TITLE: Weather Where You Live
PRIMARY SUBJECT: Science
GRADE LEVEL: 6th - 12th
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CONCEPTS / TOPICS TO TEACH:
Studying weather data is important as it helps us establish future climate expectations. It's also important to note that weather and climate differ. Weather is what you see outside on any particular day and is recorded over short periods of time. Climate is the average of such weather recorded over relatively long periods of time. Collecting weather data helps us understand our changing climate

STANDARDS ADDRESSED:

COMMON CORE	NGS STANDARDS
Grades 6-8: CCSS.ELA-LITERACY.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).	**Grades 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.
Grades 9-10: CCSS.ELA-LITERACY.RST.9-10.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.	**Grades 9-12:** HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
Grades 11-12: CCSS.ELA-LITERACY.RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.	

General Goal(s):
Have students differentiate between weather and climate and acquaint them with ways to accurately record weather patterns over a week's time.

Specific Objectives:
This activity will familiarize students with data collecting and graphing techniques. Students will engage in group work, utilize investigative research skills, and present data to the class to be compared.

Required Materials:
- Access to computer or tablet
- Daily weather data chart (provided)
- Weather.com

Anticipatory Set (Lead in):
- Q: Ask students to tell you about today's weather.
- A: Answers will vary
- Q: Ask students to tell you what they think about when describing the daily weather.
- A: Answers should involve things like daily temperatures, clouds (cloud cover), rain/snow (precipitation), wind, ect.
- Q: Ask students to consider how the climate is studied.
- A: Answers should include things like studying the weather and recording data.
- RESOLVE: Weather and climate are different. Weather is short term, recorded daily, and what you see outside on any given day. Climate is the average of daily weather recorded and studied over long periods of time.

ACTIVITY

Students, in small teams, will choose three towns from different areas of their home state and collect daily weather data over the course of one week (Monday-Sunday). Students will record daily high and low temperatures, precipitation (or % chance precipitation), cloud cover, wind speed/direction, and pressure. The activity instructions and chart handout provided can be printed so students are able to easily record daily observations (each group will need 3). After students have collected all data they will graph each category recorded over the week. A bar or line graph is suggested but teachers may use discretion to decide the type of graph would be best for their students. Each team will create a graph for temperature, precipitation, wind, could cover, and pressure. Each graph

should include Monday-Friday and and all three towns, this will help acquaint students with multiple levels of data represented on one graph.

Note: Weather.com is the recommended site students can use to collect data but if using other sources, instruct students to remain consistent with where they collect their data.

WRAP UP

- Compare the weather data recorded across the state and discuss how each group chose to record their daily data
- Discuss possible discrepancies that could have affected the data (ex: inconsistencies of where data was collected, if data was recorded at the beginning of the day versus the end of the day, ect.)
- Recap the difference between weather and climate

GLOSSARY OF LESSON TERMS

- Weather- the state of the atmosphere with respect to wind, temperature, cloudiness, moisture, pressure, etc.
- Climate- the composite or generally prevailing weather conditions of a region,as temperature, air pressure, humidity, precipitation, sunshine, cloudiness, and winds, throughout the year, averaged over a series of years.
- Precipitation- the amount of rain, snow, hail, etc., that has fallen at a given place within a given period, usually expressed in inches or centimeters of water.
- Atmospheric pressure- the force with which our atmosphere pushes down on a specific location on Earth.
- Barometer- the instrument that measures atmospheric pressure

Plan for Independent Practice:
- Ask students to research statewide averages from 20 years ago and write about how it compares to the collected class data
- Encourage students to think about why they experience the average weather they do in terms of their state's geographic location
- Ask students to do additional reading from suggested reading section and write a reflection about what they read

Suggested Reading:
Weather for kids:
http://weatherforkids.org/

National Weather Service:
https://www.weather.gov/cae/justforkids.html

Potential Connections to Other Subjects:
      Geography: physical features, earth's atmosphere, human activity
      Language: vocabulary development, scientific writing, literacy
      Meteorology: atmospheric effects on weather

<u>**ASSIGNMENT OUTLINE**</u>

<u>**WEATHER DESCRIPTION:**</u> Here is where you will write general notes about today's weather including the date and the description of the weather (foggy, snowy, sunny, showers, storms, ect)

<u>**HIGH/LOW TEMPS:**</u> Write today's high and low recorded temperatures

<u>**PRECIPITATION**</u>: Precipitation moves moisture from the upper levels of the atmosphere to the lower levels and the surface, usually as rain or snow. If the average amounts of precipitation that fall changes the 30 year average either wetter or drier, that is a part of climate change. <u>On the chart:</u> record how many inches in rain or snow, if no rain or snow on this day record % chance of precipitation.

<u>**WIND:**</u> Without wind, weather would not exist. Wind allows water vapor and temperature variations to be moved from one area of the globe to another, creating weather variations within specific climate zones. <u>On the chart:</u> You will be recording wind speed and direction. Ex: "NW 22 mph" or "S 5mph"

<u>**CLOUD COVER**</u>: If skies are clear, more heat reaches the earth's surface, if it is cloudy some of the sun's rays are reflected off the cloud droplets back into space allowing less of the sun's energy to reach the earth's surface, which causes the earth to heat up more slowly. This leads to cooler temperatures. <u>On the chart:</u> write if it is cloudy, partly cloudy, or sunny

<u>**PRESSURE:**</u> A high pressure system is a dense air mass that is usually cooler and drier than the surrounding air. A low pressure system is a less dense air mass that is usually wetter and warmer than the surrounding air. <u>On the chart:</u> write daily pressure which will be represented as a number and an up or down arrow Ex: 30.2 in ↓ represents "Barometric pressure is 30.2 inches and falling," (Falling air pressure indicates that bad weather is coming, while rising air pressure indicates good weather.)

Name:

Town observing:

Daily Weather Observation Data

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Date and weather description:							
High/ Low Temp:							
Precipitation % (rain/snow) :							
Wind Speed/direction:							

Cloud Cover:							
Pressure:							