Educator Guide

Email jenny.frank@maricopa.gov to request a full Educator Guide that includes an answer key.

Background

Take a look around you. All that empty space is filled with something vital to your existence. Air! Clean air is as necessary for life as clean water, but students typically don't think about the invisible ocean of air that surrounds them. Neither do they think about harmful air pollutants that are added to our air every day. Daily activities like turning on lights or driving a car create air pollution, which can be harmful to our health. Children are especially sensitive to the damaging effects of air pollution because their lungs are still developing. When children are active outdoors, they breathe faster and take in more air. If the air is polluted, they will take in more pollution as well.

Course Introduction

The purpose of this course is to educate students and their families about the importance of clean air, and to encourage them to take simple actions that will help improve local air quality so we can all live, work, and play in a healthy environment. This course was designed with the 5E model in mind and is organized into five modules that students can access online at CleanAirMakeMore.com. Students work independently from home as they complete each module. Use the sample schedule below as a pacing guide.

Sample Schedule

Day 1 Engage	Lesson 1: Does Air Take Up Space?	Students engage in hands-on experiments to prove that air exists and occupies space.
Days 2-3 Explore	Lesson 2: What's in the Air?	Students explore air pollution by creating a particle pollution collector and collecting particulates in their own backyard.
Day 4 Explain	Lesson 3: Where Does Air Pollution Go?	Students read an article and watch a video on the effects of air pollution from China. Students evaluate content from different media and formats.
Day 5 Elaborate	Lesson 4: How's Your Air Quality?	Students analyze data from Maricopa County's Air Monitoring Map. They apply what they have learned to a real life situation. *(Students will need a color copy of the activity guide to complete this assignment.)*
Day 6 Elaborate	Lesson 5: How Can You Help?	Students demonstrate their learning through an independent project. Note: Designing and executing the project may take multiple days.

Educator Guide

Learning Goal

Students will understand that air pollution can be identified and measured. They will also understand that air pollution may vary by location and can negatively impact human health.

Arizona Academic Standards

Core Ideas for Using Science

U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.

U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.

Core Ideas for Knowing Science

E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.

Crosscutting Concepts

- Cause and effect
- Systems and system models

Science and Engineering Practices

- Asking questions and defining problems
- Constructing explanations and designing solutions
- Obtaining, evaluating, and communicating information

Standards for Mathematical Practices (MP)

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

Social Studies Anchor Standard

G2: Human-environment interactions are essential aspects of human life in all societies.

ELA Anchor Standards

R.1 Read carefully to determine what the text says explicitly and to make logical inferences from it.

R.7 Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

W.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

SL.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.