

How Latitude, Elevation, and Local Geography Affect Climate

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Unit Overview

The purpose of this unit is to help students develop conceptual understanding of Earth's climate and the factors that influence it. The unit engages students in a variety of activities designed to specifically allow them to explore and construct their understanding of the effects of latitude, elevation, and local geography on climate. Students also discover how climate affects humans' lifestyles, especially those of Montana's tribal people.

Unit Objectives Aligned with the Montana Benchmarks

Content Objectives

1. Students will be able to explain the difference between weather and climate. (MT Standard 4, Benchmark 5, end of grade 4)
2. Students will be able to explain how latitude, elevation, and local geography influence climate. (MT Standard 4, Benchmark 5, end of grade 8)
3. Student will be able to explain how climate influences people's lifestyles, particularly those of Montana's tribal peoples. Cultural objective

Skill Objectives

1. Students will develop hypotheses about how factors influence climate and will test their hypotheses through experimentation. (MT State Standard 1, Benchmark 1, end of grade 8)
2. Students will gather data and construct a climograph (MT State Standard 1, Benchmark 3, end of grade 4).
3. Students will use the Internet to gather information about climatic effects on the lifestyles and cultures of Montana's tribal peoples and will create posters displaying their findings. (MT State Standard 5, Benchmark 5, end of grade 4 and 8)
4. Students will compare climatic variations caused by differences in elevation, latitude, and local geography. (MT State Standard 4, Benchmark 5, end of grade 8)
5. Students will develop a teaching poster and teach their peers about how climate affects people's lifestyles. (MT State Standard 5, Benchmark 5, end of grade 4)

Essential Understandings

1. There is great diversity among the 12 tribal Nations of Montana in their languages, cultures, histories and governments. Each Nation has a distinct and unique cultural heritage that contributes to modern Montana.
3. The ideologies of Native traditional beliefs and spirituality persist into modern day life as tribal cultures, traditions, and languages are still practiced by many American Indian people and are incorporated into how tribes govern and manage their affairs. Additionally, each tribe has its own oral histories, which are as valid as written histories. These histories pre-date the "discovery" of North America.

Time/Scheduling

Fifteen class periods of forty-five to sixty minutes each.

Lesson #1 - Is Climate the Same Across Earth?

Summary of the Lesson

This introductory lesson accesses students' prior knowledge about climate and weather. Students construct their knowledge through participation in pair/share, whole class discussion, the completion of a T chart and journaling in response to questions about climate and weather.

Grade Level

4th and 5th Grades

Approximate Time Required

One forty-five minute class period

Lesson Objectives and Montana Science Standards and Benchmarks Addressed

1. Students will be able to explain the difference between weather and climate. (MT Standard 4, Benchmark 5, end of grade 4)
2. Students will be able to explain how latitude, elevation, and local geography impact climate (MT Standard 4, Benchmark 5, end of grade 8).

Resources/Materials Needed

- Science journals
- T-chart worksheets
- Assessment probes

Teacher Preparation

Make a copy of the T-chart worksheet and the assessment probe for each student.

Background Information

Weather is the set of all the phenomena (e.g., temperature, humidity, cloud cover, precipitation, wind) occurring in a given part of the atmosphere at a given time. Climate is temperature, humidity, precipitation, air pressure, wind, and clouds over a period of at least several decades at a given location. Climate varies across Earth's surface due to factors including the angle of sunlight (which relates to latitude of a location), elevation, and local geographic features like proximity to water.

Procedure

1. Activate students' prior knowledge by asking them to write in their journals in response to the question: "Is climate the same everywhere on Earth?"
2. Ask students to pair/share their ideas.
3. Facilitate a class discussion, encouraging students to share their ideas about climate differences across Earth. Guide and expand the discussion so that students discuss weather and climate, what each is, and how they compare.

4. Ask students to complete a T-chart listing the characteristics of weather and climate.
5. The assessment probe attached to this lesson may also be used to check students' understanding of weather and climate.

