest path. When we find the solution, we can be surprised it wasn't obvious before!

Just like the solution to pollution is for everyone to *do their share*. Can you find the solution and make your way through the maze? Can you think of any other words that help clean our air to write into the maze?

# My Air Quality Story

Help finish our silly story! Fill in the numbered blanks below with the first thing that pops into your head. Use the matching numbered words from the list below.

- |                                 |                               |
|---------------------------------|-------------------------------|
| 1. A season                     | 10. A girl name               |
| 2. An adjective                 | 11. An animal (plural)        |
| 3. A last name                  | 12. A feeling                 |
| 4. A number                     | 13. An noun                   |
| 5. A vehicle                    | 14. A body part               |
| 6. A wild animal                | 15. A type of factory         |
| 7. A type of building           | 16. A source of air pollution |
| 8. A type of alternative energy | 17. Something you make        |
| 9. A boy name                   |                               |

Last 1 \_\_\_\_\_, my class went on one of the 2 \_\_\_\_\_ field trips of all time! My teacher, Mrs. 3 \_\_\_\_\_, thought we should all learn about air pollution. So everyone in my class, all 4 \_\_\_\_\_ of us, got into the school's electric-powered 5 \_\_\_\_\_ and headed to 6 \_\_\_\_\_ Park. When we got to the park, we went into the 7 \_\_\_\_\_. This was the only building of its type in the city that was powered by 8 \_\_\_\_\_ energy. I sat beside my best friend 9 \_\_\_\_\_, and listened to Park Ranger 10 \_\_\_\_\_, talk about air pollution. She spoke about where air pollution comes from and how it can hurt the 11 \_\_\_\_\_. Park Ranger 10 \_\_\_\_\_ was so 12 \_\_\_\_\_, she dropped a 13 \_\_\_\_\_ on my 14 \_\_\_\_\_. On the way back to school in our electric-powered 5 \_\_\_\_\_, we looked out the window to see as many sources of pollution that Park Ranger 10 \_\_\_\_\_ had spoken about. We saw: a 15 \_\_\_\_\_ factory, 5 \_\_\_\_\_, and a 16 \_\_\_\_\_ all pumping pollution into the air. When we got back to school, we asked Mrs. 3 \_\_\_\_\_ if we could create a 17 \_\_\_\_\_ about air pollution.

**Noun:** A person, place, or thing. (ex. Dog, sink, cloud, boat)

**Verb:** An action word. (ex. Throw, eat, jump)

**Adjective:** A word that describes a person, place or thing. (ex. Tall, hard, slow)

**Plural:** More than one of something.

# Discover the Secret Code!

Earth has been described as being like a "giant spaceship, with everything we need for survival on board." Like a spaceship, earth cannot make new air. The air you breathe is the same air dinosaurs once breathed! By polluting the air, we can harm plants, soil, and water, which can affect all life on earth; the cycle of life. See if you can break this secret code where all of the answers are connected.

The answers overlap, so make sure you start writing the answer in the box numbered to match the question. Once you have answered all of the questions, take the highlighted letters down to the box below to find out the secret message. Work in a clockwise direction.

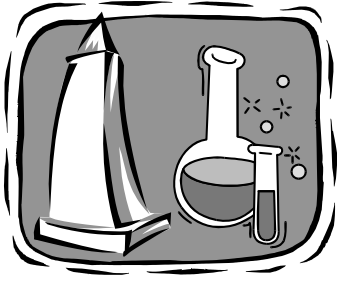
**Questions**

- 1) We need air to \_\_\_\_\_.
- 2) Pollution is bad for our \_\_\_\_\_.
- 3) Always remember to say \_\_\_\_\_.
- 4) What does U/V stand for \_\_\_\_\_.
- 5) Make sure vehicles \_\_\_\_\_ are inflated.
- 6) We should limit our activities on \_\_\_\_\_ alert days.
- 7) Bronze, silver, and \_\_\_\_\_.
- 8) If an animal is extinct it is \_\_\_\_\_.
- 9) Beautiful flying insect that doesn't breathe fire \_\_\_\_\_.
- 10) What color is moderate on the air quality index? \_\_\_\_\_.
- 11) The \_\_\_\_\_ makes air pollution move.
- 12) It can be \_\_\_\_\_ to rollerblade without a helmet and kneepads.

