

Exercise 1D

MOVING AIR

OVERVIEW

The movement of air masses can be confusing and difficult for students to conceptualize. This activity aids in the understanding of how air—and its contents—move.

BACKGROUND INFORMATION

Wind is moving air. The wind has energy and can push objects in the direction it is blowing. Some objects are very small, and hard to see; some objects are invisible. Ozone, for example, is an odorless, colorless gas. It gets pushed by wind. People hear in weather reports about how fast the wind is blowing. If the wind is moving 10 miles an hour, that means it can push pollution ten miles in a single hour — faster than most people can run! The air can push things, like leaves and balloons, and chemicals, like different types of pollution, from one place to another. Sometimes it's good; we all love to find balloons, or pretty, colored leaves. Sometimes, it's bad; we all hate it when a horrible smell comes our way from somewhere else. All those things, good and bad, move with the air, pushed by the wind.

Time

One class period.

Materials

- marble • leaf
- ball of yarn • small pebble
- clothes pin • pencil
- rubber ball • facial tissue
- crayon • blown up balloon
- masking tape • yardstick
- graph paper for students

Objectives

After participating in this hands-on activity, the students will be experienced in:

- observing data,
- gathering data,
- recording data,
- interpreting data,
- applying data to generalized statements and
- explaining how air might move pollution from one area into another, adding to problems on Ozone Alert! days when pollutants from various places combine to form ozone.

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PROCEDURE

1. Read the background information to the class and tell them to imagine that they had to move an object without touching it. What would they do? Write the answers on the board.
2. Have they ever blown a piece of hair out of their eyes? Have they ever had their hair blow-dried? What happens? Wind can move things.
3. Show the students some of the objects (listed in the materials section) one at a time and have them name them. Do the students think they can move all of these objects with wind?
4. Present rules for the activity to the class (low voices, only one person out of their seat at one time, no running or throwing and keep your hands to yourself are some suggestions.)
5. Make sure that the table tops are clean and dry for the “race.” Place a piece of masking tape about two feet long on one end of the students’ tables for the starting line. Three feet away, place another piece of tape about two feet long for the finish line. Gather all of the objects for the “race” and place them in boxes; one for each group.
6. Have students in the class pick a playing card from a deck using only the numbers ace through five. Form groups according to the numbers. Once they are in groups, have the students count off, if necessary. Pass out role labels according to numbers. All of the aces are “Getters,” twos are “Task Masters,” threes are “Timekeepers,” fours are “Recorders” and fives are “Encouragers.”
7. Announce to the class that now we are going to find out if we can use wind to move all of these objects and explain the instructions. If there are no questions, have the “Getters” come up to the front and pick up the materials they need.
8. Have the “Getters” place one object on the desk and say: “On your

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mark, get set, go!” The “Task Masters” will then blow on the object until it crosses the finish line. “Recorders” will count the number of blows it takes to move the object the entire distance and the “Encouragers” will record the number on their graph by coloring in the corresponding number of blocks. Timekeepers will monitor the length of time allotted for the race, 30 seconds to one minute, depending on the length of the desk.

9. The race continues until all of the objects have crossed the finish line or until time is up.

Note!

Be sure to have the students read the names of the objects printed at the bottom of the graph to be sure they know where to record the data for each object, or have the students draw pictures to identify each object.

Questions and anticipated responses

- What might have made the objects move? Magic, your breath, air, wind, number of blows...
- What is wind? Wind is moving air. The wind has energy and can push objects in the direction in which it is blowing.
- Which objects took the most blows to move? Clothes pin, pebble, crayon, pencil...
- Why? Bigger, heavier, not round...
- Which objects took the least amount of blows to move? Why? Smaller, lighter, round...
- What are some objects you have seen the wind blow? Hats, windmills, leaves, flags, dust, clouds, paper, balls...
- Do you think it makes a difference what direction the wind comes from

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in order for something to move? Hint: Think about your investigation. Yes, you have to blow it in the direction you want it to go (finish line). Yes, if you blow from an angle it might not move or it might go in a different direction.

