

For the answer key and to follow A.Q. and M.Dee's adventures online visit www.CleanAirConnections.org



The ADVENTURES of A.Q. & M.DEE



South Coast Air Quality Management District

1-800-4-CLN-AIR (800-425-6247)

Cleaning the air that we breathe...™



The Case of the Gasping Breath



Mystery Solving Best Friends

A.Q. and M. Dee are best friends that solve air quality mysteries. Today, they received the "Case of the Gaspin' Breath." Can you help A.Q. and M. Dee research clues to solve the mystery?



Case:

Client: Jimmy Gasp
Age: 7
Issue: Sent home ill from school
Symptoms: Having a difficult time breathing
Mission: Identify Jimmy's illness



Investigator's Glossary

- Symptom** - A sign of an illness
- Air Quality Index** - Colored flags that indicate current air quality conditions
- Pollutant** - All substances that harm the environment
- Pollution** - Harmful substances that make the air, land, water or other natural resources unsafe
- Mobile Source** - Things that move and create air pollution
- Stationary Source** - Things that don't move and create air pollution
- Area Source** - Small products that you can buy at a store which produce air pollution
- Particulate Matter (PM)** - Small particles in the air that can go deep into the body and cause negative health affects
- Smog** - Air pollution produced by cars, factories, etc..

A.Q. and M. Dee arrive at Jimmy's house.

"Hi Jimmy! We heard you had some breathing problems," said A.Q.

"I was playing basketball at the playground and all of a sudden it was hard to breathe," said Jimmy.

"Hard to breathe" said M. Dee, "that is a symptom. What other symptoms do you have Jimmy?"

As Jimmy begins to describe his symptoms, he gasps for air and the words get scrambled. Help A.Q. and M. Dee unscramble the words to determine his symptoms.



Symptoms:

- Hard to breathe
- ehzwngei wheezing
- gihcognu coughing
- tnetighss ni hcste tightness in chest

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Unhealthy For Sensitive Groups

Using the Air Quality Index below, write the meaning of "orange" on the flag.

With the list of symptoms, A.Q. and M. Dee visit the playground where Jimmy started having a hard time breathing.



Air Quality Index

	Good 0-50	Clean air, have fun! No limitations.	
	Moderate 51-100	The air is okay, but not the best for everyone. If you need to, just play easy. Sensitive people should consider reducing prolonged or heavy exertion outdoors.	
	Unhealthy for Sensitive Groups 101-150	Don't stay outside too long or play too hard. Active children and adults, and people with lung disease, such as asthma, should avoid prolonged or heavy exertion outdoors.	
	Unhealthy 151-200	It's best to stay indoors, but if you have to be outside, just relax and take it easy. Active children and adults, and people with lung disease, such as asthma, should avoid heavy exertion outdoors. Everyone else, especially children, should avoid prolonged or heavy exertion outdoors.	
	Very Unhealthy 201-300	Time to stay indoors. Active children and adults, and people with lung disease, such as asthma, should avoid all exertion outdoors. Everyone else, especially children, should avoid prolonged or heavy exertion outdoors.	

"There is an orange flag," said M. Dee pointing to the flagpole. "What does that mean?"

"Looks like there are pollutants in the air," said A.Q.

"Let's identify where they might be coming from."

Help A.Q. and M. Dee by checking the sources of pollution



A.Q. and M. Dee know that air pollution sources fit into three categories – mobile, stationary and area sources. Help A.Q. and M. Dee list the possible sources in the correct category.



Mobile Sources

Mobile sources are things that move and create air pollution. List all the pollutant sources from the previous page that are mobile.