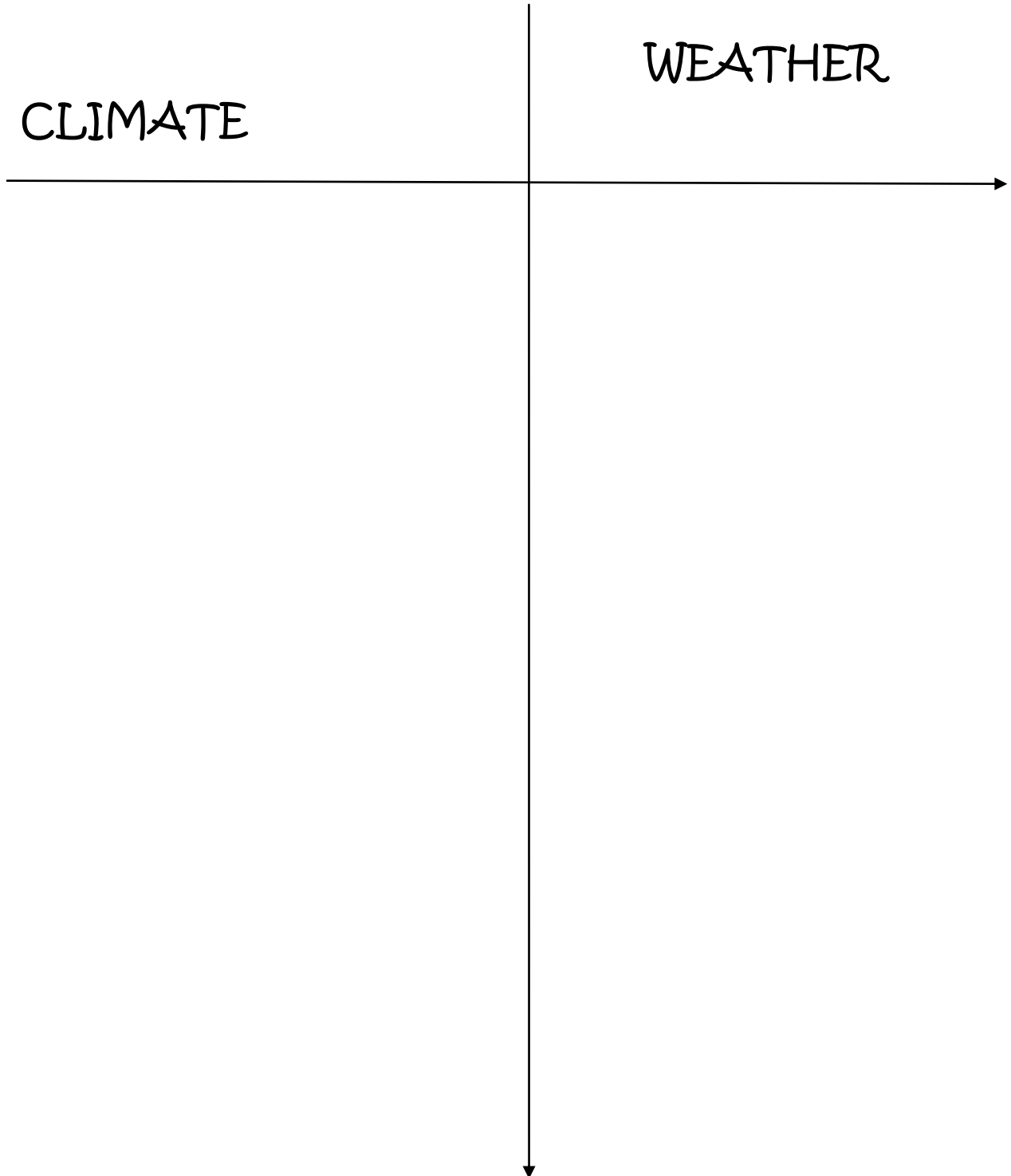
Formative Assessment

1. *Teacher Observations* - Teacher observations of the whole class discussion and pairs' discussion, and individual journal entries and T-charts will provide a means to assess students' initial understandings and naïve ideas about weather and climate concepts. The core concepts that teachers should be assessing understanding of are:
 - Weather occurs over a short period of time in a given location and includes phenomena such as temperature, air pressure, precipitation, clouds, wind and humidity.
 - Climate is temperature, humidity, precipitation, air pressure, wind, and clouds over a period of at least several decades at a given location. Climate varies across Earth's surface due to factors including the angle of sunlight (which relates to latitude of a location), elevation, and proximity of water.
2. *Assessment probe* - The teacher may also use the formative assessment probe included with the unit materials to check students' understanding of the difference between weather and climate.

Name: _____

Date _____

T chart for Weather and Climate



Name: _____

Date: _____

Assessment Probe for Weather and Climate

For each statement below, write “W” if you think the statement relates to Weather or “C” if you think the statement relates to Climate.

_____ 1. Average rainfall in Missoula is 14 inches/year.

_____ 2. It looks like we’ll get rain this week.

_____ 3. Did you hear about the hurricane in Florida last week?

_____ 4. The average temperature in Missoula in December is 23 degrees Fahrenheit.

_____ 5. I’m moving to Las Vegas, Nevada for the winter months. How will I know what to take for clothing?

_____ 6. Today’s temperature is 43 degrees Fahrenheit.

Lesson #2 – Latitude’s Effects on Climate

Summary of the Lesson

In this lesson, students engage in a differential heating activity to observe the influence of latitude on temperature. Using a globe, a directional lamp, and three thermometers, students will construct a model to test their predictions and hypotheses about where it is hottest and coldest on Earth’s surface and why.

Grade Level

4th and 5th Grades

Approximate Time Required

Two forty-five to sixty minute class periods

Lesson Objectives and Montana Science Standards and Benchmarks Addressed

1. Students will develop predictions and hypotheses about temperature variations in Earth’s climate and will test their ideas through experimentation. (MT State Standard 1, Benchmark 1, end of grade 8)
2. Students will be able to explain how latitude influences climate. (MT Standard 4, Benchmark 5, end of grade 8)

Resources/Materials Needed

For each small group of students:

- Globe
- Three strip thermometers used for reptile terrariums with temperature range sensitivity to above 100° F
- Directional Lamps (lamps should have a hot bulb and should be able to be pointed toward the globes)
- Ruler

For each student:

- Directional heating activity lab sheet
- Science journals

For the class:

- World map
- Index cards or sticky notes
- White board or chart paper and markers
- Internet access for student research
- Atlases for student research

Teacher Preparation

Before the lesson, gather the materials for the activity and make a copy of the lab sheet for each student. The thermometers can be purchased at a local pet store.

Test the experimental set up before using the lesson with students. Depending on the materials you have, the set up will vary. To create a lamp and globe set up, first attach three strip thermometers flat to the globe, placing one strip at the equator and one each at the 45th parallels north and south. Position the lamp height so that the light points directly toward the globe. Pointing the lamp directly at the equator simulates an equinox and is generally a good condition to use, although changing the angle of the light rays is one way to expand the inquiry and challenge students to think about seasonal variations in temperature. Experiment with the lamp's distance from the globe to determine the optimal distance for obtaining significantly different results for thermometers at the three latitudes - if the lamp is too close or too far, thermometer readings may not vary.

Background Information

Due to the position of the Sun relative to Earth, the equator receives more direct and thus more concentrated sunlight year round, resulting in more constant (and higher) temperatures than other latitudes. In contrast, Earth's tilt results in substantial seasonal variations in the angle of the Sun's rays at the 45th parallels north or south, leading to noticeable seasonal changes in temperature and weather. Thus latitude is a major factor influencing climate and weather on Earth.

Procedure

Engage

1. Activate students' prior knowledge by facilitating a discussion about the differences in weather in Montana's seasons. Ask students why they think these seasonal variations occur. Record students' ideas on the board or chart paper.

