

Breathing Basics



American Respiratory Alliance of Western Pennsylvania

**CLASSROOM
ACTIVITIES
INCLUDING
MINUTE
EXPERIMENTS**



American Respiratory Alliance
of Western Pennsylvania

TOBACCO EDUCATION AND PREVENTION

Classroom Activities

1 TANGIBLE DISPLAY OF CHEMICALS IN A CIGARETTE

Grade Levels: All

Objective: Students will be able to see the various toxic chemicals that are produced when tobacco is burned or mixed with saliva in the form of smokeless tobacco.

Overview: The teacher can provide the students with the provided list of chemicals that are produced when tobacco is burned or mixed with saliva. The students will then assemble household products that contain the same chemicals, and create a display for the classroom, or display case in the school.

**Cigarette
component**

Represented by...

Ammonia
Tar

Toilet bowl cleaner
16. oz. of dark molasses in a jar shows the amount of tar that passes through the lungs after having smoked one pack of cigarettes a day for a year

Naphthalene
Cadmium
Acetone
Cyanide
Formaldehyde

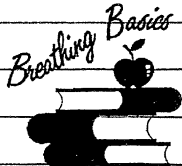
Mothballs
Batteries (acid)
Fingernail polish remover
Rat poison
Plastic frog in a jar of water

2 LETTER TO A LOVED ONE

Grade Levels: Lower Elementary

Objective: Students will use knowledge from presented tobacco information and other verbal skills to form a personal request to someone they love asking them to stop using tobacco.

Overview: Encouraging words of support to a loved one telling them that the student understands that stopping smoking can be very difficult, but the student will offer all of the help and support that he or she can.



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3 **ROLE PLAYING: Practicing refusal skills** **Grade Level: Upper elementary and Middle**

Objective: After discussing situations where peer pressure could be a problem regarding tobacco use, students can role-play practicing refusal skills.

Overview: Students can create several possible situations that they might possibly encounter where tobacco would be offered to them. Pairs or groups of students can role-play using refusal skills.

Example: You are one of five friends at a sleep over, the other four decide to smoke and you don't want to. How do you react?

4 **LIFE SIZE POSTER OF TOBACCO USE EFFECTS** **Grade Level: Upper elementary and Middle**

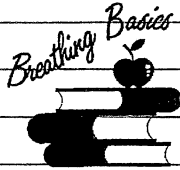
Objective: Students will see how far reaching the bad effects of tobacco use can be on the body.

Overview: Using a life-size outline on newsprint or other suitable paper, indicate the result of tobacco use on particular body parts.

5 **ANTI-TOBACCO NEWSLETTER** **Grade Level: Middle**

Objective: Students will report information gathered and presented in class in the form of a newsletter.

Overview: This is an opportunity for students to use the information presented in class as well as interviews, news stories, and school surveys, etc. to report to the others what they have learned and how they feel about tobacco use.



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6 THE PRICE OF CIGARETTES Grade Level: Middle, High

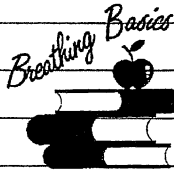
Objective: Students will gain a better understanding of the long-term cost of cigarettes and the financial impact this can make in their lives.

Overview: Students can calculate the cost of cigarettes over a period of time, then show other ways they could have spent the money. For example, one pack of cigarettes cost \$3.15— what could you do with the \$3.15 rather than spend it on cigarettes? The group can make a common list. Do the same for 7 packs of cigarettes, 30, 365. Extend this calculation for two or more years. This activity can be arranged and displayed in a high traffic area of the school.

7 TOBACCO IS TOXIC Grade Level: Middle, High

Objective: Students will observe the toxicity of tobacco.

Overview: Have a student come to the front of the room as a volunteer. Ask him or her which arm is their dominant arm (left or right). Have them raise their dominant arm to shoulder level at their side. Tell them you will try to push their arm down and they must try to resist. It is difficult to push down. Now, using their other hand, have them place a piece of fruit on the tip of their tongue. Try to push their arm down. It is still difficult. Now have them put the tobacco end of a cigarette on their tongue. Again try to push their arm down. It is very easy. Their arm will go right down to their side. This demonstration will show that tobacco is a substance that weakens the body.



