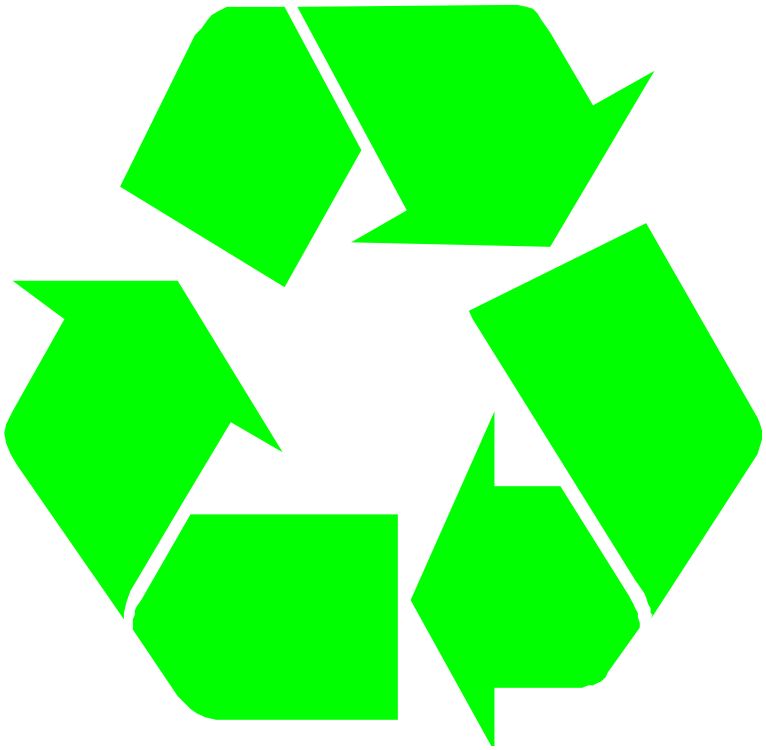
April 1999



Pollution Solution

April 1999 – Pollution Solution

Focus. Many of us can still remember back to the 60s and some of us can even remember *The Silent Spring*. Thanks to that poignant piece and the hard work of many, we are probably on a road to recovery, if as they say, the first step is to admit you have a problem. But if we don't keep a vigil, we will end up right back where we were heading not too long ago. This month, we can use positive teaching to reinforce in our youth our stewardship of the earth.

Pack Meeting Ideas

Pre-Opening Activities

Air Pollution Word Search

Here's another one! This one comes from the internet (http://www.tnrcc.texas.gov/air/monops/lessons/ lesson_plans.html), which, by the way, is one of the greatest resources for Environmental Science information and neat ideas to do with the Cub Scouts. The Word Search puzzle is at the end of this section.

Pollution Solutions

This game heightens the Pack's awareness of the different kinds of pollution and the means to correcting them. This requires some research to collect the pictures needed. Good sources for these pictures are the weekly news magazines (*Time, Newsweek, U.S. News & World Report,* etc.). Collect pictures that show different forms of pollution and pictures of how to correct the pollution problems. For example, if you have a picture of a factory spewing out smoke from a chimney, find another picture that shows a modernized stack/scrubber on the top of a building that doesn't show the same problem. Different areas to consider include streams/drains, factory buildings, cars/trucks, trashy areas, etc.

Once you've collected the pictures, mount them on construction paper and label the "bad" ones with letters and the "clean" ones with numbers. Hand out papers with the letters listed and spaces next to them to fill in the "fix it" numbers. Have them match the solutions to the pollutions.

Pollution Solution

Same name, but a different activity! Give out pages with "POLLUTION SOLUTION" written at the top. Ask the folks to list as many words as possible from the letters in the title.

Opening Ceremonies

C-U-B-S

Have the boys work together to prepare posters that reflect the message they are presenting. There will be at least four posters and up to as many as they make when you include the picture posters). The four posters have the letters C, U, B, and S on them.

The boys stand in front of the Pack and recite their lines:

C stands for "Cut back." Reduce the amount of trash and waste you make.

U stands for "Use." Use things again instead of throwing them away.

B stands for "Be sure." Be sure to recycle whatever you can instead of throwing it in the trash.

S stands for "Save." Together we can save our planet from too much pollution.

Outdoor Code Opening

CUB 1: As an American I will do my best to be clean in my outdoor manners.

CUB 2: I will treat the outdoors as a heritage. I will try to improve it for myself and others. I will keep my trash and garbage out of America's water, fields, woods and roadways.

CUB 3: I will be careful with fire.

CUB 4: I will prevent wildfire. I will build my fire in a safe place and be sure it is out before I leave.

CUB 5: I will be considerate in the outdoors.

CUB 6: I will treat public and private property with respect. I will remember that use of the outdoors is a right that I can lose by abuse.

CUB 7: I will be conservation minded.

CUB 8: I will learn how to practice good conservation of soil, water, forests, wildlife, and energy.

Activities

The Litterbug

Joyce Newell, Pack 292; White Tanks, 1980

PAPER - Crackle-crackle
TRASH - To the Dump-dump
CANS - Clitter-clatter
LITTER BUG - Toss and Throw

God put bugs in this world for many a reason
He made them to live in every kind of season

But the pesky litterbug with his paper and his can
Was made through neglected trash by the foolish man

To keep America beautiful, get rid of the litterbug
So beach-goers can again lounge on a clean sandy rug.

Because of this pest we must woller around
In paper and cans and trash and all over the ground

Just who are these litterbugs who mess up our land
Do you ever really see them toss that paper or can

Quite often thee litterbug is a sneaky guy
And at dumping his trash, he's oh so sly.

So most of the time it just appears everywhere
As if it had dropped right out of thin air

Could it be we're so used to throwing things here and there,
That we dump that paper or can without being aware?

Without even thinking when we toss trash and waste
We could be an unconscious litterbug in all of our haste

So when you unwrap that gum or small candy piece of candy,
Don't throw the paper on the ground just because it's handy.

Next time stop and think, when a pop can you toss.
'Cause if you're a litterbug, it's also your loss

So if every single person would take note of their habit,
That pesky litterbug, we certainly could nab it!

Then that terrible bug we would surely stamp out,
With no more paper or cans or trash about.

To keep America beautiful we must all do our part,
By taking care of our trash properly from the start.

Trash Sculptures

This activity is similar to doing Genius Kits except that you don't put any bounds on the materials they use except that they must come from the trash/recycling bins (and that the materials used be cleaned first!). Have the boys develop their Trash Sculptures at home and bring them to the Pack Meeting for judging. Be ready for some unbelievable results!

Songs

It's A Small World

It's a world of laughter, a world of tears;
It's a world of hopes and a world of fears.
There's so much that we share
That it's time we were aware.
It's a small world after all.

It's a small world after all,
It's a small world after all.
It's a small world after all.
It's a small, small world.

There is just one moon
And one golden sun
And a smile means friendship to ev'ryone.
Though the mountains divide
and the oceans are wide,
It's a small world after all.

America The Ugly

Oh beautiful for smoggy skies - insecticided grain
For strip mined mountains majesties, above the asphalt plains.
America, America! Man sheds his waste on thee,
And hides the pines with billboard signs from sea to oily sea.