Explore

2. Divide students into groups of three to five. Ask students to work with their group to make predictions and hypotheses about items #1 and #2 on the lab sheet, the hottest and coldest places on Earth.
3. Next, demonstrate for students how to set up their models for the experiment. Assist groups in optimizing their set ups as necessary, particularly in positioning the lamp to obtain significant temperature variation across latitudes.
4. Students should work as a group to complete the investigation and fill in the lab sheet. Circulate to observe, assess, and assist students in constructing their understanding of the core concepts, asking probing questions and listening to students' conversations.

Explain

5. Bring the class together for a whole group discussion about their results and conclusions. Solicit their ideas and expand on them to fully address the core concepts. Use key vocabulary in fleshing out students' explanations – latitude, equator, angle and concentration of the Sun's rays, temperature, weather and climate.

Elaborate

6. In a hat, place slips of paper with latitudes and longitudes of specific locations on Earth with differing climates. Ask students to randomly draw a slip of paper from the hat.

7. Instruct students to use an atlas or the Internet to research the location they chose, and to note in particular the seasonal climate of the area. The next day they should bring two items of clothing to class that they would wear if they lived at that location on this day of the year.
8. Students will present to their classmates the location they chose, pointing it out on a map and explaining their reasoning for the two pieces of clothing they brought in. Chart the global climate on a large map of the world by placing a sticky note on each location that labels the climate that the students described for that location.
9. Discuss the resulting global climate data that the class compiled on the world map. Guide the discussion to help students discern and explain the patterns in climate that they observe across the world.
10. As a final assessment of their understanding of the influence of latitude on climate, ask students to journal in response to the following question: “How does latitude affect Earth’s climate?”

Formative Assessment

1. *Observations* - Teacher observations of students working on the activity in their groups will provide an informal means of assessing students’ understandings and naïve ideas about differential heating of the globe. The core concepts that the teacher should be assessing understanding of are:
 - The Earth’s tilt results in sunlight striking Earth at different angles over different latitudes on any given day of the year. The concentration of the Sun’s rays varies with the angle at which they strike Earth.
 - Temperature variations across Earth’s surface are influenced by differences in the concentration of sunlight at each latitude.
2. *Student lab sheets* – Students’ answers on the lab sheet can be used as an assessment of their understanding at this point in the lesson.
 - For the questions “Which thermometer’s temperature increased the most? Why?”, students should indicate that the thermometer placed at the latitude receiving the most direct light from the lamp was hottest.
 - For the questions “Why do you think that thermometer got hotter than the other thermometers? Why?”, students should explain that the areas with more direct light receive a higher concentration of energy from the sun in a given area, and therefore, reach a higher temperature.

Summative Assessment

1. *Clothing presentation* - Assess students’ work in preparing the presentation and their ability to explain why people wear a particular article of clothing for their specific location on Earth’s surface, its sunlight concentration, and its resulting climate.
2. *Student journals* – Students’ journal explanations of how latitude affects Earth’s climate is a good summative assessment. The depth of the explanation expected may vary depending on the student’s grade level, etc.

Name: _____

Date: _____

Differential Heating Lab Sheet

In this lab activity, your group will be using a Sun-Earth model to investigate the differences in how much our Sun heats Earth at various latitudes. Your teacher will demonstrate how to set up the model. Before you begin the activity, you are asked to work with your group to make some predictions and hypotheses about Earth's temperatures.

1. Predict where you think it will be hottest on Earth's surface and explain why you chose that location.

2. Predict where you think it will be coldest on Earth's surface and explain why you chose that location.

Lab Activity Directions

Once your model is set up correctly, turn on the lamps and begin the stopwatch. At five minute intervals, check the temperature of each of the three thermometers. Record the temperatures in the data table below. At the 20 minute mark, turn off the lamp and complete the lab questions below.

Data Table

	5 minutes	10 minutes	15 minutes	20 minutes
Thermometer #1 Latitude _____				
Thermometer #2 Latitude _____				
Thermometer #3 Latitude _____				

Conclusions

1. Which thermometer's temperature increased the most? Write your hypothesis (explanation) for why you think this latitude had the highest temperature.

2. Which thermometer's temperature increased the least? Write your hypothesis for why you think this latitude had the lowest temperature.

3. How do these differences in temperature at different latitudes affect Earth's climate?

Lesson #3 - Elevation's Effects on Climate and Weather

Summary of the Lesson

In this lesson students use their observations of differing weather effects at different elevations in their local area to discover and describe the effects of elevation on climate and weather.

Grade Level

4th and 5th Grades

Approximate Time Required

Two forty-five to sixty minute class periods

Lesson Objectives and Montana Science Standards and Benchmarks Addressed

1. Students will be able to describe how elevation influences climate and weather. (MT Standard 4, Benchmark 5, end of grade 8)

Resources/Materials Needed

- Science journals
- Venn diagram worksheets
- Blank sheet of paper for each student
- Access to school yard from which areas of different elevation can be viewed

Teacher Preparation

Make a copy of the Venn diagram worksheet for each student.

This lesson will work best when there are discernible differences visible between the valley and the mountains, i.e., when there is snow visible in the mountains. If you cannot take students to a site where they can observe the differences in person, you can use photos showing snow covered mountain peaks and clear valleys, or just ask students to draw on their experiences with weather at higher elevations, for example when they have gone camping, hunting or hiking.

Background Information

One reason temperatures are lower at higher elevations involves differences in air pressure. If you think about a giant column of air extending into the upper atmosphere, the air pressure in the column is higher near the ground because all of the air in the column above it is pressing down on the air near the ground. Air pressure is lower at higher elevations, where there is less air above it pressing down on it.

Air is made up of moving molecules of gases. Temperature is a measure of the average kinetic energy of molecules. Where there is less pressure, the molecules are spread more widely and therefore collide less frequently with each other, thus reducing their kinetic energy and so their temperature. This is one reason that air in the upper atmosphere, where there are fewer gas molecules per unit volume, is cooler compared with air near the ground.

