# FUN-ology! Seasons Make the World Go 'Round: A Three Lesson Unit – 3-5 Earth and Space Science

## Lesson One:
## What can air temperature data tell us about the seasons in Montana?

This is the first of three lessons looking at air temperature patterns and interpreting their impacts on a region. In this introductory lesson, students are introduced to the Salish moons and the seasonal delights each moon brings with it. The students then look at air temperature data and analyze it for trends (i.e., does it seem to get warmer or colder throughout the month?).

In this three-lesson unit students will analyze and interpret data using western models of data tables and traditional seasonal rounds of Montana Indian tribes. Students will synthesize their experiences from previous lessons to build their own seasonal round using a combination of the models they have studied. Students will explore life cycles and how biotic (living) and abiotic (non-living) factors influence each other throughout the unit using multiple ways of knowing.

The second lesson explores seasonal rounds from the Salish, Shoshone Bannock, and Nez Perce tribal perspectives. The students apply average temperature data to the Salish seasonal round to help them understand how the rounds work and how western science and traditional knowledge both help people to understand more about the world around them.

In the third lesson students will synthesize western scientific knowledge and tribal seasonal round information. The students will create a list of organisms they can observe and identify the stages in their life cycles. Finally, students will share information regarding unique life cycles of organisms via their personal seasonal rounds.

Phenological (or "fun-ological") data has been collected by human beings for millennia. Phenology is the study of cyclic and seasonal natural phenomena, especially in relation to climate and plant and animal life. To survive, subsist, and thrive in a harsh environment such as Montana, tribes had to observe, track, interpret, analyze, predict, and transfer phenological knowledge. This knowledge was shared from generation to generation and helped families know where the best winter, spring, summer, and fall campsites were as well as what plants and animals could be found during each season; plants and animals that would provide food, shelter, clothing, and tools.

When one observes the landscape, weather, seasons, animal behaviors, plant availability, water availability, and uses this information to maximize their natural resources, this is called a seasonal round. Seasonal rounds can be movement within a landscape for subsistence or a round can also be based upon events that help us acknowledge those seasonal changes that happen yearly, such as birthdays or annual hunting trips or summer family camping trips to a special place. More than just annual events, seasonal rounds include those indicators such as trees getting their leaves again after winter, leaves turning orange and yellow and brown in the fall, and the longer, warmer, sunnier days of summer. Seasonal rounds remind us we are passengers on a sphere that has an annual journey around our star, the sun. This journey around our star, the tilt of the Earth on its axis, and the

Earth's daily rotation create the seasons no matter where we live on Earth. Where we live, north of the equator, south of the equator, east of a major mountain range, or west of an ocean, determines our weather and climate.

## Montana State Science Standards

### 3-ESS2-Earth's Systems

| Systems |
|---|
| Students who demonstrate understanding can: |
| **Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** [Clarification Statement: Examples of data at this grade level could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.] |
| The performance expectations above were developed using the following elements from the NRC document *A Framework for K–12 Science Education*: |

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
|---|---|---|
| **Analyzing and Interpreting Data** | **ESS2.D: Weather and Climate** | **Cause and Effect** |
| Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. | • Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. | • Cause and effect relationships are routinely identified and used to explain change. |
| • Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. | | |

| |
|---|
| *San Diego County Office of Education Science Resource Center Educator tools to support the implementation of NGSS* |
| *Articulation of DCIs across grade-bands:* **K.ESS2.D**; **4.ESS2.A**; **5.ESS2.A**; **MS.ESS2.C**; **MS.ESS2.D** |
| *Montana State Standards Connections:* |
| *Mathematics* |
| *3.MP.2 Reason abstractly and quantitatively.* |
| *3.MP.4 Model with mathematics.* |
| *3.MP.5 Use appropriate tools strategically.* |
| *3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.* |
| *3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in bar graphs.* |

# IEFA Essential Understandings

## Essential Understanding 3: Oral Histories as Valid as Written Histories

*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 predate the "discovery" of North America.*

Key Concepts of Essential Understanding 3

- The term spirituality within a cultural context can be limiting and misconstrued. Spirituality to Indigenous peoples generally refers to one aspect of their worldview in which all things are connected. Spirituality in this context does not necessarily equate to nor denote religion.