Fast Food

Tune: A ram sam sam

Pizza Hut a Pizza Hut
Kentucky Fried Chicken and a Pizza Hut
Pizza Hut a Pizza Hut
Kentucky Fried Chicken and a Pizza Hut
McDonald McDonalds
Kentucky Fried Chicken and a Pizza Hut

A Burger King a Burger King
Long John Silvers and a Burger King
A Burger King a Burger King
Long John Silvers and a Burger King
Red Lobster Red Lobster
Long John Silvers and a Burger King

Dairy Queen A Dairy Queen
Chuckey Cheese and a Dairy Queen
Dairy Queen A Dairy Queen
Chuckey Cheese and a Dairy Queen
Roy Rogers Roy Rogers
Chuckey Cheese and a Dairy Queen

Actions
Pizza Hut - Make shape of a hut in the air
Kentucky Fried- Flap elbows up and down in the manner of a demented chicken
McDonalds - Put hands on top of head and bring out and down to produce the "Golden Arches"
Burger King - Put hands on head with fingers up to make a crown
Long John Silver - mimic swordplay
Red Lobster - hold up arms and bring fingers down on thumbs like lobser claws snaping
Dairy Queen - mimic milking a cow
Chuckey Cheese - mimic throwing up a pizza
Roy Rogers - miminc riding a horse

He's Got The Whole World In His Hands

He’s got the Whole world in his hands:

He's got the whole world in His hands.
He's got the whole world in His hands.
He's got the whole world in His hands.
He's got the whole world in His hands.

2. He's got the wind and the rain in His hands.
3. He's got the tiny little baby in His hands.
4. He's got you and me sister in His hands.

Skits

The Awful Eight

It's a play more than it's a skit, but it would be a good one for the Webelos Scouts to use as part of their Showman Activity Badge. Also, it's very timely for the theme. (It's always good to get the Webelos program to coincide with the Pack's monthly theme.) The play is at the end of this section.

Advancement Ceremonies

Akela's Life Story

[Note that this and other ceremonies should be reviewed and modified to suit the specific awards being giving at the meeting. This ceremony is written so that any particular award can be used or omitted without impacting the whole of the ceremony.]

EQUIPMENT: Ceremony board or log with three small candles and one large candle; tom-tom; artificial campfire.

SETTING: Akela enters and walks behind the fire. Akela gives the Cub Scout sign and tom-tom beating stops.

(BOBCAT)

NARRATOR: Tonight we welcome new members into the Pack as Bobcats. *[Call boys receiving their Bobcat awards and their parents forward.]*

NARRATOR: You have worked hard to earn your badge. You have learned what is the foundation of the Cub Scout program. Now that you have completed the requirements, we award you the Bobcat badge.

[Hand awards to parents to present to the boys.]

NARRATOR: Before you leave the council fire tonight, we also want to tell you the story of Akela, the chief of the Webelos tribe. Come sit by the fire to learn of the great chief.

[Bobcats sit around the council fire. Parents return to their seats.]

NARRATOR: Akela was the big chief of the Webelos tribe; tall, stalwart, straight as an arrow, swift as an antelope, brave as a lion - he was fierce to an enemy but kind to a brother. Many trophies hung in his teepee. His father was the son of the great yellow sun in the sky. He was called the "Arrow Of Light" His mother, from whom he learned those wondrous things that mothers know was called "Kind Eyes". He began to understand the signs and calls of the Webelos tribe. Then he was taken on little trips to the forest among the great trees and streams. Here, from the Wolf he learned the language of the ground; the tracks and the ways to food.

(WOLF)

(At this point, Akela lights the small Wolf candle using the large candle)

AKELA: With this candle, representing the "Spirit of Akela" we light the trail of the Wolf. From the signs along the Wolf trail, I see the following braves are ready for advancement in the Wolf Clan of Akela's tribe.

(Akela calls the names of the boys receiving Wolf badges and arrow points. They come forward and stand before the campfire. Akela presents awards. to parents to present to the boys.)

NARRATOR: Then from the big, kindly bears, he learned the secret names of the trees, the calls of the birds, the language of the air.

(BEAR)

AKELA: *(lighting the Bear candle)* With the "Spirit of Akela" we light the Bear trail. From the signs along the Bear trail I see the following braves are ready for advancement into the Bear Clan of Akela's tribe.

(He calls forward the boys who are receiving Bear badges and arrow points Akela hand awards to parents to present to the boys.)

NARRATOR: But before he could become a Scouting "brave" on his own, he had to prove himself by trying out new skills, performing certain tasks and passing tests of accomplishment.

(WEBELOS)

AKELA: *(Lighting the Webelos candle)* With the "Spirit of Akela" we light the trail of the Webelos. From the signs along the Webelos trail, I see that the following braves have shown their skills and have earned their Webelos rank.

(He calls the names of the boys receiving activity badges and indicates which badges they earned. Hand awards to parents to present to the boys.)

NARRATOR: There Akela was required to pass the highest test of all. He must prove himself qualified to wear his father's name "Arrow of Light".

(ARROW OF LIGHT)

AKELA: From the signs further down the Webelos trail, I see that the following braves have proven themselves worthy to wear the "Arrow of Light", the highest award in Akela's tribe.

(He calls forward the boys who have earned the Arrow of Light Award. Hands awards to parents to present to the boys.) (Drum stops)

From the four winds, Akela hears that you braves are doing well along the trails that will lead you into Boy Scouting and the highest trail of all, that of Eagle. Now will all Cub Scouts stand and repeat with me the Cub Scout Promise.

[Congratulates ALL and calls for an applause.]

Special Ceremonies

Arrow Of Light & Graduation Ceremony

Note: Ideally, this ceremony should be performed in an outdoor campfire setting; for example, at a pack picnic. This allows for a more natural feel as well as for the use of torches, firepots, and other "special effects". If an indoor setting is preferred by the pack, candles should be used in place of smudgepots. The tokens called for in the ceremony can be provided by either the team or the pack. The team should have something prepared in case the pack doesn't (an arrow with a felt banner, leather thong bolo, etc.). The team needs to make sure (via the Webelos leader) that the Cubs participating in the ceremony know and can recite the Scout Oath and Law as they are called upon to say both in the ceremony. When performing the speaking parts, memorization is important, but also try to become familiar enough with the part so the words come out naturally.

Also, since this ceremony doesn't tie in with any Order of the Arrow induction ceremony, sashes should NOT be worn.

Arrow of Light Ceremony

(The three principles (Chief, Medicine Man, Guide) enter from the rear and take their positions: Chief at the North, Medicine Man at the West and Guide at the east.)

Chief: (pausing for a moment to look out among the pack)

Cub Scouts, leaders, parents and guests; my brothers, Weuchsowagam, the Medicine Man, Witschindin, the Guide, and I, Takachsin, the Chieftain, bring you greetings and salutations. We have come before you tonight to fulfill a prophecy spoken in the legends of our tribe.

Med: The words of the prophecy say that in the springtime of each year, young braves will be found who have met the challenges of Akela and are ready to become warriors. My brothers and I have watched your pack and have found such braves among you. We have come to present them with the highest honor: the Arrow of light. But before this can happen, they must take a journey through their memories.

