

Messages in the Sky

Subject Area(s): Science, Language Arts, Cree Language/Culture

Suggested Grade Level(s): Grade 6, Secondary 1 & 2

Duration: Depends on depth of exploration, this can be an on-going project

Standards/Goals:

Students will...

- practice the scientific method.
- gain an understanding of how their ancestors forecast weather.
- see the relationship between cause and effect.
- understand to a small degree the importance of weather forecasting.
- develop an appreciation of the accuracy of native forecasting.
- develop an appreciation of the relationship between traditional explanations of weather phenomena and western scientific explanations of the same phenomena

Performance Objectives:

Upon successful completion of this lesson, students will be able to...

- relate certain weather conditions to different phenomenon seen in the sky.
- understand the importance of keeping accurate records to verify hypothesis/predictions.
- create a chart to show their data.
- forecast the weather.
- identify where western and traditional explanations are similar/different

Preparation / Materials:

- Cassette player and microphone and/or video camera
- 5 x 7 file cards
- Discussion with local culture teacher or Elder prior to lesson regarding local weather observation

Vocabulary:

Sun dogs: Also called mock suns or solar parhelia, sun dogs are bright spots which appear on either side of the sun when it is near the horizon. They are caused by ice crystals in the upper atmosphere which refract light in a certain way. Sun dogs usually appear 22° to either side of the sun. Also, moon dogs can form at night the same way sun dogs form during the day.

Halo: Haloes form when light from the sun or moon is refracted by ice crystals associated with thin, high-level clouds (like cirrostratus clouds). A 22-degree halo is a ring of light 22 degrees from the sun (or moon) and is the most common type of halo observed.

Cirrus clouds: High altitude, thin wispy clouds.

Cumulus clouds: Big, poofy, piled-up clouds, like the ones in the introduction to *The Simpson's*.

Nimbus clouds: Dark, gray cloud heavy with moisture. Clouds that usually indicate precipitation.

Stratus clouds: Clouds in sheet-like layers.

Note: There are many more cloud types than listed. It might be a good idea to review cloud-types with the class prior.

Delivery of Lesson

Motivation/Introduction

This lesson should be started after a sun ring, sun dogs, moon ring, northern lights or other atmospheric phenomenon was present in the sky.

Ask students if they saw (noticed) the sun ring, moon ring, sun dogs, northern lights etc.

Ask:

- What did it look like? Size, shape, color; describe it in detail; Draw it on the board
- How often are they seen?
- Big question: Why does it appear? What causes them? (Accept any answers)
- Your grandparents and great grandparents used to (and still do) read the signs (messages) in the sky to forecast (predict) what the weather would/will be the next day, next week and sometimes weeks ahead. How did they do it?

Presentation:

1. Invite an Elder to come into the class to tell the students what weather/atmospheric signs they use and what each sign forecasts.
2. Students will listen and try to translate the signs and their meanings into English. If you think this will not work then the Cree (or local) Language teacher can be asked to help either in a Cree/local Language class or in your class using the video/audio tape.

3. The teacher will discuss what causes these weather signs (western scientific explanation) and how/what they indicate what the future weather may be.
4. Class will discuss where local and western explanations are similar/different.

Student Activities:

- Have students list the weather/atmospheric signs (with a drawing?) and their meanings in a chart
- Students will keep an ongoing diary of the weather signs they see and what the weather is like after the sign is seen. (This can be done individually but better would be a large class chart - weekly? monthly?) A group of 2 or 3 students can be responsible for recording the weather (cloud cover, temperature, wind and precipitation) for the days of and following the weather sign.
- Temperature should be taken the same time each day (outside of course). Perhaps your science lab has an outdoor continuous readout thermometer or high-low thermometer.
- Each student (or small group in pairs) will draw a weather sign with the meaning on index cards (or smaller). These can be arranged around the ongoing weather chart.
- Students will do a daily/weekly forecast for the class and/or the school.

Follow-Up Lessons/Activities

- Each student (or group) can be responsible for a weather sign, research it, present it to class (with both the traditional and the scientific explanations)
- A project could be set up with another class in another part of the country/world – students can compare observations, explanation of phenomena via the Internet
- Research weather signs using Google.
- Students can write stories explaining different weather signs i.e. haloes, sun dogs, rainbows

Evaluation:

Students will be evaluated on:

1. Chart construction - i.e. data included and neatness
2. Accurate gathering of the weather data
3. Develop of weather sign card.
4. Testing on weather signs.

Making Connections

Cross-Curricular:

1. Mathematics - The temperature data can be used in graphing and for problems dealing with Integers.
2. Language Arts – Students can write stories regarding weather phenomena, discover appropriate Cree terms for English explanations and vice-versa, discuss forecasting

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3. Geography – Students an examine how land forms, geographical placement impacts weather signs
4. Art – Students can create posters illustrating weather signs and what they forecast.

Cultural Connections:

Students will ...

1. learn traditional explanations of weather phenomena
2. learn how to use traditional knowledge to forecast weather

Computers & Other Technologies:

Students can...

1. research weather/atmospheric phenomena on-line.
2. publish stories and art work to a class web page.
3. work with classes in other areas of the country/world to compare and contrast weather observations.
4. find photos of various atmospheric phenomena. NASA is a great source of images.

Sources:

1. Cloud Types
http://www.ucar.edu/educ_outreach/webweather/cloud3.html
2. Indigenous weather knowledge project
<http://www.abc.net.au/science/features/indigenous/default.htm>
3. Inuit Observations on Climate Change
<http://www.iisd.org/casl/projects/inuitobs.htm>
4. The World Weather Project 2010
[http://ww2010.atmos.uiuc.edu/\(Gh\)/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/home.rxml)

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