

IN THE AIR

Tools for Learning About Airborne Toxics Across the Curriculum

3-6 EDUCATION MODULE

Developed By:
Missouri Botanical Garden's
EarthWays Center

www.intheair.org



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IN THE AIR

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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
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"In The Air" MODULE MATRIX

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CORE & CONNECTING ACTIVITIES		MAIN SUBJECT AREAS		DESCRIPTION OF ACTIVITY	
6-8 Module	Core Activity: Puppet Show "Gloomy-Doomy Go Away!"	Health, Science, Language Arts, Fine Arts	Students participate in a puppet show to learn about the importance of clean air for personal health and safety.		
	Pre-Activity #1 "Dirty Air Cards"	Health, Science	Students learn about some sources of air pollution.		
	Pre-Activity #2 "Making Puppets"	Fine Arts	Students make puppets.		
	Connecting Activity #1 "Clean Air /Dirty Air Worksheet"	Health, Science	Students identify cleaner air choices.		
	Connecting Activity #2 "Clean Up on Gloomy-Doomy"	Health, Science	Students match polluting situations with alternative actions.		
	Connecting Activity #3 "Now You See It, Now You Don't"	Health, Science	Students use their senses in identifying a potential "pollutant".		
	Core Activity: Chapter Book "Matt Tackles Air Toxics"	Health, Language Arts, Science	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.		
	Connecting Activity #1 "Now You See It, Now You Don't"	Health, Science	Students use their senses in identifying a potential "pollutant".		
	Connecting Activity #2 "Pee Yew! Is That You?"	Health, Language Arts, Math, Science, Social Studies	Students conduct a mapping activity that demonstrates the affect of wind on airborne 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.		
	Connecting Activity #3 "In A Shroud Of Smoke"	Fine Arts, Language Arts, Social Studies	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.		
3-6 Module	Core Activity: Classroom Game "Cleaner Air Everywhere"	Health, Language Arts, Science, Social Studies	Students compete in a classroom game that demonstrates the impact of governmental and individual decisions on our environmental quality and pocketbook.		
	Connecting Activity #1 "Pee Yew! Is That You?"	Health, Language Arts, Math, Science, Social Studies	Students conduct a mapping activity that demonstrates the affect of wind on airborne 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.		
K-3 Module	Core Activity: Chapter Book "Matt Tackles Air Toxics"	Health, Language Arts, Science	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.		
	Connecting Activity #1 "Now You See It, Now You Don't"	Health, Science	Students use their senses in identifying a potential "pollutant".		



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“In The Air” MODULE MATRIX

CORE & CONNECTING ACTIVITIES		MAIN SUBJECT AREAS		DESCRIPTION OF ACTIVITY
6-8 Module (cont.)	Connecting Activity #2 “Are Household Chemicals Safe?”	Health, Science		Students learn how to read a warning label and conduct a classroom investigation to determine if less hazardous cleaning products do an effective job.
	Connecting Activity #3 “TipToe Through the Toxics”	Health, Math, Science, Social Studies		Students construct a large grid in a gymnasium, large classroom or outdoor area throughout which several “pollutants” are scattered and mapped illustrating deposition. A watershed is then configured into the results.
9-12 Module	Core Activity: “Constructing a Continuum of Commonly Held Beliefs About the Magnitude of Airborne Toxics”	Health, Science, Social Studies		Students construct a continuum of common beliefs about the seriousness of airborne toxics. Strong emphasis is placed on social themes including scientific ethics, corporate integrity, and personal responsibility. Connecting Activities examine the five belief statements in more detail. A creative arts pre/post activity is used as an assessment tool.
	Connecting Activity #1 Belief: “The Magnitude and Urgency of Airborne Toxics Problems Have Been Greatly Overstated”	Health, Science, Social Studies		Students examine reasons for the differences of opinions about the seriousness of airborne toxics. In the process students study the ways scientists gather and interpret data and make predictions based on their findings.
	Connecting Activity #2 Belief: “Why Worry About Airborne Toxics? What You Don’t Know Won’t Hurt You”	Health, Language Arts, Science, Social Studies		Students explore why people want to know about some unpleasant situations but not others. Students will look at the how the media can influence their ideas about personal risk.
	Connecting Activity #3 Belief: “Airborne Toxics Are a Nuisance, But They Seriously Affect Only a Few People”	Health, Science, Social Studies		Students review the hydrologic cycle and are introduced to the need for a multi-media (air water, soil) approach to pollution control.
	Connecting Activity #4 Belief: “Airborne Toxics Are a Serious Problem, But I’m Not Responsible”	Fine Arts, Health, Science, Social Studies		Students work in teams, to complete a “degree of accountability” worksheet. Examples of personal accountability are reinforced in a short humorous skit.
	Connecting Activity #5 Belief: “Airborne Toxics Are a Critical Problem; However, the Effects May Be Remediable”	Health, Language Arts, Science, Social Studies		Students work in small groups to learn about current efforts being made to improve air quality and reduce pollution by government, environmental organizations and individuals. After the presentation of their findings to the class, students draw conclusions as to the validity of this belief statement.
	Core Activity: “Detox Your Domicile” Home Improvement Skit	Fine Arts, Health, Science, Social Studies,		Adults participate in a simulated home tour presented in a home improvement show format. Moving from room to room, participants will learn the economics, health concerns, and social responsibility issues relating to airborne toxics within our homes. Participants will leave with tools and strategies for improving their personal and community environments.