The secret message is... 

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

# Air Quality Experiments



## Vanishing Statues

We hear about air pollution harming people, but can it hurt stone? This experiment will let you test and see if air pollution can effect buildings and statues.

Collect a clear plastic cup, vinegar, chalk, and a paper clip. Carefully use the paper clip to scratch the chalk to design your statue, you could write your name or draw a face. Place the statue into the cup, and then add some "acid rain"- carefully pour vinegar into the cup, covering the statue. Watch carefully. Did anything happen?

### What you will need:

- Clear plastic cup
- Vinegar
- Chalk
- Paper clip

### My results:

---

---

---

### Why did that happen?

---

---

---

## Pollution Catcher

Collect some clear plastic lids. Spread vaseline on one side of each lid. Put the lids in different places (near a road, tree, inside your house and outside), vaseline side facing up. Try and predict which will collect the most pollution. In a week collect the lids noting which lid held the most pollution and where it was located. Look at them carefully under a magnifying glass or microscope. What do you see? Did you predict correctly?

### My prediction:

---

---

---

---

### My results:

---

---

---

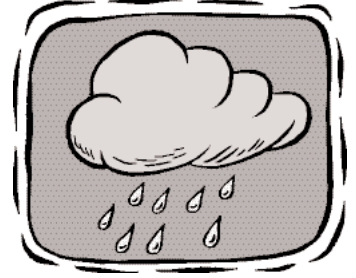
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*Check with your parents before trying these experiments at home, or your teacher before trying them at school.*

## How acidic is our rain?

Collect a jar (make sure it is clean), newspaper, and pH (litmus) paper (ask your teacher). Place the jar outside until it collects rain. Spread newspaper over a desk/table and bring the container inside. Using the pH paper carefully test the pH of the water. Is the rain falling in your area acidic? Acids turn pH paper red, and bases (the opposite of acids) turn pH paper blue. If the paper stays the same color the substance is neutral, neither acid or base.

You can test the pH of many things: milk, toothpaste, coffee, apple juice, sugar, indigestion tablets, soda, and tap water. Collect several containers and a teaspoon. For solids: add one level teaspoon to a half cup of water and stir until it dissolves, then test. For tablets: add one tablet to a half cup of water and stir until dissolved. Dip a separate piece of pH paper into each solution.



### What you will need:

- Clean glass jar
- Newspaper
- pH paper
- Rain



### What you will need:

- Small Container
- Potting Soil
- Seeds
- Water
- Sunshine

## Help clean the air naturally

All green plants help to clean out air by taking in Carbon Dioxide (a kind of air pollution) and by turning it into O\_\_\_\_\_.

