PSI: PHYSICAL SCIENCE INVESTIGATION

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GREAT LAKES Science Center

Teacher's Lesson Description

Title	**Clearing It Up**
Brief Description of Videos	In these videos, students will watch as Danté demonstrates that air pressure influences the formation of clouds in the atmosphere.
Time Needed	2 or 3 class periods
Ohio Science Benchmarks Addressed	Earth and Space Science, 6-8 Benchmark C Scientific Inquiry, 6-8 Benchmark B Scientific Ways of Knowing, 6-8 Benchmark A
Ohio Grade Level Indicators Addressed	Earth and Space Science Benchmark C • 7th Grade Benchmark C Earth Systems Indicators 1, 3, 5, 6, & 7 Scientific Inquiry Benchmark B • 6th Grade Doing Scientific Inquiry Indicator 3 • 7th Grade Doing Scientific Inquiry Indicator 6 Scientific Ways of Knowing Benchmark A • 8th Grade Nature of Science Indicator 1
Concepts Developed	Students will be able to explain that: • Air has pressure. • One system used to measure pressure is expressed as pounds per square inch. • Atmosphere is made of gases, water vapor, and particles of dust, smoke, pollen, etc. • Changes in air pressure affect cloud formation. • Cloud formation affects the weather.

	• High and low pressure areas determine the formation of clouds.
Lesson Rationale	Students will engage in scientific inquiry process. This activity includes the transition to a web-based activity. Students will learn to predict the weather based on high and low pressure. This will allow students to make simple weather predictions based on the cloud formations associated with fronts.
Background Knowledge for Teachers	Review the "teacher video" segment and student video segments. The big ideas are: • High pressure keeps water vapor close to Earth's surface not allowing clouds to form. • Low pressure allows water vapor to rise, cool, and condense forming clouds. • Particles in the atmosphere provide a surface on which water vapor can condense. • Atmospheric pressure at the Earth's surface affects weather. • High- and low- pressure areas are important because they affect the weather. • Weather maps will represent high and low pressure areas using the letters H and L. • Weather is also affected by temperature conditions around high and low pressure areas.
Classroom Procedures	Students will observe the video and record their observation, explanations, and revisions in a laboratory journal. To reinforce the concepts discussed, students will complete the following laboratory: Cloud in a Bottle Lab at http://www.weatherwizkids.com/cloud1.htm Teacher note: To reinforce the concepts of high and low pressure, have the students say high pressure when they squeeze the bottle and low pressure when they release the bottle. The next part of the lesson is most effective if students are able to access the internet individually. However, if this is not possible, it is still valuable at a single computer teacher presented activity. Weather activities and teacher guides are available at http://www.edheads.org/activities/weather/index.htm
Materials Needed	2-Liter Clear Plastic Bottle with cap or stopper. Remove labeling on the bottle so that the phenomenon is easier to observe. Matches Water Internet Connected Computer

Science Connections	Direct connection to teaching of weather at the 7th grade and review prior to the 8th grade OAT.
Additional Web Resources	Exploratorium: Make a Fog Chamber http://www.exploratorium.edu/snacks/fog_chamber.html Weather.com usually has pressure weather maps on their opening page: http://www.weather.com Weather Underground has animated time-lapse video of moving weather systems: http://www.wundergound.com Water Cycle Resource from the EPA http://www.epa.gov/safewater/kids/flash/flash_watercycle.html Search for more Web pages related to this topic at the Ohio Resource Center http://www.ohiorc.org/for/science/Default.aspx Classroom Safety: http://membership.acs.org/c/ccs/pubs/chemical_safety_manual.pdf Search the National Science Digital Library: http://nsdl.org/ Find more science teaching lessons at Teacher's Domain: http://www.teachersdomain.org/

Ohio Science Standards Abbreviations:

ES – Earth/Space Science
LS – Life Sciences
PS – Physical Sciences
SI – Scientific Inquiry
ST – Science and Technology
SW – Scientific Ways of Knowing