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Classroom Activities

8

INTERVIEW A SMOKER

Grade Level: Middle, High

Objective: Smokers attitudes will be shared with students via an interview process.

Overview: The class can develop the interview questions and then each student can interview a smoker and share the outcome.

9

ADVOCACY ACTIVITIES

Grade Level: Middle, High School

Objective: Students will see how their voice can be heard through various advocacy activities.

Overview: Advocacy is effective assertion of educationally, scientifically and medically valid principles crafted into legislation or a regulation. In general, the outcomes of carefully developed initiatives will be preventative in nature. The most efficient and cost-effective programs will seek to prevent a problem rather than correct it after the fact.

Students can choose an activity that has both group appeal and is realistic. They can then proceed with the activity.

- Develop policy for a totally smoke free school— students, staff, and employees
- Make athletic field, either school or community, smoke free
- Get a local restaurant to go entirely smoke free.
- Get local retail establishments to stop selling to minors.
- Work with local public officials to eliminate smoking in public facilities or enclosed public workplaces.
- Institute a vending machine ordinance.
- Become members of a tobacco coalition.
- Get a local grocery store to remove tobacco ads from grocery baskets.



"I—Professor Al V. OLI—have a quiz for you today! It's a short quiz—only one question. But the answer is tricky."



MINUTE EXPERIMENTS

Experiment No. 1

Supplies Needed:

- Drinking glass
- Bowl
- Cork
- Paper
- Water

"First, get a drinking glass from the cupboard. Now tell me, is the glass empty? If you answer **Yes**, I say **No**—and I'll prove it.

STEP 1: Fill the bowl with water and float the cork in the water.

STEP 2: Slowly push the glass down over the cork. As you push the glass down, the cork goes down.

STEP 3: Take glass out of the water. Crumple the piece of paper and place it into the drinking glass. Now slowly push the glass down over the cork floating in the bowl of water.

Results:

Why doesn't the water come into the glass and wet the paper?

Hint:

I already gave you a clue—the glass isn't empty. For the answer to this Minute Experiment, see below."

Solution:

The drinking glass is full of tiny air molecules. The weight of the air in the glass—called air pressure—pushes the cork down from the water's surface. The water pressure tries to force water into the glass, but there is no room for the water because the glass is filled with air. That's why the paper in the glass doesn't get wet.

"You may have heard of Flying Fish and Singing Hills, but I—Professor Al V. Oli—ask you, 'Who ever heard of Dancing Macaroni?' Yet this is one of my favorite experiments because it's so much fun to do."



Experiment No. 2

Supplies Needed:

- Large glass jar
- Water
- Vinegar
- Baking soda
- Uncooked macaroni

STEP 1: Put one-third cup of baking soda in the jar.

STEP 2: Slowly fill the jar about two-thirds full of water and stir until the baking soda has dissolved.

STEP 3: Slowly add about one-half cup of vinegar. The jar will be filled with bubbles.

STEP 4: Drop a handful of macaroni in the jar. The macaroni will sink to the bottom, then will jump to the top, float for awhile, then sink to the bottom once again. The macaroni will continue to 'dance' up and down in the jar of vinegar-water.

Results:

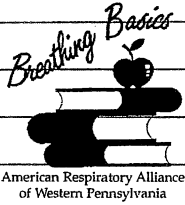
"Why did the macaroni first sink to the bottom, then jump to the top, and sink to the bottom again?"

Hint:

The bubbles of gas play an important role. This gas is just like the gas you exhale when you breathe."

Solution:

When you combine vinegar with baking soda, you release carbon dioxide gas. This is the same gas that you **exhale** when you breathe. It is this gas that allows the macaroni to 'dance' up and down in the water. As the reaction slows and less carbon dioxide is released, you can add a little more baking soda and/or vinegar to keep the macaroni 'dancing.'



Nearly 5 million children in the United States have asthma. Professor Al V. OLI wonders if you know what asthma is and what happens to your lungs when you have this chronic lung problem.