IN THE AIR

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Teacher's Guide

3-6 EDUCATION MODULE



MISSOURI
BOTANICAL
GARDEN

IN THE AIR

Teacher's Guide



IN THE AIR

3-6 Teacher's Guide

MODULE OVERVIEW

In this module students will explore the issue of airborne toxics, their sources within our communities, and the simple steps people can take to protect the quality of our air. A multidisciplinary approach is used throughout this module as well as various pedagogical methods for analyzing air quality problems and conditions. This module includes a Core Activity, three complete Connecting Activities that explore specific themes in greater depth, many suggested extensions, and background information.

MODULE THEME

Air pollution is a large and complex problem that negatively affects human health and degrades the environment. Throughout the module, emphasis is placed on the student's personal experience and personal actions that are reasonable for them to take to improve air quality.

MODULE GOALS

- To remove misperceptions about air pollution and to demonstrate that there are many sources of airborne toxics
- To explore the idea of health risks posed by air pollutants and to do so within a safe and familiar context
- To provide basic information about airborne toxics essential for carrying out the activities in this module
- To provide scientific background needed to understand the relationships between personal choices and impacts on the environment and human health
- To raise students' awareness about airborne toxics in ways that will reinforce behaviors to protect human health

MODULE OBJECTIVES

At the completion of this module, students will be able to do the following:

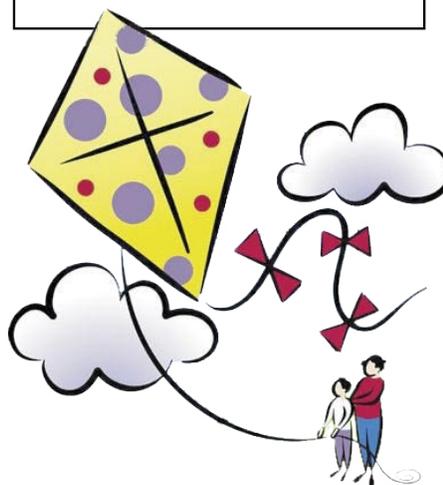
- Name the three categories of air pollution sources and give an example of each.
- Compare and contrast common activities that create or avoid creating air pollution.
- Identify a toxic as a substance that can harm human health.
- Describe the factors that contribute to risk from airborne toxics.
- Recognize how personal actions can reduce his/her exposure to airborne toxics.
- Describe how an air pollutant can also pollute land and water.

Preparation Time:

One to three hours will be needed to read the Teacher's Guide and to integrate Connecting Activities.

Presentation Time:

Time required varies depending on activities chosen.



Important Notes to Teachers About This Module

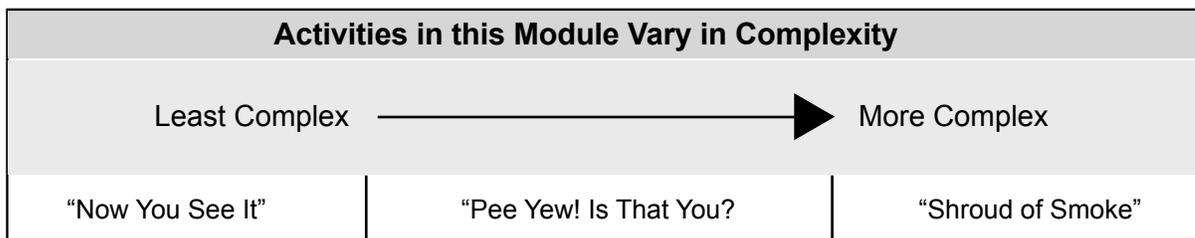
A MULTIDISCIPLINARY APPROACH

This module consists of a Core Activity and three Connecting Activities that incorporate lessons from different disciplines including personal health, math, communication arts, science, fine arts, and social studies.

