

Moving Air!



Target Grade Levels

Kindergarten - Fifth

Time

One hour

Materials

- marble
- ball of yarn
- clothes pin
- rubber ball
- crayon
- leaf
- small pebble
- pencil
- facial tissue
- inflated balloon
- feather
- sand
- graph paper
- masking tape
- yardstick

Knowledge and Skills (TEKS)

- Science:
 - Make wise choices in the conservation of resources;
 - Describe ways technology influences human capacity to modify the environment; and
 - Give examples of scientific discoveries and technological innovations that have shaped the world.
- Math:
 - Represent as in a graphic organizer; and
 - Summarize making charts.
- Visual Arts:
 - Produce visuals.

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. Wind has energy and can push objects. For example, wind can move things we can see, such as, tree leaves, grass, your hair, and sand. Wind can also move very small objects that you cannot see, such as ozone, a colorless, odorless gas.

People hear in weather reports about how fast the wind is blowing. If the wind is moving ten miles per hour, that means it can push pollution ten miles in a single hour—faster than most people run! The air can push things, such as leaves and balloons, and air pollution, from one place to another. Sometimes wind is good; people love to fly kites, or find pretty colored leaves. Sometimes, wind is bad; we don't like it when a horrible smell comes our way from somewhere else. All of those things, good and bad, move with the air, pushed by the wind.

Procedure

1) Vocabulary

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| a) wind | e) gas |
| b) energy | f) air |
| c) ozone | g) wind velocity |
| d) wind speed | |

2) Activities

- Read the background information to the class and ask them to imagine that if they had to move an object without touching it, what would they do? Write answers on the board.
- Have they ever blown a strand of hair out of their eyes? Have they ever had their hair dried with a blow dryer? What happens? Wind moves things.

- c) Show the students some of the objects (listed in the materials section) and have them name them. Do the students think they can move all of these objects with wind?
- d) Present rules for the activity to the class (low voices, only one person out of their seat at a time, no running or throwing, and keep hands to yourself).
- e) Make sure that the tabletops 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.
- f) Form the students into groups of five. Then have the students count off, if necessary. Pass out role labels according to numbers. All the ones are “Getters” twos are “Wind,” threes are “Timekeepers,” fours are “Recorders” and fives are “Encouragers.”
- g) Announce to the class that they now are going to find out if they 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.
- h) Have the “Getters” place one object on the desk and say: “On your mark, get set, go!” The “Wind” 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 given for the race.
- i) The race continues until all of the objects have crossed the finish line or until time is up.
- j) Note: 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.

3) Review

Use the following questions (anticipated responses included) to encourage a class discussion about the results.

- a) What made the objects move? *Your breath, air, wind, number of blows...*
- b) What is wind? *Wind is moving air. The wind has energy and can push object in the direction in which it is blowing.*
- c) Which objects took the most blows to move? *Clothes’ pin, pebble, crayon, pencil...*
- d) Why? *Bigger, heavier, not round...*
- e) Which objects took the least amount of blows to move? *Hats, windmills, leaves, flags, dust, clouds, paper, balls...*
- f) Do you think it makes a difference what direction the wind comes from in order for something to move in a certain direction? *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.*

4) Evaluation

- a) Students' record keeping on the activity can be evaluated as a graded task.
- b) Students can be quizzed on transported pollution math problems based on wind velocity, destination city, and time to destination city.
- c) Students can perform the following extension activities as graded exercises.

5) Extension

- a) 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 hair 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 the cotton ball went. Repeat until each student has had a turn. Graph the results. Discuss the results. Discuss some of the problems with using wind, such as harnessing its energy and controlling its effects and the way it can bring unwanted things (like pollution and odors) into the area.
- b) 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:
 - i) Stretch a string tightly from one side of the room to the other.
 - ii) Thread the string through a plastic drinking straw.
 - iii) Blow up a balloon and hold the end with a finger to prevent air from escaping.
 - iv) Using tape, attach the balloon to the underside of the straw.
 - v) Let the air out of the balloon and watch the "rocket" fly across the room on the string.
 - vi) Give each student a plastic drinking straw and a balloon. Have students work in pairs to stretch a string between two points and launch their rockets. After they experiment, discuss the scientific principle of the wind-powered propulsion.
- c) Wind picture: Give each student 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.
- d) Make stuffed clouds: Have students put two pieces of butcher or construction paper, one on top of the other, and cut a large cloud shape through both layers. Then have students paint, color, or decorate (with glitter, tissue, etc.) both of the outer layers. Staple the edges, leaving an opening to stuff with newspaper; then staple the remaining opening. Hang the clouds around the room.
- e) Cross curricular extension activities—Language Arts:

- i) 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.)
 - ii) 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. Fold 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, while wearing their hats, outside and let them see what happens.
- f) Cross curricular extension activities—Social Studies:
- i) Ask the students what significant historical events has wind been involved in? For example:
 - (1) Wind blew in the sails of the Niña, the Pinta, and the Santa Maria to take Columbus across the Atlantic Ocean to the Americas.
 - (2) A strong, dry wind spread the great Chicago fire of October 8, 1871.
 - ii) 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, oak tag and a straight pin. Cut the point and tail arrow out of oak tag and tape them to the straw. Put the pin through the straw into the eraser end of the pencil. Stick the pointed end of the pencil into a flat eraser, and glue to a square piece of oak tag. Label the sides of the oak tag 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.
- g) Cross curricular extension activities—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 and there are many cars, trucks and buses; the east side of town is surrounded by lakes, and the west by forests. Encourage students to imagine they live in a town on a day when the wind came from the east. What would they feel? Water? Warm air or cold air? Why? What would they smell? 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 student to consider their own pollution and how it blows other places, too. Ask students to think about the sources of pollution and what they can do to reduce the amount of pollution they put into the air that moves, blown by wind.