

# Iditarod-Ready... Storm Ready



What does it take to be 'storm ready'?

Students around the world are gaining a deeper awareness of the environment and helping to make the world a safer place while they improve their science skills and deepen their knowledge about climates of the world, resulting in communities that are storm ready.

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# Be an Iditarod StormReady® Classroom!



“StormReady communities are better prepared to save lives from the onslaught of severe weather through better planning, education, and awareness. No community is storm proof, but StormReady can help communities save lives.”

To learn how being storm ready makes a difference and what you can do to be better prepared, visit the following website: <http://www.stormready.noaa.gov>

## **Classroom Resources: Website and Information**

[NOAA](#) The official website contains important information for classrooms and communities.

[NOAA Storm Ready Local Communities Information](#) Can severe weather occur in my community? View all weather hazards information.

[NOAA Storm Ready Awareness Materials](#)

[Tsunami Ready Information from NOAA](#)

[NOAA Publications on Weather Safety](#)

[National Climate and Data Center](#)

## **NOAA Pod Casts**

These are short reports on NOAA science and research. They are in mp3 files for easy downloads to desktop and laptops, as well as mobile devices capable of playing these files. You also can listen to these programs by simply clicking on the links at the NOAA POD CAST site.

## **NOAA Education Resources**

Storm Ready Lessons and Classroom Activities from NOAA:

NOAA'S many educational activities will enhance classroom instruction and ensure students are ‘Storm Ready.’ This site has been designed to help students, teachers, librarians and the general public access the many educational activities, publications, and booklets that have been produced.

The information is divided into three areas, Primarily for Teachers, Primarily for Students, and Cool Sites for Everyone.

**Coming Soon:** Video conference opportunities for you classroom. Watch for updates!



Click to email your interest in participating in Storm Ready Video Conference!  
Be on our email list to participate in video conference opportunities.

Website Resources;

[www.noaa.gov](http://www.noaa.gov)

[www.iditarod.com](http://www.iditarod.com)

Iditarod Insider

## Information on Science Standards

### Resources:

#### National Science Standards

<http://www.mcrel.org/compendium/SubjectTopics.asp?SubjectID=2>

#### Alaska Cultural and Content Standards

<http://www.eed.state.ak.us/ContentStandards/science.html>

## Alaska Content Standards

SCIENCE: <http://www.eed.state.ak.us/ContentStandards/science.html>

### A Science as Inquiry and Process

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

A student who meets the content standard should:

1. develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments;
2. develop an understanding that the processes of science require integrity, logical reasoning, skepticism, openness, communication, and peer review; and
3. develop an understanding that culture, local knowledge, history, and interaction with the environment contribute to the development of scientific knowledge, and local applications provide opportunity for understanding scientific concepts and global issues.

### B Concepts of Physical Science

A student should understand and be able to apply the concepts, models, theories, universal principals, and facts that explain the physical world.

A student who meets the content standard should:

1. develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior;
2. develop an understand that energy appears in different forms, can be transformed from one form to another, can be transferred or moved from one place or system to another, may be unavailable for use, and is ultimately conserved;

3. develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems; and
4. develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.

## C Concepts of Life Science

A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science.

A student who meets the content standard should:

1. develop an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution;
2. develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms; and
3. develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.

## D Concepts of Earth Science

A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences.

A student who meets the content standard should:

1. develop an understanding of Earth's geochemical cycles;
2. develop an understanding of the origins, ongoing processes, and forces that shape the structure, composition, and physical history of the Earth;
3. develop an understanding of the cyclical changes controlled by energy from the sun and by Earth's position and motion in our solar system; and
4. develop an understanding of the theories regarding the origin and evolution of the universe.

## E Science and Technology

A student should understand the relationships among science, technology, and society.

A student who meets the content standard should:

1. develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events;
2. develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits; and
3. develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures.

## F Cultural, Social, Personal Perspectives and Sciences

A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives.

A student who meets the content standard should:

1. develop an understanding of the interrelationships among individuals, cultures, societies, science, and technology;
2. develop an understanding that some individuals, cultures, and societies use other beliefs and methods in addition to scientific methods to describe and understand the world; and
3. develop an understanding of the importance of recording and validating cultural knowledge.

## G History and Nature of Science

A student should understand the history and nature of science.

A student who meets the content standard should:

1. develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge;
2. develop an understanding that the advancement of scientific knowledge embraces innovation and requires empirical evidence, repeatable investigations, logical arguments, and critical review in striving for the best possible explanations of the natural world;
3. develop an understanding that scientific knowledge is ongoing and subject to change as new evidence becomes available through experimental and/or observational confirmation(s); and
4. develop an understanding that advancements in science depend on curiosity, creativity, imagination, and a broad knowledge base.

National Science Standards: Topic: Season, Weather, Climate

<http://www.mcrel.org/compendium/topicsDetail.asp?topicsID=666&subjectID=2>

## **Enduring Understandings.... Essential Questions**

**Educational research supports the development of essential questions leads to an enduring and life long understanding of the standards and objectives of the curriculum. Enduring questions don't necessarily have a 'definite' or 'right or wrong' answer, but provoke a deeper and richer understanding of the material. The questions, rooted in what students need to know and understand:**

- Essential questions can spark a voyage of discovery.
- Teaching using essential questions encourages critical and creative thinking.
- Teaching using essential questions helps to focus and organize lessons and concepts.
- Enlist student input when developing questions to ignite student interest

**What do essential questions do?**

1. Encourages deep thoughts
2. Encourages information gathering and using a process to evaluate data.
3. Encourages students to answer questions in an original way, demonstrating a deeper understanding
4. Encourages students to research
5. Encourages students to develop original ideas instead of expected/traditional answers.
6. Encourages students to think critically and go beyond memorization.

**Step 1: Take a look at what your students must know and understand. (Enduring understandings)**

**Step 2: Develop questions which suggest inquiry. Encourage students to develop questions of their own.**

**Step 3: Encourage students to research, collect data, explore, and discover solutions, making the learning relevant to their own lives and their own communities.**

### **Examples of Questions for Units of Study or for Science Projects**

**What does it mean to be 'storm ready'?**

**How can we make sure that our school, home, and community are 'Storm Ready'?**

**How can you help your community to be 'storm ready'?**

**What do mushers do to be 'storm' ready during Iditarod?**

**Can animals be 'storm' ready? Are animals naturally storm ready?**

**What role must humans play in helping animals be 'storm ready'?**

**Where can you go in your community or in your area/region, to be safe in a storm?**

**Why do we have storm alerts and what do they mean?**

**What can we do in our community to be alert to the possibility of storms?**

**What are the top 5 things to remember when a storm is approaching?**

**What are the most important items in an emergency storm kit?**

**Who in your community can predict information about the weather?**

**How can weather be predicted?**

**What predictors of weather are obvious in your own community?**

**What can we learn from observing the clouds?**

**How have the changes in climatic conditions over the years played a role in racing/mushing?**

**How have the changes in climatic conditions over the years played a role in your own daily life?**

**What role does daily weather play on your daily life?**

**Does ‘good’ weather have the same meaning to everyone? Does ‘bad weather’ mean the same? Explain.**

**Does Alaska have reason to fear global warming?**

**Does the planet earth have reason to fear global warming?**

**What tools predict information about global warming?**

**What signs in nature may be predictors of the existence of global warming?**

**In what ways would learning about global warming help our planet?**

**What 3 major organizations or companies should be more concerned about global warming?**

**Does the weather in summer predict the weather in winter?**

**How can a computer be used as a tool when ensuring you are ‘storm ready’?**

**What three technology tools are best tools for discovery about weather/climate?**

**Why is predicting weather necessary?**

**Does one’s past experiences have anything to do with understanding future weather conditions or how to prepare for future weather conditions?**

**Who in your community is a ‘primary’ source of information about the weather and climate?**

**Why does my grandfather and grandmother know what tomorrow's weather will be?**

**Why should you learn about weather and climate?**

**Who or what in your community is most affected by the daily weather conditions?**

**How has predicting the weather changed over the years?**

**In what ways would learning about climate and weather help you personally?**

**In what ways would learning about current weather make a difference in future weather?**

**How does understanding climate and weather conditions of the past play a role in understanding today's conditions?**

**What role does geography play in climatic conditions?**

**Who best understands the weather?**

**Does the amount of sunlight affect the temperature?**

**Why isn't the weather the same throughout the entire state of Alaska? (Or a particular state, region, country, or continent?)**

**How can the use of technology affect what people do or how they react when they are in storms?**

**What storm is the worst kind of storm?**

**Where on earth are the 'worst' weather conditions?**

**What other place on earth has climatic conditions most resembling those of your own community?**

**How does a storm severely affect the people in a community?**

**Can dehydration be an all season problem?**

**What are the signs of frostbite and how can frostbite be prevented in humans and in animals/canines?**

**What are indicators of a medical problem due to exposure to extreme weather conditions?**

**Does the kind of clothing should be worn in extreme weather conditions?**

**How has the materials used in clothing worn in extreme weather changed over time?**

**What materials and kinds of cloth provide the best protection for extreme weather conditions and why? (This could refer to clothing or to shelter, for humans, for canines?)**

**Does the kind of cloth my summer clothes are made of provide me the same protection from winter weather?**

**How can some animals survive extreme weather conditions and what can we learn from that?**

**If I were out in the elements in extreme weather conditions, what would I need to do to improve my chances of survival?**

**What kind of travel is safe in storms?**

**What kind of “storm survival kits” are most helpful at home, school, or in our community?**

**How could I develop a science project to share information about the climate/weather in our community? In our state?**

**How could I develop a scientific experiment about the weather?**

**What role does the amount of day light play in our school, home, and community?**

**What would life be like/ what is life like without wind? (Or rain, or snow, or sunlight)**

**How do changes in the environment affect all life?**

**What would life be like without harsh winter conditions?**

**Do climate/weather play a role in one’s personal health?**

**Why are the seasons different from each other?**

**How are weather reports important to the community?**

**How does personal experience about the weather conditions differ from ‘book’ knowledge about weather?**

**What is the driving force of the weather?**

**Why is it important to talk about the weather? (The amount of rain that falls? The strength of the wind?)**

**Does the color of the sky tell us anything about our weather?**

**What do meteorologists do all day?**

**Weather Questions:**

**<http://www.weatherquestions.com>**

**YOUR TURN**

Develop an essential question and email it to [djohnson@iditarod.com](mailto:djohnson@iditarod.com) and share the project students did to discover the answers to the question. We'll share your ideas with other classrooms in our quest to help schools and communities be storm ready.

## **Storm Ready: Lesson Ideas, Activities, and Games**

**Supporting NOAA Efforts to Create  
Storm Ready Communities**

**With a Focus on Science Standards, National Content  
Standards,  
and Alaska's Cultural Standards**

**By Julie Howard**

## **Storm Safety Brochure**

**NOAA Resource: <http://www.arh.noaa.gov/brochures/brochures.php>**

**Using the web site [www.mybrochuremaker.com](http://www.mybrochuremaker.com) create a brochure about storm safety. Use the web site [www.stormready.noaa.gov](http://www.stormready.noaa.gov) and others for information to include in your brochure.**



# **Historical Weather Data**

**High School Level**

## **Collecting Historical Weather Data**

**By Julie Howard**

**Prepare a list of questions for Iditarod mushers about weather problems they have had during any of the races that they participated in.**

**Work with the Iditarod Race Committee to find out how to contact the mushers. (Consult the document at the FOR TEACHERS segment of [www.iditarod.com](http://www.iditarod.com), titled, “Writing to Mushers” for information about contacting mushers.)**

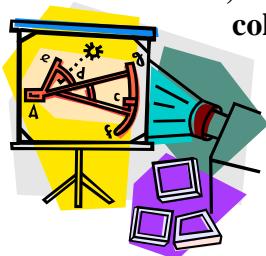
**Try to get as much specific information – year, weather conditions, location on the trail, etc. – as you can from the mushers.**

**Then plot each weather problem on a map of the trail. Use a legend with different colors for each type of weather – blizzard, extreme cold, rain, warm temperatures, whatever. See if you are able to draw any conclusions from your research.**

## **See What I'm Talking About?**

**By Julie Howard**

**Gather information about weather from your village or community Elders, the Internet, newspaper articles, or books. Use the information that you collected to create a slideshow about the weather. Remember to use source citations for your information and any images that you use. When all the slideshows are completed, have a class slideshow party. Maybe your teacher will even let you have popcorn and Kool-Aid to go along with the shows! If so, be sure you clean up after the party.**



# The Interview

By Julie Howard



Create a series of questions about predicting the weather. Then interview one of the Elders from your village or community about predicting the weather. Find out what signs they watch for and what each sign means. Then write up the interview.