CORE ACTIVITY - CHAPTER BOOK

“Matt Tackles Air Toxics” - Students learn through reading this chapter book that many people are working to protect the air we breathe. Several simple steps are modeled in the chapter book that reduce exposures to harmful substances and lessen impacts on human health and the environment. The situations within the chapter book are based on research and case studies. Activities and extensions specific to each chapter are referenced in the book’s activity guide.

The Connecting Activities are referenced at strategic points within the chapter book. They can be included with the Core Activity or used alone.



Connecting Activity #1 - “Now You See It, Now You Don’t”

Main subject areas, Health/Science

This activity relies on student observation and uses strategies for identifying potential hazards in the environment.

Connecting Activity #2 - “Pee Yew! Is That You?”

Main subject areas, Health/Communication Arts/Science/Geography/Math

Students use a map and a simple tool to measure pollutants at different locations. This activity demonstrates how wind is a factor that helps determine our exposure to pollutants.

Connecting Activity #3 - “In A Shroud of Smoke”

Main subject areas, Social Studies/Communication Arts

This activity uses editorial cartoons and photographs to chronicle a historical event that successfully cleared the air of coal smoke in St. Louis, Missouri.

Please see the chapter-by-chapter breakdown in the Core Activity section for suggested integration of these activities and suggested extensions.

TIME CONSTRAINTS

In their daydreams, writers conjure up visions of stress-free educators happily teaching every precious word of their manuscripts to fascinated students. In real life, however, they know that such a scenario is an extreme form of wishful thinking. This module on airborne toxics, therefore, is designed to fit many different circumstances and time frames. Each part of the module is designed to stand alone. The following are suggestions for modifying the module without sacrificing the previously stated goals.



Most Time: Use the pre/post assessment activity to this module. Have students read the chapter book (Core Activity) weaving in some or all of the connecting activities and follow with some of the extension ideas.

Less Time: Skip the pre/post assessment activity. Use the chapter book (Core Activity) and one or all Connecting Activities.

Least Time: Use the chapter book by itself, with or without the pre/post assessment activity. The book may also be read independently.

Note: If you choose to implement the Connecting Activities individually, the goals and objectives that apply are listed within the write-up for that specific activity.

Correlation with National Education Standards Summary

A brief description of the standards numbered below is included following the chart.

HEALTH EDUCATION STANDARDS

SOURCE: American Cancer Society

<http://www.education-world.com/standards/national/arts/index.shtml>

CORE ACTIVITY "Matt Tackles Air Toxics"	CONNECTING ACTIVITY - 1 "Now You See It"	CONNECTING ACTIVITY - 2 "Pee Yew"	CONNECTING ACTIVITY - 3 "In A Shroud of Smoke"
NPH-H. K-4 .1 .4 NPH-H. 5-8.1	NPH-H. K-4 .1 .3 NPH-H. 5-8 .1 .3	NPH-H. K-4 .1 .4 .7 NPH-H. 5-8.1 .2	NPH-H. K-4 .1 .2 .3 .4 .7 NPH-H. 5-8 .1 .3 .4 .7

LANGUAGE ARTS

SOURCE: National Council of Teachers of English

http://www.education-world.com/standards/national/lang_arts/index.shtml

CORE ACTIVITY	CONNECTING ACTIVITY - 1	CONNECTING ACTIVITY - 2	CONNECTING ACTIVITY - 3
NL-ENG. K-12 .3 .4 .7			NL-ENG. K-12 .3 .4 .5 .6 .7 .8

MATHEMATICS

SOURCE: National Council of Teachers of Mathematics

<http://www.education-world.com/standards/national/math/index.shtml>

CORE ACTIVITY	CONNECTING ACTIVITY - 1	CONNECTING ACTIVITY - 2	CONNECTING ACTIVITY - 3
		NM-PROB.REP. P K-12 .3	

SCIENCE

SOURCE: National Academies of Science

<http://www.education-world.com/standards/national/science/index.shtml>

CORE ACTIVITY	CONNECTING ACTIVITY - 1	CONNECTING ACTIVITY - 2	CONNECTING ACTIVITY - 3
NS. K-4 .1 .6 NS. 5-8 .1 .6		NS. K-4 .6 NS. 5-8 .6	NS. K-4 .6 NS. 5-8 .6

SOCIAL SCIENCES

SOURCE: National Council for the Social Sciences (NCSS), Center for Civic Education, and the National Geographic Society (NGS)
http://www.education-world.com/standards/national/soc_sci/index.shtml