Guide: Many moons ago, you entered the Cub Pack. The first challenges you encountered were from the Bobcat clan. As you met them, you learned what it means to be a Cub, the Law of the Pack, and the three words that would inspire you to meet all other challenges: Do Your Best. (Light firepot or candle) Having started on the trail, you next sought to join the Wolf clan. Here you were met with twelve challenges, harder than the Bobcat tests, But with the cleverness of the wolf itself, you met them and continued on your journey. (Light firepot or candle)

Med: Now the trail became darker and fainter as you came to the Bear clan. Again twelve challenges were presented before you. As you met them, your knowledge grew and your spirit strengthened. It was this strength of spirit, like the bear, that prompted you to move onward. (Light firepot or candle)

Chief: As you neared the summit, you joined the Webelos clan. The time of your testing had begun. In the Webelos clan you began to learn about Scouting. Just as you learned the ways of the brave as a Bobcat, Wolf, and Bear, as a member of the Webelos clan you would learn the ways of the warrior. (Light firepot or candle)

In time, you earned the Webelos badge, blazing the rest of the trail on your own. Now at last you have reached the summit and the end of this journey.

(To other principles) Let the Arrow of Light be conferred upon them.

Guide: (to Chief) Wait Brother Takachsin! Before receiving this most high honor, they must hear its legend so they may understand and appreciate what they are to receive.

Chief: (to Medicine Man) Brother Weuchsowagam, let the legend of the Arrow of Light be known to all present.

Med: (Moves forward) In the ages past, when the Nations of the red man spread across the land, there was a young member of one tribe called Akela. Akela wished to be a warrior as the older men of his tribe were, but no one would consider him so. "Little Akela, he is too young to join the hunt," they would say. "Too slow to run with the Bobcat clan. Not clever enough to hunt with the Wolf clan. Such a young one is not strong enough to join the Bear clan." No matter how hard Akela worked, all ways were barred to him. But the Aged Chieftain of the tribe saw Akela differently than the rest. "The spirit of this young one burns brighter than the largest fire. Akela has served his brethren well for one of his age. The time will come when the tribe will need only that which Akela can give."

One night in the fall during the harvest, a party of warriors was canoeing back to their village after a hunt. On this night, the fog rolled thick across the river. The fog was so heavy, the river path back to the village was hidden from view. A nearby river path to the right led to a roaring chasm. The warriors did not know the safe path to take and were trapped.

Akela had been practicing his hunting skills in the hills above the river and had seen the danger to the canoe. He wrapped an arrow in a skin, set it aflame, and shot it into the sky toward the safe river path. The warriors in the canoe saw the flaming arrow through the fog and followed it toward the safe river path and the village.

The warriors went to the Chieftain saying, "We were trapped on the river and the Highfather sent an Arrow of Light through the sky to guide us." The Chieftain smiled and said, "The sign which led you to safety came not from the heavens but from one who you thought was too young to do anything." He brought Akela forward to the surprise of the warriors.

"Akela has proved himself worthy to wear the name of warrior. He has aided his brothers in their time of greatest need. Hereafter, all youngmembers of our tribe shall become warriors only after meeting the challenges of the Arrow of Light. Let them each be filled with the spirit of Akela and follow his example of unselfish service to our brethren." And it was made so and carried through to the present day as you Webelos stand before us now, ready to receive the Arrow of Light.

Guide: Will the following Webelos an their parents please stand before us as your names are called. (As Guide recites or reads names, the Medicine Man should direct Webelos to make a line across the southern end of the circle. Parents should stand behind their son(s).)

Chief: Before this honor is conferred upon you, I must see your devotion to the high ideals of Scouting. Therefore, I ask you all now to raise your right hand to the Scout sign and repeat with me, the Scout Oath and Law.

(Raises hand in the sign of the Boy Scout (followed by other principles and Webelos) and recites Scout Oath and Law with other principles (Medicine Man and Guide) and the Webelos who will be awarded the Arrow of Light)

Guide: Having met all of its challenges, it is our duty and privilege to award you with the highest Cub Scout honor: the Arrow of Light.

(To parents) Because of the support and guidance you have given these braves, I give the Arrow of Light to you to present to them. (moves to the front and gives the Arrow of Light card and/or patch to the parents who then present it to their son(s).)

Med: My brothers and I also present you with this token from your pack. (or say our tribe if your team supplied the tokens) Keep this in remembrance of this occasion. (Moves forward and presents each Webelos with a token. As he presents the tokens, the Chief and Guide congratulate each Webelos with the Scout Handshake)

(If you are going to induct the Webelos into your troop at this time, continue, else jump to the closing (see below))

Graduation Ceremony

Guide: (After all principles have returned to their places) Parents, you may be seated.

Chief: As we have said before, this ceremony marks an end of a journey. But even as this journey ends, another is just beginning. Here at the summit of Cub Scouting you have found the start of a new trail. This trail is a pathway that leads to the realm of our brothers in the sky, the Eagles.

Med: But the trail will also be long and difficult. As you journey, you must keep the spirit of Akela strong within each of you. It will give you strength and guidance as you move onward.

Guide: (Medicine Man moves between the members of the Scout troop and the Webelos) The time has come for you to begin on the new trail. To join the

clan of the warriors: The Scout Troop. Each of you shall now cross the bridge and be welcomed by the Troop members.

Med: As the night is a bridge between each day, let this be a bridge for each of you to the fellowship of Scouting. (Medicine Man moves aside to let the Cub Scouts pass and cross the bridge. Webelos cross and are welcomed by a Troop member, after all have crossed and are greeted, Guide continues)

Closing Ceremonies

Care For My World

Margaret Nye, Pack 316, North Star District

Care for my world
For birds that fly
For fish that swim

Care for my world
For frogs that hop
For bees that buzz

Care for my world
For cows that moo
And cats that meow

Care for my world
For flowers that look and smell so sweet
And butterflies that flutter by

Care for my world,
I'm putting you in charge.

Although the earth seems very wide,
Although the North seems far away,
Away to the East looking back,
We saw the earth lie beautifully most and finished.

Then out flew Blue Jay Shamen.
Soft feathers he pulled out and let them fall.

The earth was blue with flowers.
Then out flew the Yellow Finch Shamen.
Soft feathers he pulled out and let them fall.
The earth was yellow with flowers.
Thus was it fair, our year.

Thus should you also think,
All you my kinspeople.

Just as the bountiful earth is beautiful, we may take and use of it as we wish. It must be respected and tenderly kept. So is the Scout here tonight, a truly wonderful gift yet unfinished, standing ready on the brink of life, ready for his trek through it. We must prepare him, guide him, teach him. Yes, son, your life stands before you. Make well of it, this gift of love.

AOL Closing

[This Closing is used with the Arrow of Light Award and Graduation ceremonies that are listed earlier in the section.]

Guide: (To all still standing) You may now be seated.

Chief: Once again, I congratulate you on your achievements. Having finished the work for which we were called to do, we now depart this gathering of your pack. Before we go, I would remind you to keep Akela's spirit alive. Let it ignite a spark within each of you that will fan into a fire as you grow.

(Pause)

We challenge all the younger braves present to continue on your trails and strive to reach the summit and the Arrow of Light. May the great master of all Scouts be with you until we meet again. (Principles silently depart)

Outdoor Code Closing

CUBMASTER: Let's take a moment to think about the wonderful land and world we've been given to enjoy and to watch over. Think of all that we have to be thankful for.

