Iditarod Fever in Boulder, Colorado
Laurie Nakauchi-Hawn
First Grade Teacher, Friends' School

Although the temperatures in Boulder have been in the 70's, the first graders in my class have Iditarod Fever. We've been choosing dogs, packing and testing gear and putting the final touches on our sleds. Watching the race through the Iditarod Insider has added to all the fun.

Once the children learned about what characteristics make a good sled dog, they chose some sled dogs to accompany them to the starting line. With the right dogs, then the students built sleds out of popsicle sticks. While the sleds were drying overnight the first graders performed a Reader's Theater play that taught them about the required items in a musher's sled an animals that live in the arctic. They use this information to pack their own miniature sleds.

With the dogs and sleds ready, the final experiment of our Iditarod preparation was choosing the warmest socks to wear This experiment was done with baked potatoes and three types of socks. The first graders were tickled by the idea of putting potatoes into socks but they put on their "scientific faces" and took careful temperature measurements to determine which sock kept the potato the warmest. Surprisingly, out of cotton, wool and polyester, the polyester sock won.

My students were excited to see Lance Mackey win the race but for them, the most exciting part of the race is seeing who will win the Red Lantern.

Title: Keeping Warm – An Inquiry-based Science Experiment

Developed by: Laurie Nakauchi-Hawn

Discipline/Subject: Science

Grade Level: K-5

Topic: Which fabric keeps you the warmest- cotton, wool or polyester?

Resources/References/Materials Needed:

1. 2 or 3 socks or gloves made of cotton, wool and polyester (different fabrics can be substituted)*
2. ice cubes
3. plastic Ziploc baggies
4. hot water
5. insulated cups
6. hot potatoes wrapped in aluminum foil
7. timers
8. thermometers
9. recording sheet

(

Lesson Summary: Students test different materials to see which one will melt an ice cube first. They use these results to decide which kind of socks they would choose to wear in the cold weather.

Standards Addressed:

***National Science Standard 12 –**Understands the nature of scientific inquiry

***Alaska Science Standard A- Science as Inquiry and Process**

-A student should understand and be able to apply the processes and applications of scientific inquiry.

Learning Objectives:

Students will use the materials to set up an experiment to test which socks would keep your feet the warmest**.**

The students will use their findings from the experiment to make a choice of a sock to keep their feet warm.

Method of Assessment:

Observing the experiments, the teacher will determine if students designed a reasonable experiment for testing the socks' warmth.

When students present recommendations for socks the teacher will note if the student used his/her results to draw a conclusion.

Procedural Activities:

1. Tell the students that they have been hired by a musher to find out the warmest sock material for wearing in the Iditarod. Their job is to test the socks and choose which one to take on the trip. They must design a scientific experiment to test the socks.
2. Take predictions about what students think will be the best material.
3. Show the students the available materials for the experiment. Tell them they must design their experiment on their recording sheet before they can gather materials.
4. If you have not done experiments, go over the importance of having one variable (sock material) and keeping everything else constant.
5. Assign groups of 4 or 5 and hand out recording sheets. Have the teams design their experiments, clearly explaining or drawing what they will do to test the socks.

6. Check each group's experiment design.
7. Hand out materials.
8. Have the students perform their experiments and record the results.
9. Students present their recommendations to the class, explaining why they made their choice.
10. Discuss the experiments. Some possible questions to discuss: Were the results from each experiment valid or not? What made each one different? How did students choose their design? How did students draw conclusions from the experiment? Were the findings the same even if the experiments differed? How did your results compare to your prediction?
11. Collect the recording sheets.

Technology used to enhance learning:
Websites with background information:
http://www.okamotocorp.co.jp/english/okamoto_story/teller/02.html
This site has some information and additional reasons a scientist could explore when choosing a sock.

http://www.okamotocorp.co.jp/english/okamoto_story/teller/05.html
This site has a scientific explanation about different sock materials and how they insulate and even generate warmth.

http://revver.com/video/1087794/how-wool-is-made-aka-how-sheep-are-sheared/
This site features a video of sheep being sheared.

Modifications for Special Learners/Enrichment Opportunities:

- For younger students the experiment can be designed and done as a class. You can also do three experiments using ice, hot potatoes and hot water and compare the results. This is less of an inquiry based lesson but gives students the chance to understand how to design and do a scientific experiment.
- For older/more advanced students you can have them research about wool, cotton and polyester to find out how each fabric is made.
- More advanced students can extend this sock search by seeing which sock dries the fastest. This can be done with a blow drier or letting the socks air dry during the day.
- Let students try combinations of socks layered for warmth. Is there a difference?
- Let students design an experiment to see which socks absorb the most water.
- An additional writing assignment could be writing to your favorite musher to find out what kind of socks he/she wears during the race. Go to http://iditarod.com/pdfs/teacher/letterwritinglesson2009.pdf for the guidelines and information about contacting the mushers. (Please note that the responses make take up to 3 or 4 months, depending on the time of year and not all mushers will respond.)

Notes:

- Keep the potatoes wrapped in foil in a crock pot or oven on 200 before they are used.
- Other fabrics like alpaca wool, yak wool, neoprene, nylon, silk can be substituted or added.

Laurie Nakauchi-Hawn

Which kind of sock is the warmest?

Imagine you are an Iditarod musher and have to choose the warmest kind of socks to choose.

My Prediction

Which sock do you think will be the warmest?

- ☐ cotton
- ☐ wool
- ☐ polyester

_____

I think _____ will be the warmest

because _____
_____

The Experiment Results

	Time 1	Time 2	Time 3
Cotton			
Wool			
Polyester			

_____

The _____ sock was the warmest.

Challenge questions

I think this was because _____
_____

On the back of the paper, list other important things to think about when choosing socks for the Iditarod.