IN THE AIR

Tools for Learning About Airborne Toxics Across the Curriculum

ADULT EDUCATION MODULE

Developed By: Missouri Botanical Garden's EarthWays Center

www.intheair.org



Missouri Botanical Garden

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Foreword

Most students will never be scientists or engineers. If we truly want the full spectrum of students and adults to gain greater understanding about air pollution and airborne toxics, using this knowledge to affect daily decisions, then we need to meet them in their non-science interest areas. *In The Air: Tools for Learning About Airborne Toxics Across the Curriculum* uses the multi-disciplinary breadth of education – reading and communication arts, mathematics, social studies, science, art, etc. – to explore how our individual and collective behaviors produce airborne toxics. The airborne toxics information used as the basis in the modules is from the perspective of the U.S. Environmental Protection Agency, the funder of this project.

The origin of these materials came from the discovery that there was very little available to help people understand airborne toxics. Activities on acid rain or climate change were easily found, but not on airborne toxics. The St. Louis Community Air Project and the North Side (St. Louis) Clean Air Project were looking for ways to help their communities understand and manage airborne toxics. Educational material goals were to increase knowledge about air pollution (as it related to airborne toxics) and to make connections between behaviors and air quality. They had no access to appropriate materials. New materials had to:

- be low/no-cost and be usable across all age and skill levels (Kindergarten through Adult);
- use engaging multi-disciplinary activities aligned with current educational needs and standards;
- be designed to be effectively used for environmental education, meaning to be fair, accurate, action oriented, instructionally sound, useable, of appropriate depth and with an emphasis on skill building;
- emphasize how one's choices impact human health and include connections among air, water and soil.

A specialized science education is not needed to understand the concepts presented in these modules. Users will be able to understand and take specific actions to improve their air quality. We developed accessible and appropriate materials containing activities for all grade levels, formatted into the following modules: K-3, 3-6, 6-8, 9-12 and Adult. All materials have been correlated to National and Missouri education standards. The North American Association for Environmental Education's *Environmental Education Materials: Guidelines for Excellence* were used to ensure the modules met the guidelines to be well-rounded environmental education materials. We established an extensive review process using four review panels: EPA science specialists, non-EPA science specialists, formal and non-formal educators, and community members. We greatly appreciate the 69 individuals who assisted in the review process. Visit www.intheair.org where you may download all materials for free as well as provide comments and suggestions for future additions. For more information about the modules you may also call 314-577-0220.

Each module has: A) Teacher's Guide with a Module Overview, Goals, and Correlations; B) Pre- and Post-Activities; C) Core Activity–the primary activity for the module; D) One to five Connecting Activities-activities that supplement the concepts in the Core Activity, but they also stand alone as individual activities; E) Appendix -background information on airborne toxics such as key terms, risk assessment information, and a brief history on clean air efforts in the U.S.; F) Further reading and research references; G) Evaluation form.

Modules are coordinated so that all activities complement one another. The entire module may be implemented in the classroom as a unit, or you may choose to do just individual activities from one or more units as each group has different needs, interests and abilities.

Our greatest appreciation goes to the writers of these materials, Margaret Lilly and Eleanor Hall. Their creativity, incredible writing abilities and excellent understanding of the educational needs of all ages along with their belief in educating in this topic is what enabled these modules to be the exceptional materials they are today. Thank you, Margaret and Ellie.

Certainly a final thanks is due to those who choose to use *In The Air: Tools for Learning About Airborne Toxics Across the Curriculum* with their students. Without you, this excellent work goes nowhere. Each educator has the power to make a difference!

Glenda Abney, Missouri Botanical Garden Marcus G. Rivas, U.S. Environmental Protection Agency Project Managers December, 2004 Dear Educators,

Humans are increasingly altering Earth's land, water, and atmosphere on local, regional, and global levels. We all need to understand that our actions do impact our living planet. *In The Air: Tools for Learning About Airborne Toxics Across the Curriculum* addresses how individual actions specifically alter the air, which in turn affects other aspects of our environment including the soil, the water, and all plants and animals. Coupled with this understanding, the lessons in *In The Air* provide tools to better manage behaviors that can be implemented where we live – in our local towns and cities and in our homes. I encourage you to utilize these excellent materials with the students and adults you work with.