## Option A:

After your interview, team up with a village Elder and learn how to predict the weather. With the help of your Elder, make predictions about the weather for one week. Keep track of how many of your predictions you had correct. Write a report about what it was like to work with a village Elder.

## Option B:

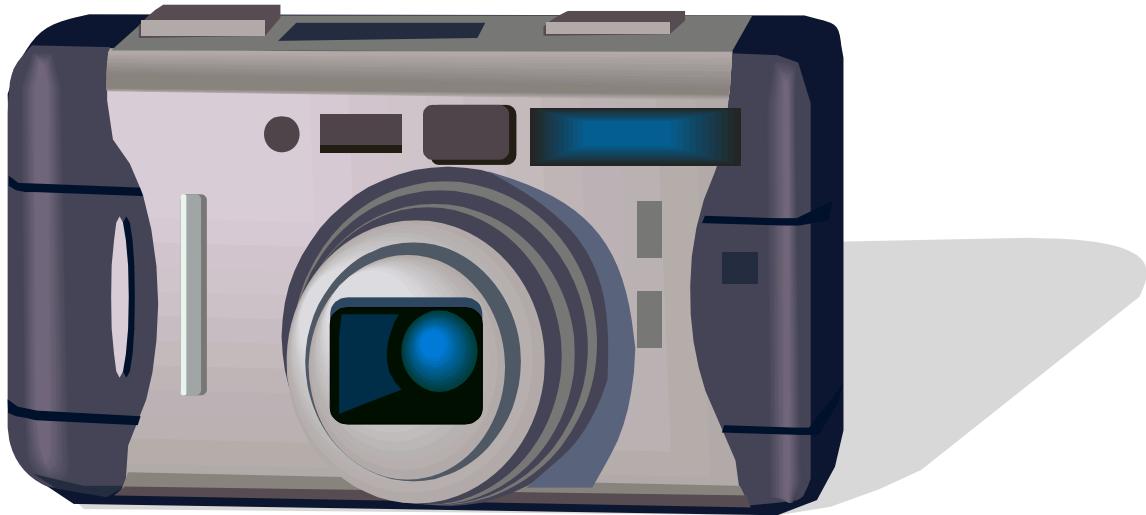
After your interview, divide the class into small groups. Each group will work with an Elder and predict the weather for one week. At the end of the week, each group of students will design a newsletter with all of the interviews, the results of their predictions, and stories about working with the Elder. You may use a word processor, a publishing program, or work with your art teacher to create newsletters using colored poster board. If a digital camera is available, take pictures of your group and Elder as you make your weather predictions.



# Say Cheese: Connecting with the Past

By Julie Howard

Use a digital camera to take pictures of the Elders from your village or community as they explain what signs they look for in the weather. Then use the pictures to create a booklet showing all of the weather signs that they showed you and write a paragraph explaining what the Elder is showing you in each picture.



# Ask A Vet

Julie Howard and Diane Johnson

**As a class, write a letter to a local veterinarian asking them to come and speak to your class. Ask the vet to tell you about what types of weather cause the most problems for animals and how you can be prepared to help your pets in severe weather.**



**Option: Ask your teacher to help you get in touch with an Iditarod Race Veterinarian and ask them about what they look for at the checkpoints during the race.**

**FACT:** Each year, veterinarians from around the United States and other countries volunteer to be Iditarod Race Veterinarians. You can learn more information at the Veterinarian Center of Iditarod's website. There are many interesting articles that can be read at that section of the site: <http://www.iditarod.com/learn/vetcenter.html>.

**To learn about sled dog care during the race, read the following article which is found at the above website:**

- [Thermal Concerns for Racing Sled Dogs, by Stuart Nelson, Jr., DVM](#)

**Suggested activities as follow up:**

- Ask student to list the main points of the article.
- Ask students to create a 'booklet' of information for mushers based on the facts found in the article.
- Ask students to create posters to share main points of the article.
- Ask students to create a list of game show question and answers based on the information from the article.
- Ask students to create factual posters or reports about dog booties and why they are used. Encourage students to research for more information about dog booties to discover what they are made of and their durability. Challenge students to make dog booties as a class project or to invent a 'better bootie'.

**Read the following article: Volunteerism:**

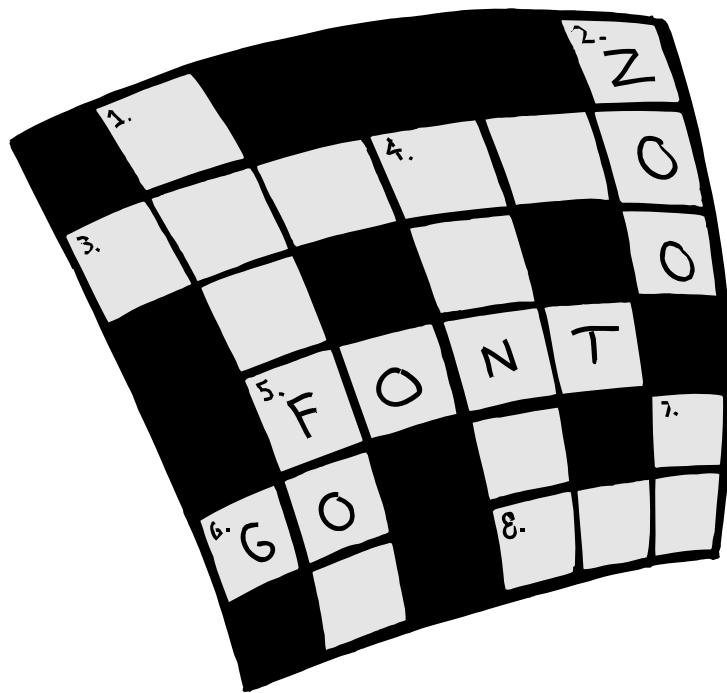
<http://www.iditarod.com/learn/vet-13.html>

- Ask students to create a poster about the veterinarians on the Iditarod Trail or to create job descriptions for trail veterinarians.
- Ask students to summarize the facts in the article and to write a report or make a poster sharing the information.

# Cross Words

By Julie Howard

Use the web site [www.puzzlemaker.com](http://www.puzzlemaker.com) to create a crossword puzzle of weather terms. Create the clues for each word and then create your puzzle. Print out your puzzle and see if your friends can solve it.



# Where is That Word?

By Julie Howard

Use the web site [www.puzzlemaker.com](http://www.puzzlemaker.com) to create a word search of weather terms. Make a list of weather terms and then create your puzzle. Print out your puzzle and see if your friends can solve it.

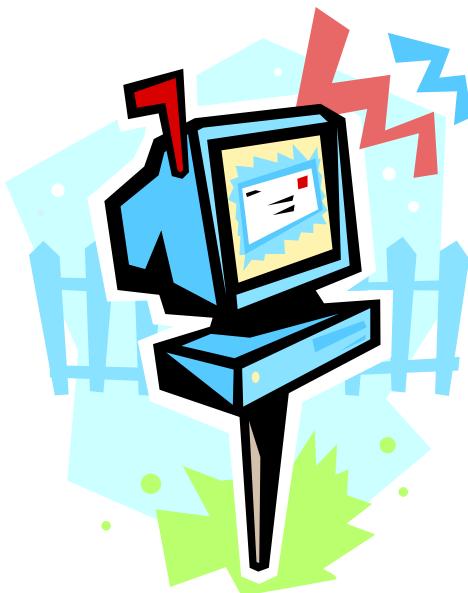


Option: If you are feeling brave, try to create the puzzle without using the web site. Draw a square grid on a piece of paper that's two squares larger than your longest word. For example, if your longest word is 10 letters long make your grid 12 columns by 12 rows. Once you have the grid drawn, place all of your words in the grid, one letter per square. After you fit all of your words in the grid, fill in the blank squares with random letters. Don't forget to have a list of your words under the grid so people know what to look for.

## E-Pals

By Julie Howard

With the help of your teacher, find someone in another state, or even another country, to exchange e-mail messages with. Tell them about your weather and they will send you information about their weather. Include the high and low temperature for each day. While you're at it, get to know more about your e-pal and the place where they live by asking them questions about it. After you have a month of data, graph the high temperatures from both your home and your e-pal's home.



Option: Find your e-pal's home on a map. Research your e-pal's home town and give a report to the class.

## Read All About It!

By Julie Howard

Create a class newspaper about the weather. Include storm safety tips, facts about past storms in your area, stories about the weather, weather related disasters such as forest fires that were started by lightning, and interviews with village Elders, EMS workers, firemen, or policemen.



## I Didn't Know That

By Julie Howard

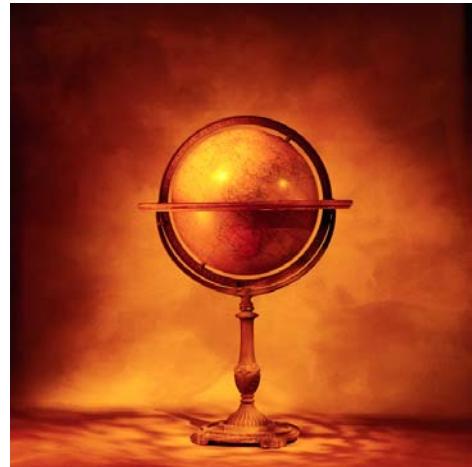


**Research a famous storm, weather related event, or an event in which weather can play a major role such as the Iditarod. Give a report to your class about the weather and its effects.**

## Where is That City?

By Julie Howard

**Record the high and low temperatures for your home town and for your state capitol. Locate a map of your state and find both places on the map. Figure out the distance between your home and the state capitol, and determine the direction of your home town from the state capitol.**

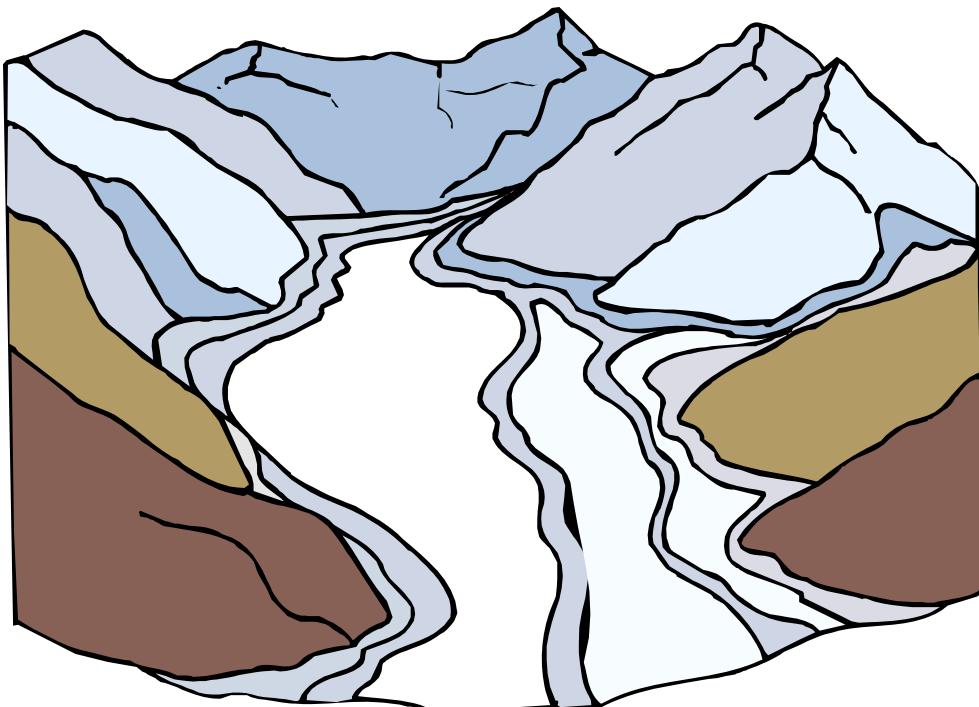


# Glaciers

Use the web site

[http://www.fs.fed.us/r10/tongass/forest\\_facts/resources/geology/icefields.htm](http://www.fs.fed.us/r10/tongass/forest_facts/resources/geology/icefields.htm)

to gather information for a research paper. If you need more information, do a Google search on Alaskan glaciers. Remember to use source citations for any web sites or images that you use for your paper.