CORE ACTIVITY	CONNECTING ACTIVITY - 1	CONNECTING ACTIVITY - 2	CONNECTING ACTIVITY - 3
NSS-C. K-4 .5 NSS-C. 5-8 .5		NSS-C. K-4 .5 NSS-C. 5-8 .5 NSS-G. K-12 .1 .5	NSS-C. K-4 .5 NSS-C. 5-8 .5

PERSONAL HEALTH

K-4

- NPH.K-4 .1: HEALTH PROMOTION AND DISEASE PREVENTION
Students will comprehend concepts related to health promotion and disease prevention.
- NPH-H.K-4 .2: HEALTH INFORMATION, PRODUCTS AND SERVICES
Students will identify characteristics of valid health information and health-promoting products and services.
- NPH-H.K-4 .3: REDUCING HEALTH RISKS
Students will demonstrate the ability to practice health-enhancing behaviors and reduce health risks.
- NPH-H.K-4 .4: INFLUENCES ON HEALTH
Students will analyze the influence of culture, media, technology, and other factors on health.
- NPH-H.K-4 .7: HEALTH ADVOCACY
Students will demonstrate the ability to advocate for personal, family, and community health.

5-8

- NPH-H.5-8 .1: HEALTH PROMOTION AND DISEASE PREVENTION
Students will comprehend concepts related to health promotion and disease prevention.
- NPH-H.5-8 .2: HEALTH INFORMATION, PRODUCTS AND SERVICES
Students will demonstrate the ability to access valid health information and health-promoting products and services.
- NPH.H.5-8 .3: REDUCING HEALTH RISKS
Students will demonstrate the ability to practice behaviors that enhance health and reduce health risks.
- NPH.H.5-8 .4: INFLUENCES ON HEALTH
Students will analyze the influence of culture, media, technology, and other factors on health.
- NPH-H.5-8 .7: HEALTH ADVOCACY
Students will demonstrate the ability to advocate for personal, family, and community health.

Correlation with National Education Standards- (cont.)

LANGUAGE ARTS

K-12

- NL-ENG.K-12 .3: EVALUATION STRATEGIES
Students apply many of strategies to comprehend, interpret, evaluate, and appreciate texts.
- NL-ENG.K-12 .4: COMMUNICATION SKILLS
Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and non-print texts.
- NL-ENG.K-12 .5: COMMUNICATION STRATEGIES
Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
- NL-ENG.K-12 .6: APPLYING KNOWLEDGE
Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and non-print texts.
- NL-ENG.K-12 .7: EVALUATING DATA
Students conduct research on issues and interests by generating ideas and questions and by posing problems. They gather, evaluate, and synthesize data from various sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
- NL-ENG.K-12 .8: DEVELOPING RESEARCH SKILLS
Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

MATHEMATICS

- NM-PROB.REP.PK-12 .3:
Students use representations to model and interpret physical, social, and mathematical phenomena.

SCIENCE

K-4

- NS.K-4 .1: SCIENCE AS INQUIRY
As a result of activities in grades K-4, all students should develop an understanding of:
 - Abilities necessary to do scientific inquiry
 - Understanding about scientific inquiry.
- NS.K-4 .6: PERSONAL AND SOCIAL PERSPECTIVES
Science and technology in society: As a result of activities in grades K-4, all students should develop understanding of:
 - Personal health
 - Characteristics and changes in populations
 - Types of resources
 - Changes in environments
 - Science and technology in local challenges.

5-8

- NS. 5-8 .1: SCIENCE AS INQUIRY
As a result of activities in grades K-4, all students should develop an understanding of:
 - Abilities necessary to do scientific inquiry
 - Understanding about scientific inquiry.

Correlation with National Education Standards- (cont.)

5-8 (cont.)

- NS.5-8 .6: PERSONAL AND SOCIAL PERSPECTIVES
Science and technology in society: As a result of activities in grades 5-8, all students should develop understanding of:
 - Personal health • Populations • Resources and environments • Natural hazards
 - Risks and benefits • Science and technology in society.

SOCIAL SCIENCES

K-4

- NSS-C.K-4 .5: ROLES OF THE CITIZEN
What are the responsibilities of citizens? How can citizens take part in civic life?

5-8

- NSS-C.5-8 .5: ROLES OF THE CITIZEN
What are the responsibilities of citizens? How can citizens take part in civic life?