- A complex history of pre-Columbian tribal migrations and intertribal interactions, European colonization and Christianization efforts, and federal assimilation policies have contributed to the broad range of spiritual beliefs held by American Indians today.

- Despite this history, Native people have retained their spiritual beliefs and traditions – tribal languages are still spoken, sacred songs are still sung, and rituals and ceremonies are still performed.

- It is not important for educators to understand all the complexities of modern day American Indian cultures; however, they should be aware of their existence and the fact they can influence much of the thinking and practice of American Indians today.

- Humor plays an important role in American Indian cultures, there was no "stoic" Indian.

- Tribal oral traditions, ideologies, worldviews, and the principles and values associated with them, are as valid as other such traditions from around the world and should be accorded the same respect and standing.

- Educators should be aware that portions of these principles and values are private and are to be used and understood by certain individuals, groups, or the entire tribe. Tribal culture bearers, experts, and others can assist educators in navigating these situations.

# Learning Objectives

Students will:

- analyze air temperature information;
  represent seasonal weather data using tables and graphical displays.

# Background Information

The Salish Seasonal Round by Julie Cajune

Salish, Pend d'Oreille, Blackfeet, and Kootenai background knowledge building on seasons from Glacier National Park's Workhouse Curriculum

The Story of the Bitterroot video (Part 1 of 7)

Blackfeet Seasonal Round

Blackfeet Seasonal Round Teacher Toolkit

Nez Perce Seasonal Round

Excellent NGSS-aligned lesson: Differences between Climate and Weather and NSTA review of lesson

Make your own phenology wheel from Montana Natural History Center

## Materials

- *Huckleberries, Buttercups, and Celebrations*, by Jennifer K. Greene
(*\*this book has been purchased and sent to all public Montana elementary school libraries by the Office of Public Instruction Indian Education for All Unit*)

- One of the data tables provided at the end of this lesson

- Graph paper

## Procedure

Read-Aloud

Begin this lesson by reading students the book, *Huckleberries, Buttercups, and Celebrations*, by Jennifer K. Greene. This book will introduce students to the idea of traditional Salish record keeping through oral and pictorial traditions while setting the stage for the entire unit. Invite students to share the moments in the book they connected with and how they think the traditions in the book might be important in modern-day life.

Class Discussion

Ask students how information and data is collected. Is it only with instruments by scientists? Is it through observation and note taking? Can it be through observation and sharing of that information from generation to generation? How do the Salish know to use ancient names for their months?

*Teacher tip – Excellent culturally responsive instruction would include weaving the following into the class discussion:*

- *Tribal knowledge of all plants, animals, weather patterns, ways the climate has changed over time, geologic features, etc. on both aboriginal territories and treaty lands has existed for thousands of years and has been shared throughout the generations. This knowledge continues to grow and be shared among tribal members and contributes to the way tribes manage natural resources on their lands.*

- *Tribal worldviews (epistemologies) include a belief that all things are connected and related. Therefore, every tree, every bird, every insect, every human is part of an interconnected web. If one is to respect oneself, one must respect all other beings. The values of respect, reciprocity, redistribution, and responsibility guide how knowledge of the natural world is gained, used, and shared.*

- *Both Western science and traditional knowledges are valid ways of knowing and understanding the world around us. They were both developed by vastly different cultures for different purposes. Traditional ecological knowledge evolved to support subsistence and survival. Western science was developed to measure and prove ideas about how the universe works. Both help us make sense of the many mysteries about life, the planet we live on, and our place in the universe.*

- *Seasonal rounds vary with each tribe and are dependent on where they live and the climate of that location.*

Let students know they will be studying the air temperature over the next few lessons, and they are going to start by using modern science to help them. Ask students how our society has come to rely on thermometers and what information or data can be collected with thermometers. Invite students to think-pair-share about weather patterns. Allow them time to engage with the topic and pull from their own experiences for increased engagement.