Procedure

1. Take students outside to the playground with their journals. Instruct them to make written observations and drawings of both the valley floor and the mountaintops. Ask students, “What do you notice that is different when you compare the mountains and the valley?”. Students should notice that there is more snow at higher elevations. Ask them to predict what the weather is like at each location and to hypothesize why this difference exists.
2. Back in the classroom, facilitate a discussion, soliciting students’ observations and hypotheses about why they observed differences between the valley and the mountains.
3. Instruct students to complete a Venn diagram, comparing and contrasting the valley and the mountain tops.
4. Ask students to share their Venn diagrams. Ask them what they think caused the differences they observed between the valleys and the mountains. The students will likely infer that it is colder at higher elevations compared with lower elevations.
5. Lead a discussion to help students understand why there is an inverse relationship between temperature and elevation. Using a Smart board or whiteboard, draw a diagram of a column of air and explain that near the ground the gas molecules are closer together, under more pressure, and colliding more frequently, resulting in greater kinetic energy and higher temperatures. There are good online diagrams and simulations of this effect that could also be shared with students to help illustrate the concept.
6. After the discussion, ask students to revise their Venn diagrams using the new information they have talked about as a class. Ask students to share with the class how their Venn diagrams changed.

Formative Assessment

Teacher Observations - Teacher observations of students while they are outside, while they are completing their Venn diagrams and pictures, and during the ensuing discussions will provide a means to assess students’ understandings and naïve ideas about how elevation affects climate. The core concept that the teacher should be assessing understanding of is that it is relatively colder at higher elevations and warmer at lower elevations. At this grade level, students may not come to this lesson with a scientific understanding of the relationship between air pressure and temperature of gases.

The teacher may also opt to use a checklist to monitor individual students’ participation.

Summative Assessment

Students’ Final Venn Diagrams – Assess student learning by looking for some of the following types of differences/similarities on students’ revised Venn diagrams:

Differences:

- Precipitation in the mountains is more likely to be frozen precipitation compared with valley.
- Air pressure is lower in the mountains compared with the valley.
- Temperatures will be lower in the mountains compared with the valley.
- The molecules of gas are closer together near the ground (in the valley) compared with on the mountains.

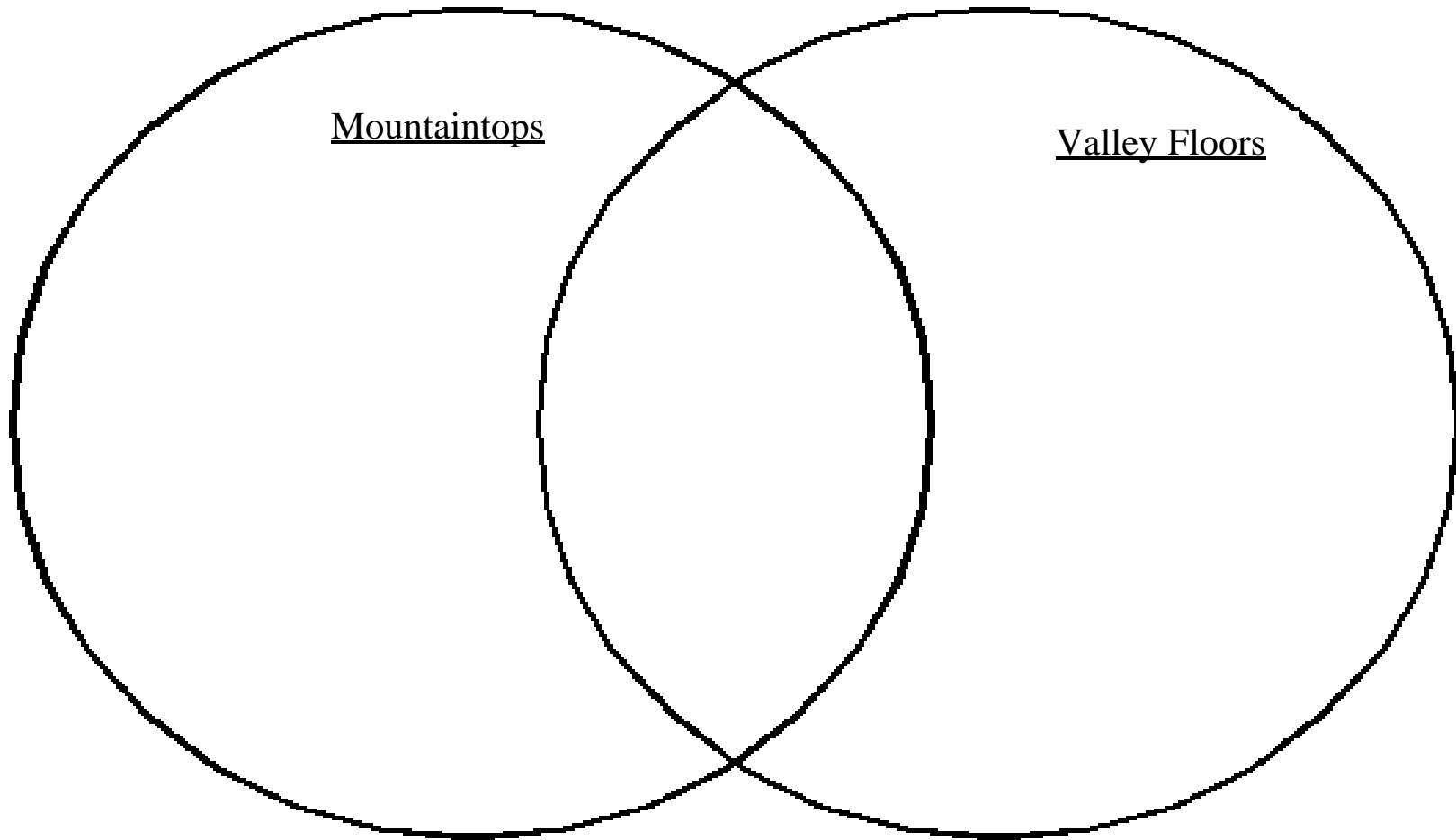
Similarities:

- Both the valley and the mountains are in the troposphere.
- There are grasses and trees in both the valley and on the mountains (though they may be different types).

