Weather and Climate 5E Lesson Plan

Grade Level	Standard(s)
6 - 8	MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

Objective

Students will be able to:
- identify the difference between weather and climate.
- Identify the factors used to determine each.

* All Gale In Context: Science resources used in this lesson plan and how to locate them are listed on page three.

ENGAGE

1. As a class, discuss what students know about climate. Some questions you may want to ask are:
   a. How would you describe the climate we have in (your state)?
   b. What tells you this is our climate?
2. Next, as a class have students share what they know about California's climate (if you live in California, you can skip this step.) You may want to have students share how it is similar or different from your own.
3. After discussing the students' prior knowledge, show the video "**Parts of California blanketed by snow in rare winter storm**" and ask students to write down what they observe.
4. After watching the video ask students to share their thoughts on the video and if it matched what they previously thought about California's climate. Also, ask how the title of the video is important.
   a. You want students to recognize this is a "rare" occurrence.
5. Explain to students that this snowstorm in California would be considered a weather occurrence and not an indication of climate.
6. Tell students that today they will be learning the difference between weather and climate.

EXPLORE

1. Share the link to **NASA Global Maps** website and direct students to the "Land Surface Temperature Anomaly" Map.
2. Allow students a few minutes to watch the map animation.
3. Next, ask students to work with a partner to find examples of a change in weather and a change in climate on the map animation.
4. Have students share their evidence as a class to see what different groups noticed.
5. Ask students to write what factors they think are important in determining a change in climate.
   a. Change in weather could be temperature change from one month to another in the same year.
   b. Change in climate could be change in temperature from a month in the year 2000 to the same month in the year 2022.

Gale, here for **everyone.**

✳ GALE

EXPLAIN

1. Have students watch the **Weather vs. Climate Video** and take notes on the factors used to determine weather and climate and how much time it takes to collect each.
2. Have them answer the questions:
    a. How much data do we need to determine the weather?
    b. How much data do we need to determine the climate?
    c. What would be an example of the climate changing?
3. Then, as a class listen to **Why There is a Change Coming to Your Local Weather Forecast** Audio Clip.
4. After listening, ask students to discuss with their partner why meteorologists are having to update their averages and why this is important.
5. Explain after that climate is based on years of weather data. We can no longer make predictions and comparisons of seasonal weather using old data on our climate since it is changing. We can see this change by comparing the current year's weather averages to those from 20 – 30 years ago.

ELABORATE

1. Students will work independently on steps 2 & 3 and then join into group of four for the remainder of the activity.
2. For the first part of this lab students will need a digital spinner, divided into 6 colors. Each color will represent a different weather condition:

    Yellow = Sunny and hot   Orange = Sunny and cool
    Pink = Windy and warm   Green = Thunderstorms
    Blue = Cloudy and cold   Purple = Cloudy and rainy

3. Students will spin their spinner to determine each month's average weather and fill out the following table:

	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
4												
5												

4. After completing the table individually, students will work in a group of 4 to find the average weather over their individual 5 years and the average climate over their combined 20 years.

EVALUATE

1. As students are completing the "elaborate" section, circulate the room to ensure the tables they are completing are clear and easy to read.
2. Ask students to interpret their data and answer the following questions on the same sheet as their table:
    a. How did your 5 years of weather impact the overall climate of your group?
    b. If I added 4 more people to your group and included their data, would it give a clearer idea of your climate?
    c. What if I took away 2 group members so you had your data and one other persons? Would this be a good indication of climate?
3. Collect student work as this will serve as their assessment.

Lesson Sources

Below are the sources used throughout the Weather & Climate 5E Lesson Plan. Utilizing Advanced Search, select the Gale Document Number limiter and search for the below numbers to pull the content for this lesson

GALE IN CONTEXT: SCIENCE

ENGAGE
- "Parts of California blanketed by snow in rare winter storm" Video
  Document Number: **A738648495**

EXPLORE
- NASA Global Maps
  Document Number: **PC4295900019**

EXPLAIN
- "Weather Versus Climate" Video
  Document Number: **DNDVRZ025350585**

- "Why There is a Change Coming to Your Local Weather Forecast" Audio
  Document Number: **A658020328**

ELABORATE
- Online Spinner https://toytheater.com/spinner/