**Weather vs. Climate**

**Agenda**

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| Activities | Time Required |
| 1. Snack and Attendance 2. Climate or Weather Wildlife Quiz Game 3. Science Girl: Climate Reality Video (<https://youtu.be/Eij91cInLHI>) 4. Weather Parameters Lab using Vernier Probeware-   Temperature, Relative Humidity, Wind Speed, and Cloud Cover/Type Lab   1. Professional Speaker: Climatologist or Local Meteorologist 2. Content Questions (5 multiple choice questions) | 5 minutes  20 minutes  5 minutes  90 minutes  20-25 minutes  5 minutes |

**What should students know before they leave the club?**

-The difference between weather and climate

-How to determine various weather parameters (temperature, relative humidity, wind speed, wind direction, cloud types, cloud cover, dew point (what instruments are used to measure each, the definition of each, relate measurements to external weather conditions)

-Laying the initial scientific foundation for discussion of climate change next meeting

**Notes**

* **Weather** is the day-to-day state of the atmosphere in a region and its short-term (minutes to weeks) variations, whereas **climate** is defined as statistical weather information that describes the variation of weather at a given place for a specified interval. They are both used interchangeably sometimes but differ in terms of the length of time they measure and what trends affect them.
* Weather is the combination of temperature, humidity, precipitation, cloudiness, visibility, and wind. In popular usage, climate represents the synthesis of weather; more formally, it is the weather of a locality averaged over some period (usually 30 years), plus statistics of weather extremes.
* In a 2012 survey, a majority of Americans blamed global warming (or "climate change") for erratic weather patterns in the country, especially heat waves.

**Comparison chart**

|  | **Climate** | **Weather** |
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| **Definition** | Describes the average conditions expected at a specific place at a given time. A region's climate is generated by the climate system, which has five components: atmosphere, hydrosphere, cryosphere, land surface, and biosphere. | Describes the atmospheric conditions at a specific place at a specific point in time. Weather generally refers to day-to-day temperature and precipitation activity |
| **Components** | Climate may include precipitation, temperature, humidity, sunshine, wind velocity, phenomena such as fog, frost, and hail storms over a long period of time. | Weather includes sunshine, rain, cloud cover, winds, hail, snow, sleet, freezing rain, flooding, blizzards, ice storms, thunderstorms, steady rains from a cold front or warm front, excessive heat, heat waves and more |
| **Forecast** | By aggregates of weather statistics over periods of 30 years | By collecting meteorological data, like air temperature, pressure, humidity, solar radiation, wind speeds and direction etc. |
| **Determining factors** | Aggregating weather statistics over periods of 30 years ("climate normals"). | Real-time measurements of atmospheric pressure, temperature, wind speed and direction, humidity, precipitation, cloud cover, and other variables |
| **About** | Climate is defined as statistical weather information that describes the variation of weather at a given place for a specified interval. | Weather is the day-to-day state of the atmosphere, and its short-term (minutes to weeks) variation |
| **Time period** | Measured over a long period | Measured for short term |
| **Study** | Climatology | Meteorology |

(Taken from: <http://www.diffen.com/difference/Climate_vs_Weather>)

**Weather definitions are given in the Weather Parameters Lab Activity Handout. These terms should be reviewed as well.**

**NGSS-Middle School**

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| * MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |
| * MS-ESS2-5. | Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. |

**More multimedia sites for further information**

**How to decode a weather forecast:** https://youtu.be/lITCF3UPVu4

**What is climate change, really?:** <https://youtu.be/WNFFTpKL_vE>

**Dew Point and Relative Humidity**: https://youtu.be/S8W-xl4mcJ8