MINUTE EXPERIMENTS

Experiment No. 3

Supplies Needed:

- Plastic drinking straw
- Rubber band.

STEP 1: Wrap the rubber band loosely around the straw until it doesn't slip off.

STEP 2: Continue wrapping the same rubber band around the straw as many times as you can. Try to keep the rubber band in the same place on the straw.

Results:

1) What happens to the straw?

2) Can you still blow air through the straw?

3) This experiment is a good example of _____ that occurs during an asthma attack (choose one):

- A. inflammation
- B. constriction
- C. excessive mucus

Hint:

Asthma is respiratory disease. The airways or bronchioles become inflamed and swollen. The muscles that surround these breathing tubes tighten and constrict. Also there is excess mucus produced. All of these events make it harder to breathe.

Solution:

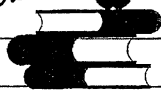
1) It collapses.

This demonstrates the smooth muscle that surrounds the airways.

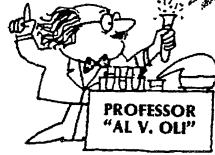
2) Yes, but it's harder and not as much air goes through.

During an asthma attack airflow is obstructed and you become short of breath.

3) B. constriction



Humidity is moisture, or water, in the air. Too much or too little humidity can affect your breathing. This is especially true if you have asthma or other types of breathing disorders.



MINUTE EXPERIMENTS

Experiment No. 4

Supplies Needed:

- A clean, dry drinking glass
- Ice water
- Paper towel
- Small plate or saucer

STEP 1: Make sure the outside of the glass is dry. Fill with ice and water. Place it on a paper towel on a plate or saucer in your room. Wait for 15 minutes.

STEP 2: Repeat Step 1 in other rooms of your house—the kitchen, the bathroom (before and after a shower or bath), the basement, etc. You might also try this experiment at different times of the year to see how the humidity changes.

Results:

- 1) What happens to the outside of the glass?
- 2) Are the results the same or different in other rooms?

Bedroom: _____
Kitchen: _____

Bathroom: _____
Basement: _____
Other Places: _____

- 3) In general, when and/or where would you expect the humidity to be high: _____

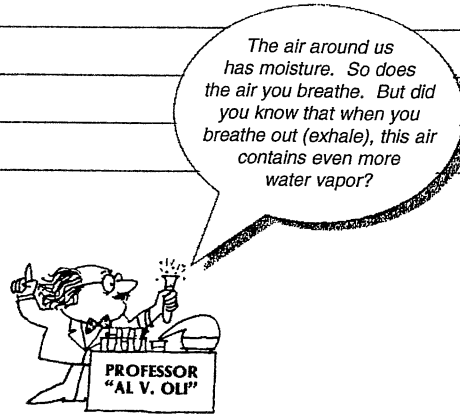
Low: _____

Hint:

Humidity or the moisture content of air varies constantly. Meteorologists report the relative humidity during the news. When we expect rain or snow, the relative humidity is high. Desert climates usually have low relative humidity.

Solution:

If the glass looks like it's "sweating," then your room has **high** humidity. If the glass is damp or "misty," then there's **moderate** humidity. If the outside of the glass is dry, then there is **low** humidity in the room.



Experiment No. 5

Supplies Needed:

- A small mirror.

STEP 1: Place mirror near your mouth.

STEP 2: Exhale (breathe out) against the mirror so that the air washes over the glass.

Results:

1) Does the mirror get cloudy?

2) Why does the mirror feel wet when touched?

3) How else can you prove there is water vapor in your exhaled air?

4) What is the source of the moisture that you see on the mirror?

Hint:

Humans exhale nearly 2 quarts of water each day. As a gas this water vapor is also invisible. The water comes from the body tissues, especially the lungs. It is very important to replenish this moisture by drinking at least 6-8 glasses of water daily.

Solution:

- 1) Yes.
- 2) Yes.
- 3) Seeing your own breath when walking or playing outside on a cold day. The water vapor you exhale condenses or forms water droplets when it meets the cold air, making your breath visible.
- 4) The moisture is water provided by the lungs and the body.