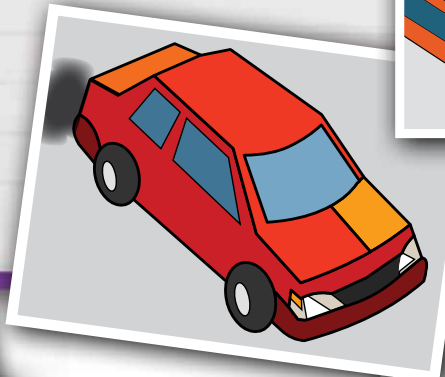
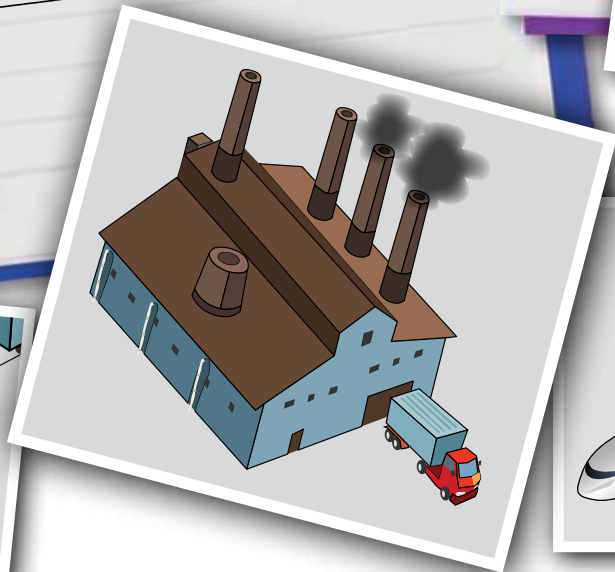
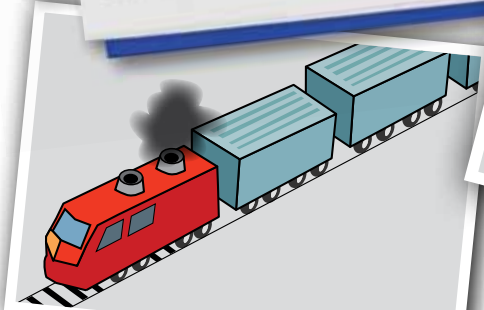
1 airplane

2 train

3 cars

4 trucks

5 ships



Stationary Sources

Stationary sources are things that don't move and create air pollution. List all the pollutant sources from the previous page that are Stationary.

1 gas station

2 dry cleaners

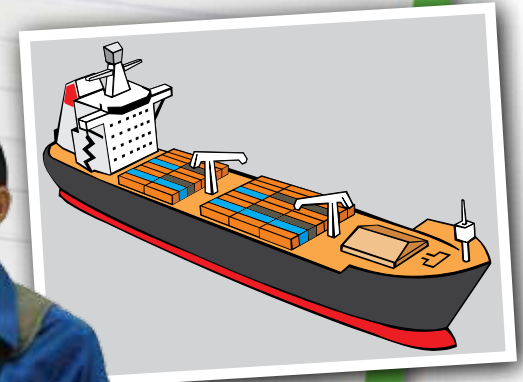
3 factory



Area Sources

Area sources are small products that you can buy at a store which produce air pollution. List all the pollutant sources from the previous page that can be bought.

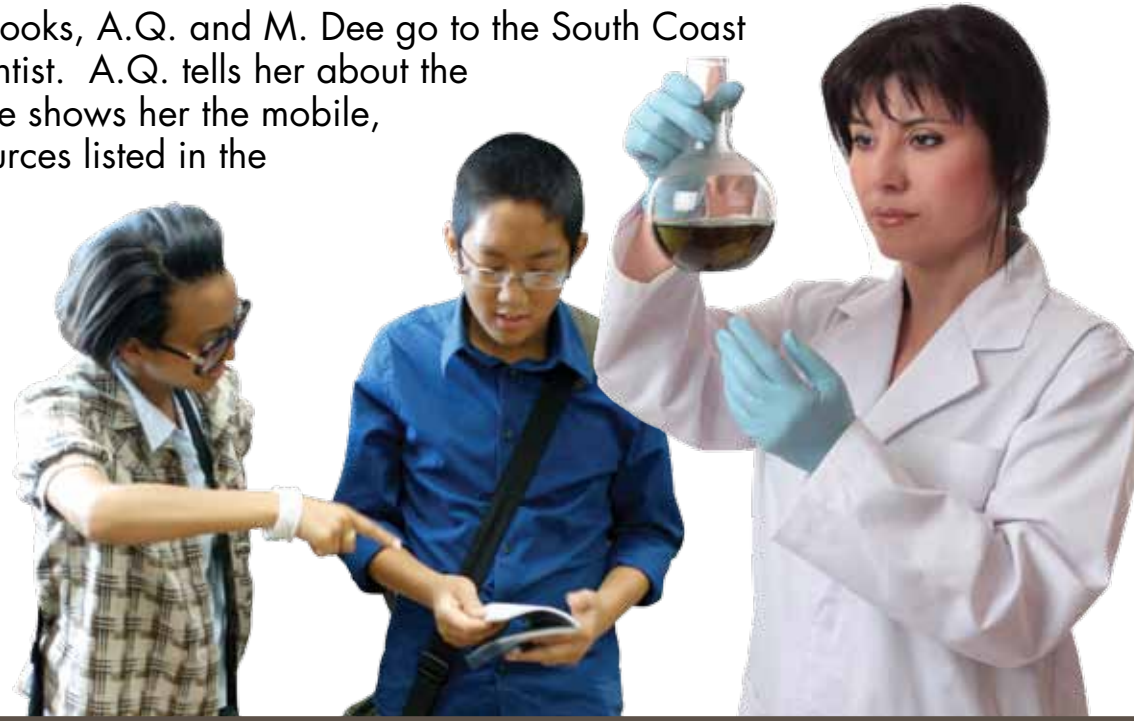
1 paint



With their source notebooks, A.Q. and M. Dee go to the South Coast Lab to meet with a scientist. A.Q. tells her about the orange flag and M. Dee shows her the mobile, stationary and area sources listed in the notebook.