<u>Small Group Work</u>

The students are divided into pairs or small groups and given one of the tables provided at the end of this lesson. *Teachers will need to decide prior to teaching this lesson which of the three tables is most appropriate for their classes' level, the time students will have to interpret the table, and other activities beyond this unit that students might be doing with weather information*.

The groups should discuss what this data means, and how it might impact organisms living in the region. Ask the students what they notice about the data, what do they notice about how the data is presented, and if they can explain how this data was presented in the book, *Huckleberries, Buttercups, and Celebrations* (e.g., Do the temperatures seem to increase or decrease over time? Is there other information provided with your data set? Was similar information presented in the book? If so, how was the information presented in the text?).

Ask students to interpret the data given to them by creating a line graph that depicts the temperature patterns. *This data will be also used in a FUN-ology Lesson Two assignment.*

Ask students what they notice about this visual temperature representation. What benefits and drawbacks do they notice about this model and what is the evidence for their argument?

Ask students how they would record temperature data if thermometers had not been invented? *This question is intended to prepare students for the next lesson.*

## Assessment

Students will describe how a table of weather data can be transferred to a graphical representation and will create their own line graphs. This can be measured through verbal discussions and completion of a line graph using one of the weather data tables provided.

Students will articulate how the line graph they created helped them understand the temperature patterns they studied and provide evidence for their understanding using the correlation between the increase and decrease of temperatures on their graphs (i.e., explaining the correlation between the increase and/or decrease of the temperature with the lines on their graphs). This can be measured through verbal discussions.

## Resources

[US Climate Data Website](US Climate Data Website) (open source)

# Teacher Resources for Weather Data

## Resource 1

<u>Monthly High Temperature Averages for Helena, MT</u>

This data of monthly high average temperatures in Fahrenheit was collected from daily temperature readings in Helena, Montana from 1981-2010.

| January: | 33°F |
|----------|------|
| February: | 39°F |
| March: | 48°F |
| April: | 58°F |
| May: | 67°F |
| June: | 76°F |
| July: | 86°F |
| August: | 85°F |
| September: | 73°F |
| October: | 59°F |
| November: | 43°F |
| December: | 32°F |

Fun-ology! Lesson 1: What can air temperature data tell us about the seasons in Montana 2020

Page 6

## Resource 2

January, April, July, and October Daily High Temperature Averages for Helena, MT

Four months (reflecting each season after the solstice and equinox to better represent each season's average) of daily high temperatures. This data of daily high average temperatures in Fahrenheit was collected from daily temperature readings in Helena, Montana from 1981-2010 in January, April, July, and October.

| DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F |
|---|---|---|---|---|---|---|---|
| 1 Jan | 31.1 | 1 Apr | 53.5 | 1 Jul | 81.3 | 1 Oct | 65.6 |
| 2 Jan | 31.3 | 2 Apr | 53.8 | 2 Jul | 81.6 | 2 Oct | 65.1 |
| 3 Jan | 31.4 | 3 Apr | 54.1 | 3 Jul | 82.0 | 3 Oct | 64.7 |
| 4 Jan | 31.5 | 4 Apr | 54.3 | 4 Jul | 82.4 | 4 Oct | 64.2 |
| 5 Jan | 31.7 | 5 Apr | 54.6 | 5 Jul | 82.8 | 5 Oct | 63.8 |
| 6 Jan | 31.8 | 6 Apr | 54.9 | 6 Jul | 83.2 | 6 Oct | 63.3 |
| 7 Jan | 31.9 | 7 Apr | 55.2 | 7 Jul | 83.5 | 7 Oct | 62.9 |
| 8 Jan | 32.1 | 8 Apr | 55.5 | 8 Jul | 83.9 | 8 Oct | 62.4 |
| 9 Jan | 32.2 | 9 Apr | 55.8 | 9 Jul | 84.2 | 9 Oct | 62.0 |
| 10 Jan | 32.4 | 10 Apr | 56.1 | 10 Jul | 84.6 | 10 Oct | 61.5 |
| 11 Jan | 32.6 | 11 Apr | 56.4 | 11 Jul | 84.9 | 11 Oct | 61.1 |
| 12 Jan | 32.7 | 12 Apr | 56.7 | 12 Jul | 85.2 | 12 Oct | 60.6 |
| 13 Jan | 32.9 | 13 Apr | 57.0 | 13 Jul | 85.5 | 13 Oct | 60.2 |
| 14 Jan | 33.0 | 14 Apr | 57.3 | 14 Jul | 85.8 | 14 Oct | 59.7 |
| 15 Jan | 33.2 | 15 Apr | 57.6 | 15 Jul | 86.1 | 15 Oct | 59.2 |
| 16 Jan | 33.3 | 16 Apr | 57.9 | 16 Jul | 86.3 | 16 Oct | 58.8 |
| 17 Jan | 33.5 | 17 Apr | 58.2 | 17 Jul | 86.6 | 17 Oct | 58.3 |
| 18 Jan | 33.6 | 18 Apr | 58.5 | 18 Jul | 86.8 | 18 Oct | 57.9 |
| 19 Jan | 33.8 | 19 Apr | 58.8 | 19 Jul | 87.0 | 19 Oct | 57.4 |
| 20 Jan | 33.9 | 20 Apr | 59.1 | 20 Jul | 87.2 | 20 Oct | 56.9 |
| 21 Jan | 34.1 | 21 Apr | 59.4 | 21 Jul | 87.4 | 21 Oct | 56.5 |
| 22 Jan | 34.2 | 22 Apr | 59.8 | 22 Jul | 87.5 | 22 Oct | 56.0 |
| 23 Jan | 34.3 | 23 Apr | 60.1 | 23 Jul | 87.6 | 23 Oct | 55.5 |
| 24 Jan | 34.5 | 24 Apr | 60.4 | 24 Jul | 87.7 | 24 Oct | 55.0 |
| 25 Jan | 34.6 | 25 Apr | 60.7 | 25 Jul | 87.8 | 25 Oct | 54.5 |
| 26 Jan | 34.8 | 26 Apr | 61.0 | 26 Jul | 87.9 | 26 Oct | 54.0 |
| 27 Jan | 34.9 | 27 Apr | 61.4 | 27 Jul | 87.9 | 27 Oct | 53.5 |
| 28 Jan | 35.1 | 28 Apr | 61.7 | 28 Jul | 88.0 | 28 Oct | 53.0 |
| 29 Jan | 35.2 | 29 Apr | 62.0 | 29 Jul | 88.0 | 29 Oct | 52.5 |
| 30 Jan | 35.4 | 30 Apr | 62.3 | 30 Jul | 88.0 | 30 Oct | 52.0 |
| 31 Jan | 35.5 | Blank | Blank | 31 Jul | 87.9 | 31 Oct | 51.5 |

**Resource 3**

Daily High Temperature Averages for Helena, MT
Twelve months of daily high temperature averages in Fahrenheit collected from daily temperature readings from 1981-2010.

| DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Jan | 31.1 | 1 Feb | 35.7 | 1 Mar | 42.8 | 1 Apr | 53.5 | 1 May | 62.7 | 1 Jun | 71.3 |
| 2 Jan | 31.3 | 2 Feb | 35.8 | 2 Mar | 43.2 | 2 Apr | 53.8 | 2 May | 63.0 | 2 Jun | 71.6 |
| 3 Jan | 31.4 | 3 Feb | 36.0 | 3 Mar | 43.6 | 3 Apr | 54.1 | 3 May | 63.3 | 3 Jun | 71.8 |
| 4 Jan | 31.5 | 4 Feb | 36.1 | 4 Mar | 43.9 | 4 Apr | 54.3 | 4 May | 63.6 | 4 Jun | 72.1 |
| 5 Jan | 31.7 | 5 Feb | 36.3 | 5 Mar | 44.3 | 5 Apr | 54.6 | 5 May | 64.0 | 5 Jun | 72.4 |
| 6 Jan | 31.8 | 6 Feb | 36.5 | 6 Mar | 44.7 | 6 Apr | 54.9 | 6 May | 64.3 | 6 Jun | 72.6 |
| 7 Jan | 31.9 | 7 Feb | 36.7 | 7 Mar | 45.0 | 7 Apr | 55.2 | 7 May | 64.6 | 7 Jun | 72.9 |
| 8 Jan | 32.1 | 8 Feb | 36.9 | 8 Mar | 45.4 | 8 Apr | 55.5 | 8 May | 64.9 | 8 Jun | 73.2 |
| 9 Jan | 32.2 | 9 Feb | 37.1 | 9 Mar | 45.8 | 9 Apr | 55.8 | 9 May | 65.2 | 9 Jun | 73.5 |
| 10Jan | 32.4 | 10Feb | 37.3 | 10Mar | 46.1 | 10Apr | 56.1 | 10May | 65.5 | 10Jun | 73.7 |
| 11Jan | 32.6 | 11Feb | 37.5 | 11Mar | 46.5 | 11Apr | 56.4 | 11May | 65.8 | 11Jun | 74.0 |
| 12Jan | 32.7 | 12Feb | 37.7 | 12Mar | 46.9 | 12Apr | 56.7 | 12May | 66.1 | 12Jun | 74.3 |
| 13Jan | 32.9 | 13Feb | 38.0 | 13Mar | 47.2 | 13Apr | 57.0 | 13May | 66.4 | 13Jun | 74.7 |
| 14Jan | 33.0 | 14Feb | 38.2 | 14Mar | 47.6 | 14Apr | 57.3 | 14May | 66.7 | 14Jun | 75.0 |
| 15Jan | 33.2 | 15Feb | 38.5 | 15Mar | 48.0 | 15Apr | 57.6 | 15May | 67.0 | 15Jun | 75.3 |
| 16Jan | 33.3 | 16Feb | 38.7 | 16Mar | 48.3 | 16Apr | 57.9 | 16May | 67.2 | 16Jun | 75.6 |
| 17Jan | 33.5 | 17Feb | 39.0 | 17Mar | 48.7 | 17Apr | 58.2 | 17May | 67.5 | 17Jun | 76.0 |
| 18Jan | 33.6 | 18Feb | 39.3 | 18Mar | 49.0 | 18Apr | 58.5 | 18May | 67.8 | 18Jun | 76.3 |
| 19Jan | 33.8 | 19Feb | 39.5 | 19Mar | 49.4 | 19Apr | 58.8 | 19May | 68.1 | 19Jun | 76.7 |
| 20Jan | 33.9 | 20Feb | 39.8 | 20Mar | 49.7 | 20Apr | 59.1 | 20May | 68.3 | 20Jun | 77.0 |
| 21Jan | 34.1 | 21Feb | 40.1 | 21Mar | 50.0 | 21Apr | 59.4 | 21May | 68.6 | 21Jun | 77.4 |
| 22Jan | 34.2 | 22Feb | 40.5 | 22Mar | 50.4 | 22Apr | 59.8 | 22May | 68.8 | 22Jun | 77.8 |
| 23Jan | 34.3 | 23Feb | 40.8 | 23Mar | 50.7 | 23Apr | 60.1 | 23May | 69.1 | 23Jun | 78.1 |
| 24Jan | 34.5 | 24Feb | 41.1 | 24Mar | 51.0 | 24Apr | 60.4 | 24May | 69.3 | 24Jun | 78.5 |
| 25Jan | 34.6 | 25Feb | 41.4 | 25Mar | 51.3 | 25Apr | 60.7 | 25May | 69.6 | 25Jun | 78.9 |
| 26Jan | 34.8 | 26Feb | 41.8 | 26Mar | 51.7 | 26Apr | 61.0 | 26May | 69.8 | 26Jun | 79.3 |
| 27Jan | 34.9 | 27Feb | 42.1 | 27Mar | 52.0 | 27Apr | 61.4 | 27May | 70.1 | 27Jun | 79.7 |
| 28Jan | 35.1 | 28Feb | 42.5 | 28Mar | 52.3 | 28Apr | 61.7 | 28May | 70.3 | 28Jun | 80.1 |
| 29Jan | 35.2 | 29Feb | 42.7 | 29Mar | 52.6 | 29Apr | 62.0 | 29May | 70.6 | 29Jun | 80.5 |
| 30Jan | 35.4 | Blank | Blank | 30Mar | 52.9 | 30Apr | 62.3 | 30May | 70.8 | 30Jun | 80.9 |
| 31Jan | 35.5 | Blank | Blank | 31Mar | 53.2 | Blank | Blank | 31May | 71.1 | Blank | Blank |

| DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F | DATE | HIGH °F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Jul | 81.3 | 1 Aug | 87.9 | 1 Sep | 79.0 | 1 Oct | 65.6 | 1 Nov | 51.0 | 1 Dec | 35.1 |
| 2 Jul | 81.6 | 2 Aug | 87.8 | 2 Sep | 78.6 | 2 Oct | 65.1 | 2 Nov | 50.5 | 2 Dec | 34.7 |
| 3 Jul | 82.0 | 3 Aug | 87.7 | 3 Sep | 78.2 | 3 Oct | 64.7 | 3 Nov | 49.9 | 3 Dec | 34.3 |
| 4 Jul | 82.4 | 4 Aug | 87.6 | 4 Sep | 77.7 | 4 Oct | 64.2 | 4 Nov | 49.4 | 4 Dec | 33.9 |
| 5 Jul | 82.8 | 5 Aug | 87.5 | 5 Sep | 77.3 | 5 Oct | 63.8 | 5 Nov | 48.9 | 5 Dec | 33.5 |
| 6 Jul | 83.2 | 6 Aug | 87.3 | 6 Sep | 76.9 | 6 Oct | 63.3 | 6 Nov | 48.3 | 6 Dec | 33.2 |
| 7 Jul | 83.5 | 7 Aug | 87.1 | 7 Sep | 76.4 | 7 Oct | 62.9 | 7 Nov | 47.8 | 7 Dec | 32.9 |
| 8 Jul | 83.9 | 8 Aug | 87.0 | 8 Sep | 76.0 | 8 Oct | 62.4 | 8 Nov | 47.2 | 8 Dec | 32.6 |
| 9 Jul | 84.2 | 9 Aug | 86.8 | 9 Sep | 75.6 | 9 Oct | 62.0 | 9 Nov | 46.7 | 9 Dec | 32.3 |
| 10 Jul | 84.6 | 10 Aug | 86.6 | 10 Sep | 75.1 | 10 Oct | 61.5 | 10 Nov | 46.1 | 10 Dec | 32.0 |
| 11 Jul | 84.9 | 11 Aug | 86.3 | 11 Sep | 74.7 | 11 Oct | 61.1 | 11 Nov | 45.6 | 11 Dec | 31.8 |
| 12 Jul | 85.2 | 12 Aug | 86.1 | 12 Sep | 74.2 | 12 Oct | 60.6 | 12 Nov | 45.0 | 12 Dec | 31.6 |
| 13 Jul | 85.5 | 13 Aug | 85.8 | 13 Sep | 73.8 | 13 Oct | 60.2 | 13 Nov | 44.4 | 13 Dec | 31.4 |
| 14 Jul | 85.8 | 14 Aug | 85.5 | 14 Sep | 73.3 | 14 Oct | 59.7 | 14 Nov | 43.9 | 14 Dec | 31.2 |
| 15 Jul | 86.1 | 15 Aug | 85.3 | 15 Sep | 72.9 | 15 Oct | 59.2 | 15 Nov | 43.3 | 15 Dec | 31.1 |
| 16 Jul | 86.3 | 16 Aug | 85.0 | 16 Sep | 72.4 | 16 Oct | 58.8 | 16 Nov | 42.7 | 16 Dec | 30.9 |