Let's now recite The Outdoor Code

As an American I will do my best,
Be clean in my outdoor manners,
Be careful with fire,
Be considerate in the outdoors,
Be conservation minded.

And now let's all stand and sing "God Bless America.."

Den Meeting Ideas

Places To Go & Things To Do

"Recycle"

I went onto the internet and used the Yahoo Yellow Pages search engine to find all businesses in and around York, PA that were listed under the keyword "recycle" and here are those within a 45-mile radius of the center of York. You can contact some of these businesses to see how they can help you put together a filed trip to see how they affect and support pollution reduction.

Winter Equipment
300 Kings Mill Rd
York, PA
(717) 764-9916
0.6miles

Marisol Inc
320 Loucks Rd
York, PA
(717) 854-5695
1.6miles

York County Solid Waste
2700 Black Bridge Rd
York, PA
(717) 845-1066
3.0miles

Recycle America
Rr 9 Box 317
York, PA
(717) 246-0262
5.3miles

Remediation Inc
4331 Fox Run Rd
Dover, PA
(717) 292-4432
6.5miles

Myco Enterprises
74 Meyers Rd
Felton, PA
(717) 246-8556
11.5miles

Remtech Environmental Group
550 Industrial Dr
Lewisberry, PA
(717) 938-6745
15.2miles

Lancaster Enviroservice Corp
229 Shellyland Rd
Manheim, PA
(717) 293-5559
17.5miles

Laukemann Recycling
Mechanicsburg, PA
(717) 732-0510
22.7miles

Besco Systems Inc
6 State Rd # 110
Mechanicsburg, PA
(717) 691-7490
23.7miles

A & M Composting Inc
2022 Mountain Rd
Manheim, PA
(717) 664-2073
24.4miles

Bfi Waste Systems
123 E High St
Palmyra, PA
(717) 838-8845
25.2miles

USA Waste Svc
7429 Allentown Blvd
Harrisburg, PA
(717) 545-4219
25.6miles

Edward Armstrong & Sons Inc
205 Greenfield Rd
Lancaster, PA
(717) 393-2770
25.7miles

Planet Earth Recycling
4492 Bolton Notch Pl
Harrisburg, PA
(717) 657-6226
26.5miles

Warren Whitman & Sons Inc
2325 S Lincoln Ave
Lebanon, PA
(717) 273-3671
28.7miles

J E Gruber Investment Recovery
1535 Poplar St
Lebanon, PA
(717) 270-6051
29.7miles

George F Weidle Sanitation Svc
1322 Poplar St
Lebanon, PA
(717) 272-7061
29.9miles

Recycling Works Inc
113 N 8th Ave
Lebanon, PA
(717) 270-0400
31.6miles

Waste Control System Inc
2835 Merrymans Mill Rd
Phoenix, MD
(410) 252-9360
32.9miles

Soil Solutions Inc
PO Box 928
Reisterstown, MD
(410) 526-0930
34.9miles

Ingold's Hico Inc
442 Franklin St
Bel Air, MD
(410) 879-9114
35.2miles

Harford Sanitation Svc
440 Franklin St
Bel Air, MD
(410) 838-5472
35.2miles

Maryland Recycle Co
24 Gwynns Mill Ct
Owings Mills, MD
(410) 363-3347
37.9miles

Terra Industries & Recyclng Ct
710 Pulaski Hwy # B
Joppa, MD
(410) 679-1200
42.0miles

Jones Waste Oil
5131 Chalgrove Ave
Baltimore, MD
(410) 466-6705
42.4miles

Certified Storage & Disposal
PO Box 168
White Marsh, MD
(410) 391-2800
42.8miles

Cylinder Technologies
312 Goforth Dr
Havre De Grace, MD
(410) 575-6804
43.2miles

Waste Energy Partners Ltd
1 Magnolia Rd
Joppa, MD
(410) 679-6200
43.6miles

Fluid Technologies Inc
7200 Rutherford Rd #100
Baltimore, MD
(410) 944-0230
43.7miles

Maryland Recycle Co
8920 Yellow Brick Rd
Baltimore, MD
(410) 780-3060
45.1miles

Somat Corp
855 Fox Chase Rd
Coatesville, PA
(610) 384-7000
45.6miles

Den Meeting Activity Ideas

Debris Hike

Get the den together on a Saturday morning and take them on a debris hike. Make sure you don't endanger them in any way (especially if you're cleaning up along a road) and make sure you have enough adults to keep things safe. Check with your local municipal office and they'll probably gladly provide the materials and arrange to pick up the trash that you collect.

Lots To Do

In the sheets at the end of this section you will find several Activity Suggestions that I found on the internet. I have copied these from the site:

http://www.tnrcc.texas.gov/air/monops/lessons/lesson_plans.html

In addition, these sites have lots of activities that you can do, too:

- http://www.ceismc.gatech.edu/busyt/eco.html#env
- http://www.bagheera.com/clasroom/activity/activity.htm
- http://www.enc.org/classroom/claslinx/nf_ressci.htm#earth

Games

Scavenger Hunt

We already talked about a debris hike, but how about adding a twist to it. First, try to identify common litter that you'd find on a debris hike. Then, list out the generic names for these items, like "candy bar

wrapper, cigarette pack, soda can, drink bottle, etc. Then, as they go along the hike, they mark off on their lists what they find. The one who finds the most trash from his scavenger list wins.
words

Reduce It - Reuse It

This one's made from scratch and has never been tested that I know. Best of luck! And if it or a variation of it works well, let the world know about it.

This game focuses on the idea of "Reduce, Reuse, Recycle" as the way to minimize personal pollution. It will take a little bit of courage on someone's part (the Den Leader's?) because someone has to come forward with their recycling bin and whatever is in it. The object of the exercise os to get the boys thinking about the "stuff" we throw out on a regular basis and how we might eliminate some of it.

The leader brings in the recycle bin of "stuff" and, one at a time, displays their wares. The boys then discuss/disgust what, if anything, could have been done to reduce or reuse the item shown. [Note: If you've got beer or other alcoholic beverage bottles in the bin, please remove them before doing this game!]

Crafts

Puzzle Spider

About this project - recycle those old puzzles and make this cute little spider. Children love to have them sitting around in their room. This project is rated EASY to do.

Supplies -

- Acrylic Paint (OC 176 Black)
- Tacky Glue
- Satin Finish Varnish
- Black Glitter
- Shrink-It Clear Plastic
- 4 Black Chenille Stems
- 2 Large 18 mm Moving Eyes
- Approx. 40 puzzle pieces

Project how to -

1. Paint approx. 40 puzzle pieces (both sides). Let dry.
2. Cut a circle out of paper -- 4 inches in diameter. Place the paper circle under the clear plastic sheet.
3. Row 1: Place a row of puzzle pieces inside circle. Fill in center with as many pieces that will fit.
4. Row 2: Glue puzzle pieces around 1st. layer, keeping inside outer edge of circle. Over-lap as much as possible. Let dry, turn Spider body over for 3rd. row.
5. Row 3: Follow same instructions for row 2, over-lap as much as you can, keeping inside of circle, glue down.
6. When dry re-paint spider body, then varnish with the Satin Varnish, doing back side as well. When still wet sprinkle glitter over front of body. Shake excess glitter off. Let dry.
7. Cut 4 chenille stems in half (makes 8 legs). Bend the 8 legs in half. Place evenly on each side of spider. Put a GOOD spot of glue in location of where the inside of the leg will go, set leg in place. (To help keep them secure set something between each leg to help it set up-right, if you have enough paint bottles that works great. Or wrinkled up waxed paper.) Put 4 legs on each side.
8. Glue eyes in place.
9. Option is to cut a piece of black felt the same size as the spider, glue to bottom.