"Can these sources be causing Jimmy's sickness?" A.Q. asks.

"In order to determine that," says the scientist, "we first have to determine what these sources are putting into the air."



With the list of pollutants released by mobile, stationary and area sources, A.Q. and M. Dee visit a doctor to learn how these pollutants enter a person's body and affect that person's health.

"The smaller the pollutant, the further it can travel inside the body," the doctor says. "Once trapped inside, these pollutants can cause watery eyes, coughing, tightness in the chest, and trouble breathing. Let me show you."

Help the doctor demonstrate to A.Q. and M. Dee how pollutants travel inside the body. Draw a picture in the box of the size particle that traveled to the location.

Help A.Q. and M. Dee search for the names of air pollutants caused by these sources.

D E Q N E D M W V D O M E P K S P
 N P D M E X R A S H Y D F J T A H
 F H K I I D U M S Q I X P F R G M
 Q V J N X E Q Y M X X T U T Z E S
 L D Q Q I O T K O R N J I L E S G
 R E F F H J N I G A M C P G E U V
 D Y A J N K D O K I U B N B X O E
 G W N D J R X R M L B B W V R H B
 Q I U Z U F W S A N C M H B O N B
 J V V F L E U T J Q O F E Z L E X
 V O L J W H E B P Q T B M G D E C
 C U A V Z M T O X I N S R I M R H
 S E E D A D L F J V D U X A M G I
 V J V T M G U S R H W D T E C G C
 Q N T J N H D D S O X D X P B B D
 G E D I X O I D N E G O R T I N O
 R J D Y V A X M S W D R R V D M G

Word Key

- | | | |
|-----------------|--------------------|----------------|
| CARBON MONOXIDE | NITROGEN DIOXIDE | SULFUR DIOXIDE |
| GREENHOUSE GAS | PARTICULATE MATTER | TOXINS |
| LEAD | SMOG | VOC |



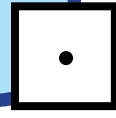
Large particles and gases irritate nose, throat, sinuses and can cause sore throat and coughing.



Fine particles penetrate deep in the lungs causing damage.



Microscopic particles can irritate lung tissue and impair the immune system cells that protect your lungs against infections.



Pollutant Key
 ▲ PM 10.0
 ■ PM 2.5
 ● PM 0.1

You have helped A.Q. and M. Dee discover all the clues to Jimmy's illness. Now, put all the clues together to make the diagnosis.

Down

1. The flag at the playground was _____ indicating unhealthy air quality
2. At the playground, one of the major sources of mobile pollution came from _____
3. A source of air pollution that does not move is called _____
4. The doctor said that unhealthy air quality can cause difficulty with _____
5. One of the air pollutants was _____ which is a combination of the words smoke and fog
6. The _____ in size the pollutant is, the further it travels inside the body.



			4	b		
				r		
	2	c		e		
1	o	a		a		6
	r	r	3	s	t	5
	a	s	t	h	m	a
	n		a	i	o	l
	g		t	n	g	l
	e		i	g		e
			o			r
			n			
			a			
			r			
			y			



1. **Layer Up, Layer Down**
 - Wear a sweater, grab a blanket, put on extra warm socks when it gets cold instead of turning up the heat.
2. **Bottle & bag it**
 - Use reusable bottles for water and other drinks instead of purchasing bottled water, soda, or juice.
 - Use reusable bags and take them to the store when you shop.
3. **Lights out!**
 - Turning off the lights when you leave the room can cut your family's lighting bill by a third.

4. **Lighten your "footprint" to school**
 - Ride your bike, skateboard, or walk.
 - If you must drive, organize a carpool or take the bus.
5. **Remember to recycle**
 - Learn what can be recycled and remember that every bottle, can, and piece of paper counts.
 - Buy items made from recycled goods.
 - Recycling should be the last step. Reduce your consumption and reuse what you already have before buying something new.
6. **Shorter showers**
 - Keep a shower timer to reduce the amount of water used.
7. **Keep it contained**
 - Use reusable containers (preferably glass or metal)
 - Use reusable bottles for drinks
 - Bring home uneaten food to compost, or toss into the school's compost bin.
8. **Consume less!**
 - Less IS produced when demand goes down.

What are two more things you can do to help clean the air that we breathe? Draw and write your ideas below.

9. _____

10. _____