# **Weather Journal**

By Julie Howard

**Grades 3 - 5**



Keep a weather journal for one week. Each day write about that day's weather and what it felt or sounded like. Write about the temperatures, precipitation, clouds, and wind. Be as descriptive as possible. You may use a word processing program to practice your keyboarding skills, or paper and pencil to practice your penmanship skills.

# **Weather Journal**

By Julie Howard

**Grades 6 and above**



Keep a weather journal for one month. Each day write about that day's weather and what it felt or sounded like. Write about the temperatures, precipitation, clouds, and wind. Be as descriptive as possible. You may use a word processing program to practice your keyboarding skills, or paper and pen to practice your penmanship skills.

# Weather Booklet: Say Cheese!

By Julie Howard  
Diane Johnson

Use a digital camera to take pictures of the weather for one week. Write a description of each day's weather and then put the descriptions together with the picture for that day to create a weather booklet. (This can be done as a class, small groups, or as an assignment for individuals, depending on the age and ability level of students.)

Encourage students to continue collecting data over a month or a quarter.

Repeat this project when the next 'season' or quarter begins.



After your weather booklet is complete, exchange your booklet with a partner school. Compare and contrast your booklet with the booklet from a partner school.

Develop a project with a partner school in another part of the United States or world. Pick an outdoor location in your learning environment. Each day, take a picture of the weather and have students write a description or weather report. Send the digital image and the weather report to your partner school. Receive the digital image and weather report from your partner school. Compare, contrast, graph, or chart your partner school's weather and the weather conditions where you are. At the end of the month, summarize the weather data in written reports, projects, or posters to demonstrate what has been learned during the exchange.

## The weather and the Iditarod Trail

Take note of the weather conditions each day of the race at the locations where the mushers are during the race. Watch for pictures on [www.iditarod.com](http://www.iditarod.com) and the Iditarod Insider which give information of the daily conditions.

Track the weather and create a picture book of sketches that portray the conditions each day as if you were the photographer on the Iditarod Trail.

Students can be encouraged to create projects to share information they have learned. (Power Point, news casts, written summary reports, etc.)

# **Weather Baseball**

By Julie Howard

After doing weather research, come up with a list of questions that are included in that research. Have the students help by letting them submit questions as well. Then arrange 5 chairs into a baseball diamond using one chair for each base and the fifth chair for the “pitcher”. Then divide the class into two teams. The teacher will then pitch a question to the team one student, or batter, at a time. If the batter answers the question correctly, they advance to first base. If they answer incorrectly it counts as an out. Runners advance one base at a time and a run is scored when a runner advances to home plate. When a team reaches three outs the other team is up to bat.



## **WEATHER Internet Research**

By Julie Howard

**Go to the [www.weatherwizkids.com](http://www.weatherwizkids.com) web site, [www.noaa.gov](http://www.noaa.gov) ,  
<http://www.stormready.noaa.gov>, and other websites approved by your  
teacher to find information on the following topics and answer the  
questions.**

### **HURRICANES**

How do hurricanes gather their energy?



What does evaporation of the seawater do to the hurricane?

What is the center of the storm called?

What must the water temperature be in order for a hurricane to form?

What makes the storm clouds?

What is frequently the most devastating element of the hurricane?

Where will the hurricane cause more of a storm surge?

When is the Atlantic hurricane season?

How many lists of names are there for hurricanes?

What is a tropical storm in the Western Pacific Ocean called?

Who are Hurricane Hunters?



## TORNADOES

What is a tornado?

Wind speeds in a tornado can reach up to what speed?

What is a water spout?

Where are they the most common?

What is Hail?

When can tornadoes occur?

Where are tornadoes most likely to occur?

What is “Tornado Alley”?

## **WINTER STORMS**

Where do winter storms get their energy?

The point at which two air masses meet is called this.

What is deposition?

What is a blizzard?

What are snowflakes made of?



How many sides does a snowflake have?

Where do snowflakes form?

What do they form around?

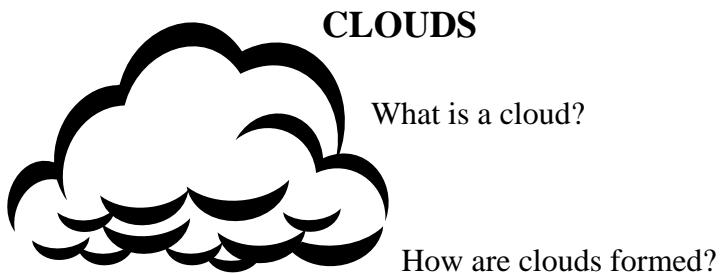
What is sleet?

What is freezing rain?

What is frost?

How is frost created?

What is Wind Chill?



Why are clouds white?

What do you get when you add all of the colors of the rainbow?

Why do clouds turn gray?

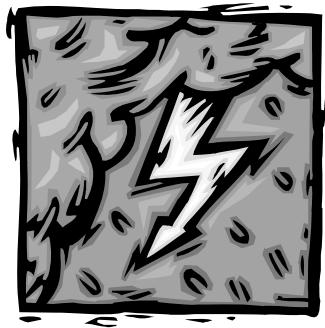
Why do clouds float?

At what altitude or height do we find Cirrus clouds.

It's what the lowest level of clouds are called.

## **LIGHTNING**

What is lightning?



How hot is lightning?

What causes thunder?

How can you tell if lightning is close?

How can you tell how far away a storm is?

## **WIND**

What is air in motion called?

What produces wind?

What two factors are necessary to have wind?

What is a derecho?

What will classify the storm as a derecho?

What type of front are they usually associated with?



What is the jet stream?

What are the Trade Winds?

What are the doldrums?

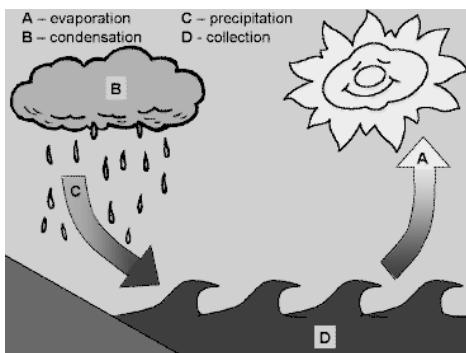
Where are the Prevailing Westerlies?

In a Sea Breeze is the air over the water warmer or cooler than the air over the land?

## CLIMATE

What is climate?

What four things make up the Water Cycle?



What is Global Warming?

## WEATHER Internet Hunt Answers

### HURRICANES

How do hurricanes gather their energy?

**Through contact with warm ocean waters.**

What does evaporation of the seawater do to the hurricane?

**It increases their power.**

What is the center of the storm called?

**The eye.**

What must the water temperature be in order for a hurricane to form?

**80 degrees F or higher.**

What makes the storm clouds?

**Humid air rising.**



What is frequently the most devastating element of the hurricane?

**The storm surge.**

Where will the hurricane cause more of a storm surge?

**Areas where the ocean floor slopes gradually.**

When is the Atlantic hurricane season?

**June 1<sup>st</sup> through November 30.**

How many lists of names are there for hurricanes?

**Six**

What is a tropical storm in the Western Pacific Ocean called?

**A Typhoon**

Who are Hurricane Hunters?

**Crews who fly into the hurricanes to take scientific readings.**



## **TORNADOES**

What is a tornado?

**A violent rotating column of air extending from a thunderstorm to the ground.**

Wind speeds in a tornado can reach up to what speed?

**300 mph**

What is a water spout?

**A tornado that forms over the water.**

Where are they the most common?

**Along the Gulf Coast.**

What is Hail?

**Water drops that get caught in updrafts.**

When can tornadoes occur?

**Anytime.**

Where are tornadoes most likely to occur?

**The central US.**

What is “Tornado Alley”?

**An area where typically more than 500 tornadoes form each year.**

## WINTER STORMS

Where do winter storms get their energy?

**From two air masses of different temperature and moisture levels.**

The point at which two air masses meet is called this.

**What is a front.**

What is deposition?

**When water vapor changes directly to ice without first becoming a liquid, high in the atmosphere at a temperature of less than 32°F and then falls to the ground.**



What is a blizzard?

**A long-lasting snowstorm with very strong winds and intense snowfall.**

What are snow flakes made of?

**Ice crystals.**

How many sides does a snowflake have?

**6**



Where do snowflakes form?

**In clouds that have temperatures below freezing.**

What do they form around?

**Tiny bits of dirt.**

What is sleet?

**Rain drops that freeze into ice pellets before reaching the ground.**

What is freezing rain?

**Rain that falls and freezes on contact.**

What is frost?

**White ice crystals that form on a surface.**

How is frost created?

**The air temperature drops below freezing and the water vapor in the air freezes into ice crystals.**

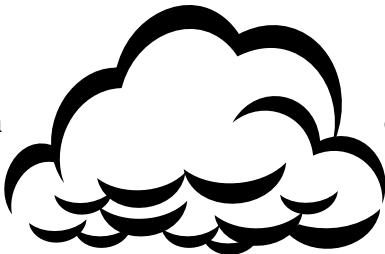
What is Wind Chill?

**The temperature your body feels when the air temperature is combined with the wind speed. The higher the wind speed the faster exposed areas of your body lose heat and the colder you feel.**

## CLOUDS

What is a cloud?

A large collection of water or ice crystals. The crystals are so small and light that they can float



of very tiny droplets of water or ice droplets are so small and light that they can float in the air.

How are clouds formed?

**Water vapor condenses onto tiny pieces of dust that are floating in the air and forms a tiny droplet around each dust particle. When billions of these droplets come together they become a visible cloud.**

Why are clouds white?

**They reflect the light of the sun**

What do you get when you add all of the colors of the rainbow?

**White light. Clouds reflect all the colors the exact same amount so they look white.**

Why do clouds turn gray?

**If the clouds get thick enough or high enough all the light above does not make it through, hence the gray or dark look. Also, if there are lots of other clouds around, their shadow can add to the gray or multicolored gray appearance.**

Why do clouds float?

**As long as the cloud and the air that it's made of is warmer than the outside air around it, it floats!**

At what altitude or height do we find Cirrus clouds.

**Above 18,000 feet**

It's what the lowest level of clouds are called.

**Stratus**

## **LIGHTNING**

What is lightning?

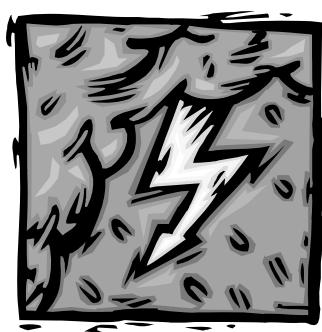
**A bright flash of electricity produced by a thunderstorm**

How hot is lightning?

**54,000 Degrees F**

What causes thunder?

**A sound wave created by air filling in the channel created by the lightning.**



How can you tell if lightning is close?

**If you hear thunder, lightning is nearby.**

How can you tell how far away a storm is?

**Count the number of seconds between when you see the lightning and hear the thunder. Take the number of seconds and divide by 5 and that will tell you how far away the storm is in miles.**

# WIND

What is air in motion called?

## Wind

What produces wind?

**The uneven heating of the earth's surface by the sun.**

What two factors are necessary to have wind?

## Speed and direction

What is a derecho?

**A derecho is a widespread and long-lived windstorm that is associated with a fast-moving band of severe thunderstorms.**



What will classify the storm as a derecho?