This project was contributed by BONNIE HAPPE (HAPPE CRAFTER), happeb@dgabby.mfldclin.edu

Car Litter Container

Supplies -

- 1-lb. Cottage sheese called "reuse")
- Pant leg - small
- Pipe cleaner
- Piece of cardboard
- Dried beans

1. Insert cardboard in the center of the pant leg stitch to hold in place.
2. Fill ends of pant leg with beans and sew closed
3. Punch two holes in bottom of container and matching holes in cardboard section of pant leg.
4. Insert pipe cleaner through holes and twist ends together.

When "bean bags" are placed on either side of car's hump, litter container is held in place.

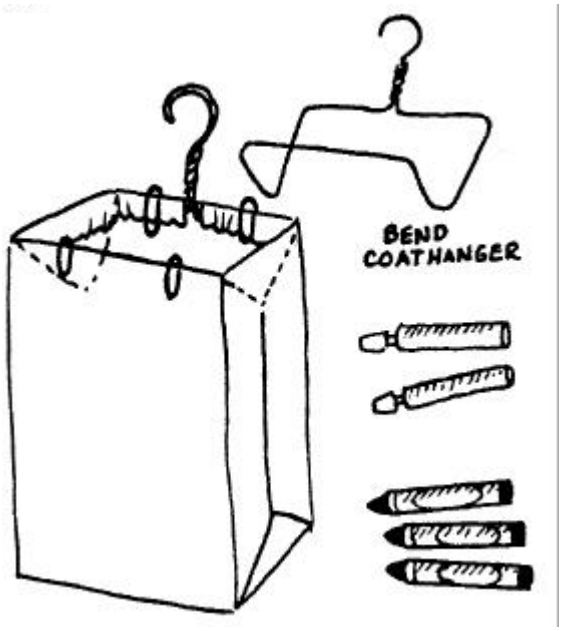
Litter Bag

1. Bend a coat hanger as shown) for the frame of the litterbag.

2. Cover with a brown paper sack, folding down the top and securing with paper clips. The bag can be removed and replaced.

3. Also, you can line the paper sack with a plastic bag that can be removed.

4. You can decorate the bag with crayons and markers.



Pollution Solution **WORD SEARCH**

This puzzle contains words and phrases related to Air Polution. See how many you can find.

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

AIR
CAR
EYES
NOSE
SICK

BREATHE
CLOUDS
FRESH
OXYGEN
SMOG

BUS
DUST
LUNGS
POLLUTION
TRUCK

Particulate Matter Information, Activities and Data

Background:

Particulate matter is made up of tiny particles in the atmosphere that can be solid or liquid (except for water or ice) and is produced by a wide variety of natural and manmade sources. Particulate matter includes dust, dirt, soot, smoke and tiny particles of pollutants. Some particles attract and combine with amounts of water so small that they do not fall to the ground as rain. Major sources of particulate pollution are factories, power plants, trash incinerators, motor vehicles, construction activity, fires, and natural windblown dust. Particles below 10 microns in size (about seven times smaller than the width of a human hair) are more likely to travel deep in the respiratory system, and be deposited deep in the lungs where they can be trapped on membranes. If trapped, they can cause excessive growth of fibrous lung tissue, which leads to permanent injury. Children, the elderly, and people suffering from heart or lung disease are especially at risk. Particles of 10 microns or less are also referred to as PM10.
The Texas Natural Resource Conservation Commission samples particulate matter with a monitor that holds a filter which collects the tiny particles over one day. The captured particles are then examined and counted to determine if the size and the amount are within a safe range. The standard set by the United States Environmental Protection Agency is 150 micrograms of dust per cubic meter of air. Therefore, if a site has a reading of 150 or more, then an exceedance of the standard set to protect health has occurred.
Large amounts of pollution particles in the air cause haze and can lower visibility. Particulate matter concentrations may worsen in the winter due to wood-burning and coal-burning fires that produce tiny particles of pollutants. Vehicles also emit particulate matter, which can cause higher pollution levels in more densely populated areas. Highs or lows may also be caused by area-wide weather conditions such as dust storms or rain. Some areas within a city may be worse than others if they are located closer to major pollution sources such as industry.
Sand and dust from the Sahara Desert in Africa can rise into the air and be carried across the Atlantic ocean, the Caribbean, and the Gulf of Mexico to Texas. This may be why high particulate matter levels are sometimes measured all across the state on the same day.

Suggested Activities:

Activity 4:

Students will observe differences between suspended particulates and a solution, and classify common atmospheric gases and particulates.

Materials:

1 clear glass bowl or large clear plastic glass
1 tablespoon of milk
1 teaspoon of pepper
1 plastic spoon
water

This activity takes approximately 15 to 20 minutes. Students can do this in small groups using clear disposable cups instead of the glass bowl. If the teacher does this as a demonstration with the clear glass bowl, it helps to have a light or white paper behind the pepper so it is easier to observe. Tell the students the water in the bowl is a model of the air in the atmosphere.

Procedure:

1. Fill clear glass bowl or clear disposable cup half full with water.
2. Add one tablespoon of milk to water, stir to mix.
3. Add one teaspoon of pepper to water, stir.
4. Observe the differences between the milk and the pepper.

What the students will do:

- Students will observe the differences between what happens with the milk and what happens with the pepper.
- Students will observe how long it takes the pepper to settle to the bottom.
- Students will discuss the results with the class.

Discussion:

Ask before the experiment:

- What is the water in the bowl a model of? (Air)
- What is the milk and pepper supposed to represent? (The milk represents gaseous air pollution; the pepper represents particulate air pollution.)

Ask after the experiment:

- What kind of pollutant(s) did the milk act like in the water? (Gases)
- What kind of pollutant(s) did the pepper act like in the water? (Particulates)
- Would it be easier to get the milk or the pepper out of the water? (Pepper)
- Would it be easier to remove the gases or particulates out of the air? (In a controlled area, particulates can be removed by filtering the air. To remove gases from the air is more difficult. Some gases can be removed by using industrial "scrubbers.")
- How can we measure the gases in the air when we can't see them? (Equipment called a gas chromatograph can be used to test for some gases; also air samples can be taken for a lab analysis.)

Assessment:

Students will classify air pollutants on the student worksheet as either particulates, gases or both. (Teacher worksheet provides the answers.)

Rain Forest Deforestation

Purpose:

To demonstrate how forest fires contribute large amounts of carbon dioxide to the atmosphere.

Grade Level:

6th grade

Essential Elements:

Environmental Essential Elements Across the Curriculum - 75.25 (2) Acquire data through the senses. The student shall be given opportunities to (B) observe properties and patterns of objects, organisms, and events in the environment.
(4) Communicate data and information in appropriate oral and written form. The student shall be given opportunities to (B) describe objects, organisms, and events from the environment, (D) describe changes that occur to objects and organisms in the environment.