We've enjoyed working on this project with the fine staff at the U.S. EPA. With your help, the information and ideas in these materials will make a difference to people of all ages. Thank you for your efforts. What a great way to start making a positive and long lasting impact, educating others.

Sincerely, Peter H. Raven Director Missouri Botanical Garden

Dear Educators,

The U.S. Environmental Protection Agency (U.S. EPA) and its partners have developed a new set of educational materials. These educational materials will help us all improve our personal health and become better stewards of the environment. Healthier air, cleaner water, and better protected lands describe our mission. *In The Air: Tools for Learning About Airborne Toxics Across the Curriculum* will enable us all to be more deliberate in our choices and behaviors for improved personal health and a better environment. The decisions we make regarding products we use and how we use them make lasting impacts on air quality. The learning and behavior changes that will result after presenting the activities in these modules will make a positive and long-lasting difference in your students.

We appreciate your interest in these exciting and effective materials. Without your help, these outstanding modules developed by the staff of Missouri Botanical Garden and U.S. EPA wouldn't reach the intended audience. As an educator who uses these materials, you also are a critical part of this project. Thank you for using *In The Air: Tools for Learning About Airborne Toxics Across the Curriculum.*

Sincerely, James B. Gulliford Regional Administrator U.S. Environmental Protection Agency

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6-8 Module		3-6 Module				K-3 Module							5
Connecting Activity #1 "Pee Yew! Is That You?"	Core Activity: Classroom Game "Cleaner Air Everywhere"	Connecting Activity #3 "In A Shroud Of Smoke"	Connecting Activity #2 "Pee Yew! Is That You?"	Connecting Activity #1 "Now You See It, Now You Don't"	Core Activity: Chapter Book "Matt Tackles Air Toxics"	Connecting Activity #3 "Now You See It, Now You Don't"	Connecting Activity #2 "Clean Up on Gloomy-Doomy"	Connecting Activity #1 "Clean Air /Dirty Air Worksheet"	Pre-Activity #2 "Making Puppets"	Pre-Activity #1 "Dirty Air Cards"	Core Activity: Puppet Show "Gloomy-Doomy Go Away!"	CORE & CONNECTING ACTIVITIES	"In The Air" MODULE MATRIX
Health, Language Arts, Math, Science, Social Studies	Health, Language Arts, Science, Social Studies	Fine Arts, Language Arts, Social Studies	Health, Language Arts, Math, Science, Social Studies	Health, Science	Health, Language Arts, Science	Health, Science	Health, Science	Health, Science	Fine Arts	Health, Science	Health , Science, Language Arts, Fine Arts	MAIN SUBJECT AREAS	E MATRIX
Students conduct a mapping activity that demonstrates the affect of wind on airbome pollution and the pervasiveness of mobile source pollution while reinforcing the concept that we all share the same air. "Town Hall Meeting" skit allows students to examine how environmental issues interplay with other economic and social issues.	Students compete in a classroom game that demonstrates the impact of governmental and individual decisions on our environmental quality and pocketbook.	Students analyze editorial cartoons from the 1930's to learn about an historic pollution event in St. Louis that impacted our nation's clean air efforts. Students develop their own editorial cartoon to draw attention to a current environmental issue that is important to them.	Students conduct a mapping activity that demonstrates the affect of wind on airbome pollution and the pervasiveness of mobile source pollution while reinforcing the concept that we all share the same air. "Town Hall Meeting" skit allows students to examine how environmental issues interplay with other economic and social issues.	Students use their senses in identifying a potential "pollutant".	Students read a chapter book in which a group of students explore the sources of pollution within their community and learn what choices people make to protect their air. Connecting activities are integrated within the story.	Students use their senses in identifying a potential "pollutant".	Students match polluting situations with alternative actions.	Students identify cleaner air choices.	Students make puppets.	Students learn about some sources of air pollution.	Students participate in a puppet show to learn about the importance of clean air for personal health and safety.	DESCRIPTION OF ACTIVITY	www.intheair.org

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"In The Air" MODULE MATRIX

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Facilitator's Guide

ADULT EDUCATION MODULE



Missouri Botanical Garden

IN THE AIR Facilitator's Guide

IN THE AIR Facilitator's Guide

MODULE OVERVIEW

Many of the household products we use everyday contain toxic chemicals that add to air and water pollution and can damage human health. Through a fictional home improvement show and home tour, participants will learn of pollution prevention techniques and safer substitutes for chemicals we use everyday. In this activity, the audience will test homemade cleaners, learn how to read hazard labels, and participate in commercials with environmentally friendly themes. A take-home inventory is printed in the brochure so participants have a tool to help them eliminate potentially hazardous products they use within their homes.

