

**Teacher:** Cynthia Vallarelli

**Lesson Objectives:**

1. Students will utilize NASA climate change data to create a box and whisker graph. Students will find the mean temperature over 20-30 year intervals of time. Students will then analyze the box and whisker graph and make inferences about the data collected and determine climate change over a 140 year period of time.
2. Analyze a box and whisker and calculate mean and median.

**Essential Question:** How does the data collected in a box and whisker help assist in determining climate change on Earth?

**Task:** You have been hired by NASA to review the land temperatures over a period of approximately 100 years. Your task is to compile the data list finding the mean temperature based on intervals of years by creating a visual representation that shows a climate trend over time.

1. Look at the box and whisker and identify a trend.
1. What decades show the most change over time?
2. What can you infer from the data collected during each time period?

**NGSS Standards:**

**MS-ESS3-4** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

**MS-ESS3-5** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

**Cross Cutting Concepts:**

**Patterns**

**Cause and Effect**

Climate at a glance: ;[https://www.ncdc.noaa.gov/cag/global/time-series/globe/land\\_ocean/1/12/1880-2016](https://www.ncdc.noaa.gov/cag/global/time-series/globe/land_ocean/1/12/1880-2016)

**CCSS:**

**6.SP.4 - Display numerical data in plots on a number line, including dotplots, histograms and box plots.**

**6.SP.5 - Summarize numerical data sets in relation to their context.**

**CCSS.MATH.CONTENT.6.SP.B.5.C**

**Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.**

**MP.2 - Reasoning**

**Task 1**

Teacher will create a line graph with the class to show the trend in the climate over time. Then we will break down the data by making a box and whisker of each 20 year period of time as a model.

Students will then break out into groups and create a box and whisker of a 20 year time period. The box and whisker will be created on chart paper to maximize visualization. Once the box and whisker charts are made, we come back together and have each group share out.

1. How does the temperature change?
2. Are there significant changes occurring during different decades of time?
3. What events happened during this time period that impacted this climate change?
4. What predictions can you make about the climate?

**Measurable Objective:**

1. Create a visual representation (box and whisker) of the NASA climate change data over the past 140 years. Climate at a glance: ;[https://www.ncdc.noaa.gov/cag/global/time-series/globe/land\\_ocean/1/12/1880-2016](https://www.ncdc.noaa.gov/cag/global/time-series/globe/land_ocean/1/12/1880-2016)

**Vocabulary:**

Anomalie  
Trend  
Box and whisker  
Mean  
Median  
Extremes  
Lower quartile  
Upper quartile

**Assessment:**

I will save the last 2 decades of data and have students create a box and whisker of this time period as an assessment tool, which will guide my instruction.

[https://docs.google.com/forms/d/1ZazrPwrAln1D4Ev3cgjzwBMoRtlg4IK7JJeiQ8BK\\_vk/edit](https://docs.google.com/forms/d/1ZazrPwrAln1D4Ev3cgjzwBMoRtlg4IK7JJeiQ8BK_vk/edit)

**Rubric:**

[https://docs.google.com/document/d/1AdkPj5ISkjwxqGG-Gqdu\\_rlYcbZ7SFiqlvt7jIV0Cyl/edit](https://docs.google.com/document/d/1AdkPj5ISkjwxqGG-Gqdu_rlYcbZ7SFiqlvt7jIV0Cyl/edit)

DOK 1 - Create the box and whisker plot.

DOK 2 - Identify the Mean and median of the data.

DOK 3 & 4 - Analyze the data and answer the questions on the google doc.

