



Lesson Plan: Kite Meteorology

Grade Level: 3

Subject Areas: Science and Math

Time Required: *Preparation:* 1 hour
Activity: 1 hour every day for five days

National Standards Correlation:

Science (grades K-4)

- Science as Inquiry Standard: Understanding about scientific inquiry
- Science as Inquiry Standard: Abilities necessary to do scientific inquiry.
- Science and Science Technology: Understanding about science and technology.
- Science in Personal and Social Perspectives: Changes in environments.

Math (grades 3-5)

- Number and Operations Standard: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.
- Measurement Standard: Understand measurable attributes of objects and the units, systems and processes of measurement.
- Data Analysis and Probability Standard: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Summary:

Students will use thermometers to record the temperature at ground level for five days. Also during those five days, a class kite with a thermometer attached to it will be flown in order to record a temperature at a higher altitude (50 feet). Students will be recording temperatures every day, and will be responsible for computing the difference between the two temperatures and graphing the data from day to day. Students will make predictions about what they will find before the activity and will draw conclusions at the end of the activity based on the data recorded. Also during this lesson, students will learn about the history of kites and how meteorologists have used kites to gather weather data.

Objectives:

Students will:

- Record temperatures at both ground level and kite-flying level for five days
- Compute the difference between the two temperatures each day
- Graph the temperature at ground level, the temperature at kite level, and the difference between the two temperatures
- Make conclusions about temperature and air based on the data collected in this lesson.
- Examine the history of kites and how kites have been used in meteorology

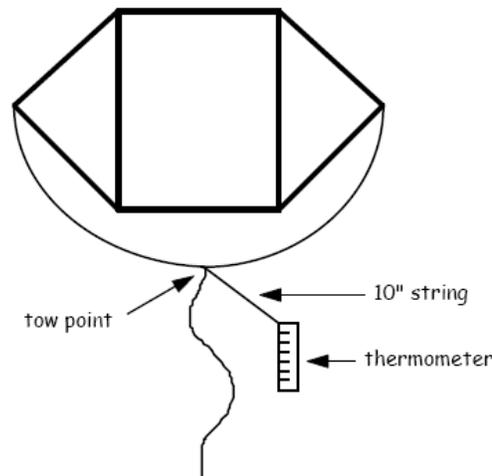
Materials:

Students will need:

- 1 sled kite with flying line (see “Sled Kite” lesson for materials list and construction directions)
- 10 thermometers (or enough for each pair of students to use)
- 12" of string to attach thermometer to sled kite
- 1 data sheet for each student
- 3 graphs for each pair of students



Special Instructions: In advance, the teacher will attach a thermometer to the kite at the tow point using a 12" piece of string (see drawing). Also, teacher will measure 50 feet of flying line and make a red mark at the 50 foot point.



Safety Instructions: See “Kites in the Classroom” presentation at <http://www.nationalmuseum.af.mil/shared/media/document/AFD-070523-007.ppt>

Procedure:

A. Warm-up

1. Give a brief history lesson (see introduction) about kites and how they have been used in meteorology.
2. Review with students how to read a thermometer correctly and how to care for it safely.
3. Divide class into pairs.
4. Explain the following activity and have students predict what the temperature is at ground level and at 50 feet above ground.

B. Activity

The following steps will be completed every day for five days:

1. Each pair of students will sit on the ground and measure the temperature with the thermometer. Record temperature on data sheet.
2. On the first day, the teacher will demonstrate how to fly the kite with the thermometer attached. The kite string will be released 50 feet, which has already been marked on the flying line with a red marker. Due to the angle at which the kite is flying, the kite will not be 50 feet from the ground, and the height will vary day to day. It should provide a sufficient difference in temperature for purposes of this lesson. Advanced classes may want to use trigonometry to determine actual altitude.
3. Allow the kite to fly at that level for five minutes. During this time have the students line up in pairs underneath the kite about three feet apart.
4. After the five minutes, the students closest to the teacher will gently grab the flying line and pull it toward the ground. Each pair of students will do this after the pair next to them



has done so. The last pair should gently grab the kite and read the temperature on the thermometer for the class. Thermometer 10" string tow point.

5. Lay the kite and flying line down gently. Record temperature on data sheet.
6. Return to the classroom and compute the difference between the two temperatures (ground and air) and complete the data sheet.

C. Wrap-up

1. After recording data for five days, students will complete the data sheet and graphs. Ask students to make conclusions based on the data that they have recorded. Were they close to their predictions?
2. Discuss what students concluded and/or predicted. What have they learned about air and temperature? Why is this so? Is using a thermometer attached to a kite a good way to record temperature? How do meteorologists today record higher altitude temperatures?
3. Make a list of any questions relating to meteorology for a future visit to a local meteorologist.

Assessment/ Evaluation:

Students should be evaluated on accuracy of computing differences and completing the graphs. Conclusions should relate to data collected.

Extensions:

1. Do this activity for a week in the fall and a week in the spring. Compare and contrast the data.
2. Fly three different kites at three different altitudes and record temperatures.

Resources/ References:

Hosking, Wayne. *Flights of Imagination*. Washington, D.C.: National Science Teachers Association, 1990.

Cosgrove, Brian. *Weather*. New York: Alfred A. Knopf, 1991.



Kite Meteorology Data Sheet

Day	Temperature Ground Level	Temperature Kite Level	Difference
1			
2			
3			
4			
5			

Predictions - What do you think will happen?

Conclusions - What happened and why?



Kite Meteorology

Ground Level Temperature Graph

90°F					
85°F					
80°F					
75°F					
70°F					
65°F					
60°F					
55°F					
50°F					
	Day 1	Day 2	Day 3	Day 4	Day 5



Kite Meteorology

Kite Level Temperature Graph

90°F					
85°F					
80°F					
75°F					
70°F					
65°F					
60°F					
55°F					
50°F					
	Day 1	Day 2	Day 3	Day 4	Day 5

