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The Wagner Free Institute of Science and its supporters
The National Science Foundation, through NSF# 0139303 and #0440506
Saint Joseph's University

Sample Lesson from Grade 2 Unit: Cycles and Systems Week 6: The Power of Air

Standards:

Pennsylvania Academic Standards for Science and Technology

3.1.4 C Illustrate patterns that regularly occur and reoccur in nature.

Materials:

- Chart paper
- Laptop computer
- Projector
- Power of Air PowerPoint
- Water basin
- Clear glass
- Paper towel
- Hot pot
- Balloon
- 20 ounce bottle
- "Feel the Wind" by Arthur Dorros
- For pinwheels- one for each child
 - Pinwheel template
 - Pencil with eraser
 - Push pin
 - Scissors
- Wind Vane
- Journal page

Lesson:

1. Review the unit title, Cycles and Systems in Science. On chart paper, define a cycle, and list the cycles we have learned about so far, i.e. seasons, water cycle, earth's daily rotation, earth's yearly rotation around the sun, etc. What makes these a cycle? Next, define a system, and list some of the systems we have learned about so far, i.e. earth, weather, solar system, universe, etc. What makes this a system?(15 min.)
2. Direct students' attention to their Daily Weather Data poster. Discuss briefly the information they have been gathering daily. Explain that today we will learn about another important part of weather systems, air. (5 min.)
3. Show "Power of Air" PowerPoint presentation to focus children on how people use air every day, and also how air affects our lives every day. (5 min.)
4. Next we'll do two simple demonstrations to show that air takes up space, and that hot air rises. (10 min.)
 - Air Takes Up Space: Stuff a piece of paper towel in the bottom of a glass so that it will not fall out when you turn it upside down. Ask students whether or not they think you can plunge the glass all the way into the sink of water without getting the

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paper towel wet. Hold the glass upside down and plunge it into a basin of water. Hold the glass under water for about 10 seconds and then slowly and steadily lift the glass up, making sure not to tilt it at all. Pull out the dry piece of paper towel and show it to the students. Discuss why the piece of paper towel stayed dry. (Air filled the glass up and that is why water could not get in.)

- Hot Air Rises: Put a balloon around the open neck of an empty 20-ounce bottle. Place the bottle in a container of very hot water. Have students observe the balloon expanding with hot air. Discuss why the balloon filled with air. (Hot air is less dense than cool air, and rises when heated.)
5. Read aloud Feel the Wind by Arthur Dorros (10 min.)
 6. Students will make pinwheels. (20 min.)
 7. Finally, we will go outside to show the wind vane to the children, and to try out our pinwheels. (15 min.) Discuss how the wind changes from day to day, i.e., direction and speed.

Journal entry: Explain something you learned about air today. What do you like and dislike about wind?

Follow up:

- Students can work in pairs to make paper airplanes designed to hit a target. Once we find which ones work best, we can discuss what qualities make a good airplane. Insect gliders can be used to introduce the idea that shape, size, etc. can change the way something flies.
- Daily weather data collection.