MODULE GOAL

 To provide an opportunity for adults to learn how purchasing choices and home decisions impact indoor air quality and their personal and environmental health

Recommended Age Level:

Adult

Preparation:

Review the Procedures and Presentation Options and determine show presentation method. Gather all materials, obtain cast support, practice and present show.

Presentation Time:

50 minutes

Read-through time of the script is approximately thirty minutes. You will need an additional twenty minutes to include the audience participation components and the commercials. This presentation works best within already established groups such as parent teacher organizations, church groups, community groups. It can also be used in a public forum setting. The use of door prizes is highly recommended. A list of suggestions is included.

MODULE OBJECTIVES

When this Activity is completed, the participants will be able to do the following:

- Identify at least one strategy for reducing their exposure to household chemicals in each of the seven main areas of a home (kitchen, living room, bedroom, bathroom, utility room, outdoors and garage).
- Describe at least one safer alternative (homemade) cleaner to a commercially purchased cleaning product.

PROCEDURES

Note: The following procedures are assuming that you already have a group to present this skit to. For suggestions on marketing this program go to, www.intheair.org and download "Marketing Detox Your Domicile".

- 1. Read through the entire set of materials to determine if you will present the entire skit or selected sections.
- 2. Determine the materials and props you will need and arrange to obtain them.
- 3. Recruit your presenters and provide them with scripts ahead of time.
- 4. Obtain your performance space and set up for the skit.
- 5. Present the show.

Facilitator's Guide

The script contains the following sections (in order):

- Facilitators introduction
- Baking soda commercial
- · Kitchen with audience participation baking pan cleaning activity, prizes for participants
- Living Room with audience participation label reading activity, prizes for participants
- Bedroom with attendance prize awarded
- Bathroom
- Utility Room
- · Outdoors with audience participation Compost Song, attendance prize awarded
- · Garage with Green Car Garage commercial
- · Facilitator's closing

PRESENTATION OPTIONS

These materials have two presentation options:

Option One: Requires the most time but is the most fun. Present Detox Your Domicile skit in its entirety. You will need time to make photocopies and read over the scripts. We recommend that you hold one brief rehearsal to familiarize your cast with the flow of the presentation and the use of the props. You will also want to obtain all your props and either purchase prizes or contact local businesses for donations.

Option Two: Requires less time than option one. Present portions of the Detox your Domicile skit. Edit the script to meet your needs. You will need time to make photocopies and to assemble the room and props. Have your presenters read the script ahead of time.

MATERIALS

Poster-sized copies (one with the show title, one of each of the seven rooms, two audience cue cards, one label reading exercise, and one of the signal word definitions). The sheets can be copied onto overhead transparencies or downloaded and used in an electronic slide presentation. You will also need to make regular size copies of the signal words and the happy face for the label reading exercise. You may want to color the posters or overheads to enhance their appeal. The master sheets for copies follow the skit script.

- Five people to present the script (Facilitator, Host, Les, Nonnie, and Vanna)
- Five copies of the script
- · Copies of the brochure, one per each audience member
- Letter from the Occupants in an envelope
- Copies of the Compost Song lyrics for each audience member.
- Props and costumes such as a feather boa for Vanna would be a fun addition.
- Tables, chairs, easel
- · Props for audience participation portions of the script
- Audience / Attendance prizes (see list).