**The path length of the storm has to be at least 280 miles long. Widths may vary from 50-300 miles.**

What type of front are they usually associated with?

**A stationary front.**

What is the jet stream?

**A fast flowing river of air.**

What are the Trade Winds?

**Warm steady breezes toward the equator that blow almost continuously.**

What are the doldrums?

**An area of calm water where there is no steady surface wind.**

Where are the Prevailing Westerlies?

**Between 30 and 60 degrees latitude.**

In a Sea Breeze is the air over the water warmer or cooler than the air over the land?

**Cooler**

## CLIMATE

What is climate?

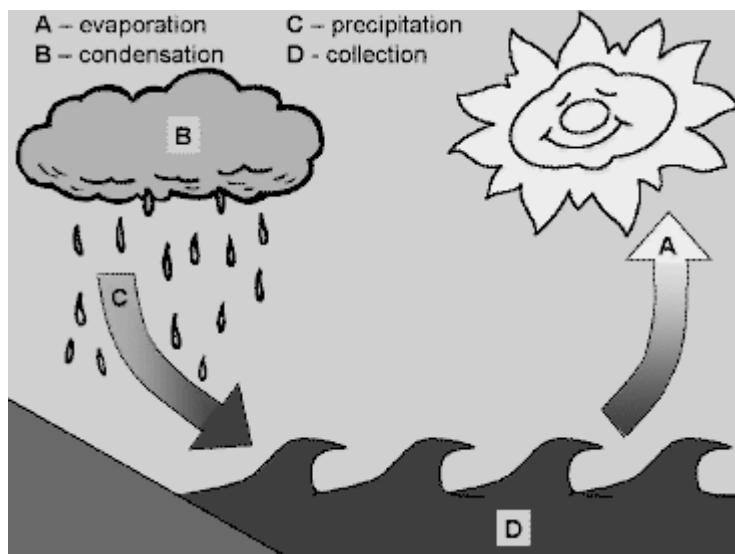
**It is the average pattern of weather, generally over a 30 year period, for a particular region.**

What four things make up the Water Cycle?

**Evaporation (and transpiration), condensation, precipitation, and collection**

What is Global Warming?

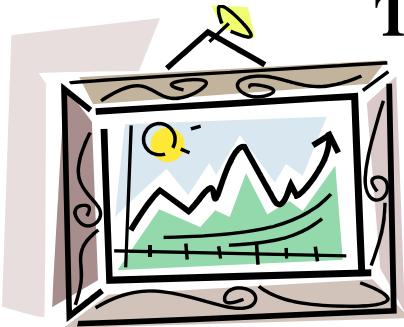
**An average increase in the Earth's temperature which causes changes in climate.**



<http://www.weatherwizkids.com/climate.htm>

## The High and the Low of it

### Math Grades 3 – 5



Keep track of the high and low temperatures in your area for one week. At the end of the week, enter the name of the day along with the high and low for that day into a spreadsheet.

Now enter a formula that will find the maximum temperature for the high temperatures. Enter that formula again to find the maximum low temperature. Do the same thing to find the minimum high and low temperature. After you find the maximum and minimum for the high and low temperatures, create a graph that shows the names of the days and the high temperatures for those days. Be sure you don't include the maximum and minimum formulas in your graph.

## The High and the Low of it

### Math Grades 6 - 8



For one month, keep track of the high and low temperatures, precipitation, wind speed, wind direction, and percent of cloud cover for your area. Enter the data into a spreadsheet. Now enter the formulas to find the average, minimum and maximum for the high, low, and precipitation. Create a graph that shows the high and low temperatures for the month. Be sure you don't include the average, maximum and minimum formulas in your graph.

**Optional Stuff:** Export your spreadsheet into a database program and create a report that is sorted by the high temperature. Then create a second report that groups the information by cloud cover and is sorted within each group by the low temperature.

# Secret Weather Words

By Julie Howard

This is based on the old Password TV game show. Create a list of weather related “Secret Weather Words” and have the students come up with individual words that relate to the secret weather word. Then create sets of one secret weather word and 4 or 5 related individual words. Divide the class into two teams and have them line up on opposite sides of the room. The first student in line will be the first clue giver for their team. The teacher or moderator will show the first of the 4 or 5 related words to the clue givers while keeping the Secret Weather Word a secret. Team 1 clue giver will give a one word clue to the first classmate in his/her line. The student will try to guess the related word. If the guess is incorrect, the clue giver from team 2 will give a one word clue to the first classmate in his/her line for them to guess. If that guess is incorrect, control returns to team 1 and a clue is given to the second person in line. This continues until the word is guessed, or the teacher may set a limit on the number of clues to guess the related word. Teachers may also want to put a limit on the time allowed to either give or respond to a clue, for example three clues to each team. When the word has been correctly identified, or the limit of clues has been reached, the word is written on the board as a reference. The student that correctly identified the related word then has an opportunity to try and guess the Secret Weather Word. If correct, that team is awarded a point and the moderator will move to the next Secret Weather Word. If incorrect, the moderator will show the next related word to the clue givers and the game resumes with the next student in line on the team that correctly identified the previous related word. When the Secret Weather Word has been identified, the clue givers go to the end of the line and the next student becomes the clue giver. Some sets might be:

Secret Weather Word	Related words
Hurricane	Ocean, Spin, Eye, Storm-surge
Tornado	Column, Rotation, Alley, Waterspout
Cirrus Clouds	Ice, White, High, Wispy
Thunder	Flash, Electricity, Channel, Sound
Front	Clash, Air, Cold, Stationary

A good resource for students is [www.weatherwizkids.com](http://www.weatherwizkids.com) and the related Internet Search. (You might want to check out Password on the Game Show Network too.)



# **Narrative: Assignments for Students: Storm Ready Awareness and Lesson Ideas for Teaching About the Weather**

By Julie Howard

- This information summarizes activities and lessons supplied by Julie Howard for inclusion in the Iditarod Ready, Storm Ready project, as explained in earlier pages of this booklet. Julie has included personal comments about the projects she did with her students in this narrative.

## **Weather Journal:**

Keep a weather journal for one week/month. Each day, write about the day's weather and what it felt or sounded like. Write about the temperatures, precipitation, clouds, and wind. Be as descriptive as possible.

The younger students can keep a journal for a week, the older ones can keep it for a month – or teacher's choice. They can use a word processor or paper and pencil. Last year the principal at the school I was at, told the teachers that each student was to write with paper and pencil at least one full page each day because their handwriting was so illegible. It's becoming a lost art, so remember to stress good handwriting practices.

**EDITOR'S NOTE:** Journaling is an important skill that can be incorporated across the curriculum. Using a 3 – ring binder or a spiral notebook can encourage students to save what they write in a journal. In later years, students can reflect on their journaling.

Keeping a weather journal all school year is a great challenge. Make it an extra credit project for your students to earn extra credit for science class. Encourage students to consult a variety of sources for information. (Internet, TV, radio weather reports, The Local Weather Station, Newspaper, as well as interviewing others are all important resources. Students can compare and summarize information.)

**The Interview:**

Talk to one of the village or community Elders and interview him/her about predicting the weather. Find out what signs they watch for and what each sign means. Then write up the interview.

**The Interview Extended:**

Team up with a village or community Elder and learn how to predict the weather. With the help of your Elder, make predictions about the weather for one week. Keep track of how many of your predictions are correct.

**The Interview Extended Even More:**

Divide the class into small groups with an Elder for each group. Each group should work with their Elder to predict the weather for one week. At the end of the week, the students will put together a newsletter with all of the interviews and the results of their weather predictions.

**EDITOR'S NOTE:**

Who are our ELDERS? This is a great question for discussion. Elders are those in the community or village who are ‘older’ or have more experience, sometimes called ‘seniors’. There is much for us to learn in all curriculum areas from our elders. The experiences that elders have faced provide us with information that can help us in many areas. Sometimes, this information is called, ‘Traditional Knowledge’. Sometimes this information is not written down or recorded. As educators, think about what you can do to help preserve traditional knowledge as you assist students in recognizing the value that it holds. On the flip side, what can the youth--- share with elders? How can a sharing of knowledge between generations build relationships, strengthen family or community, or make the world a better place than it is today? Encourage students to respond to those questions and develop plans to discover the knowledge from our elders as well as book knowledge.

### **See What We're Talking About:**

Create a slide show about weather using information from your community or village Elders, Internet sites, newspaper articles, or books. Remember to use proper source citations for your information and any images that you use.

### **Read All About It:**

Create a class newspaper about weather. Include storm safety tips, facts about past storms in your area, stories about the weather, interviews with village Elders, EMS workers, firemen, or policemen.

### **I Didn't Know That:**

Research a famous weather event and give a report to your class about that event.

### **For The Little Ones:**

Draw a picture of your favorite type of weather.

### **E-Pals:**

With the help of your teacher, find someone in another state, or even another country, to exchange e-mail messages with. Tell them about your weather and they will send you information about their weather. Include the high and low temperatures for each day. While you're at it, get to know more about your e-pal and the place where they live by asking them questions about it. After you have a month of data, graph the high temperatures from both your home and your e-pal's home.

### **Storm Safety Brochure:**

Using the web site [www.mybrochuremaker.com](http://www.mybrochuremaker.com) create a brochure about storm safety.

The site doesn't allow much changing in their templates, so it's very easy for any grade level.

**Cross Words:**

Using the web site [www.puzzlemaker.com](http://www.puzzlemaker.com) create a crossword puzzle of weather terms. Create the clues for each word and then create your puzzle. Print out your puzzle and see if your friends can solve it.

**Where Was That Word:**

Make a list of weather terms and create a word search puzzle.

**Where is That City:**

Record the high and low temperatures for your home and your state capitol. Locate a map of your state and find both places on the map. Figure out the distance between your home and the state capitol, and determine the direction of your home from the state capitol.

**Making the Math Connection in Science Class****Math Grades 3 through 5:**

Keep track of the high and low temperatures for one week/month. Enter the temperatures in a spreadsheet. Enter a formula to find the Minimum and Maximum for both the high and the low temperatures. Graph the temperatures.

**Math Grades 6 through 8:**

Same as above but add precipitation, wind speed, wind direction, and cloud cover. For the high temperature, low temperature and precipitation, find the average, minimum and maximum. Graph the high and low temperatures.

**Math Grades 6 through 8 Extended:**

Import the data into Access and create a report that is sorted by the high temperature. Create a second report grouped by Cloud Cover and sorted by the low temperature.

# Jack Frost Nipping at your Toes

**Developed by:** Terrie Hanke 2006 TOTT™

**Discipline:** Health & Safety

**Topic:** Emergency Care

**Grade Level:** Upper Elementary or Middle School

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

Worksheets provided; Knowledge of First Aid / Survival Skills; First Aid text from American Red Cross or like source; Frostbite information from [www.webmd.com](http://www.webmd.com) and [www.mayoclinic.com](http://www.mayoclinic.com); *Iditarod Classics* by Lew Freedman

**Lesson Summary:** Using the Iditarod as a theme, students will explore First Aid. This particular lesson focuses on frostbite – recognizing, caring for and preventing. Students will do guided research on the topic using the suggested websites. Once familiar with strategies for care and prevention, students will address two Iditarod related application problems.

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

**Health Std 5)** Knows essential concepts and practices concerning injury prevention and safety.

**Learning objectives:** Students will

- 1) understand how frostbite occurs.
- 2) know how to prevent frostbite.
- 3) know how to treat frostbite including what to do and what not to do.

**Assessment:**

**Written -**

- 1) Complete guided study exercise with 90% accuracy.
- 2) Complete application problems with 100% accuracy.