Name: _____

Venn Diagram on Mountains and Valleys

Write three characteristics of climate of mountaintops, and three of climate of valley floors. Write three similarities between the two.



Lesson #4 – Graphing Climate on Climographs

Summary of the Lesson

In this lesson, students will create climographs for cities located at the same line of latitude that have differing climates. They will use evidence to discover that local geography also influences climate.

Grade Level

4th and 5th Grades

Approximate Time Required

Four forty-five to sixty minute class periods

Lesson Objectives and Montana Science Standards and Benchmarks Addressed

1. Students will develop hypotheses about what factors impact climate and will test them through investigations. (MT State Standard 1, Benchmark 1, end of grade 8)
2. Students will be able to explain how local geography influences climate and weather. (MT Standard 4, Benchmark 5, end of grade 8)

Resources/Materials Needed

- U.S. map
- Sticky notes
- Climograph data sheets
- Blank climographs
- “Questions about Climographs” worksheets
- Computer lab

Teacher Preparation

Copy the materials for the activity. Each student will need a climograph data sheet, a question worksheet, and a blank climograph. Schedule computer lab time for the class, if needed. Create the groups that students will work in for the activity.

Background Information

A climograph depicts the annual cycle of temperature and rainfall for a geographical location. On the graph, one vertical axis shows temperature and a second vertical axis shows rainfall. The horizontal axis shows time, usually in months.

The following website provides an example climograph and several helpful climate links:
www.uwsp.edu/geo/faculty/ritter/glossary/a_d/climograph.html

Procedure

Day One: Engage

- 1) Hold a class discussion about climographs, explaining that they are one method that scientists use to represent climates in specific locations. Show some example climographs for various

cities and climates.

- 2) Ask students to describe the climate, in terms of precipitation and temperature, for their own city. Demonstrate and assist students in creating a climograph for their city. The necessary monthly precipitation and temperature data can be provided or students may find it themselves on the Internet.

Day Two: Explore

1. As a class, locate each of the following cities on a map of the United States: Portland, Oregon; Missoula, Montana; Bismarck, North Dakota; Green Bay, Wisconsin; and Augusta, Maine. Place a sticky note on each city, to help students see that they are located at nearly the same latitude.
2. Ask students to pair/share their predictions of whether climate will be similar or different for all of the cities and why. What factors do the students think will influence the climate of the cities?
3. Group the students and assign each group a city to research. Go to the computer lab and using www.google.com or www.wikipedia.org, ask student groups to research and record on their data sheet the average monthly precipitation and temperature of their city over the course of a year. Check that all of the groups are recording data in the correct units - Celsius for temperature and centimeters for precipitation.

Day Three: Explore continued

1. Have student groups collaborate to create a climograph for their city.
2. After they create their climograph, students should discuss with their group what the climate of their city is like. Is it wet or dry? Is it hot or cold? How do the temperatures and precipitation levels vary over the course of a year?
3. Ask student groups to present their climographs and conclusions about their city's climate to the class.

Day Four: Explain

1. Lead a class discussion about the similarities and differences between the climates of the different cities. Point out each city again on the U.S. map. Solicit students' ideas about what they think causes the differences between the climates. Help students to consider factors such as elevation, how close the city is to a large body of water, if the city is located near any mountains and so forth. Some questions to ask the students include:
 - Are the climates of all of these cities the same?
 - Which cities have high levels of precipitation? Which cities have low levels?
 - Looking at the coldest month of each city, how would you order these cities from warmest to coldest?
 - What do you think causes these differences?
2. Ask students to answer the worksheet questions pertaining to climographs individually.

Day 5: Elaborate

1. Discuss other world cities, looking at their location on a globe or map. Students should consider the factors that they have learned that affect climate; assist them as needed. Have students work in pairs to write a prediction for the climate of each city and to provide an explanation for their prediction. Assign pairs to look up the climate for one of the cities.
2. As a class, encourage students' to discuss their predictions and compare them to the actual climate of each site. Were their predictions accurate? Why or why not?

Formative Assessment

Teacher observations - Teacher observations of students as they learn about climographs and work in their groups will provide a means to assess students' understanding of climographs and climate differences across a line of latitude. The core concepts that the teacher should be assessing understanding of are:

- Multiple factors can impact the climate of an area including elevation, proximity to bodies of water, proximity to mountains, and latitude.
- The climate of an area can be represented as a climograph showing average monthly precipitation and temperature over a year. Inferences about what the climate of a place is like can be made using a climograph.

Summative Assessment

1. *Climograph presentations* - Use the attached rubric to assess the groups' climograph presentations.
2. *"Questions About Climographs" Worksheet* - Examine students' worksheets for accuracy and thoroughness. Have they identified appropriate cities for high and low temperatures and precipitation levels? Have they chosen cities with similar climates and clearly explained why they are similar? Have they described accurately the factors that impact climates and can account for differences in climate for sites along the same latitude?