MOVING AIR – EXTENSIONS

Wind-powered puffs: Discuss ways in which the wind is helpful to us and how we might use the wind to help us accomplish tasks. For example, we use blow dryers, clothes dryers, fans and we even blow on hot food to cool it before we eat it.

Encourage the students to think of other ways to use wind. Invite children to use their wind power to accomplish a task. Divide the class into four or five equal teams. Have one person from each team kneel behind a starting line. Place a cotton ball in front of each person. On the start signal, have each student blow the cotton ball with just one puff. Measure how far each cotton ball went. Repeat until each student has had a turn. Graph the results. Discuss the results. Discuss some of the problems with wind power, such as harnessing its energy and controlling its effects and the way it can bring unwanted things (like pollution and awful smells) to their area.

Wind-powered rocket: Show the students a picture of a wind turbine and explain how wind can help generate power that can be used to create energy. Demonstrate how to build a wind-powered rocket with the following instructions:

1. Stretch a string tightly from one side of the room to the other.
2. Thread the string through a plastic drinking straw.
3. Blow up a balloon and hold the end with your finger to prevent the air from escaping.
4. Using tape, attach the balloon to the underside of the straw.
5. Let the air out of the balloon and watch the “rocket” fly across the room on

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the string.

Give each child a plastic drinking straw and a balloon. Have children work in pairs to stretch a string between two points and launch their rockets. After children have had a chance to experiment, discuss the scientific principle of wind-powered propulsion.

Wind picture: Give each child a 9"x12" sheet of black construction paper and a straw. Drop a few drops of diluted white paint in the center of each child's paper and encourage students to aim the straw at the paint and blow into it to create an interesting, wind-blown design. It is important that the straw does not touch the paint. For variety, try using bright colors of paint on white construction paper.

CROSS CURRICULAR EXTENSION ACTIVITIES

MATH:

There are a few math activities in this learning cycle. During the exploration, students will record and graph the number of blows it takes to blow each of the objects. Elaborating with "Wind-Powered Puffs," they are measuring distance and recording their findings on a graph.

LANGUAGE ARTS:

Read a poem about wind and have students write their own rhymes and poems about wind. (Recommended: "Who Has Seen the Wind" by Christina Rossetti.)

Read the book *The Wind Thief* by Judi Barrett. Make hats out of newspaper and masking tape by placing two sheets of paper on your head and having someone else take the tape and wrap it around your head where the newspapers are. Folding the sides up or down to create a unique design, students can then decorate their hats. If it is a windy day, take the students, in their hats, outside and let them see what happens.

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SOCIAL STUDIES:

Ask the students: Does the wind ever change direction? How can you tell? For study, have the students construct a wind vane and investigate the direction of the wind for three days. To make a wind vane, you need an eraser, a pencil, a straw, oaktag and a straight pin. Cut the point and tail of the arrow out of oaktag and tape them to the straw. Put the pin through the straw into the eraser end of a pencil. Stick the pointed end of the pencil into a flat eraser, and glue to a square piece of oaktag. Label the sides of the oaktag base North, East, South and West and set the wind vanes outside with the north sides facing north. Record the direction of the wind for three days.

ENVIRONMENT:

Make an imaginary map of an imaginary city where people live on the south side of town, factories manufacture things on the north side of town, the east side of town is surrounded by lakes and the west by forests. Encourage students to imagine they lived in the town on a day when the winds came from the east.

What would they feel? Water? Warm air or cold air? Why? What would they smell? Water? Fish? Ask students to imagine the wind changes direction and is now blowing from the west. What would they see? Leaves blowing? Dirt blowing? What might they smell? Animals? Trees? Flowers? Ask students to imagine the wind came from the north side of town. What would that be like? Would there be pollution? Would it smell bad? Look funny? Ask students to consider their own pollution and how it blows other places, too. Ask students to think about the sources of pollution and about what they can do to reduce the amount of pollution they put into the air that moves, blown by wind.



Educational activities for Kindergarten - Grade 5

From: Southeast Michigan Council of Governments

http://www.semco.org/Services/OzoneAction/assets/gradek_5.pdf