Setup #1 baking pan cleaning

- Cookie sheet or baking pan with baked on grease stains
- Cream of tartar (maybe a couple of teaspoons)
- White vinegar (not much, all they are doing is making a paste)
- Scrubbing pad
- Towel

MATERIALS (CONT'D)

Setup #2 label reading

- Four signs copied on letter sized paper (master sheets follow the script) WARNING, CAUTION, DANGER OR POISON, NON-TOXIC

- One copy on letter sized paper of the smiley face (from master sheets)
- Eyedropper
- Teaspoon
- Coffee scoop or medicine dosing cup (like the plastic ones that come with children's liquid pain reliever).
- Two label reading/signal word posters (described previously).

ATTENDANCE / PARTICIPATION PRIZES

Eleven or more attendance prizes are written into the script (six for audience participation, two for attendance, four for the people who perform in the commercials). However, you can modify the script to suit your own circumstances. Award attendance prizes by having participants answer simple questions about air toxics, randomly picking a number, sticker on the bottom of a chair, etc. Local businesses may be willing to donate prize items. Award prizes in the most appropriate places to emphasize the points being made in the script i.e. award the potpourri after discussing alternatives to air fresheners. Possible prizes include:

- Childproof cabinet lock
- Reusable micro fiber dust cloths
- Compact fluorescent bulb (buy one with the energy star label on the package)
- Air cleaning houseplants-spider plant, philodendron, etc.required for script as written
- · Charcoal chimney-required for script as written
- Box of baking soda
- Bottle of white vinegar
- Assortment of empty spray bottles
- Container with a shaker top for baking soda (empty Parmesan cheese or spice containers work well).
- Commercially prepared safer cleaners
- Book on "green" housekeeping hints
- Lead testing kit
- Isopropyl alcohol
- Enzyme drain cleaner
- Potpourri
- Tire pressure gauge
- Low emission gas can

COMMERCIALS SUPPORT

Best Baking Soda Commercial

- two volunteers to read the script
- two boxes of baking soda
- two copies of the commercial section of the script (highlighting the parts is helpful for the volunteers)

Green Car Garage Commercial

- two volunteers to read the script
- two copies of the commercial section of the script (highlighting the parts is helpful for the volunteers)

SETUP SUGGESTIONS

- A table at the front of the room for the attendance prizes and other props is helpful. Props may be covered with a cloth or hidden from view until needed.
- Three chairs for Host, Les, and Nonnie
- An easel to display posters.
- Small table for Setup #1 and 2.

TIPS FOR THE FACILITATOR

Choose your presenters wisely. Who are the most animated people in your group? Do they read aloud well? Can they read with feeling and not rush the words? Do you have others who wish to be included? Can they assist in handing out the door prizes, changing the posters, or distributing the brochures?

If possible get copies of the script to your main presenters ahead of time and hold a rehearsal. Though this is not necessary, if you rehearse your program will flow smoothly. You may also want to consider the room you will be using for your presentation and your audience size. Will it be easy for them to hear those who are reading? Can you arrange the room so that everyone can see your visual aids? If you will be using a microphone, be sure that your presenters are comfortable with it. Check all audiovisual equipment ahead of time. Be aware if anything requires a battery or an extension cord. Have a backup plan, how will you adapt if you have a technical glitch?

If you have solicited prizes and other support from local businesses, remember to invite them to your program. Add their name to the take-home brochure as a way of thanking them for their support. Verbally acknowledge their participation at the event as well.

Most importantly, have fun. Though reducing toxic air pollution is an important and serious topic, it needs to be presented in an approachable and friendly manner.

CONCLUSION

At the end of this presentation participants will have gathered several strategies to reduce their exposure to potentially harmful household chemicals. The take home booklet will provide the tools to ensure that these ideas can be implemented.

SUGGESTED EXTENSIONS

- At the conclusion of the script have all materials needed for each audience member to make a bottle of all-purpose cleaner using the recipe in the brochure.
- Host a household product swap party. Invite everyone to round up household and craft products that are gathering dust and find out if someone else can use them. Make the party fun with prizes for the most unusual product, ugliest paint color, and so forth. While you are at it, take the opportunity to distribute recipes and information about safer alternatives for household needs. After the party is over, make arrangements for the proper disposal of products no one wanted.
- Does someone in your group use homemade alternatives to commercially prepared cleaners? Set up testing stations around the room where people can compare the effectiveness of prepared cleaners. Use your imagination. Green cleaning tips books and web sites are good sources for ideas.

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