Name: _____

Date: _____

Climograph Data Sheet

Climograph data for the community of: _____

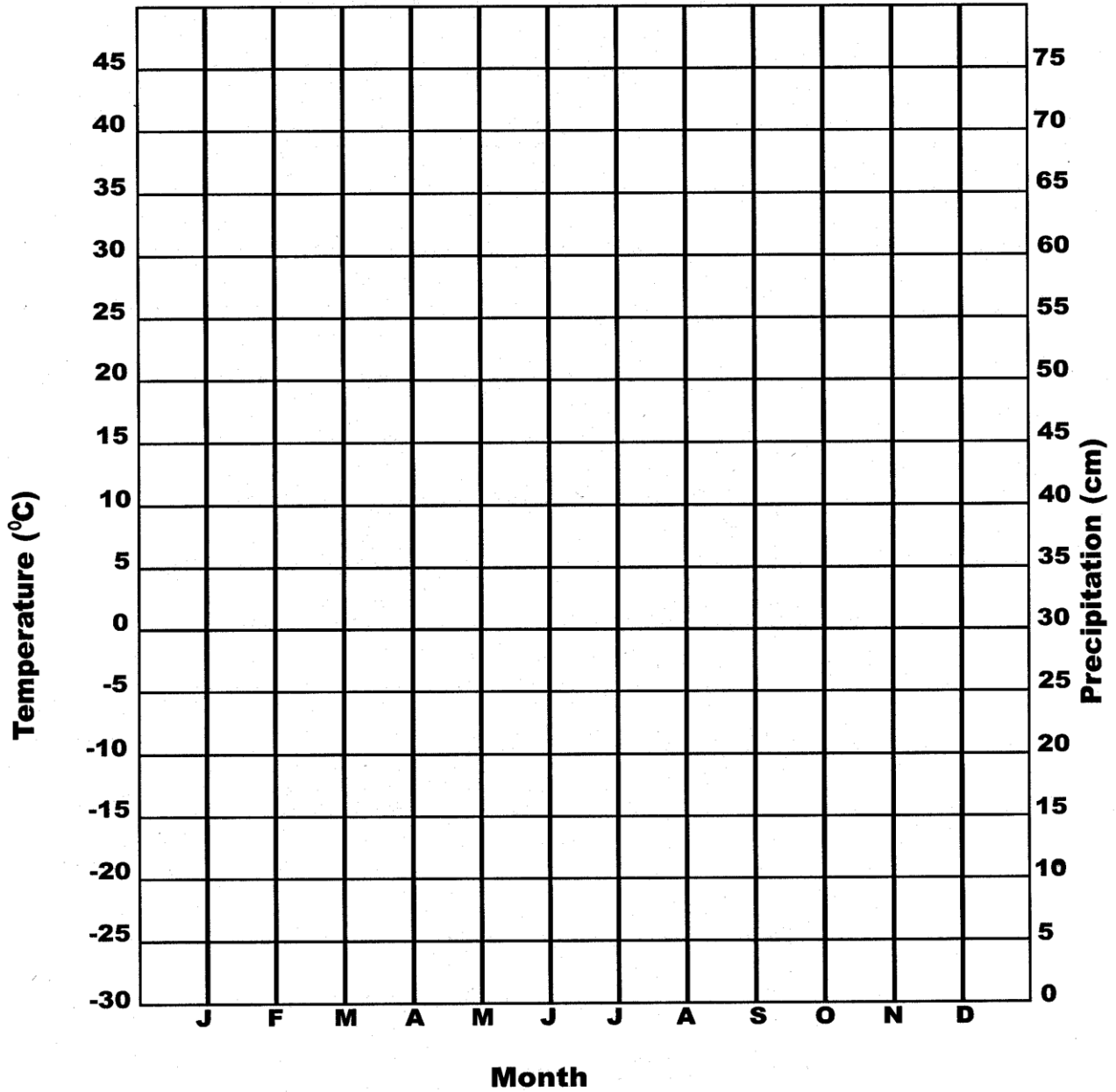
Website address where data came from: _____

Month	Average Temperature (degrees Celsius)	Average Precipitation (centimeters)
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Name: _____

Date: _____

Climograph for the Community of:



Name: _____

Date: _____

Questions about Climographs

1. Which city has the highest average precipitation?

Lowest average precipitation?

2. Which city has the highest average temperature?

Lowest average temperature?

3. Which two cities are most alike in temperature and precipitation? What factors do you think influence their climates to make them similar?

4. These cities are all located along the 45 degree north latitude line, but their climates are not all similar. Look more closely at the cities on the U. S. map. What might be some specific things about these cities that are making their climates differ?

Lesson #5 – Climate’s Influence on Tribal Lifestyles

Summary of the Lesson

In this activity, students research Montana’s tribal peoples and how their lifestyles are influenced by the climates in which they live. Students research specific information about a Montana tribe, design a poster using the information they find, and present it to their classmates. As a culminating activity for this lesson, a member of a Montana tribal community is invited to visit the class to discuss seasons and climate and how they relate to the tribe’s lifestyles.

Grade Level

4th and 5th Grades

Approximate Time Required

Four forty-five to sixty minute class periods

Lesson Objectives and Montana Science Standards and Benchmarks Addressed

1. Students will be able to describe the lifestyles and traditions of Montana’s tribal people as they relate to climate and seasonal change in Montana. (MT State Standard 5, Benchmark 5, end of grade 4 and 8)
2. Students will be able to reasonably infer the factors affecting the climate on each of Montana’s Indian reservations. (MT State Standard 5, Benchmark 5, end of grade 4 and 8)

Resources/Materials Needed

- Data sheet for gathering information about a Montana tribe (one per student)
- Poster board (one for each group)
- Books and other reference materials about specific tribes
- Tribal guest speaker to talk about tribal lifestyles (past and present) and climate
- Trunk on Montana’s First People, available at <http://montanahistoricalsociety.org>

Teacher Preparation

1. Copy the materials for the activity and schedule computer lab time for the class, if needed.
2. Designate the groups for the activity.
3. Gather reference materials for students to use in researching Montana’s tribal peoples. Most tribes have an official website. Also, Montana’s Office of Public Instruction has good resources for learning about Montana’s Native peoples (<http://opi.mt.gov>). Click the Indian Ed tab on the home page to find valuable links.
4. Invite a tribal guest speaker to visit the class. Make sure the class understands and follows respectful protocols for having a tribal visitor. For example, the visitor should be met at the door of the school, provided with a comfortable seat and something to drink. After the visit, it is appropriate for students to write thank you notes to the visitor. The visitor should be compensated appropriately.
5. Order the *Montana’s First People* trunk from the Montana Historical Society. This needs to be completed at least a month before this lesson.

Background Information

Montana has seven American Indian reservations and twelve tribes with diverse cultures and histories. Students should have knowledge of the reservations and tribes in Montana, including the history of each tribe. Use the Montana Historic Society trunk and the Montana Office of Public Instruction website to find lessons or reference materials to help students learn about Montana tribes.