| 17 Jul | 86.6 | 17 Aug | 84.7 | 17 Sep | 72.0 | 17 Oct | 58.3 | 17 Nov | 42.2 | 17 Dec | 30.8 |
| 18 Jul | 86.8 | 18 Aug | 84.3 | 18 Sep | 71.5 | 18 Oct | 57.9 | 18 Nov | 41.6 | 18 Dec | 30.7 |
| 19 Jul | 87.0 | 19 Aug | 84.0 | 19 Sep | 71.0 | 19 Oct | 57.4 | 19 Nov | 41.1 | 19 Dec | 30.6 |
| 20 Jul | 87.2 | 20 Aug | 83.7 | 20 Sep | 70.6 | 20 Oct | 56.9 | 20 Nov | 40.5 | 20 Dec | 30.6 |
| 21 Jul | 87.4 | 21 Aug | 83.3 | 21 Sep | 70.1 | 21 Oct | 56.5 | 21 Nov | 40.0 | 21 Dec | 30.5 |
| 22 Jul | 87.5 | 22 Aug | 83.0 | 22 Sep | 69.7 | 22 Oct | 56.0 | 22 Nov | 39.5 | 22 Dec | 30.5 |
| 23 Jul | 87.6 | 23 Aug | 82.6 | 23 Sep | 69.2 | 23 Oct | 55.5 | 23 Nov | 38.9 | 23 Dec | 30.5 |
| 24 Jul | 87.7 | 24 Aug | 82.2 | 24 Sep | 68.8 | 24 Oct | 55.0 | 24 Nov | 38.4 | 24 Dec | 30.5 |
| 25 Jul | 87.8 | 25 Aug | 81.8 | 25 Sep | 68.3 | 25 Oct | 54.5 | 25 Nov | 37.9 | 25 Dec | 30.6 |
| 26 Jul | 87.9 | 26 Aug | 81.5 | 26 Sep | 67.9 | 26 Oct | 54.0 | 26 Nov | 37.4 | 26 Dec | 30.6 |
| 27 Jul | 87.9 | 27 Aug | 81.1 | 27 Sep | 67.4 | 27 Oct | 53.5 | 27 Nov | 36.9 | 27 Dec | 30.7 |
| 28 Jul | 88.0 | 28 Aug | 80.7 | 28 Sep | 66.9 | 28 Oct | 53.0 | 28 Nov | 36.4 | 28 Dec | 30.7 |
| 29 Jul | 88.0 | 29 Aug | 80.3 | 29 Sep | 66.5 | 29 Oct | 52.5 | 29 Nov | 36.0 | 29 Dec | 30.8 |
| 30 Jul | 88.0 | 30 Aug | 79.8 | 30 Sep | 66.0 | 30 Oct | 52.0 | 30 Nov | 35.5 | 30 Dec | 30.9 |
| 31 Jul | 87.9 | 31 Aug | 79.4 | Blank | Blank | 31 Oct | 51.5 | Blank | Blank | 31 Dec | 31.0 |

Fun-ology! Lesson 1: What can air temperature data tell us about the seasons in Montana 2020

Page 9