

**Halloween - Musher Costume**  
(one definition for costume is "a set of clothes")

**Developed by:** by Jane Blaile 2008 WFTOTT™

**Discipline / Subject:** science

**Topic:** heat transfer/insulation

**Grade Level:** 3-8

**Resources / References / Materials Teacher Needs:** Iditarod website, pictures of mushers during the race, online or printed catalogs of Arctic/musher gear, lists of typical musher clothing layers, winter clothing for testing, other materials as deemed necessary by student investigation design

**Lesson Summary:** Students will experiment with different articles of winter clothing to determine which are warmest. Then students will learn the necessary layers of clothes a musher wears, a "costume", to survive Arctic elements during the Iditarod. (Sometimes mushers in full gear certainly look like they are in a costume!)

**Standards Addressed:**

**national standards:**

**NS.5-8.1** Students should develop abilities necessary to do scientific inquiry and understandings about scientific inquiry.

**NS.5-8.2** Students should develop knowledge of transfer of energy.

**Alaska state standards:**

The student demonstrates an understanding of the processes of science by

**[5] SA1.1** asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating

**[5] SA1.2** using quantitative and qualitative observations to create inferences and predictions

**Arizona state standards:**

**SC5-S1-C1-PO1-3** The students will formulate predictions, questions or hypotheses based on observations, locate appropriate resources.

**SC5-S1-C2-PO1-5** The students will design and conduct controlled investigations.

**SC5-S1-C3-PO1-5** The students will analyze and interpret data to explain correlations and results; formulate new questions.

**SC5-S1-C4-PO1-3** The students will communicate results of investigations.

<p><b>Learning objectives:</b> The students will:</p> <ul style="list-style-type: none"> <li>• define: "insulator" as it relates to heat transfer, "heat transfer" as it relates to body heat</li> <li>• design an experiment to test warmth of winter clothing</li> <li>• conclude which clothing items are warmest</li> <li>• describe typical clothing an Iditarod musher wears for insulation against Arctic conditions</li> </ul>	<p><b>Assessment:</b> Check student investigations for all steps of the scientific method, completeness, and thoroughness.</p>
<p><b>Procedural Activities:</b></p> <p><b>Part I</b></p> <ol style="list-style-type: none"> <li>1. Teach students the meanings of insulator and heat transfer as it relates to body heat and winter clothing.</li> <li>2. Have students design an investigation based on the scientific method to test the insulation qualities of articles of winter clothing.</li> <li>3. Have students conduct their investigations.</li> <li>4. Students can present their findings to other students.</li> </ol> <p><b>Part II</b></p> <ol style="list-style-type: none"> <li>1. Introduce students to clothing mushers wear to keep warm in Arctic conditions.</li> <li>2. Show pictures of mushers in full costume.</li> <li>3. Give students a list or pictures of clothing layers needed. Explain the purpose of each item. Note that these kinds of clothes are designed especially for Arctic weather conditions - revisit examples of Arctic conditions.</li> <li>4. Have students find examples of each piece from online or printed catalogs.</li> <li>5. Students may cut out, draw, or print examples of each item of clothing and match them to the item description or name.</li> </ol>	
<p><b>Materials Students Need:</b></p> <p><b>Part I:</b> access to various articles of winter clothing and materials needed to conduct an investigation of their insulating capabilities , investigation planning sheet</p> <p><b>Part II:</b> typical musher clothing list, computer access, scissors, glue, print catalogs of Arctic/musher gear, paper, writing and drawing materials</p>	
<p><b>Technology Utilized to Enhance Learning:</b> show pictures from <a href="http://www.iditarod.com">www.iditarod.com</a></p>	

**Other Information:**

This lesson would need to be prefaced with training in the scientific method.

Try these companies with online catalogs: Cabela's, Wintergreen Designs, Ibex, North Face, CampMor, or REI.

Here is a sample list of layers of clothing: polyester long johns, insulated shirt, normal pants, wind stopper fleece coat, snow pants, fleece shirts, wind stopper outer coat, insulated balaclava with fur hat, rag wool gloves with musher mittens, goggles for the wind, sunglasses

**Modifications for Special Learners/ Enrichment Opportunities:**

- Younger students might enjoy cutting clothing pictures from catalogs and gluing the pieces on a paper doll to "outfit" a musher.
- For young students, the term "insulator" can be explained as clothing that keeps you warm.
- Older students could tie this into a budgeting lesson by creating a shopping list, finding the clothes, and arriving at a total cost.
- If the weather in your area permits, let students wear different winter clothing outside as part of their test.
- A musher in your area might be able to visit your school and bring in the clothes.
- Have a follow-up lesson on hypothermia and frostbite.