

# Asthma, the Environment and Your Health 8<sup>th</sup> Grade Lesson Plan

## Maryland Core Learning Goals: *Goal 6: Environmental Science*

### *Expectations 6.3*

**6.3** The student will analyze the relationships between humans and the earth's resources.

**6.3.1** The student will evaluate the interrelationship between humans and air quality.

### *Optional: Expectation 6.4*

**6.4** The student will develop and apply knowledge and skills gained from an environmental issue investigation to an action project which protects and sustains the environment.

**Core Objectives:** In a 30 to 50 minute lesson, the instructor will introduce 8<sup>th</sup> grade students to asthma, links to the environment and how it can be controlled. The lesson introduces the concept that asthma affects people of all ages, and backgrounds; however, data demonstrates that certain populations have higher rates of asthma than others. These differences in asthma rates are not totally understood, but geographic location, income and ethnicity are believed to contribute to the differing rates. Studying differences in disease rates among populations helps scientists learn more about diseases such as asthma, its causes, and how it might be prevented. Options are provided to modify and/or extend the module based on time available, as well as student interests and abilities.

Following the lesson, students should be able to:

- Define asthma, causes, symptoms, and potential contributors
- Recognize that asthma disproportionately impacts certain populations
- Identify specific behaviors by individuals, government, industry, and communities that can help control asthma
- Know that scientists are studying asthma to learn more about its causes, and how it might be prevented

**Additional Objective:** Using data from the Maryland Environmental Health Tracking Network students will identify and discuss possible contributors to Maryland asthma rate variations.

### **Vocabulary:**

**Core:** asthma, asthma triggers, chronic and acute conditions, respiratory disease, genetics, allergens, epidemiology, population demographics

**Additional:** health disparities, social determinants of health, ozone, air quality index, air quality standards, environmental justice, U.S. Clean Air Act

### **Materials:**

- *Asthma, the Environment and Your Health* PowerPoint presentation
- Maryland Environmental Public Health Tracking Network Site (M-EPHTN) <http://ideha.dhmh.maryland.gov/OEHFP/EH/tracking/SitePages/Home.aspx> and computers with Internet access for students to explore the site. *Note: depending on*

*teacher's preference and computer availability, the lesson can be adapted for use with one computer projected for the class to see or multiple computers for small group or individual student work.*

- Handouts: vocabulary sheet and slide notes page
- Videos:  
Asthma Campaign YouTube Videos:  
70 Asthma Facts in Record Time: (5 min. 13 secs)  
<http://www.youtube.com/user/AsthmaCampaign?v=4DQxUwrOolc&feature=pyv>  
  
Causes of Asthma: (2 min. 13 secs)  
<http://www.youtube.com/user/AsthmaCampaign?v=4DQxUwrOolc&feature=pyv#p/a/u/1/K4fKkfVnzY4>

## **ENGAGE**

### *Pre-assessment and Introduction*

Assess students' general knowledge about asthma including causes, symptoms and ways to control it. Options for the pre-assessment include class discussion, small breakout group discussions, or individual activities, such as having students write what they know about asthma on an index card that could then be revised at the conclusion of the lesson.

Students will likely be familiar with various asthma symptoms and a number of students may have asthma or know someone that does. The focus of the lesson should not be on any particular individual with asthma or specific symptoms, but rather on the link between asthma and environmental conditions. Additionally, actions by individuals, government, and communities that can help prevent and control asthma should be highlighted.

## **EXPLORE**

Introduce asthma, what causes it, and its contributors focusing specifically on how it is associated with the environment. Using the materials and additional resources provided, interspersed with class discussion and student activities (i.e., each student could independently write down some possible environmental contributors to asthma) as the instructor desires and time allows.

## **EXPLAIN**

Discuss asthma's connections to the environment (i.e. asthma rates higher in areas with poor air quality) and variations in asthma rates among populations. Encourage students to think about why asthma rates might vary among populations (i.e. higher asthma rates in urban areas). The reducing asthma disparities link below in the Resources and References section may be particularly helpful here. If time allows, students can brainstorm specific actions that can be taken by government, individuals, schools and business to help prevent and control asthma. The class can then examine (either as a class, in small groups, or individually as instructor desires) what is being done by local, state and federal agencies, as well as community groups. Are the

ideas the students came up with being implemented? If not, any thoughts as to why not? What might be some potential barriers? Do factories that pollute provide jobs for the people in the community? Do people live too far to bike to work?