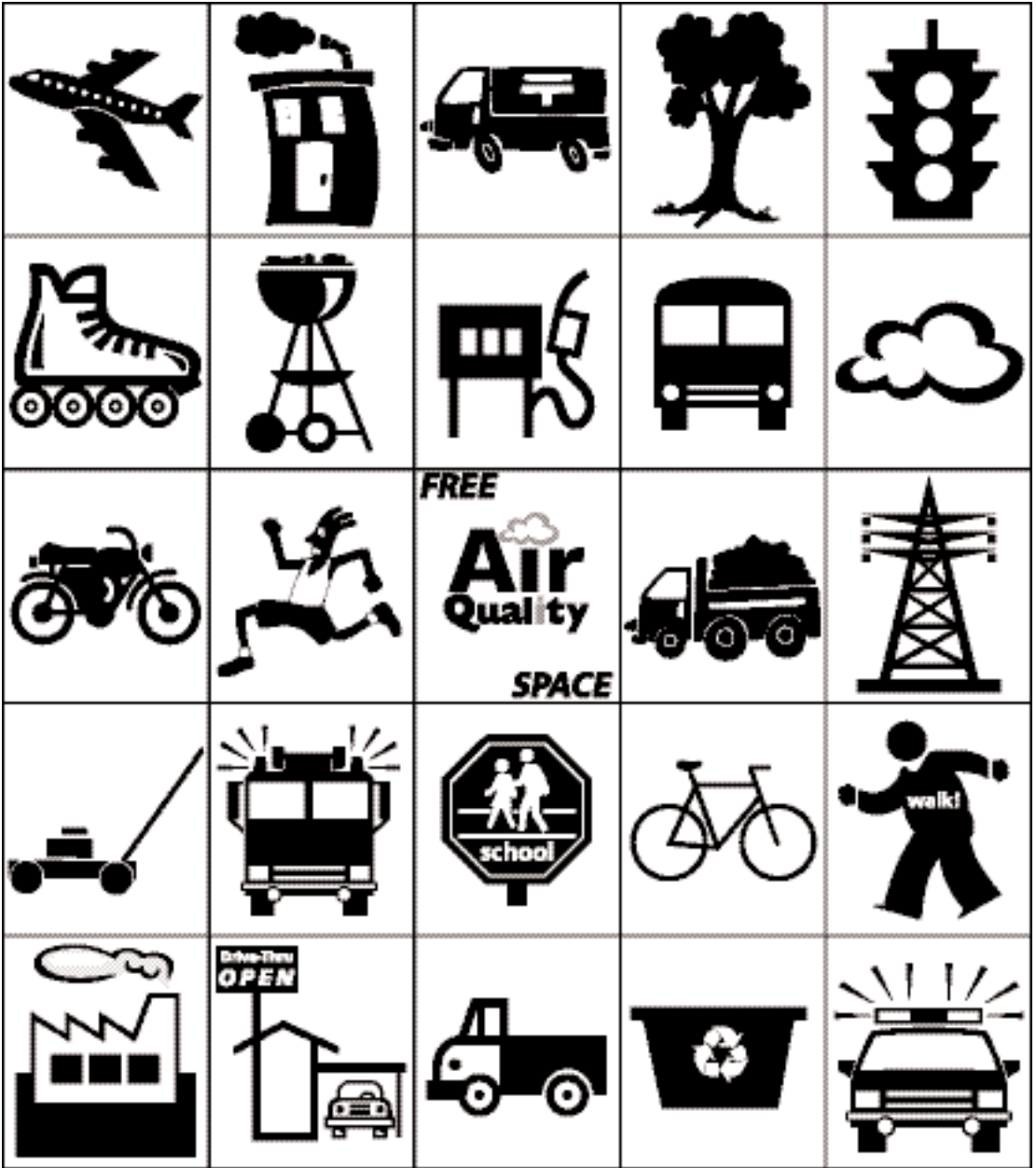
To grow a plant, collect soil, plant seeds, and containers for planting. Use an old pot, buy new, or reuse a small plastic (yogurt) container. Fill the pot with soil and make a shallow hole for the seed. Place a seed in the hole and gently cover the seed with soil.

Now that you have planted the seed, it needs your care. What does the plant need to grow strong?  
w\_\_\_\_\_ and s\_\_\_\_\_.