Procedure

Days One and Two: Engage and Explore

1. Ask students about their own lifestyles – How does the climate in which they live affect their culture and lifestyles? Facilitate a discussion about climate and lifestyle, using examples from around the world. Share photos of diverse groups of people that show their climates and lifestyles.
2. Ask students if they can name the American Indian tribes and reservations in Montana. Point them out on a map. Ask what else they might know about Montana’s tribal people and about the climates on the various reservations.
3. Explain to students that they will be creating a teaching poster about a specific Montana tribe detailing their lifestyles, traditions, current issues, and so forth, especially as they relate to the climate in which they live. Emphasize that every member of the group should have a specific topic to research and contribute to the poster. Share with students the rubric with the criteria for their posters and presentations.
4. Divide the students into groups and assign each group a Montana tribe to study.
5. Provide the groups with time to research their assigned tribe.
6. Provide the groups with time to put their information together and design their posters.

Day Three: Explain

7. Ask student groups to share their posters. Allow time for discussion. Ask questions as needed to bring out the influence of factors (latitude, elevation, geography) on climate and the effects of climate on people’s lives.

Day Four: Elaborate

8. Invite a guest speaker from a Montana tribal community to visit the class to discuss how their tribe’s traditions and lifestyles relate to the climate of the place where they live.
9. After the visit, ask students to write a letter of thanks to the guest speaker explaining what they learned and enjoyed about the presentation.

Formative Assessment

Teacher observations - Teacher observations of students as they work in their groups to research a tribe are one means of assessing students’ developing understandings about the connection between climate, lifestyles, and cultural traditions of Montana tribes.

The teacher may also want to evaluate whether the students were effective in their group work, and making equal contributions to the research and presentations.

Summative Assessment

Research and presentation on Montana tribes - The teacher will evaluate students’ research by examining

1. *The data sheets for research on tribes* - Did students find accurate information that relates the tribe's lifestyle and traditions to the climate in which they live? Was their work thorough and their notes clear?
2. *The posters and their presentations* - Use the attached rubric to assess the groups' posters and presentations. Is their poster accurate, relevant, and aesthetically pleasing? Was the presentation informative and thorough? Did they include all of the requested elements? Did all members of the group make significant contributions?

Names: _____

Date: _____

Data Sheet for Research on a Montana Indian Tribe

Use the Internet, books, interviews, and other reliable resources to research the Montana Indian tribe you have been assigned. Gather information that is both historical (in the past) and contemporary (in the present). Your group will use this information to make a teaching poster that you will present to the class.

Name of the Montana Tribe you are researching: _____

1. Where does the tribe live? _____

2. What is the geography like in that area of Montana? _____

3. What is the elevation of the area? _____

4. Describe the climate where the tribe lives: _____

5. Describe the traditional clothing for the tribe: _____

6. Describe the traditional types of lodging for this tribe: _____

7. List typical foods, both past and present: _____

8. Describe past and present tribal traditions related to climate factors: _____

9. Describe present day tribal issues related to climate: _____

Lesson #6 – Seasons of the Montana Salish

Summary of the Lesson

In this lesson, students explore how the lifestyles of the Salish people of Montana (both past and present) relate to the climate of northwest Montana. Students examine the Salish calendar months and the seasonal events that go with them.

Lesson Objectives and Montana Science Standards and Benchmarks Addressed

1. Student will be able to describe the lifestyles and traditions (both past and present) of the Salish people of Montana. (MT State Standard 5, Benchmark 5, end of grade 4 and 8).
2. Students will be able to describe the connection between climate and seasonal activities of the Salish people.

Grade Level

4th and 5th Grades

Approximate Time Required

Two thirty to forty-five minute class periods

Resources/Materials Needed

- Salish and Pend d Oreille calendar months descriptions (attached)
- Photos showing seasonal activities of the Salish people (some are attached with the lesson)
- 3 x 5 notecards – one per student
- Salish and Pend d Oreille monthly activities cards

Teacher Preparation

1. Gather photos of Salish people engaged in seasonal activities. Some are included with this lesson. Many others are available on the Internet. One source is the Salish Kootenai College library collection (www.skclibrary/skc.edu). Copy two of each photo you intend to use.
2. Copy and cut apart the Salish and Pend d Oreille monthly activities descriptions and mount them on construction paper.

Background Information

Students should have knowledge of the tribes living on the Flathead Reservation, the contemporary home of the Montana Salish, Pend d Oreille and Kootenai people. There are numerous sources of accurate information about the tribes and the Flathead reservation available. Two recommended web sites are the Salish Kootenai College web site (www.skc.edu) and the web site of the Confederated Salish and Kootenai Tribes (<http://cskt.org>). Curriculum resources for K-12 that support learning about the tribes of Montana can be found on the web site for the Montana Office of Public Instruction under the Indian Ed tab (<http://opi.mt.gov>).

Procedure

Day One:

1. Ask students what conventions we commonly use to divide up our calendar year. Write the calendar months of the Gregorian calendar (the calendar commonly used in the United States and many other countries today) across the board, leaving space between each month. Discuss with students that calendars can vary, and that different groups of people define their calendars differently. Ask for students to contribute their ideas on this.
2. Show students the monthly activity cards for the Salish and Pend d Oreille calendar, in random order. Ask them what they notice about the names of the months on the Salish calendar. Guide the discussion as necessary so that students realize that the months are named after seasonal events – e.g., the Month of Bitterroot, when bitterroot is harvested.
3. Pair students up and give them a Salish and Pend d Oreille monthly activity card. Ask them to discuss with their partner what month they think the activity on the card occurs in each year and then place this card under the appropriate month written on the whiteboard. Give students about 10 minutes to do this.
4. Facilitate a class discussion, asking students to explain why they thought their card belonged in the month they chose. Give students an opportunity to change the placement of their monthly activity card as they hear other groups explain their thinking.
5. Once all of the partners are satisfied with their decisions, place the activities cards under the appropriate months and let students see if they were correct. Lead a final discussion about the monthly activities and guide students toward connecting the activities to climate and weather.

