

Lesson Plan Title  
**WIND CHILL**

**Developed by:** Adam Keeton, North High School Science Department

**Discipline:** Science

**Topic:** Meteorology – Calculating Wind Chill Temperature

**Grade Level:** Grades 6 - 12

**Resources / References / Materials Teacher Needs:**

- Thermometer
- Anemometer
- Wind Chill calculation Table
- Wind Chill Factor Equation
- Wind Chill Rule of Thumb

**Lesson Summary:**

Students in meteorology will be learning about what the wind chill factor is, how it is calculated and why it is so important to understand.

**Standard's Addressed:** McREL (Mid-continent Research for Education and Learning)

**Science**

Std 1) Understand atmospheric processes and the water cycle.

Std 12) Understand the nature of scientific inquiry.

**Mathematics**

Std 3) Uses basic and advanced procedures while performing the processes of computation.

Std 4) Understands and applies basic and advanced properties of the concepts of measurement

**Learning objectives:** The students will

- Measure Temperature
- Measure Wind Speed
- Calculate Wind Chill
- Understand implications of wind chill for personal safety

**Assessment:** Students will be assessed on their ability to

- measure temperature and wind speed
- use information to solve for wind chill factors
- apply information for personal safety

**Procedural Activities:** Prior to Iditarod students will learn about wind chill through research, classroom discussion and activities. Students will complete the Wind Chill Lab by following these steps –

- Get materials including coats and move outside.
- Using the thermometer, measure the outdoor air temperature. (Students will need to wait at least 3 minutes to allow the thermometer to acclimate to the environment.
- Record the air temperature.
- Using the anemometer, measure the outdoor wind speed.
- Record the outdoor wind speed.
- Once you have recorded both air temperature and wind speed, use the wind chill table, rule of thumb (see other information below) or the equation to solve for wind chill temperature.
- Repeat the above steps two more times then calculate an average.
- Consider how to account for gusting winds.

Ask some groups of students to calculate Wind Chill Temperature by using the Wind Chill Table. Ask other groups of students to use the Rule of Thumb. Compare the results.

**Project:**

During Iditarod, follow three mushers (one in the top 10, one in the middle of the pack and a Red Lantern candidate) on a daily basis. Using a weather resource such as the weather tab at iditarod.com chart temperature, wind speed and wind chill for the most recent checkpoint the musher has checked into. Select a checkpoint and write a weather bulletin for mushers, veterinarians and checkpoint volunteers advising them of the serious consequences of the wind chill in their area. Create a poster with products and procedures that mushers might consider using to prevent serious bodily harm from the wind chill.

**Materials Students Need:**

- Thermometer
- Anemometer
- Wind Chill Table
- Wind Chill Equation
- Wind Chill Rule of Thumb
- Calculator
- Internet Access

**Technology Utilized to Enhance Learning:**

- Interactive weather information can be obtained for each of the Iditarod Checkpoints from [www.iditarod.com/weather](http://www.iditarod.com/weather).
- Find a web site that allows data entry.
- Useful Websites
  - [www.weather.gov/om/windchill](http://www.weather.gov/om/windchill)
  - [www.science.howstuffworks.com](http://www.science.howstuffworks.com)
  - [www.theharlowreport.com/distance/windchill.html](http://www.theharlowreport.com/distance/windchill.html)
  - [www.atd.ucar.edu/homes/rilling/wc\\_formula.html](http://www.atd.ucar.edu/homes/rilling/wc_formula.html)
  - [www.cac.ca/news/background/forcesofnature/windchill.html](http://www.cac.ca/news/background/forcesofnature/windchill.html)
  - [www.wildernesssurvival.net](http://www.wildernesssurvival.net)

**Other Information:** Rule of Thumb for wind chill Calculation –  
Wind Chill Temperature = Outside Temperature – 1.5\* Wind Speed in mph.

**Modifications for special learners/ Enrichment Opportunities:**

- Students with limited use of hands may work in small groups with others to help use the equipment.
- Create thermometers and anemometers with adaptive pieces that allow students to handle and control the tools necessary for the lab.
- Students may be assisted with the table or equation to calculate wind chill
- Using the equation can be an optional activity. Tables can be used to check calculations.
- Consider how wind chill affects the dogs of Iditarod.
- How are the northern breeds of dogs able to adapt to the severe conditions they often encounter?
- What special “gear” has been designed for the dogs for extreme cold and wind chills?

**Notes:**