

*The purpose of this lesson is to foster an understanding of mechanical airflow.*

<b>TOPIC(S)</b>		COMPOSITION OF AIR		DEFINING THE INDOOR ENVIRONMENT
EFFECTS OF INDOOR AIR POLLUTION ON OCCUPANTS		SOURCES OF INDOOR AIR POLLUTION	√	MOVEMENT OF AIR Natural and mechanical airflow (HVAC)
IDENTIFYING INDOOR ENVIRONMENT POLLUTANTS		SOLVING INDOOR ENVIRONMENT PROBLEMS (Preventing and Fixing)	√	VOCABULARY

### OBJECTIVE(S)

Students will describe the process of mechanical airflow by making a diorama and writing a 3 - 4 sentence description.

### SCIENCE/HEALTH STANDARD CORRELATIONS

#### National Science Education Standards, Science Content Standards

##### 6.1 Science as Inquiry

- Levels K-12: Abilities necessary to do scientific inquiry, Understanding about scientific inquiry

##### 6.6 Science in Personal and Social Perspectives

- Levels K-4: Personal Health; Changes in environments
- Levels 5-8: Personal Health; Populations, resources, and environments, Natural hazards
- Levels 9-12: Personal and community health; Environmental quality; Natural and human-induced hazards

#### Mid-continent Research for Education and Learning (McREL), Science Standards

Earth and Space Sciences 1.1, 1.4, 1.5 and Physical Sciences 8.1, 8.3, 8.5

*\*See "Curriculum Connections" section for standards that apply to other content areas.*

### SUGGESTED GRADE BAND

1-3

### ESTIMATED TIME LENGTH

1 class period

### LESSON PROCEDURES

Collect materials needed to build dioramas and place materials on a table for students to select.

Begin the lesson by building background knowledge about ventilation. Ask students what they think happens to allow air to move in and out of their classroom. Discuss

why ventilation systems are necessary. Tell the students that they will be building a model that demonstrates the ventilation process. Show students enlarged pictures of ventilation systems from the [IAQ Backgrounder](#) (see Materials section) found in the [EPA's IAQ Tools for Schools Action Kit](#) and discuss.

Divide students into groups of three. Each group will have three "Construction Foreman" positions.

- Diorama Foreman (*oversees the making of the diorama*)
- Background Foreman (*oversees the making of the background for the diorama*)
- Summary Foreman (*oversees the writing of the summary*).

Give students time in class to construct and label the dioramas. When they are completed, allow time to share.

### **MATERIALS**

[IAQ Backgrounder](#) from the [EPA's IAQ Tools for Schools Action Kit](#), shoeboxes, construction paper, clay, glue scissors, writing paper, pencil, duct tape, cotton balls, toothpicks, etc.

*\*To order EPA's Indoor Air Quality Tools for Schools (IAQ TfS) Action Kit or any of the supplemental materials found in the Kit, contact IAQ INFO at 800-438-4318 or visit <http://www.epa.gov/iaq/schools/actionkit.html>.*

### **GROUPING**

whole class, small group

### **ASSESSMENT**

Teacher can observe student participation. Diorama and summary can be checked for accuracy. Students will share the diorama and summaries with the class. Groups will answer questions generated by classmates.

### **MODIFICATIONS/EXTENSIONS**

Have students work independently instead of small groups. Assign students all three types of ventilation systems, then compare and contrast the dioramas. Add to the dioramas as the unit progresses to include the topics of pollution and maintenance. Invite a maintenance/HVAC technician or custodian to the classroom to talk to the students.

### **CURRICULUM CONNECTIONS**

**Reading and Language Arts, International Reading Association and National Council of Teachers of English Standards, Standards for the English Language Arts**

- 4: Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.
- 8: 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
- 12: Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information)

**Social Studies, Center for Civic Education, National Standards for Civics and Government**

- Content Standard K-12, V: What are the Roles of the Citizen in American Democracy? /What are important responsibilities of Americans?

**Health, American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD), National Health Education Standards**

- Health Education Standard 1, Grades PK-12: Students will comprehend concepts related to health promotion and disease prevention

**Technology, International Society for Technology in Education (ISTE), National Educational Technology Standards Project (NETS)**

- Performance Indicators K-2  
9: Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)

**Math, National Council of Teachers of Mathematics, Math Standards**

- Data Analysis and Probability  
Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer

## RESOURCES

- EPA's IAQ Tools for Schools Action Kit (3<sup>rd</sup> Edition), Reference Guide, Section 2, Pages 3-8