Objective:

(1) Students will observe how the burning of forest fires releases carbon dioxide into the atmosphere.
(2) Students will describe how the deforestation of the rain forest relates to the greenhouse effect.

Focus:

Discuss with students the destructive deforestation of rain forests in Brazil to clear the land for crops and livestock. Tell students they are going to demonstrate how the burning of a forest releases carbon dioxide. Explain to the students that they will be using limewater (calcium hydroxide) as an indicator of carbon dioxide, and that in the presence of carbon dioxide, limewater will turn cloudy in color and a white sediment (calcium carbonate) will collect at the bottom of the beaker.

Background:

Forest fires emit many pollutants and gases into the air. Carbon monoxide and carbon dioxide are two of these gases. In large quantities, these gases can cause serious atmospheric problems. Due to the rapid deforestation of the rain forests in Brazil, tons of carbon dioxide, and lessor amounts of carbon monoxide, soot and other particulates enter the atmosphere. Scientists estimate that 1/10 of the carbon-based gases in the atmosphere are from burning Brazilian forests.
Carbon monoxide is a colorless, odorless, tasteless gas that comes from the incomplete combustion of fossil fuels. It is a deadly gas that can cause our reflexes to slow down, sleepiness, and even death.
Carbon dioxide, along with methane and water vapor, make up the greenhouse gases. These three gases are responsible for the greenhouse effect. They absorb and redirect heat back down to earth. Normally this heat would escape into space. Because this heat is trapped in the atmosphere, scientists believe that it could be making the earth warmer. Global warming could have devastating effects. It could cause the ice caps to melt, weather patterns to shift, and disrupt ecosytems.

Materials:

10-gallon fish tank
glass lid for fish tank
sand or gravel
30 to 40 wooden matches
limewater (calcium hydroxide)
two small glass beakers or jars
water
long, fireplace matches

Procedure:

1. Cover the bottom of the fish tank with 8 cintimeters of sand and/or gravel.
2. Take 30 to 40 matches and place them in a tight circle in the center of the tank.
3. Fill the two beakers or jars with limewater. Place one jar inside the tank and one jar just outside the tank.
4. Wet the outside of the tank with water so that the lid will form a seal with the tank.
5. Light the matches with one of the long, fireplace matches and then immediately slide the glass lid onto the tank. The matches will burn and give off billows of smoke, soot, and ash.
6. Leave the lid on the tank and observe the beakers of lime water. Record your observations.
7. Continue to make observations for the next two to three days.

Extensions:

-
- Have students make a list of things they can do to help prevent rain forest deforestation.
- Have students investigate other gases that pollute the air.
- Students can research the long term effects of global warming.
- Have students write letters to their Senators and Representatives stating their position on the deforestation of rain forests.

Resource:

Experiments That Explore The Greenhouse Effect by Martin J. Gutnik; *Air Pollution* copyright 1991, Air & Waste Management Assocication.

Acknowledgment:

Pamela K. Cook, University of Texas at El Paso TES Course, 1995

Ground-level Ozone

Background:

Ozone is the same molecule regardless of where it is found, but its significance varies. Stratospheric ozone is found 9 to 18 miles high where it shields us from harmful ultraviolet rays from the sun. A high accumulation of ozone gas in the lower atmosphere at ground level is air pollution and can be harmful to people, animals, crops, and other materials.

Elevated levels above the national standard may cause lung and respiratory disorders. Short-term exposure can result in shortness of breath, coughing, chest tightness, or irritation of nose and throat. Individuals exercising outdoors, children, the elderly, and people with pre-existing respiratory illnesses are particularly susceptible. Chemists say the materials damaged by ozone include rubber, nylon, plastics, dyes, and paints.

Ozone pollution, or smog, is mainly a daytime problem during summer months because sunlight plays a primary role in its formation. Nitrogen oxides and hydrocarbons are known as the chief "precursors" of ozone. These compounds react in the presence of sunlight to produce ozone. The sources of these precursor pollutants include cars, trucks, power plants and factories, or wherever natural gas, gasoline, diesel fuel, kerosene, and oil are combusted. These gaseous compounds mix like a thin soup in the atmosphere, and when they interact with sunlight, ozone is formed.

Large industrial areas and cities with heavy summer traffic are the main contributors to ozone formation. When temperatures are high and the mixing of air currents is limited, ozone can accumulate to unhealthful levels.

The United States Environmetal Protection Agency has set the National Ambient Air Quality Standard for ozone at 0.12 parts per million (ppm). Ozone concentrations of 0.125 ppm (125 in parts per billion) or above are considered an exceedance of this standard because of mathematical rounding. Four areas of Texas violate the national standard for ozone of 0.125 ppm: El Paso, Dallas-Fort Worth, Houston-Galveston-Brazoria, and Beaumont-Port Arthur. Other areas have ozone levels high enough that they are close to exceeding the standard: Austin, Corpus Christi, Tyler-Longview-Marshall, San Antonio, and Victoria.

Suggested Activites:

Activity 1:

Ozone And Weather

Objective: To plot data and ozone measurements for a two-or three-week period and evaluate the data collected.

Procedure:

1. Divide the class into groups of five or six students.

2. Each team should then assign a different radio station, television station, or newspaper to each student. For example, Team 1 has five students. Student A will collect data from reports on radio station KXXX. Student B will collect data from television station WXXX. Student C will collect data from television station WBBB. Student D will collect data from newspaper X. Student E will collect data from newspaper Y. Students can also call the TNRCC's 1-800-64TEXAS hotline or click on Ozone Query for yesterday's peak ozone concentrations in Texas' major metroplitan areas. The National Weather Service can also provide weather information.
3. Data Collection. Have the students obtain weather and ozone data over a two-week period. The students will need to collect the following weather information:
    - temperature
    - precipitation
    - wind speed
    - cloud cover
    - wind direction
    - time of day for report
    - location of data collected (e.g., downtown, the radio station, the local airport)

    After the two-week period, have each group compare and contrast their reports. Ask the students the following questions:
    - Did each radio station, television station, newspaper or other source report the same information?
    - What was different?
    - What was alike?
    - What factors would cause the reports to be different or the same?
4. Mapping. Obtain maps of your city or metroplitan area for each team. Have each team research and label the following areas:
    - the major traffic arteries and hubs, including airports, train stations, and bus stations
    - manufacturing areas
    - commercial centers
    - major topographical features such as mountains, valleys, or bodies of water
5. Plotting. Ask students to review the background information on factors affecting ozone formation. Then, ask them to answer the following questions and to label each area on their maps.
    - Which areas might be high "ozone producers"? Label these "high ozone production."
    - What places should a person with respiratory problems avoid on ozone action days? Label these "sensitive."
    - Which areas are downwind from high ozone-production areas? (Hint: Use the weather data to determine prevailing winds.) Label these "downwind."
    - Where are low-lying areas located in which ozone can collect? Label these "depressions."
    - Are any residential areas located in or near areas identified in the areas above? Label these as "critical residential areas."
    - Are any elementary or preschools located near critical areas? Label these as "critical schools."
    - Are any residential senior-citizen or nursing homes located near critical areas? Label these as "critical senior-citizen centers."
    - Are any medical centers located near critical areas? Label these as "critical medical areas."
6. Interpreting patterns. Do the following:
    - Ask the students to find the three days with the highest ozone readings.
    - Ask them to identify any common factors for those three days, such as high temperatures, weather, or day of the week.
    - Explain that scientists investigate the true composition of air pollution by tracking common factors and then seeking explanations for correlations.
7. Have the students design a graph or chart that would correlate one or more factors to the high ozone readings.