**Discussion**

**Procedural Activities:** Ask students to write or verbally describe what cold feels like. Check the weather tab at [www.iditarod.com](http://www.iditarod.com). This is a great interactive sight with a map of the trail that provides temperature and wind speed information for each checkpoint. List health concerns associated with cold weather and cold exposure. Focus on issues Iditarod mushers might face as they travel from Anchorage to Nome. Frostbite would certainly be a concern. Before completing the worksheet and application problems, ask the students to write the word “FROSTBITE” on a sheet of paper and then list the 5 words that come to mind. Set this sheet of paper aside for later use. Using the suggested web sites or other similar sites, complete the **Frostbite – Jack Frost Nipping at your Toes!** worksheet. Discuss the questions to check for understanding. Having acquired knowledge and understanding of how to prevent, recognize and treat frostbite, have the students complete the **Doug Swingley** application problem. Share answers and ideas through class discussion. Next, ask students to read the info-sheet about dogs and frostbite. If time permits, ask students to research or verify the information presented in the info-sheet. **Complete the Jack Frost Nipping at your Tail** application problem. Again, share answers by discussing the problem. Finally, return to the sheet of paper with Frostbite and the 5 words. These five words represent the student’s pre-activity perspective or perception of frostbite. Have the students evaluate their initial perception as to accuracy and fact. Discuss how the students’ perception or perspective changed as a result of this activity. Ask the students, “With regard to frostbite, what are the advantages of advancing from your original level of perception.”

**Materials Students Need:**

Internet access for research [[www.webmd.com](http://www.webmd.com)] [[www.mayoclinic.com](http://www.mayoclinic.com)] [[www.iditarod.com/weather](http://www.iditarod.com/weather)]

Worksheet – Jack Frost Nipping at your Toes

Worksheet – Frostbite Application Problems

Info-sheet – How Can Dogs Walk Around in Snow and Subzero Weather Without Getting Frostbite on Their Feet?

**Technology Utilized to Enhance Learning:**

Web research on frostbite; Interactive weather information at [www.iditarod.com](http://www.iditarod.com); Archive search on Doug Swingley’s frozen corneas in 2004; Web product search.

**Other Information:** A colleague who teaches Language Arts has come up with an unusual activity for descriptive writing. His topic is “COLD.” When it gets somewhere near freezing, he takes the kids outside with coats in hand. While outside without their coats on, they try to put into words what cold feels like. Writing activity continues inside.

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

1. Role play the proper treatment for frostbite. Create posters including prevention, recognition and care.
2. Research and recommend the best types of clothing and coverings for outdoor activities in your climate to prevent frostbite.
3. Dress a musher with the idea of preventing frostbite in the extreme conditions experienced during Iditarod.

## **FROSTBITE – Jack Frost nipping at your nose!**

Iditarod! Jack Frost is nipping at the noses of mushers and dog on the trail from Anchorage to Nome. When he does more than nip, you need to take care. Frostnip, chilblains, frostbite, or tissue freezing, occurs in temperatures below 32 degrees Fahrenheit. As the skin cools, blood vessels constrict to keep blood away from that cold area to preserve body warmth. Because there's no blood flow, the skin dies. Mild cases are most common but with proper preventive measures, frostbite and other cold related illnesses need not occur at all. Answer the following questions to learn more about frostnip, chilblains and frostbite. Suggested sources: [www.webmd.com](http://www.webmd.com); [www.mayoclinic.com](http://www.mayoclinic.com)

1. What is frostnip or chilblains?
  
  
  
  
2. What are the signs and symptoms of frostnip?
  
  
  
  
3. What is frostbite?
  
  
  
  
4. What are the signs and symptoms of frostbite?
  
  
  
  
5. What causes frostnip, chilblains and frostbite?
  
  
  
  
6. What First Aid should be given for frostbite or chilblains?  
What to do –  
  
  
  
What not to do –
  
  
  
  
7. Until medical help becomes available, what First Aid can be given for frostbite?  
What to do –  
  
  
  
What not to do –
  
  
  
  
8. How can you prevent frostnip, chilblains and frostbite?

## **FROSTBITE APPLICATION PROBLEMS**

Now that you know a few facts about the cold-related illness of frostbite and how it affects people who work or play in the out-of-doors during cold weather, let's consider two special questions. These questions will require some additional research on your part.

### **DOUG SWINGLEY**

What unusual circumstance required Doug Swingley to withdraw from the 2004 Iditarod? Was this situation related in any way to frostbite? What preventive measures could Doug have taken to avoid having to withdraw from the 2004 Iditarod? How might skiers or snowboarders benefit from Doug's experience?

### **JACK FROST NIPPING AT YOUR TAIL**

During cold weather, human athletes need to protect fingers, toes, noses and ears from frostnip or frostbite by wearing protective clothing when outside yet without wearing hats and mittens and warm socks, canine athletes, wolves and other animals survive in frigid temperatures rarely being affected by frostbite. What factors make animals, especially sled dogs, so capable of surviving in cold conditions that would be extremely dangerous for humans?

Sources: Terrie Hanke – North High School – Eau Claire, WI

## **How can dogs walk around in snow and subzero weather without getting frostbite on their feet?**

In researching this question, I found two very knowledgeable sources. The first was my veterinarian, Rebecca Lee. Dr. Lee lived in Fairbanks, Alaska and served in the veterinary corps for many sprint races as well as the Yukon Quest. She also cared for the dogs in Susan Butcher's Kennel. The second was an article that quoted Stuart Nelson Jr. DVM, the head veterinarian for the Iditarod. Given their experience, I figured if ever a vet knew about dogs and frostbite it would be one or both of these two. They both concurred as to why dogs don't frostbite their feet.

In an article found in the Chicago Reader at [straightdope.com](http://straightdope.com), Dr. Nelson says he's seen some frostbitten canine parts but never any feet. He thinks this may result from some peculiarity of the canine circulatory system. When people are exposed to extreme cold, vasoconstriction in the extremities reduces the flow of blood to the area, helping reduce heat loss and maintain the body's core temperature. Maybe this doesn't happen with dogs. Or maybe they just have more blood vessels in their feet. Whatever the case, it's not something peculiar to sled dogs. Nelson says he's never seen frostbitten dog feet in private practice either.

Dr. Lee has seen dogs with frostbitten nipples as well as the tips of their tails and ears. She attributes the rarity of frostbitten feet in dogs to several factors. The dogs have fur on their feet and around their pads. The thick epithelial (leather like) pads protect the bottom of their feet. Dogs have a higher body temperature (100 – 102.5) than humans do and their heart rate (100 – 120) is also higher. Their metabolism is very high and up to 50 percent of their calories come from fat. Dogs and other animals are able to curl their feet next to their bodies when they sleep. For the dogs, this is an adaptation to their environment. It's a survival mechanism – if a dog or other wild animal can't move, it dies. When extremities get cold in animals, circulation doesn't decrease as it does in humans.

Other vets doubt that dogs enjoy any special protection though they concede that frostbitten paws are rare. A 1975 veterinary account of the Iditarod, before Nelson's time, mentions a few cases of frostbite but these occurred because booties intended to protect dogs with paw abrasions were tied too tightly and impeded circulation. This backs the circulation theories presented by both Nelson and Lee.

The explanations offered by Dr. Lee and Dr. Nelson seem to satisfy the question – dogs don't wear warm boots or clothes but they withstand conditions that would most certainly kill a human.

# 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?

**This lesson was supplied for the website by 2006 TOTT Terrie Hanke.**

ADDITIONAL LESSONS from Terrie Hanke can be found at the Teacher on the Trail 2006 Archived materials, at [www.iditarod.com](http://www.iditarod.com) at the FOR TEACHERS section of the website.

## HYPOTHERMIA – THE CHILL THAT KILLS

**Developed by:** Terrie Hanke 2006 TOTT™

**Discipline:** Health & Safety and Language Arts

**Topic:** Emergency Care - Hypothermia

**Grade Level:** Upper Elementary to Middle School

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

Worksheet provided; Knowledge of First Aid / Survival Skills; First Aid Text from American Red Cross or like source; Hypothermia information from [www.webmd.com](http://www.webmd.com); [www.mayoclinic.com](http://www.mayoclinic.com); [www.expeditionsamoyeds.org/hypothermia](http://www.expeditionsamoyeds.org/hypothermia), Iditarod Classics by Lew Freedman; optional video from merchandise tab at Iditarod website.

**Lesson Summary:** Using Iditarod as a theme, students will explore First Aid. This particular lesson focuses on hypothermia – recognizing caring for and preventing. Students will do guided research on the topic using the suggested website. Once familiar with strategies for care and prevention, students will complete an application problem which portrays a fairly typical hypothermia incident. Teachers or students can create their own Iditarod hypothermic incident based on any number of stories from [Iditarod Classics](#) by Lew Freedman.

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

Health Standard 5) Knows essential concepts and practices concerning injury prevention and safety.

Language Arts Standard 1) Uses the general skills and strategies of the writing process.

Language Arts Standard 8) Uses listening and speaking strategies for different purposes.

**Learning objectives:** Students will

- 1) understand how hypothermia occurs
- 2) know how to prevent hypothermia
- 3) know how to treat hypothermia - what to do and what not to do
- 4) recognize circumstances that are likely to cause hypothermia.

**Assessment:**

Discussion

Written

- 1) Complete guided study exercise with 90% accuracy
- 2) Complete application problem with 100% accuracy

**Procedural Activities:** Check the weather tab at [www.iditarod.com](http://www.iditarod.com) to see how cold it is in the checkpoints along the Iditarod Trail. This is a great interactive sight with a map of the trail that provides temperature and wind speed information for each checkpoint. Ask students to write or verbally describe what it feels like to be cold. Write the word hypothermia on the board. Ask students to make a list of 5 words (pre-activity perception) that come to mind. Set that list aside. List health concerns associated with exposure to the elements. Include hypothermia. Using the suggested web sites or other similar sites, complete the hypothermia worksheet. Share answers and ideas through class discussion. Having acquired basic knowledge and understanding of how to prevent, recognize and treat hypothermia, have the students complete the application problem. This problem was specifically designed to help students understand that hypothermia can occur in weather conditions and temperatures that are above freezing. Upon completion of the application writing exercise, make a board list of the conditions that caused the incident, actions by people that accelerated the incident and what immediate First Aid could be given. Using examples of “close calls” from Lew Freedman’s book, Iditarod Classics, students can work in groups to create their own Iditarod hypothermic incident. Exchange incidents with another group and answer the following questions. What conditions caused the incident? What did the characters do or not do to accelerate the incident? What First Aid should be given? How will the victim get to the next checkpoint safely? Reflect on the special out-door skills musher must have to run Iditarod. Finally return to the five words on the pre-activity perception list. Have students describe how their perception of hypothermia has changed as a result of this activity. List the advantages & disadvantages of changing.

**Materials Students Need:**

Internet access for research [[www.webmd.com](http://www.webmd.com)]; [www.mayoclinic.com](http://www.mayoclinic.com)] {[www.iditarod.com/weather](http://www.iditarod.com/weather)}

Worksheet – Hypothermia – the Chill that Kills

Worksheet – Hypothermia Application Problem

**Technology Utilized to Enhance Learning:**

Web research on frostbite; Interactive weather information at [www.iditarod.com](http://www.iditarod.com); Web product search

**Other Information:**

Close call stories from [Iditarod Classics](#) -

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

1) Create posters for the care, prevention and recognition of hypothermia.

2) Compare materials used for outdoor clothing and sleeping bags. What materials continue to insulate when wet, what materials don't. Create a poster or brochure to share your findings

Name\_\_\_\_\_

### **Hypothermia – The chill that kills!**

#### **Lesson from Shageluk**

Hypothermia is a medical emergency the doctor from Shageluk has to be ready to treat. Hypothermia is not always brought on by severe cold but can occur in milder temperatures as we experience in the lower 48. Hypothermia can affect adults, children and even sled dogs. Answer the following questions to learn more about the chill that kills. Suggested sources: [www.mayoclinic.com](http://www.mayoclinic.com); [www.webmd.com](http://www.webmd.com)

1. What is hypothermia?
  
  
  
2. When is hypothermia most likely to occur?
  
  
  
3. What are the signs and symptoms of hypothermia?
  
  
  
4. What causes hypothermia?
  
  
  
5. Why are children more susceptible to hypothermia than adults?
  
  
  
6. Until medical help becomes available, what first aid can be given for hypothermia?  
What to do –

What not to do –

7. How can you prevent hypothermia and stay healthy in cold weather?
  
  
  
8. What special care do mushers provide for their dogs to prevent hypothermia?

## **Hypothermia – the Chill the Kills** **Lesson from Shageluk**

Now that you know a few facts about hypothermia, can you apply what you've learned?