# Word Scramble

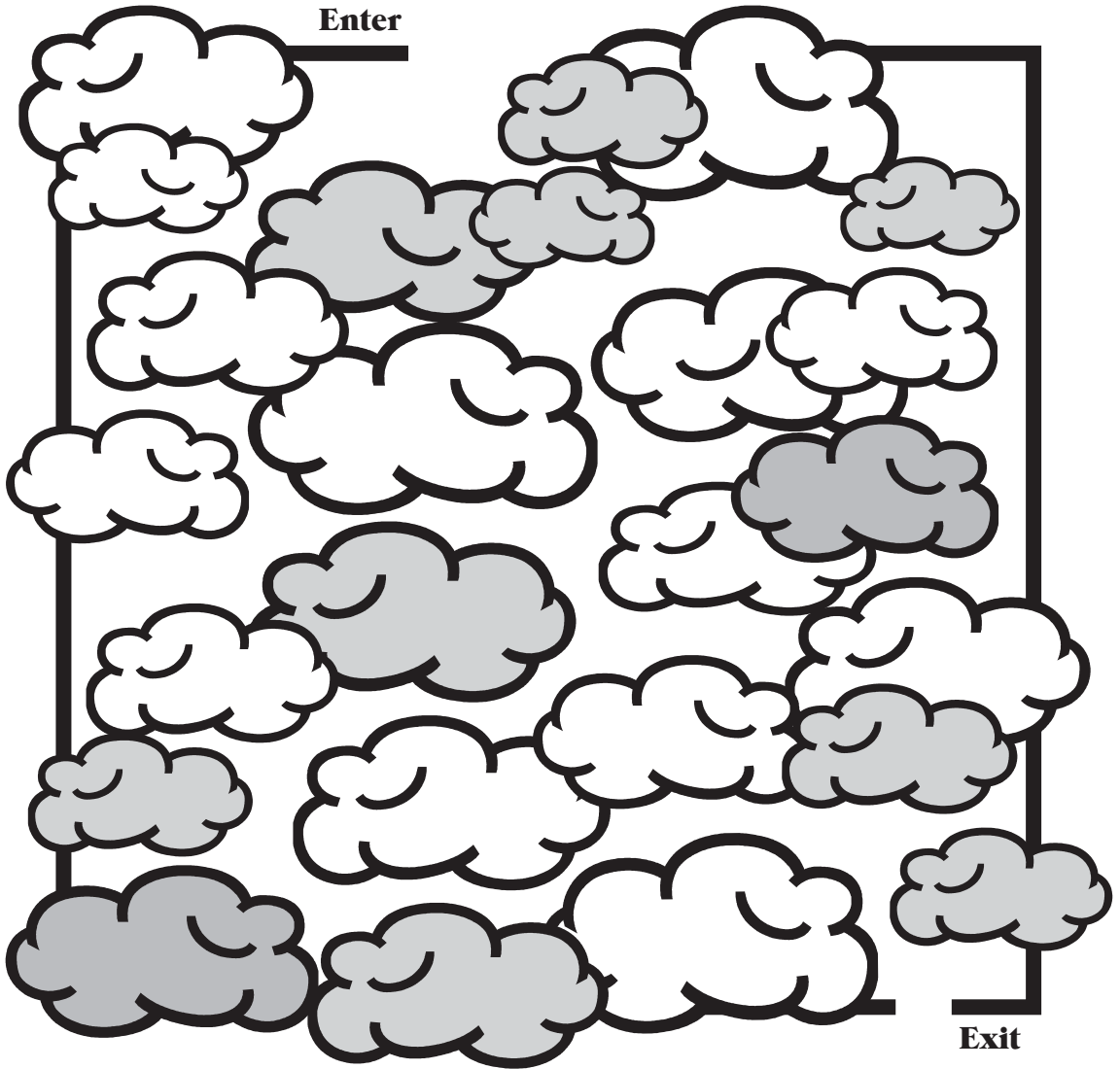
1. Often produced by people and dirties the air. LNOPTOLI  
\_ \_ \_ \_ U \_ \_ \_ \_
2. Dangerous air pollutants are often called \_\_\_\_\_ air pollutants (HAP's) USADAROZ  
H \_ \_ \_ \_ \_ \_ \_ \_
3. Small pieces of dirt and dust in the air. CETALARUIT TAREM  
P \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ T \_ \_ \_
4. Harmful kind of air pollution. NEOZ  
O \_ \_ \_ \_
5. We breathe this pollutant out. RBCOA IIXDEO  
\_ \_ \_ \_ \_ N D \_ \_ \_ \_ \_ \_
6. Scientists worry that the Greenhouse Effect is causing. LLOAG RANIGW  
\_ \_ \_ B \_ \_ \_ \_ \_ M \_ \_ \_
7. Cars, trucks, planes, trains, and boats are all different kinds of OROTTNAIRSRP.  
\_ \_ \_ N \_ \_ \_ \_ \_ \_ \_ \_ \_ \_
8. Solar, wind, and hydro are all reusable types of VITARTEALE GERYE.  
\_ \_ \_ \_ \_ N \_ \_ \_ \_ \_ \_ N \_ \_ \_ \_
9. We should avoid exercising outdoors when the air is EUYHAHTN.  
\_ \_ \_ \_ \_ L \_ \_ \_ \_
10. People who have trouble breathing may suffer from this disease. AMSTA  
\_ \_ \_ H \_ \_

# Air Quality Bingo



Here's a game to play when you're on your way home from school or on a trip. When you see one of the objects pictured here, mark it with a pencil. If you are playing with a friend, the first person to see an object should mark it on their card. To win, mark all the objects in a straight line, or play black out and mark all the objects. Good luck!