The discussion should conclude with potential actions students individually (or together as a school, community group, etc.) can do to help prevent and control asthma. If the instructor desires, this can serve as a springboard for specific action projects. See evaluation options below.

### **ELABORATE**

Discuss varying rates of asthma in Maryland and the importance of having this data available to researchers, public health officials, and policy makers. Highlight specific population and geographic differences in asthma rates and discuss what might contribute to these disparities. Highlight potential environmental and social conditions (i.e. pollution, highways, and industrial facilities) that are linked to asthma.

If time and availability exists, examine the Maryland asthma data on the M-EPHT site with particular attention to the M-EPHT maps and queries section (either navigating the site together as a class, or if computer access is available allowing students to work individually or in small groups). Giving students time to navigate the EPHT site (perhaps in response to a specific question, such as using the map section of the site determine the asthma rate for their county in a specific year) can help them develop their own questions about the website and the value of the information available.

It is important to note disparities in asthma rates among populations and geographic areas across Maryland. Which geographic areas and populations are more likely to have high asthma rates? What might be some of the possible contributors to these disparities? What can be done to address these disparities? The concept of environmental justice recognizes that all people are entitled equal protection from environmental and health hazards can be introduced.

### **EVALUATE**

#### **Evaluation options:**

- Respond to several brief constructed response (BCR) questions:  
Examples:
  - What is asthma and what are its causes, and contributors?
  - Provide examples (three or more) of how asthma is linked to environmental conditions.
  - Identify at least two specific actions that can be taken to help prevent and control asthma.
- Construct a quiz on asthma, based on the material, and include an answer key.
- Compose a short essay relating information learned about asthma.

#### **Individual or Group Project Options:**

- Present on asthma its causes, contributors, and ways to treat and control it, presentation options could include (poster, skit, PowerPoint, video, etc.)

- Write a letter to the governor or a state or local representative, discussing a specific asthma concern and suggest actions or request funding/attention/more research to address the problem.
- Develop an asthma education campaign (perhaps in the form of a video, poster, PowerPoint presentation, or brochure) about asthma and ways to control it.
- Prepare a response to an asthma case study question (i.e., there is a rise in asthma rates at their middle school after a new highway is built nearby). Building on the concepts from the lesson, formulate potential causes for the rise in asthma rates and a list of suggested actions.
- Use the M-EPHTN website to create an asthma profile of a community. Describe in terms of links to environmental conditions, as well as what geographic/social factors might explain the community's asthma rates.

## **Resources and References:**

NoAttacks.org

<http://www.noattacks.org/>

U.S. Environmental Protection Agency (EPA) Asthma page (Includes quiz on asthma and additional videos)

<http://epa.gov/asthma/>

American Lung Association (ALA) Asthma Page:

<http://www.lungusa.org/lung-disease/asthma/>

ALA Finding Cures:

<http://www.lungusa.org/finding-cures/>

ALA Epidemiology and Statistics Page:

<http://www.lungusa.org/finding-cures/our-research/epidemiology-and-statistics-rpts.html>

National Heart Lung and Blood Institute (NHLBI) Reducing Asthma Disparities:

<http://www.nhlbi.nih.gov/health/prof/lung/asthma/naci/discover/disparities.htm>

Maryland Environmental Public Health Tracking Program:

<http://ideha.dhmf.maryland.gov/OEHFP/EH/tracking/SitePages/Home.aspx>

Centers for Disease Control and Prevention (CDC) National Environmental Public Health Tracking Program:

<http://www.cdc.gov/nceh/tracking/>

U.S. Environmental Protection Agency (EPA) Teaching Resources  
<http://www.epa.gov/teachers/health.htm>

EPA My Environment Query Tool:  
<http://www.epa.gov/myenvironment/>

EPA Environmental Justice:  
<http://www.epa.gov/environmentaljustice/index.html>

EPA Clean Air Act:  
<http://www.epa.gov/air/caa/>

Environmental Health Career Website:  
Meet the Experts: Environmental Health Professionals:  
<http://experts.thinkport.org/envirohealth/default.aspx>

National Institute of Environmental Health Sciences (NIEHS) Curricular Material:  
<http://www.niehs.nih.gov/health/scied/teachers/curricular/index.cfm>

Enviro Health Connections: Curriculum Resources:  
<http://www.thinkport.org/CLASSROOM/CONNECTIONS/general/other.tp>