



Title: Gone With The Wind
(Meteorology)

Grade Level(s): 6-8

Introduction: The ability to safely navigate a boat depends upon the prevailing winds and currents. Keeping a course maybe be easier on a calm day during a slack tidal current, however, the boat may become difficult to maneuver when coping with stiff crosswinds or crosscurrents.

Winds may be classified into four major types: the **prevailing winds**, the **seasonal winds**, the **local winds**, and the **cyclonic** and **anticyclonic winds**. The Beaufort wind scale is used by mariners and meteorologists to indicate wind velocity.

Learner Objective(s):

- The student will give an explanation on what causes the wind.
- The student will be able to explain what is weather's driving force.

Sunshine State Standards: Science: SC.B.1.3.5 SC.B.1.3.6.

Competency-Based Curriculum: Science: Sci.M/J3 IV-2-A

Materials:

Pinwheel

Lamp with incandescent light bulb(approximate time for demonstration should be 15 minutes).

Activity Procedures:

1. The teacher should start with the question "What drives weather?" Ask: "What makes the wind blow?" Guide the students toward the sun as the driving force for weather.
2. After recalling that it was the wind that helped their kite fly, ask "What is Wind?" Remind the students how hard it can be to hold on to a kite against the force of a strong wind. Stress that even though air is an invisible gas, it still consists of molecules and their movement, especially at high speeds, can exert a lot of force.

Activity Procedures (Cont'd):

3. Review that it is the difference in the air pressure that causes air movement.
4. Air is a fluid that tends to move from an area of high pressure to an area of low pressure. Students should understand that wind is the movement of air from an area of high pressure to an area of low pressure. Stress that all winds are caused by differences in air pressure.
5. The fact that air pressure differences are caused by the uneven heating of the atmosphere is a concept that all students must understand.
6. Demonstrate how differences in temperature cause air movement by having the students construct a pinwheel and placing it by a light bulb.
7. The light bulb causes heating of the air around the lamp.
8. The pinwheel moves because the air close to it is heated. Ask the students "Why did the pinwheel move?"

Student Assessment:

Allow students to review each others answers to the questions in the lesson. In a cooperative manner, and using alternative assessment measures, students can serve as peer assessors.

Activity Extensions:

Have students trace the global winds on a map and then use the globe to determine which global wind belt flows over or across Miami. **(Geography)**

Home Learning Activity:

Have students address the question of how global winds influenced sea travel in the past.

Vocabulary: prevailing winds, local winds, seasonal winds, cyclonic wind, and anticyclonic winds.

References/Related Links:

<http://www.ruf.rice.edu/~feegi/weather.html/>
[http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/fw/sea/htg.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/fw/sea/htg.rxml)
<http://www.sspboatsite.com>

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Reading Passage

Wind is air in motion. It is caused by horizontal variations in air pressure. The greater the difference in air pressure between any two places at the same altitude, the stronger the wind will be. The wind direction is the direction from which the wind is blowing. A north wind blows from the north and a south wind blows from the south. The prevailing wind is the wind direction most often observed during a given time period. Wind speed is the rate at which the air moves past a stationary point.

Winds and storms made the South Atlantic impossible to sail. All ocean sailors, before 1400, depended upon highly predictable seasonal winds and currents. These winds, also known as "trade winds," were named such because when they blew, the traders sailed into, or out of, harbors. Trade winds and currents were the reason for regular long distance travel in the Pacific and Indian Oceans.

A variety of instruments measure the wind. A wind vane measures the wind direction. Most wind vanes consists of a long arrow with a tail that moves freely on a vertical shaft. The arrow points into the wind and gives the wind direction. Anemometers measure wind speed. Most anemometers consist of three or more cups that spin horizontally on a vertical point. The rate at which the cups rotate is related to the speed of the wind.

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FCAT Questions

Directions: Read the passage, then answer the questions. Answer multiple choice questions by circling the letter of the answer that you select. Write your answer to the “Read, Think, and Explain” question on the lines provided.

1. Winds are caused by:

- A. Varying rates of gas flow
- B. Altitude
- C. Horizontal variations in air pressure
- D. Differences in air pressure

Answer: C

2. What does a wind vane measure?

- A. Wind direction
- B. Wind velocity
- C. Wind speed
- D. Wind pressure

Answer: A

3. The difference between air and wind is:

- a. Direction
- b. Motion
- c. Temperature
- d. Density

Answer: B

4. How do sailors measure wind during oceanic expeditions?