# Cloudy Maze



See if you can safely avoid breathing in the smog. When we encounter air pollution we can feel it in many ways: headaches, coughing, itchy eyes and nose, and perhaps even trouble breathing. Sometimes we may not feel anything, but our bodies can still be effected.

On a badly polluted day, it can be bad for us to exercise outdoors. When we exercise, our breathing rate goes up and we breathe in even more pollution. Fortunately in SW Ohio, our air quality is usually moderate. You can find out how polluted our air is each day by reading the newspaper, watching the news, or on the internet at [www.hcdoes.org](http://www.hcdoes.org).

# What's the Rainbow About?

## Code

Have you heard about a special color coded system called the Air Quality Index (AQI)? The AQI tells us about the amount of pollution in the air. Sometimes people call this rainbow colored AQI the **pollution index**. Use the code below to learn what the AQI means to you. Read what each color means and listen for the AQI on the radio, television, in the newspaper, or at [www.hcdoes.org](http://www.hcdoes.org). This will help you plan your outdoor activities and is good indicator of how well everyone is doing their share for cleaner air. When you've cracked the code, you can fill in the flag's color for each level of the AQI index.

- 1=W
- 2=E
- 3=J
- 4=M
- 5=Q
- 6=Y
- 7=B
- 8=Z
- 9=R
- 10=N
- 11=T
- 12=A
- 13=V
- 14=H
- 15=D
- 16=O
- 17=C
- 18=S
- 19=L
- 20=P
- 21=F
- 22=I
- 23=U
- 24=G
- 25=X
- 26=K

On these days, people who are sensitive to smog should consider limiting their outdoor activities.

6 2 19 19 16 1

---



Good days! No health impact when we have this color day.

24 9 2 2 10

---



Active children and adults and especially those with breathing problems like asthma should limit their outdoor activities on this color day.

16 9 12 10 24 2

---



This color is considered unhealthy. When you hear this color; all children and adults especially those with breathing problems should limit their time outdoors.

9 2 15

---



Very unhealthy day. Active children, adults, and people with breathing problems should avoid all outdoor exertion. Everyone else, especially children should limit their outdoor activity.

20 23 9 20 19 2

---



## Fun Web Sites

Visit our site for more fun games and activities, ideas for science fairs, and all sorts of other information visit [www.hcdoes.org/airquality/web-pages/kidsweb.htm](http://www.hcdoes.org/airquality/web-pages/kidsweb.htm)

**Easy Breathers** has a lot of fun interactive games, and you can make your voice heard by sending in your stories, art, songs, and information about what you are doing to help in your community. They even have a homework help page. [www.easybreathers.org/](http://www.easybreathers.org/)

**Smog City** lets you control the temperature and wind, change the number of cars or trucks, play with the population, and see how you can have an effect on smog conditions. [www.smogcity.com/welcome.htm](http://www.smogcity.com/welcome.htm)

Calculate how much carbon dioxide your family adds to the atmosphere at **Air Info Now**. Interactive games and activities show how ozone is built and what pollution can do to your lungs. [www.airinfonow.com/html/activities.html](http://www.airinfonow.com/html/activities.html)



Find out what other kids have done to make a difference at **Carly's Kids Corner**. Play Treevial Pursuit, Who Wants to be a Treellionaire, and other games at the Arbor Day Foundation. [www.arborday.org/carly/](http://www.arborday.org/carly/)

Save Planet Polluto at this interactive site where you can meet the micron monsters! [www.planetpolluto.com/fun.html](http://www.planetpolluto.com/fun.html)

## A Message to Parents and Teachers

*This activity book has been designed by the Air Quality Management Division (AQMD) of the Hamilton County Department of Environmental Services to help young people learn about the air they breathe. Our goal is to create an activity book that will show children/students that they can have a positive influence on our air quality. We at the AQMD hope you will go through this book with your children/students and discuss some of the important ideas presented.*

*If you would like more information about local air quality, call (513) 946-7777 or (Toll free in Ohio 1-800-889-0474), or visit our website at [www.hcdoes.org](http://www.hcdoes.org), or write to:*