SITUATION: Your family has driven to a fishing camp in Ontario. Sioux Lookout, the nearest town with a hospital, is about 100 miles or two hours away. Your cabin is primitive – there is a woodstove for heat but no lights or running water. It's a beautiful day, about 72 degrees, very little wind but a few clouds are on the horizon. Your Dad's ready to go fishing, you and your younger brother go along. Before getting in the boat, you stuff your rain suit and a couple of candy bars into your backpack. Before pushing off your Dad tells the camp owner where he plans to fish. You've heard the big ones are really biting but the spot's a long distance from camp!

Fishing is good but the sky is getting darker, it's getting cooler and the wind is picking up. It begins to mist then rain. You decide to put your rain suit on and have a snack. Your Dad and brother keep on fishing not concerned about getting wet. It's raining harder and it's getting colder and the wind keeps blowing. You notice that your little brother is shivering. He's mumbling and grumbling about not having any bites while you and your Dad are. He finally gets a bite but doesn't seem to care whether he lands the fish or not.

Finally it quits raining but the wind continues to blow and it seems to be getting colder. Now even your Dad is shivering. Your brother fumbles during a cast and drops his pole, nearly losing it in the lake. He's having trouble on almost every cast. He doesn't have his limit but he gives up fishing to sit and shiver. It begins to rain again. Now your Dad is mumbling and grumbling too. You'd like to go back to camp. It's a long way and it'll be windy and rough.

Finally your Dad says it's time to go. He fumbles around trying to get the motor started. He stands up, stumbles and nearly falls overboard. You look at your poor little brother; he's still shivering and really pale. Suddenly it hits you - your Dad and brother have HYPOTHERMIA! You studied this last winter in school during the Iditarod. What can you do to help your brother and Dad?

Write an essay to explain what you have learned about hypothermia. Create an introductory paragraph. Then include a paragraph listing the signs and symptoms of hypothermia. Write a third paragraph telling what could have been done differently to avoid hypothermia. Write a fourth paragraph defining the First Aid you'd give. Finally, come up with a plan to get yourself, your Dad and your brother back to the fishing camp safely. Your final paragraph should conclude your essay. Your paragraphs must each have a topic sentence followed by information or the action you'd take. If you wish, create an outline before beginning to write.

Terrie Hanke 2006 TOTT  
Iditarod

## **Weather Around the World: Analysis, Study, and Comparison of World Temperatures Using the *Los Angeles Times* Newspaper**

**Developed by:** Jazmin Calvo

**Discipline / Subject:** Language Arts and Math; Social Studies, Science

**Topic:** Temperature Collection and Comparison using the *Los Angeles Time*

**Grade Level:** 2- 12 (can be adjusted to each grade per teacher and grade level focus)

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

pencils, writing booklet, recording sheets, Atlas, maps. Information source: newspapers and/or internet. This unit of study can be done with hard copies of newspapers or online using computers; whatever is feasible or available to the teacher. The newspapers for my unit were supplied by the *Los Angeles Times in Education Program*. Students were able to take home a newspaper three times a week.

**Lesson Summary:**

The focus for this lesson is earth's seasonal climate changes as experienced in different parts of the world and reported by the *Los Angeles Times* newspaper. Students selected two cities each (one city from the U.S. and one international city) and recorded temperatures over the course of the year. Periodically we compared them to our Los Angeles temperature and to each other. By selecting a U.S. City and an international city, it brought the whole concept of seasonal changes to the forefront because as the inverse seasons caused by hemispherical location. As the temperatures of one city rose the others decreased, and visa versa, as the year progressed. Depending on the location of the two contrasting cities, the temperature changes can be drastic or minimal. It was great to have students come up with the reasons this is occurring along the way rather than telling them outright what will happen when they have collected sufficient data. Learning is more meaningful by discovery!

Students learned to read "The Weather" page (the back page on the *California* section -*Part B* of the newspaper- usually page 10). It is full of information! It has 5 day local forecasts divided into regional California zones: metropolitan L.A., valleys, beaches, mountains, deserts. There is an extended forecast for that day by regions. There is a surf and sea report. There is a local Southern California map of the region with expected high and low temperatures. There is a "Driving Conditions" section. *Tides and Ultraviolet index*, *Air Quality Color Key* and air quality are featured in the local map on the right top side of this page. There is *Almanac* information. There is a "Sun and Moon" section noting rise and set times as well as moon phases. Toward the mid-bottom half of the newspaper page there is a section entitled: "*California Cities*" and "*Today in North America*" which gives a visual continental map of temperatures along with a temperature color key. The report is complete with information of high and low pressure, barometric pressure, jet stream currents, troughs, cold or warm fronts, rain, snow, ice or thunderstorms. There is satellite photo included of a small area featured or specified due to pending eminent danger such as cyclones or hurricanes that are being watched along with a brief summary of the condition. On the right side of the page is a section entitled: "*U.S. and Worldwide Cities*" where high and low temperatures reported for major cities broken down by U.S. cities and then by continents. There is comparison of national extreme temperatures and weather notes. At the very bottom of the page there usually is some type of endorsement or propaganda. There is a treasure chest full of opportunities to connect curriculum across many disciplines! The teacher can decide how long to focus on items on this page based on grade level standards and desired depth of content.

**Standard's Addressed:****Standards Addressed:**

For more information see: <<http://www.cde.ca.gov/be/st/ss/>> (Here is a sampling of appropriate standards that apply:

Grade 2-6 English-Language Arts Content Standards: 2.0, 2.1-2.8; Writing: 1.0 – 1.4; Written and Oral English Language Conventions: 1.0 – 1.8; Listening and Speaking, Comprehension, Organization and Delivery of Oral Communication

Grade 2- Math- Statistics, Data Analysis, and Probability- 1.0 – 1.4; 2.0

Grade 2- History-Social Science Content Standards: 2.2

Grade 2 - Science- Investigation and Experimentation: 4a-g;

Grade 3- Science Investigation and Experimentation: 5 a-e

Grade 3- History-Social Science Content Standards: 3.1

Grade 3- Math -Statistics, Data Analysis, and Probability 1.0 -1.4

Grade 3- Mathematical Reasoning- 1.0 – 2.0, 3.0 – 3.4

Grade 4- Math- Statistics, Data Analysis, and Probability: 1.0, 1.1, 1.2. 1.3, 2.0- 2.1 2.2

Grade 4 -Mathematical Reasoning 1.0, 1.1, 1.2, 2.0 – 2.6; 3.0-3.3

Grade 4 – Science, Investigation and Experimentation: 6a-f

Grade 6- Math- Statistics, Data Analysis, and Probability: 1.0 -1.4; 2.0 – 2.5; 3.0 – 3.5

Grade 6 - Mathematical Reasoning: 1.0 -1.3; 2.0 – 2.7; 3.0 – 3.3

Grade 7 – Math- Statistics, Data Analysis, and Probability: 1.0- 1.3

Grade 7 - Mathematical Reasoning: 1.0 – 1.3; 2.0 – 2.8; 3.0 – 3.3

Grades 8 Through 12 - Mathematics Content Standards- Probability and Statistics: 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0

Grades 9 Through 12 Science Content Standards Investigation & Experimentation – “a – n”

\* English Language Development Standards are also addressed with academic vocabulary of unit.

<p><b>Learning objectives:</b></p> <ol style="list-style-type: none"> <li>1. Students will use informational resources.</li> <li>2. Students will learn the different parts of the newspaper.</li> <li>3. Students will record temperatures on chosen cities.</li> <li>4. Students will analyze and evaluate climatic changes.</li> <li>5. Students will report findings and observations in oral and written form.</li> </ol>	<p><b>Assessment:</b></p> <ol style="list-style-type: none"> <li>1. Oral presentation rubric: <a href="http://rubistar.4teachers.org/index.php?screen&gt;ShowRubric&amp;rubric_id=1440507">http://rubistar.4teachers.org/index.php?screen&gt;ShowRubric&amp;rubric_id=1440507</a></li> <li>2. Informal assessment</li> <li>3. Teacher made tests</li> </ol>
<p><b>Procedural Activities</b></p> <p>In order for the class to be ready to engage in this project, there are instructional lessons that must be taught prior in the areas of geography. The world hemispheres and continents need to be known. Some of the countries and most famous cities, such as New York, London, Cairo, Buenos Aires, Hong Kong, etc. should be known and recognized on a map. The states that make up the United States need to be taught as well as their location. <b>Each area on the weather page from the newspaper needs to be understood that will be used in the unit of study.</b> We spent a lot of time on weather patterns and flows of the currents. Discussed hurricanes and other weather related natural disasters. Students must understand how to do the record keeping. I had each student highlight their cities on their newspaper so we could cross check that the information was recorded correctly. I designed a special recording sheet for this purpose. The sheet also helped to make comparisons weekly, monthly etc. Each student only had their particular cities and respective data on their sheets they were tracking. This minimized confusion and made it easier to discuss in a group format. In order to note climatic seasonal changes, students must have ongoing sufficient data to reflect those changes. The teacher needs to monitor the seasonal changes to be able to point them out when they occur if students are not recognizing them. Once they notice what is happening, they know what to look for and they can interpret the information independently from the teacher pointing it out. These may differ from student to student depending what cities they are tracking. My class extended this activity to include each student becoming an “expert” reporter on the events that were occurring in their cities. They also cut out and kept in a folder any news reported from their countries/cities and shared this information. These were discussed and global social issues were addressed such as crimes, economy, natural tragedies, laws, policies, and ecology. There also was the focus on elements of depth and complexity. The details, patterns, trends, unanswered questions, rules, the big idea, ethical considerations, points of view, changes over time were discussed regarding the reported news. Again this unit of study can be as long as the teacher wishes and students are engaged in learning. The grade level will dictate the depth of the content.</p>	
<p><b>Materials Students Need:</b></p> <p>pencils, newspapers, record keeping sheets, writing notebooks, scissors, highlighters, magnifying glasses</p>	

**Technology Utilized to Enhance Learning: The following websites provide great additional information:**

[http://weather.latimes.com/US/CA/Los\\_Angeles.html?main=1](http://weather.latimes.com/US/CA/Los_Angeles.html?main=1)

<http://mobile.wunderground.com/>

<http://www.wunderground.com/tropical/>

<http://www.wunderground.com/ndfdimage/viewimage>

<http://www.climateregistry.org/ABOUTCLIMATECHANGE/>

<http://www.texasppsp.org/all/DepthComplexity.pdf>

<http://www.jtayloreducation.com/books.html>

[http://www.gate.pylusd.org/resources/differentiation/Mini\\_Icons\\_page\\_black\\_white.ppt#258,2,Mini Icons](http://www.gate.pylusd.org/resources/differentiation/Mini_Icons_page_black_white.ppt#258,2,Mini Icons)

**Other Information:** Teachers: to make any desired rubric you can do so at:

<http://rubistar.4teachers.org/index.php>

You can access the rubrics from home, school, or on the road. Registration and use of this tool is free.

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

All the parts of the newspaper can also be taught section by section. When I taught this to my students, they became interested in becoming experts on their chosen cities. They scavenged the paper to find any stories of interest and current event items from their chosen cities. This led to many class discussions on social issues. The application of the elements of depth and complexity helped improve comprehension. Students identified and drew the icons\* right on the news article on the margins. Additionally, I was pleased to hear that there were sharing sessions and discussions at home. The newspapers were highly sought after and because of the interest created, parents purchased the *Los Angeles Times* and other local papers on days students did not take one home from school. There was the additional benefit of family communication and increased family literacy.

\* (see tech resources above)

Activities such as this one throughout the school year prepares my students to be able to track their chosen mushers for the Iditarod. My students have multiple opportunities to practice the skills of gathering information, record keeping, writing their ideas, predicting, summarizing, analyzing and evaluation as well as making oral presentations.