Extensions

The TNRCC has developed an ozone education/awareness campaign called the Ozone Action Days Program. This voluntary campaign outlines reasonable actions each participating community can take, from local industries to individuals, to reduce ozone pollution.

Write the following scenarios on the chalkboard. Ask the students to determine in which scenarios they would declare an Ozone Action Day. Then they should write a paragraph for each scenario, explaining their choice.
A. It is 8 a.m. on a typical weekday. There is rush-hour traffic on all the highways. The weather forcast is mostly sunny skies, light winds from the southeast, temperature to reach 98 degrees, and a 30 percent chance of late morning thunderstorms. The current ozone reading is 30 parts per billion (ppb). Should you delcare an Ozone Action Day?

Answer:

Yes, because of the traffic, light winds, and the temperature. The 30 percent chance for precipitation means that any showers would be isolated, so you will probably have high levels of ozone.
B. It is 6 a.m. on Saturday. The forecast for the day is overcast skies, light and variable winds, and a maximum temperature of 91 degrees. No ozone reading is available. Should you call an Ozone Action Day based on the infomation you have?

Answer:

No, sunny to partly cloudy skies are required for the photo chemical process that creates ozone.
C. For this question, consider the Dallas-Ft. Worth area. It is 9 a.m. Yesterday was an Ozone Action Day. The weather today is very much like the weather yesterday. One difference is that today is a holiday and many people are off from work and school. The ozone reading is 40 ppb. The safety and comfort of many people depend on your decision. What will it be?

Answer:

The answer is no because you should not expect to have the high rush-hour traffic congestion.

To participate in a World Wide Web site for hands-on, inquiry-based science involving ozone monitoring by students around the state of Texas, click on http://chico.rice.edu/armadillo

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Acknowledgement:

Adapted from the Alternative Transportation Fuels Workshop with The Texas Railroad Commission, The General Land Office, and The Texas Education Agency.

The Awful 8: The Play

A play about eight major air pollutants

CAST OF CHARACTERS

The number of characters and some suggestions for props and costumes are in parentheses.

Connie Lung, reporter (1; props: microphone, notebook)

Harry Wheezer, reporter (1; props: microphone, notebook)

The Particulates (3; prop: dirt; costume: dirty jeans and brown t-shirts, smear dirt on face)

Carbon Monoxide (1; costume: sneakers, hat, trench coat, and sunglasses)

The Toxins (5; props: gasoline cans made from cardboar; costume: black clothing)

Sulfur Dioxide (1; prop: water gun or spray bottle filled with water; costume: torn t-shirt, yellow and white streamers attached to clothing)

Nitrogen Oxides (Nitros) (5; props: dead branches; costume: each Nitro can wear one of the letters in "nitro")

Bad Ozone (1; costume: sunglasses, sophisticated clothing for a "big city look")

Good Ozone (1; costume: sunglasses and light-colored clothing with bits of cotton attached to represent clouds)

Chlorofluorocarbons (CFCs) (4; costume: heavy coats and jackets with the initials "CFC" staped to the lapel and on the back, gloves and scarves)

EPA Scientists (2; prop: notebooks)

Carbon Dioxide (2; costume: t-shirts and shorts, black costume makeup wiped on clothing, legs and faces)

Tips For Putting On The Play

* Have the Pollutants make picket signs by taping large pieces of poster board to yardsticks and writing slogans on the poster board. (See slogan suggestions in description of the play's setting.)

* If some kids prefer non-speaking roles, you can let them carry picket signs or be camera people filming the report. They could also take on the responsibilities of stage manager, costume designer or set designer.

* Go over these pronunciations with the kids playing the Toxins; benzene (BEN-zeen), xylene (ZI-leen), toluene (TOL-you-een).

* If your audience is small, have Harry and Connie come up with some ways that people can help reduce air pollution at the end of the play.

Setting: In front of the Environmental Protection Agency (EPA) building. The air pollutants are picketing the EPA. Some carry picket signs with phrases such as "Dirty Air! Let's Keep It That Way," "Down with the Clean Air Act" and so on. TV reporters Connie Lung and Harry Wheezer are at center stage. In turn, each pollutant comes over to be interviewed, while the other pollutants continue to picket in the background.

Connie: Hi! I'm Connie Lung.

Harry: And I'm Harry Wheezer. We're here at the Environmental Protection Agency to cover a late-breaking story. Eight of the world's worst air pollutants are picketing the EPA to protest clean-air legislation.

Connie: In tonight's special report, we'll give you the scoop on where these pollutants come from and the ways they can hurt people and other living things.

Harry: Our first interview is with the Particulates. (Particulates walk over, carrying signs and chanting.)

Particulates: Dust, soot and grime.

Pollution's not a crime

Soot, grime and dust,

The EPA's unjust!

Connie: (coughs) So-- you're the Particulates.

Particulates 1(Soot): Yeah- I'm Soot, this is Grime and this is Dust.

Harry: You guys are those tiny bits of pollution that make the air look really dirty?

Grime: Yeah! Some of us are stirred up during construction, mining and farming. (throws some dirt in air)

Soot: But most of us get into the air when stuff is burned-- like gasoline in cars and trucks or coal in a power plant and even wood in a wood-burning stove!

Dust: And we just love to get into your eyes and make them itch and make your throat hurt and...

Grime: (interrupts) Come on, Dust, quit bragging! We gotta get back to the picket line. (Particulates return to picket line. Carbon Monoxide sneaks up behind Harry.)

Harry: Let's introduce the folks at home to our next pollutant, Carbon Monoxide. Hey, where did he go? Oh, there you are! Pretty sneaky, Carbon Monoxide!

Carbon Monoxide: Yeah, sneaking up on people is what I do best. I get into the air when cars and trucks burn fuel inefficiently -- but you can't see or smell me.

Connie: Then how can we tell when you're around?

Carbon Monoxide: You'll find out when you breathe me in! I can give you a bad headache and make you really tired. (gives an evil laugh)

Harry: (yawns) Oh-- I see what you mean. Thanks for talking with us Monoxide. (yawns again) (Carbon Monoxide returns to picket line.) Connie: (checking notes) Next we'd like you to meet some of the most dangerous air pollutants-- The Toxins. (Toxins walk over, carrying signs and chanting.)

Harry: You Toxins are made up of all kinds of poisons. How do you get into the air?

Toxins 1: Hey, man, we come from just about everywhere. Chemical plants, dry cleaners, oil refineries, hazardous-waste sites, paint factories...

Toxins 2: Yeah, and cars and trucks dump a lot of us into the air too. You probably don't know it, but gasoline is loaded with us toxins.

Toxins 3: Wow, that's for sure. There's benzene, toluene- all kinds of great stuff in gas.

Connie: Scientists say you cause cancer and other kinds of diseases. What do you think of that?

Toxins 4: They can't prove a thing!