*Hamilton County Department of Environmental Services  
Air Quality Management Division, Attn: Lynn White  
250 William Howard Taft Road  
Cincinnati, OH 45219*

## Page 3:

### Crossword Answers

Down:

1. Smog
2. acidrain
5. automobiles
6. sunlight
8. rideshare
11. allergies

Across:

3. pollution
4. temperature
7. lawnmower
9. asthma
10. do your share
12. AQI
13. greenhouse
14. ozone

## Page 12:

### Word Scramble

Answers:

1. Pollution
2. Hazardous
3. Particulate Matter
4. Ozone
5. Carbon Dioxide
6. Global Warming
7. Transportation
8. Alternative Energy
9. Unhealthy
10. Asthma

## Page 15:

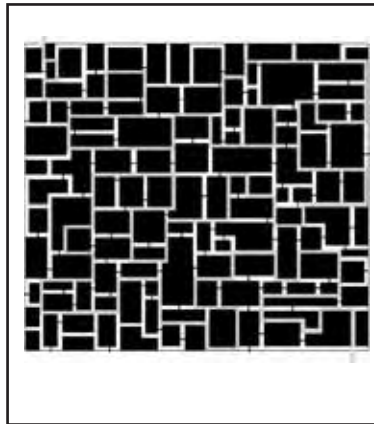
### What's the Rainbow About? Answers:

1. Yellow
2. Green
3. Orange
4. Red
5. Purple

## Page 5: Pollution Search



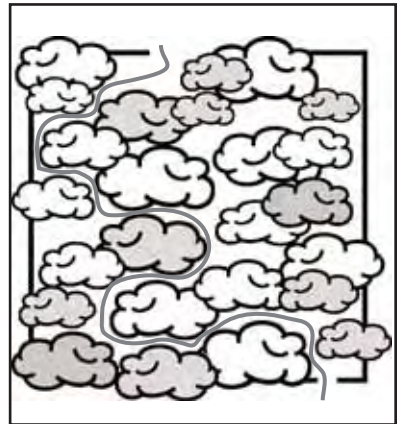
## Page 7: Maze



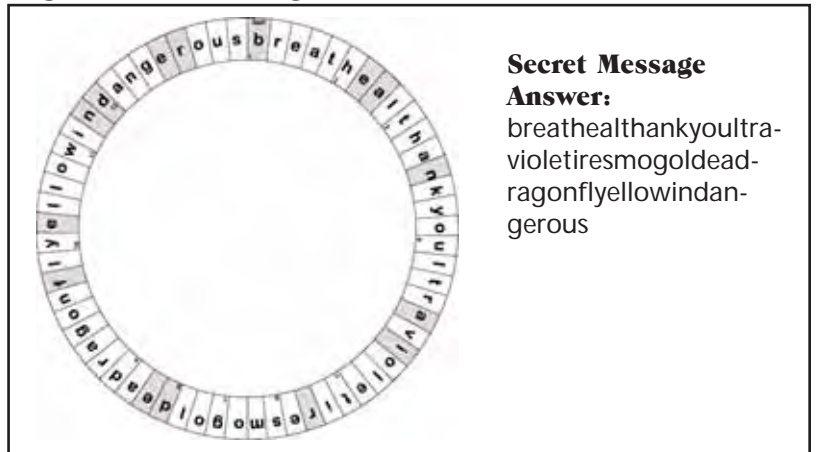
## Page 6: Word Search



## Page 14: Cloud Maze



## Page 9: Secret Message



### Secret Message

Answer:

breaththankyouultra-  
violetiresmogoldead-  
ragonflyyellowindan-  
gerous



***Hamilton County Air Quality Management Division***

*Serving Butler, Clermont, Hamilton and Warren Counties*

*Air Quality Management Division  
250 William Howard Taft Road  
Cincinnati, Ohio 45219  
[www.hcdoes.org](http://www.hcdoes.org)*



**Air Quality Hotline Numbers:**

**Air Quality Index/Pollen and Mold Hotline  
(513) 946-7753**

**24-Hour Complaint Hotline  
(513) 946-7777  
(800) 889-0474 (toll areas)**

**Smog Information  
(800) 621-SMOG**

**To order a Living With Allergies Brochure  
(513) 946-7747**