Notes from Editor:

The website resources in this lesson were valid as of 9/07. As with any resource on the Internet, website are subject to change. As an educator, it is your responsibility to supervise Internet use and double check resources that students are using. Iditarod is not responsible for content found at the links provided in these lessons.

Made by: Jazmin Calvo – MUSD 2005-06

## **Freezing Fingers and the Blubber Mitten (Science/Language Arts Checkpoint)**

**Developed by:** Amy Strine, Lead Teacher and 2008 TOTT FINALIST

**Discipline / Subject:** Science, Language Arts

**Topic:** compare and contrast, descriptive writing, Scientific Process

**Grade Level:** 3-5

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

Large Rubbermaid™ container ½ filled with water, 22 pounds of ice, vegetable shortening (lard), quart size baggies, gallon size baggies, towels. Compare/Contrast worksheet, Scientific Process worksheet

**Lesson Summary:** Students experiment with the potential effects of hypothermia in a controlled setting. Students investigate one adaptation to cold.

**Standard's Addressed: (Local, State, or National)**

1. 5.1.2 Begin to evaluate the validity of claims based on the amount and quality of the evidence cited.
2. 5.1.7 Give examples of materials not present in nature, such as cloth, plastic, and concrete  
that have become available because of science and technology.
3. 5.2.6 Write instructions that others can follow in carrying out a procedure.
4. 5.2.8 Recognize when and describe that comparisons might not be accurate because some  
of the conditions are not kept the same.
5. 5.3.9 Investigate, observe, and describe that when warmer things are put with cooler ones,  
the warm ones lose heat\* and the cool ones gain it until they are all at the same  
temperature. Demonstrate that a warmer object can warm a cooler one by contact or at  
a  
distance.
6. 5.3.10 Investigate that some materials conduct\* heat much better than others, and poor  
conductors can reduce heat loss.
7. 5.4.4 Explain that in any particular environment, some kinds of plants and animals  
survive well, some do not survive as well, and some cannot survive at all.
8. 5.5.7 Explain that predictions can be based on what is known about the past, assuming  
that conditions are similar.
9. 5.4.11 Use logical organizational structures for providing information in writing, such  
as  
chronological order, cause and effect, similarity and difference, and stating and  
supporting a hypothesis with data.
10. 5.5.5 Use varied word choices to make writing interesting.
11. 5.5.6 Write for different purposes (information, persuasion, description) and to a  
specific audience or person, adjusting tone and style as appropriate.
12. 5.6.6 Use correct capitalization.

<b>Learning objectives:</b> 1. Testing hypotheses/predicting 2. Effects of temperature 3. Descriptive writing 4. Compare/contrast 5. Scientific Process	<b>Method of assessment for learning:</b> Venn diagram, written description, Scientific Process worksheet
<b>Procedural Activities:</b>	
1. Each student writes his or her full name in his/her best handwriting. 2. Each student submerges his/her writing hand in a tub of ice water for a minimum of one minute/maximum of two minutes. 3. Immediately after taking his/her hand out of the water, student rewrites his/her full name. 4. Students compare writing samples. 5. Students write a descriptive paragraph explaining what they felt/observed during/after the experiment. 6. Students brainstorm different ways animals/humans stay warm in extreme temperatures. 7. Conduct second experiment. Each student wears a blubber mitten and submerges his/her hand in the tub of water again. 8. Students record information on the Scientific Process worksheet and discuss findings.	
<b>Materials Students Need:</b> Handwriting sample/summary worksheet, Venn diagram, Scientific Process worksheet	
<b>Technology Utilized to Enhance Learning:</b> Internet for further research on hypothermia	
<b>Other Information:</b> Due to the fact that each child may react differently to the cold water, pay careful attention to each child as he/she submerges his hand in the ice water. If at any time a student appears to be having difficulty, remove his/her hand immediately. Provide towels and allow students to keep one of their gloves or mittens nearby.  Blubber Mitten: Fill 4 quart size baggies with vegetable shortening. Line a gallon size baggie with the four smaller ones. Students slip the gallon size bag onto their hands before submerging the hand in water.  This lesson could lead directly to “You’ve Got To Have This”.	

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

Special learners could complete the Venn diagram/description orally or through the use of pictures. They could also collaborate with another student and include the observations/experiences of both students on one diagram. Students could work in Science groups to complete the Blubber Mitten portion of the experiment, using the same Scientific Process worksheet. Peer tutors could scribe for special learners. Opportunities for enrichment include: additional research on animal adaptations, testing of follow-up ideas (be careful, I had several students who wanted to lay their entire unclothed bodies in the snow or ice water with and without the Blubber Mitten), and creation of brochures or posters warning of the dangers of hypothermia. “You’ve Got To Have This” is an excellent follow-up activity.

**Amy Strine is an Iditarod ‘Lead Teacher’.**

**Amy was a finalist for 2008 TOTT.**

**Amy demonstrates her dedication to her students and her knowledge of teaching and learning through the standards driven curriculum she creates. Her lessons provide authentic learning experiences for students and engages them in life long learning.**

**Iditarod congratulates Amy Strine and recognizes her as an Iditarod Lead Teacher.**

**Diane Johnson  
2007**

## Freezing Fingers and the Blubber mitten

Name\_\_\_\_\_



Purpose:

Hypothesis:

Materials:

Procedure:

Conclusion:

Follow up questions:

Name \_\_\_\_\_

Write your full name in your best handwriting before the experiment.

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Write your full name again, in your best handwriting, after the experiment.

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Sources:

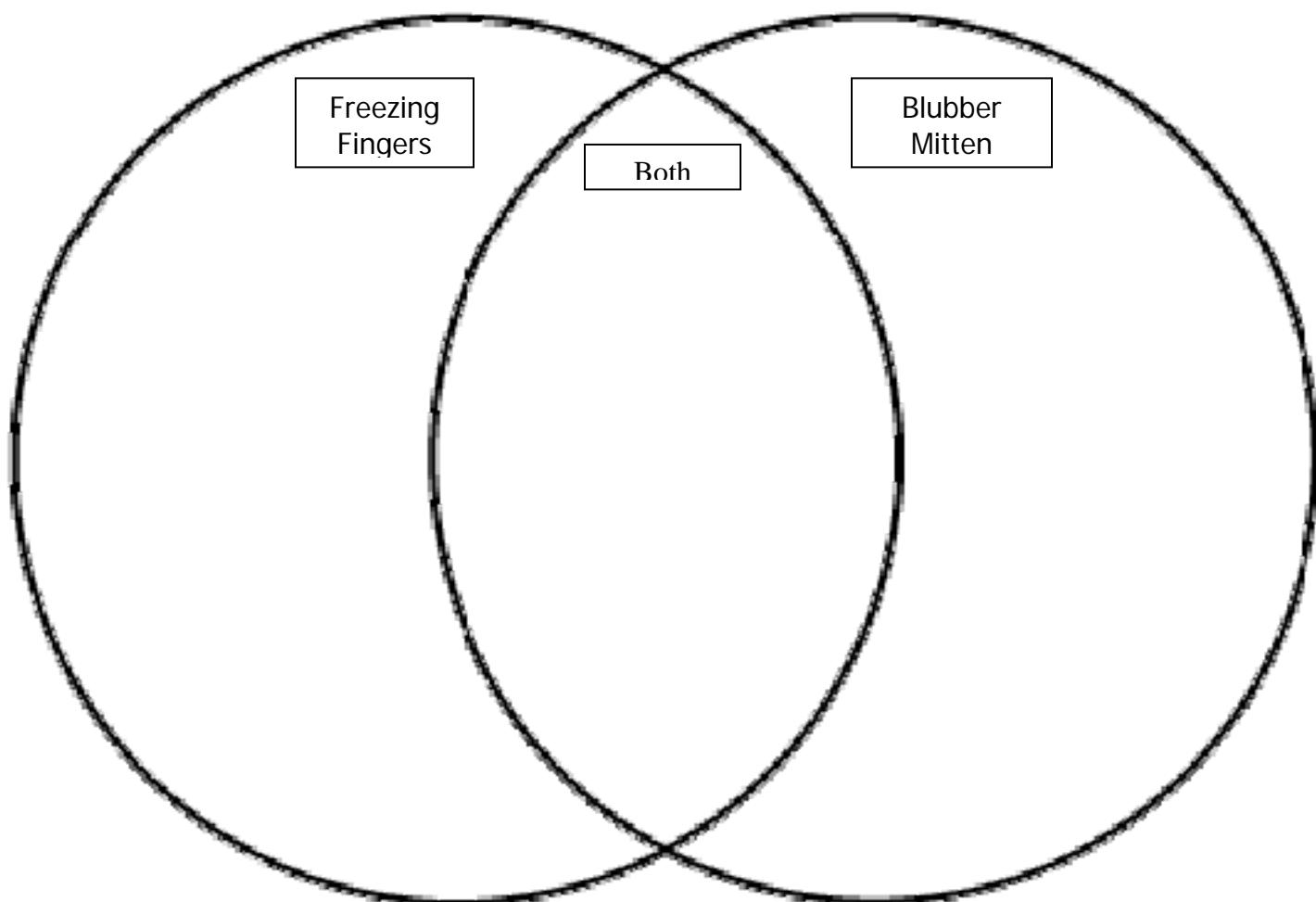
[http://www.todayscacher.com/2004/dec/img/Frozen\\_person.gif](http://www.todayscacher.com/2004/dec/img/Frozen_person.gif)

Write a summary that describes what you felt or noticed while your hand was submerged in the bucket of ice water.

## Freezing Fingers and the Blubber Mitten

Name \_\_\_\_\_

Complete the Venn diagram based on your experiences with the tub of ice water.



<b>Is It Still Summer?</b>	
<b>Developed by:</b> Jane Blaile 2008 Teacher on the Trail	
<b>Discipline/Subject:</b> science, writing	
<b>Topic:</b> comparing local seasonal weather to the calendar and to Alaskan seasonal weather	
<b>Grade Level:</b> 3-8	
<b>Resources/References/Materials Teacher Needs:</b> “Seasons” game guide	
<b>Lesson Summary:</b> Students compare how long they “feel” seasonal weather compared to the calendar seasons and how long people “feel” seasonal weather in Alaska.	
<p><b>Standards Addressed:</b></p> <p><b>National standards:</b> NL-ENG.K-12.4 Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes</p> <p><b>Alaska state standards:</b> SD3.1 [4] Students develop an understanding of cycles influenced by energy from the sun and by Earth’s position and motion in our solar system by recognizing changes to length of daylight over time and its relationship to seasons W2.2.2 [5] The student writes for a variety of purposes and audiences by writing in a variety of nonfiction forms using appropriate information and structure</p> <p><b>Arizona state standards:</b> S4-S6-C3-PO6 Compare weather conditions in various locations (e.g., regions of Arizona, various U.S., coastal vs. interior geographic regions) W5-S3-C2-PO2 Students will compose expository writing that describes, explains, informs, or summarizes ideas and content. Students write an expository paragraph that contains a topic sentence, supporting details, and relevant information</p>	
<p><b>Learning Objectives:</b> The students will:</p> <ul style="list-style-type: none"> <li>○ recall calendar dates that mark the beginning of each of the 4 seasons. (knowledge)</li> <li>○ deduce that weather that feels like each season doesn’t always match the calendar season (analysis)</li> <li>○ infer the dates of when they experience weather that “feels” like each season. (analysis)</li> <li>○ compare length of seasonal weather between their home state and Alaska. (analysis)</li> <li>○ evaluate factors which make the seasons feel different for each state (evaluation)</li> </ul>	<p><b>Method of Assessment for Learning:</b> Observe student participation. Assess paragraph written by students for thoughtful and accurate comparison.</p>

**Procedural Activities:**

1. Review with students season start dates according to the calendar. (March 20, June 21, September 22, December 21)
2. Through discussion, elicit from students the actual dates that the weather feels like spring, summer, winter, or fall in their home state. In Phoenix, for example, we are experiencing swimming weather in March and the 100s before school lets out as well as long into September.
3. Ask students if they think everywhere in the world has the same 4 seasons. Inform them that Alaska has the same four seasons as their state.
4. Play the “Seasons” game with students to illustrate the difference in the lengths of the seasonal weather experienced in Alaska as compared to their home state.
5. As a class, discuss what factors have influence over the weather. (latitude, topography, wind patterns, humidity, hours of daylight, etc.)
6. Students write a comparative paragraph noting differences and similarities between the seasons as experienced in their home state to those experienced in Alaska.

