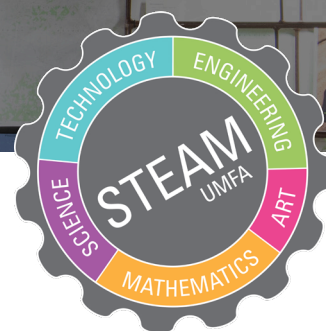


LESSON PLAN: Wind Detectors

by Kellie Yates



There are many places where it is important to know where and how much moving air is present. Such places include air canisters, sick/isolation rooms, and wind farm locations. Multiple technologies have been identified and developed to help people measure this air. Students will create their own wind detector and put it up to various tests.

Objectives:

Student will...

- participate in a drawing breathing exercise
- identify wind detectors in nature
- create and test their own wind detectors

Grade level:

Kindergarten

Duration:

45-60 minutes

Materials:

- Paper
- Crayons
- [Image of Forest seed basket for present and future understanding by Merritt Johnson, UMFA2022.5.1](#)
- Popsicle Sticks
- Tissue Paper
- Bendable Wire or Pipe Cleaners
- Glue

Materials cont:

- Duct Tape
- Hot Glue (for adult use only)
- Variety of other recyclable material as available
- Box Fan
- Hair Dryers
- Straws
- Airzooka

Vocabulary/Key Terms:

- Wind: Moving air

Activity

Part 1 | Breathing Exercise and Discussion

- Begin with a short breathing exercise while creating a line drawing.
- With a crayon or other drawing utensil and piece of paper, have the students close their eyes and create a drawing on the paper moving with their breath. Have them focus on the difference of feeling while breathing in, then out. You can direct students with timing and give additional instruction like to stand up vs sit down, close one nostril with a finger vs. the other, etc.
- How did they show the movement of their breathing in their art? How is their drawing different and the same from the people around them?
- What are some ways they could test if the person next to them was moving air in and out? What about in a room? What are some ways we could know if there is air moving in and out in a room? What are other places we would want to be able to know if air is moving in and out?
- Let's consider the artwork, UMFA2002.5.1, that looks like an oxygen canister. What are these used for? Why would we want to know if air is moving in and out? How do we know if air is moving in nature? What is that air called?

Part 2 | Wind Detectors

- Have students talk about what types of things out in the world can help to see the movement of wind. If possible, look or go outside to gather inspiration.
- We are going to use the rest of our time to make wind detectors with the variety of materials provided. Creating anything that could help measure the movement of wind, whether a slight breeze or a large gust. This is very open to the creativity of students.
- Things to consider: Where would your wind detector best be used? Would you expect your detector to often show air movement or rarely show movement? How much air do you think you should plan for it to experience? Is it going to experience air pushing on it or will air be pulling on it, or will it experience both equally?
- While working provide students opportunities to test and adjust their detector.

Methods for Assessment:

To assess each participant's wind detector, first determine how much wind it was built to withstand, then try it! Options could include participants blowing air on their detector through a straw to ensure it moves with the wind without falling apart- this would be appropriate for a detector for an air canister. If they made a wind detector for an outdoor setting, a box fan or hair dryer would be an appropriate test. For fun, you could use an airzooka for a short large burst of air to test a detector.

It is always best to make testing tools available if possible during the building time so students can test and evaluate as they work.

Additional Resources

Adaptations for Other Grades:

This activity can be easily modified for any grade level for the science standard being addressed. For example, to modify this for grade 2, add a component that the wind detector must make a sound when wind is detected. For other grades, add a seed dispersal component, or require it to be wind resistant up to a certain level. Specific art components could also become requirements to keep it grade appropriate.

State Core Standards:**SEEd**

- Standard K.1.1: Obtain, evaluate, and communicate information about local, observable weather conditions to describe patterns over time. Emphasize the students' collection and sharing of data. Examples of data could include sunny, cloudy, windy, rainy, cold, or warm.
- Standard K.3.1: Plan and conduct an investigation to compare the effects of different strengths or different directions of forces on the motion of an object. Emphasize forces as a push and pull on an object. The idea of strength should be kept separate from the idea of direction. Non-contact forces, such as magnets and static electricity, will be taught in Grades 3 through 5. (PS2.A, PS2.B, PS2.C, PS3.C)
- Standard K.3.2: Analyze data to determine how a design solution causes a change in the speed or direction of an object with a push or a pull. Define the problem by asking questions and gathering information, convey designs through sketches, drawings, or physical models, and compare and test designs. Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, or knock down other objects. (PS2.A, PS2.B, PS2.C, PS3.C, ETS1.A, ETS1.B, ETS1.C)

Visual Arts

- Standard K.V.CR.2: Build skills in various media and approaches to art-making; use art materials, tools, and equipment in a safe way; and create that communicates a story about a natural or constructed environment.
- Standard K.V.CR.3: Share and talk about the artwork and the process of making art while creating.

Artwork Spotlight:

Merritt Johnson (born 1977, lives Sitka, AK)

Forest seed basket for present and future understanding, 2019, handwoven black ash wood and Sitka Spruce cone seeds. Purchased with funds from The Phyllis Cannon Wattis Endowment Fund, UMFA2022.5.1

- Artist Merritt Johnson handwove fibers from a black ash tree to create this artwork in the form of a portable oxygen tank with a regulator and mask. Inside, there are seed cones for Sitka Spruce trees. These seeds can grow into large and strong trees to tolerate the wind and salty air in their natural climate on the pacific coast of North America.
- Today, forests are under threat globally due to human activity including global trade, unsustainable logging, forced burning, and industrial pollution. The black ash tree, that this basket is woven out of, is under threat from an invasive beetle, the Emerald Ash Borer, which likely traveled to the U.S. in the 1980s in shipping materials from its native home.
- Johnson says, “the work insists on our dependence on forests for clean, oxygenated air, on the connection and interdependence of all life, and the responsibility we have to everything living now and in the future.” Trees play a key role in removing carbon from the atmosphere and releasing the oxygen we need to breathe.
- Trees can also act as wind detectors. Looking at how their leaves and branches move with the wind we can see not only the direction but strength of the wind.



Contributer Bio:

Kellie Yates, Collaboration and Program Development Manager at the Utah STEM Action Center, is a strong advocate for STEM and the Arts as a way to help individuals of all ages develop empathetic perspectives and more problem-solving skills using critical and creative thinking skills. A former technology & engineering teacher, she feels lifelong learning is a must, and has recently taken up the hobbies of book binding and D&D.

This Lesson Plan was created for the October 5, 2022 UMFA Evening for Educators: *STEAM is in the Air*. The evening and activities were inspired by the special exhibition *Air*, on view from July 16–December 11, 2022.



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Heading image | Detail of installation views from UMFA's *Air* exhibition of Will Wilson, (Diné, born 1969, lives Santa Fe, NM) *AIR Lab* (Auto Immune Response Laboratory), 2005–ongoing, steel, wood, plants, lights, books, and various media. Courtesy the artist.