K-12

- NSS-G.K-12 .1: THE WORLD IN SPATIAL TERMS
Students will understand how to use maps and other geographic representations, tools and technologies to acquire, process and report information from a spatial perspective.
- NSS-G.K-12 .5: ENVIRONMENT AND SOCIETY:
Students will understand how human actions modify the physical environment.

Correlation with Missouri “Show-Me” Standards

MISSOURI ASSESSMENT PROGRAM: FOUR PERFORMANCE STANDARDS & SIX KNOWLEDGE STANDARDS*

SOURCE: Show-Me Standards and the Missouri Assessment Program,
Missouri Department of Elementary and Secondary Education, 1998
<http://www.dese.mo.gov/standards>

	CORE ACTIVITY “Matt Tackles Air Toxics”	CONNECTING ACTIVITY #1 “Now You See It”	CONNECTING ACTIVITY #2 “Pew Yew!”	CONNECTING ACTIVITY #3 “In a Shroud of Smoke”
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PERFORMANCE STANDARDS

Goal 1. Gather and Analyze Information	6, 10	2	6	
Goal 2. Communicate Effectively			3, 5	3, 4
Goal 3. Solve Problems	1, 5, 6, 7		1	1, 2, 6
Goal 4. Make Decisions	1, 7	1, 4, 7	1, 2, 4, 7	1, 3, 4, 7

KNOWLEDGE STANDARDS

#1. Communication Arts	1, 3	1	1, 3, 6	3, 5, 6
#2. Fine Arts				4, 5
#3. Health/Physical Education	5	5	5	6
#4. Mathematics			1	
#5. Science	8	7, 8	7, 8	8
#6. Social Studies	7		5, 6, 7	2, 5

PERFORMANCE STANDARDS

Students will demonstrate within and integrate across all content areas the ability to:

GOAL #1 - Gather & Analyze Information

- #2. Conduct research to answer questions and evaluate information and ideas.
- #6. Discover and evaluate patterns and relationships in information, ideas, and structure.
- #10. Apply acquired information, ideas, and skills to different contexts as students, workers, citizens, and consumers.

GOAL #2 - Communicate Effectively

- #3. Exchange information, questions, and ideas while recognizing the perspectives of others.
- #4. Present perceptions and ideas regarding works of the arts, humanities and sciences.
- #5. Perform or produce works in the fine and practical arts.

GOAL #3 - Solve Problems

- #1. Identify problems and define their scope and elements.
- #2. Develop and apply strategies based on ways that others have prevented or solved problems.
- #5. Reason inductively from a set of specific facts and deductively from general premises.
- #6. Examine problems and proposed solutions from multiple perspectives.
- #7. Evaluate how much a strategy addresses a problem.

GOAL #4 - Make Decisions

- #1. Explain reasoning and identify information used to support decisions.
- #2. Understand and apply the rights and responsibilities of citizenship in Missouri and the United States.
- #3. Analyze the duties and responsibilities of individuals in societies.
- #4. Recognize and practice honesty and integrity in academic work and in the workplace.
- #7. Identify and apply practices that preserve and enhance the safety of self and others.

KNOWLEDGE STANDARDS

Students in Missouri public schools will acquire a solid foundation which includes knowledge of:

COMMUNICATION ARTS

- #1. Speak and write Standard English (including grammar, usage, punctuation, spelling, capitalization).
- #3. Read and evaluate nonfiction works and material (such as biographies, newspapers, technical manuals).
- #5. Comprehend and evaluate the content and artistic aspects of oral and visual presentations (such as storytelling, debates, lectures, multimedia productions).
- #6. Participate in formal and informal presentations and discussions of issues and ideas.

FINE ARTS

- #4. Examine interrelationships of visual and performing arts and the relationships of the arts to other disciplines.
- #5. Examine visual and performing arts in historical and cultural contexts

HEALTH / PHYSICAL EDUCATION

- #5. Examine methods used to assess health, reduce risk factors and avoid high-risk behaviors.
- #6. Examine consumer health issues (such as the effects of mass media and technologies on safety and health).

MATH

- #1. Show ability for addition, subtraction, multiplication and division; other number sense, including numeration and estimation; and the applications of the operations and concepts in the workplace and other situations.

SCIENCE

- #7. Understand processes of scientific inquiry.
- #8. Understand impact of science, technology and human activity on resources and the environment.

SOCIAL STUDIES

- #2. Review continuity and change in the history of Missouri, the United States and the world.
- #5. Show the major elements of geographical study and analysis (such as location, place, movement, regions and their relationship to changes in society and in environment).
- #6. Show the relationships of the individual and groups to institutions and cultural traditions.
- #7. Show the use of tools of social science inquiry.