**Materials Students Need:** none**Technology Used to Enhance Learning:** Excel for extension activity

**Other Information:** This activity is based on “typical”. Encourage students to think about how seasons would feel in different latitudes in Alaska.

Not all places on Earth experience 4 seasons. Places in the far north or south as well as along the equator have 4 calendar seasons, but no change or one change (dry/wet) in the weather.

This activity is bodily-kinesthetic which has appeal to most students.

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

A science/math extension would be to keep a side by side temperature graph for the entire or remainder of the year comparing the highs each day or average monthly highs between a city in Alaska and your city.

For younger students, do the Seasons game for just the calendar seasons and Alaskan weather seasons.

As an extension, have the students use Excel to make a circle graph for each place, Alaska and their home state, showing the amount of each year that the weather “feels” like the season.

Use Jon Van Zyle’s “Arctic Lights, Arctic Nights” book and read the 21<sup>st</sup> each month.

### **Seasons Game**

**For this game, a calendar year has been divided up into one minute with each month having 5 seconds. As a start, you may wish to do this for or at least discuss how the calendar seasons are divided equally into 3 months each.**

**1.**

**Have students name the seasons and give a brief description of each season, including typical signs of or activities for each season. For example, in spring we think of plants and flowers budding and blooming. In summer we are hot and enjoy swimming. A typical sign of fall is falling leaves, and winter brings cold temperatures along with snow.**

**2.**

**Brainstorm which months actually feel like that season's weather in your home state. In Phoenix, we usually come up with this:**

**spring: 1 month (mid-Feb through Mid-March) 5 seconds**

**summer: 6 months (mid-March through September) 30 seconds**

**fall: 3 months (October – mid-December) 15 seconds**

**winter: 2 months (mid-December – mid-February) 10 seconds**

**3.**

**Let the class decide an action to represent each season. Here are some suggestions;**

**winter: quickly rub arms while saying “BRRRRR!!”**

**spring: simulate a flower popping up and opening and say, “Ahhhhh!”**

**summer: wipe your forehead with the back of your hand while panting and saying, “Whew!”**

**fall: flutter hands downward like falling leaves and say, “Fall!”**

**4.**

**Correlate a minute on the clock with the amount of time seasonal weather is felt in your state, giving each month 5 seconds. (see Phoenix example above)**

**5.**

**Have the students do the actions for each season as felt in their home state for one minute, announcing when the next season starts, signaling a change in actions.**

**6.**

**Then have them do it for Alaska using these times or times you feel appropriate.**

**winter – 35 seconds – 7 months**

**spring – 10 seconds – 2 months**

**summer – 5 seconds – 1 month**

**fall – 10 seconds – 2 months**

## **Weather Watch I**

(This is an ongoing lesson throughout the year and will be paired with Weather Watch II)

**Developed by:**

Kim Slade and Indian River County Science Team

**Discipline / Subject:**

Interdisciplinary

**Topic:**

Weather data collection

**Grade Level:**

3-6

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

- Weather Watch Chart
- Internet access

**Lesson Summary:**

- Students will collect data around the country including Alaska, Florida, and their state and then draw conclusions about the climate of these areas.

**Standard's Addressed: (Local, State, or National)**

1. Students use scientific process and habits of mind to solve problems
2. Students understand that science, technology, and society are interwoven and interdependent
3. Students measure quantities in the real world and uses the measures to solve problems
4. Students write to communicate ideas and information effectively
5. Students select and use appropriate technologies to enhance efficiency and effectiveness of communication

**Learning objectives:**

Students will:

- Collect data from the internet
- Record observation of weather across the country
- Draw conclusions about the climate in selected areas around the country

**Assessment:**

Completing the Weather Watch Charts correctly and continuing data collection over time

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### **Procedural Activities**

1. Select specific cities in Alaska, Florida, and student's state – suggestions are Anchorage and Nome, Alaska; Vero Beach, Florida; and student's city, state
2. Discuss selected areas that students will focus on for weather data collection
3. Explain the weather data chart and information that students will be collecting
4. Have students share what they know about weather and climate. Discuss the difference between climate and weather.
5. Students visit [www.weather.com](http://www.weather.com) and/or [www.wunderground.com/](http://www.wunderground.com/) to collect weather data
6. Students chart weather data, three times a week, for at least a four week period (data collection over several months would be optimal)

### **Materials Students Need:**

- One copy of Weather Watch Chart for each week of data collecting
- Internet access

### **Technology Utilized to Enhance Learning:**

Internet access to [www.weather.com](http://www.weather.com) and/or [www.wunderground.com/](http://www.wunderground.com/)

### **Other Information**

Students will reflect back and respond to weather conditions watch time and record observations on chart. After four weeks of collecting data from selected areas, students will draw conclusions about the climate of those locations (See Weather Watch II Lesson)

The "Air Feels" portion of the Weather Chart is important to help students start to make the connections with conditions and temperature.

### **Vocabulary:**

precipitation  
temperature  
overcast  
weather  
climate

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

- Collecting weather data in various locations around the world will allow students to draw conclusions about different climates and gain an understanding of climatic regions around the world

Notes:

Dates: \_\_\_\_\_

Week #: \_\_\_\_\_

### Weather Chart

Day one			Day two			Day three		
Sky (check one)	Sky (check one)	Sky (check one)	Air Feels (check one)	Air Feels (check one)	Air Feels (check one)	Air Temperature F	Air Temperature F	Air Temperature F
sunny	sunny	sunny	cold	cold	cold	highs	highs	highs
partly cloudy	partly cloudy	partly cloudy	chilly	chilly	chilly	lows	lows	lows
cloudy/overcast	cloudy/overcast	cloudy/overcast	warm	warm	warm			
			hot	hot	hot			
Air Temperature F	Air Temperature F	Air Temperature F	Precipitation	Precipitation	Precipitation	Type	Type	Type
highs	highs	highs	Type	Type	Type	Amount measured	Amount measured	Amount measured
lows	lows	lows						
Precipitation	Precipitation	Precipitation						
Type	Type	Type						
Amount measured	Amount measured	Amount measured						

Key for Precipitation:

S=snow SR=sleet R=rain N=none

## **JOIN OUR PROJECT: Iditarod Ready! Storm Ready! Blog With Us!**

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**Join us at our Iditarod Ready: Storm Ready Blog**

**Participate in our collaboration zone designed to provide  
an opportunity to combine teaching and learning efforts and  
ensure ‘storm ready’ communities while learning science  
curriculum!**

**Visit the Blog!**

**<http://iditarodready.blogspot.com>**

**Interested in the project?  
Email [djohnson@iditarod.com](mailto:djohnson@iditarod.com)**

\*If this blog is blocked from access at school, contact your school district’s technology department to inquire about getting it unblocked so that you can access it for educational purposes.

## **Website Resources: Lesson Ideas**

The following links are provided as resources to assist educators in creating projects to meet the standards, objectives, and curriculum goals.

NOAA Education:

[Weather](#)

Science News for Kids: Resource of information and lesson ideas.

[Science News for Kids](#)

How can I study the weather? Lesson Plan, The University of Sydney  
[Resources for weather unit of study](#)

Weather Unit by Teaching Treasures

[The Weather](#)

Lesson plan for making Blubber Mittens

[Blubber Mitten](#)

Arctic Adaptations: Why Do Tundra Animals Have Shorter Ears, Tails, Noses, and Toes?

[Arctic Adaptations](#)

Sample Web Quest:

[Weather and Math](#)

How do you say snow?

[Words for Snow](#)

Nick Walker, Weather Dude: Musical Meteorology, Sing along with the Weather Dude, audio files.

[The Weather Dude](#)

Scholastic Book List:

[Teaching about the Weather](#)

Songs for Teaching

[What will the weather be today?](#)

PBS: Thematic Teaching: The Weather

[How's the Weather](#)

PDF Document: Teaching Weather and Climate

[Weather Vs. Climate](#)

ERIC

[Teaching Weather Concepts](#)

Weather Outreach

[Teaching Links](#)

Discovering and Exploring Elementary Science

[Ideas for Teaching Weather](#)

**Colonial Williamsburg**  
[Predicting Weather in the 18<sup>th</sup> Century](#)

**DLESE Science Lesson: Grade 9 -12**  
[Essentials of Weather](#)

**PDF Document: Teaching Unit**  
[Weather Unit for Ages 3 - 6](#)  
**Instructor Web**  
[Tornado Lesson Plan](#)

**Severe Weather Forecasting Project**  
[A Web Based Exercise](#)

**Vocabulary Terms: Weather and Climate**  
[Forecasting Terms](#)

**Project Samples:**  
**How are classrooms around the world learning about climate?**  
**Get ideas for projects or jump on to an ongoing project!**

**Shageluk, Alaska**, a village along the southern route of Iditarod, shares their school project: Alaska Lake Ice and Snow Observatory Network, “a project that tracks lake ice thickness, snow densities, and conductive heat flow in efforts to show global environmental change.”

[Innoko River School - Shageluk, AK](#)

**The Globe Project: Globe Learning and Observations to Benefit the Environment**, a learning expedition involving 109 countries around the world.  
[Globe](#)

**EMO Weather Watching: A National Teacher Enhancement Project**  
[Weather Watching](#)

**Polar Husky: Live Dog Sledding Expedition**  
[Polar Husky](#)

**Teaching Expertise**  
[Teaching on Ice](#)

**Discovery Education: Weather and Climate project and lesson ideas**  
[Project Ideas](#)

**A Teacher Developed Project: Reading the Weather**  
[Project Activities and Website](#)

**NASA and NSF Project: Using Science and Math, the Language of Patterns, to discover information about weather, 1996 project**

### **Project SkyMath**

The Australian School Weather Project: Collaboration Site for Schools in Australia  
[Project](#)

Staffordshire Weather Data Site: Collecting Basic Weather Data and Encouraging Weather Enthusiasts: Project and Links to Data Collecting and Setting Up Weather Stations

### **Weather Data Project**

Extreme Weather Film Project and Research Project  
[Student Broadcast Project](#)

EPICS Happy Hollow Elementary School Project:  
[Weather Station Project](#)

CIESE Real Time Data Project: An Investigation on Local and World Weather  
[Weather Scope](#)

## **Science Projects: Weather and Climate: Resources and Links**

Free project fair ideas and samples from Science Buddies  
[Weather and Atmosphere](#)

Meteorology Science  
[Science Fair Project Ideas and Experiments](#)

Weather Station Science Fair Projects  
[Super Science Fair Projects](#)

## **Creating Emergency Kits**

NOAA: A Guide for Developing Severe Weather Emergency Weather Plans for Schools  
[The Guide](#)

American Red Cross: A disaster preparedness curriculum teaches children how to prevent, prepare for and respond to disasters and other emergencies.  
[Masters of Disasters](#)

\*\* When you follow links at this site, you will be leaving [www.iditarod.com](http://www.iditarod.com). The links are provided to you as a learning tool and for your convenience. The inclusion of any link does not imply endorsement of the linked site. Teacher and parental supervision of students using the Internet at home is recommended and encouraged. Links change so please confirm link prior to using link with students. The links in this document were working links as of 10/07.

## Website Links: NOAA

**LINKS to NATIONAL WEATHER SERVICE MARINE FORECAST OFFICES**  
[http://www.nws.noaa.gov/om/marine/marine\\_map.htm](http://www.nws.noaa.gov/om/marine/marine_map.htm)

**NOAA Weather Radio**  
<http://www.nws.noaa.gov/nwr/>

**NOAA Radio Frequencies**  
<http://www.nws.noaa.gov/om/marine/wxradio.htm>

**NOAA Offices of Services**  
<http://www.weather.gov/os/>

**National Oceanic and Atmospheric Administration**  
<http://www.noaa.gov>

**NOAA Watch: Weather Outlook**  
<http://www.noaawatch.gov>