Toxins 5: That's why we're here-- to make sure you people don't pass any more laws that might keep us out of the air. C'mon, Toxins- we're outta here! (Toxins return to picket line. Sulphur Dioxide walks over.)

Connie: Next we'd like you to meet Sulphur Dioxide. (Turns to face Sulphur Dioxide) I understand you just blew in from the Midwest.

Sulphur: Hey, I wouldn't miss this for all the pollution in New York City!

Harry: I'm sure the folks at home would like to know how you get into our air.

Sulphur: Well, heck, don't they read the newspapers? I've been making the front page at least once a week! Most of the time, I shoot out of smokestacks when power plants burn coal to make electricity.

Connie: And what kinds of nasty things do you do?

Sulphur: Nasty-- that's me! (snickers) I think it's cool to make it hard for some people to breathe. And I can make trees and other plants grow more slowly. But here's the most rotten thing I do: When I get way up into the air, I react with oxygen in water in the sky, and presto! You get acid rain! (sprays water at audience)

Harry: Acid rain is a big problem. It can hurt or kill fish and other animals that live in lakes and rivers and some scientists think it makes trees sick. Acid rain can even eat away at statues and buildings.

Sulphur: (proudly) That's right. Hey, I can even travel a long way to do my dirty work. If I get pumped out of a smokestack in Ohio, I can ride the wind for hundreds of miles and turn up as acid rain in Vermont!

Connie: I sure hope we can get rid of you soon, Sulphur Dioxide!

Sulphur: Good luck, guys! I gotta do some more picketing before I catch the next east wind! (Sulphur Dioxide returns to picket line. Nitros walk over.)

Harry: (to the audience) He's really rotten!

Nitros: (all together) You think Sulphur Dioxide is rotten? You haven't met us!

Connie: You must be the Nitrogen Oxides.

Nitro 1: Just call us the Nitros for short. (turns to audience) Give me an "N"!

Audience and other Nitros respond: "N"!

Nitro 2: Give me an "I"!

Audience and other Nitros respond: "I"!

Nitro 3: Give me an "T"!

Audience and other Nitros respond: "T"!

Nitro 4: Give me a "R"!

Audience and other Nitros respond: "R"!

Nitro 5: Give me an "O"!

Audience and other Nitros respond: "O"!

Nitro 1: What's that spell?

Audience and other Nitros: NITRO!

Nitro 2: What's that mean?

Other Nitros: DIRTY AIR!

Harry: Hey, I didn't know pollutants could spell.

Nitro 4: Very funny, Harry.

Connie: So, how do you Nitros get into the air?

Nitro 5: We get airborne when cars, planes, trucks and power plants burn fuel.

Harry: And what happens once you're in the air?

Nitro 1: We can make people's lungs hurt when they breathe-- especially people who already have asthma.

Nitro 2: And, like Sulphur Dioxide, we react with water in the air and form acid rain.

Nitro 3: But we also make another form of pollution. And here she is-- BAD OZONE! (Bad Ozone waves and walks over. Nitros return to picket line.)

Bad Ozone: Well, my friends, the Nitros, pour into the air, they get together with some other pollutants. As the sun shines on all these lovely pollutants, it heats them up-- and creates me, Bad Ozone. And where there's ozone, there's smog.

Harry: (to audience) Smog contains a lot of ozone.

Connie: That's right, Harry. And smog can really make city life miserable. It can make your eyes burn, your head ache and it can damage your lungs.

Harry: But what I want to know is, if ozone is so bad, why are people worried about holes in the ozone layer? (Good Ozone walks in from offstage.)

Good Ozone: That low-level ozone is my rotten twin sister-- she's just a good gas turned bad! I'm the good ozone that forms a layer high above the Earth. I help absorb the harmful rays of the sun.

Bad Ozone: (nastily to Good Ozone) So what are you doing here, sis?

Good Ozone: I'm here to support the clean air laws. If certain chemicals keep getting pumped into the atmosphere, I'll disappear. And without me, the harmful rays of the sun will kill some kinds of plants and give many more people skin cancer and eye disease!

Harry: But what kinds of chemicals are making you disappear?

Good Ozone: It's those terrible CFCs! (CFCs walk over from picket line.)

CFC 1: Hey, we're not so bad! People have used us CFCs in coolants for refrigerators and air conditioners for your home and car.

CFC 2: So what if we destroy a little bit of ozone? There's enough to last for years!

CFC 3: Yeah- who needs ozone anyway?

Good Ozone: People do! Tell them what else you CFCs are doing!

CFC 4: What's Ozone complaining about now- global warming? (EPA scientists walk in from offstage. Good and Bad Ozone walk offstage.)

Scientist 1: Excuse me, but did I just hear someone mention global warming?

CFC 2: Yeah. What do you want?

Scientist 2: We just happen to be experts on global climate change.

Connie: Are CFCs really changing the world's climate?

Scientist 1: Well, we're not positive. But over the past 100 years or so, people have been pouring gases, such as CFCs and carbon dioxide, into the air.

Scientist 2: And as they build up in the atmosphere, these gases may be acting like the glass in a greenhouse.

Scientist 1: That's right. They let the radiation from the sun in -- but they keep the heat from getting out. And this may be causing the Earth's climate to become warmer.

Harry: I've read that if the temperature goes up, sea levels may rise. Wow, some cities on the coast might be flooded some day!

Scientist 1: Well, nice talking with you all, but we've got to do some more research so that we can really nail these pollutants. (Points to CFCs. CFCs give scientists a dirty look, stick out tongues. Scientists walk offstage.)

CFC 1: Hey, we're not even the biggest cause of global climate change. You gotta talk to another of the big pollutants about that.

Harry: (checks notes) There's only one other pollutant on the list: Carbon Dioxide. (CFCs return to picket line. Carbon Dioxide 1 and 2 walk over.)

Dioxide 1: Did we hear you mention our name? We aren't really a bad gas, in the right amount. About a hundred years ago, there was just the right amount of us in the air.

Dioxide 2: But then people started burning more and more things -- they built power plants that burn coal, and cars and trucks that burn gasoline. And they started cutting down and burning forests! Every bit of that burning releases extra amounts of us into the air.

Dioxide 1: As more and more of us got into the air, people started saying that the Earth was warming up-- because of us!

Dioxide 2: Yeah-- like it's our fault! (to audience) The reason you're in such a mess is because you use so much fuel and cut down so many trees!

Connie: You're right, Carbon Dioxide. Maybe we should be doing a special report on people-- we're the ones who are really causing most air pollution.

Harry: But people can change! (turns to audience) How about you? Can you think of some ways that people can help fight air pollution? (Audience responds with ideas, such as driving cars less, using less electricity, conserving forests, planting trees and so on.)

Connie: And that's the end of our special report. The bottom line? These air pollutants are a pretty tough bunch-- but people help create much of them, and people can reduce the amounts that are in our atmosphere. Thank you and good night.

Pollutant curtain call. The End.

Acknowledgments:

Lois Myers, Stephen F. Austin University Nacogdoches TES Course, 1994; Pollution: Let's Clean Up Our Act, National Wildlife Federation, 8925 Leesburg Pike, Vienna, Virginia, 22184, 1-800-822-9919, the Environmental Protection Agency's Guide to Environmental Issues and What You Can Do To Reduce Air Pollution