

Name: _____

Date: _____

STATION 1: Wind Inspectors

Station 1: Wind Inspectors

Summary

Students design and construct an instrument for measuring wind speed.

Real-world connection

- Wind speed can be measured using simple tools.
- Measurements can differ depending on who does the measuring and where it is done.

Preparation

- Order Sky Watchers Weather Observation Wall Chart from Environment Canada's Inquiry Centre: enviroinfo@ec.gc.ca
- Student Instruction Sheet, one per group
- Student Handout, one per group



Materials

- Sewing needle (large enough to pierce a ping pong ball)
- Thread
- Ping pong balls (two for each time the station is used)
- Protractor (one for each time the station is used)
- Sky Watchers Weather Observation Wall Chart

NOTE: Students will construct an anemometer and measure wind speed outdoors. *If adult supervision is not possible, students have the option of measuring an indoor wind speed (Step 5).*

Other weather observations to consider

- Temperature
- Pressure (indoor mounted barometer)
- Relative humidity (using sling psychrometer and conversion charts)
- Wind direction
- Weather phenomena (e.g. sky condition and precipitation type)

Instructions

See Chapter 1 of the Sky Watchers guide:
www.ec.gc.ca/gge-ftg/default.asp?lang=En&n=2538CD87-1

Curriculum outcomes

Theme: Measuring and Describing Weather (Weather Instruments). For a complete list of curriculum outcomes, please go to the appropriate table at the end of this document.

References

Hislop, Theresa (2002, 09 28). Measuring Wind Speed. Retrieved December 12, 2008, from Utah Education Network website:

www.uen.org/Lessonplan/preview.cgi?LPid=2454

(2008). The Power of the Wind. Retrieved April 10, 2009, from National 4H Curriculum website:
<http://projects.4hcurriculum.org/curriculum/wind/book1.aspx>

Station 1: Wind Inspectors – Student Instructions

Unusual events have been occurring around your school, both indoors and out. Students have noticed papers flying through the air, assignments suddenly missing, doors slamming shut, and weird whistling coming from around every corner. Is it just the wind blowing throughout the school, or could it be something more mysterious?

Your science teacher has thought of a way to find out the truth, once and for all. Today you are going to test for wind, or something else...

1 Cut a piece of thread about 20 cm long. Thread the needle and tie a large knot in the end of the thread.

2 Stick the needle into one side of the ping pong ball and out the opposite side. Draw the thread through until the knot at the other end stops the thread from moving.

3 Tie the thread to the centre of the straight base of the protractor (through the hole) so that the ball hangs below the arc of the protractor which has the angles marked on it. If the protractor is held level where there is no wind, the thread will hang still over the 90 degree mark. Now you have successfully made an ANEMOMETER, a scientific devise to measure wind speed.

4 OUTSIDE: Do this step only if you can go outside with supervision and test your wind instrument! Hold the wind instrument level and

face into the wind. The wind will blow the ball and when it does, watch to see the position of the thread on the protractor.

Record the angle that the ping pong ball has been blown and then use the chart below to convert the angle to a wind speed. Make sure you put your results on the Sky Watchers Weather Observation Wall Chart.

5 INDOORS: Have one student hold the instrument near any of the places where there may have been "ghostly appearances" or lots of wind. Check for wind near a window, closet, or above a radiator or vent. Try blowing a ghostly wind yourself on the ping pong ball. Watch the angle and then convert that number to wind speed using the chart on the next page.

6 If time allows take other weather observations and record them on the Sky Watchers Weather Observation Wall Chart.

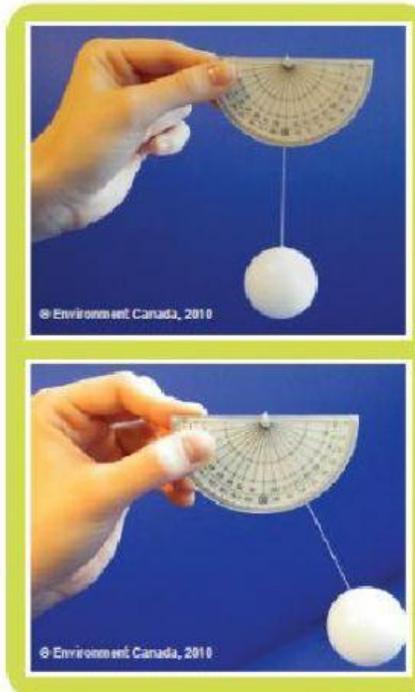




TABLE OF WIND SPEEDS (kilometres per hour)

| | | | | | | | | | | | | | | | |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Acute Angle | 90° | 85° | 80° | 75° | 70° | 65° | 60° | 55° | 50° | 45° | 40° | 35° | 30° | 25° | 20° |
| Speed (km/h) | 0 | 9 | 13 | 16 | 19 | 22 | 24 | 26 | 29 | 32 | 34 | 38 | 42 | 46 | 52 |

Consider your indoor and/or outdoor wind speed results.

1 Pick one of your results and explain the angle you used to calculate the wind speed.

2 Did you measure any wind indoors in unexpected places? If so, where? _____

3 What was the outdoor wind speed? _____

4 Look at your natural surroundings (trees blowing, grass moving). Does the wind speed appear to match current weather conditions, or is it unexplained? _____

5 Write an announcement that you could read to the school tomorrow morning to explain the unusual events. _____