Day Two:

1. Place five to ten photo copies on different desks in the room. Tear the copy of each photo into two or three pieces, depending on how many students you have in class.
2. Hand a piece of the torn photo to each student and have them find the photo on one of the desks that matches their photo piece. Students with pieces of the same photo will form a collaborative group.
3. Have each group discuss among themselves their observations about the photo. What time of year is it? What are the people wearing? What are they doing?
4. Write the seasons spring, summer, autumn and winter at the four cardinal points in a large circle on the board. Ask students to place their photo in the season in which they think it belongs. Hold a class discussion in which student groups discuss why they think their photo depicts a particular season's activities. Guide students to make connections between the seasonal activities and the weather and climate of northwestern Montana.
5. Wrap up the lesson with an assessment. Have each student write one to two sentences on a note card that summarizes how climate and season affect the traditions and lifestyle of the Salish people. How does it affect the way Salish People live today? Do they have new ways to follow an old tradition? Do the students' families have traditions they follow throughout the year (e.g., berry picking in August)?

Formative Assessment

Teacher Observation/ Student note cards - Teacher observations of students as they work in their groups, as well as examination of students' comments on their note cards, will provide a check of students' developing understandings about the connection between climate and cultural traditions of Montana tribes.

Salish and Pend d'Oreille Calendar Months

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■ THE HAND SHAKING MONTH

Long ago, before the coming of the Black Robes and the trappers, our people, the Pend d'Oreille and Salish, would get together for the mid-winter gatherings. In these gatherings, they would sing what is called a hand shaking song. The second name for this month came about through the influences of the trappers and traders. During this time the people would gather together and shoot off their rifles and guns at midnight to welcome the New Year. After they shot off their rifles and guns they would go back inside and sing the hand shaking song. After the song was sung, the people would have a small meal and head off to bed.

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■ COLDEST MONTH

This is the month that our people regarded as the coldest month of the year. Their name for it meant it was very, very cold. The weather was often below zero during this month and the snow deep. This month was a long hard time for the Indian people.

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■ THE MONTH of the GEESE

When the geese are spotted flying in from the south, it is a good sign that the winter months are coming to an end. It is time to look ahead to warmer weather. During the first part of the month, some of the people would go to certain lakes to snag and trap fish. The people will be preparing for the hunting trips, berry picking, and root digging. This is also when the blackbirds start arriving back.

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■ MONTH of the BUTTERCUP

This is the Spring month. The first thunder is heard this month. All the bears, snakes, gophers, and other hibernating animals come out. Coyote stories are no longer told, they have been put away until the next snow fall. This is also the month when the buttercup, yellow bells and little dog, pussy willows are in bloom. The yellowbell is used as a fruit. It would also be mixed with bitterroot.

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■ MONTH of BITTERROOT

About this time each year the Salish & Pend d'Oreille started digging the bitterroot. When it was time to dig, the Chief would select a group of women to go ahead and check the roots to see if it was ready. If it peeled easily, then it was ready. Following a feast, everyone was then free to dig all that they need. A long time ago the people, they'd all get together when it was time to dig bitterroot or camas and go together and camp for days where the bitterroot was plentiful. They were making and storing food for the winter. Now days most of us are rich in food. We don't have such a hard time during the winter for our food anymore. But a long time ago the Indians

had to make and store food all summer for the winter months as we had no money to be buying food each day or week like now.

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■ MONTH of CAMAS

This is usually the month when the Camas is ready to dig. The Camas is baked in the ground for three days with black tree moss. During this month the Salish People make bark baskets for berry picking. Tipi poles are cut during this month as well, they peel easier. When the wild rose blossoms our people know that the buffalo are nice and fat. When the strawberries were ripe, the baby elk and deer were born.

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■ CELEBRATION MONTH

This is the middle of the summer months when all the people get together to celebrate and give thanks that they survived the wars and the long hard winter. The people donate in many ways to celebrate at this time of year. Each day several Indian leaders would gather at the Chief's tipi to discuss the activities for that day. After they had it all planned, the camp crier would ride among the encampment to announce each activity. The annual Arlee Celebration is usually the first weekend of this month.

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■ MONTH of the HUCKLEBERRY

The huckleberries ripen in the month of August and some as early as late July. They grew in abundance years ago. If they were plentiful, we would pick enough to last all winter and spring. Our people use cedar bark baskets made earlier in the year for holding the berries. The baskets are light weight and easy to carry. Berries never get crushed in these baskets. Other berries that are also ripe at this time are foam berries (Indian Ice Cream Berries), thimble berries, and raspberries. As we still do today, throughout this entire month we are picking and gathering the berries.

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■ MONTH of the CHOKECHERRY

The chokecherry is a dark red or black berry grown on tall bushes. It is one of the foods the Salish-Pen d'Oreille people pick for the winter supply. This is also the month for wild grapes. After it is picked it may be eaten fresh or mashed for drying. Elderberries are also picked during this month, which is usually when the last of the berries are gathered for the winter supplies.

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■ HUNTING MONTH

A hunting party of young men would go up into hunting grounds. The leader would give the directions and calls to let the others know when to be ready and when to make moves. The

animals were chased into a corral and only what was needed was taken. After the men killed enough meat for the camp they would then take all the meat back to the women who would then slice and dry the meat, then divided it equally among all the camps. They would pack their meat in their hunting packs and start for home. This is the month for getting the meat needed to last through the long winter months, usually the large game animals.

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■ STORY TELLING

Story telling begins after the first snowfall. This is a time of year when the Salish people relax from the summer and early fall harvesting seasons. Stories are told by parents and grandparents to the younger generations. The children are encouraged to sit quietly and listen with thoughts of their own about being part of the stories. The stories teach and tell of values and morals. From these stories we can still today see landmarks that tell us of the creation of mankind. From these stories, we learn how mankind came to be. In early spring the stories are put away and are not to be told until snowfall again in the winter season.

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■ TRAPPING MONTH

This is the time of year when Salish and Pend d'Oreille did the trapping. Some time ago, we trapped martin, weasel, mink, otter, beaver and muskrat. We use the skins of these animals in different ways – braid wraps, trimming for outfits among other uses. Today, these animals aren't in as much as abundance as they once were long ago and are trapped and used carefully.