LESSON 8: IT'S ALL IN THE NAME
WEATHER VERSUS CLIMATE

TEACHER BACKGROUND

Overview:

Weather and climate are commonly misinterpreted by students as terms that are interchangeable. In fact these terms, while related, are different.

Weather is what we experience on a daily basis. It helps us decide what we should wear for the day or what to bring on an upcoming getaway in the next week. Weather is a prediction based on a variety of data collected in a variety of ways from ground stations to radars and weather maps are created to help us understand what to expect based on the evidence compiled by meteorologists.

Climate on the other hand allows us to see long term patterns in weather data collected over time. ***Note*** "over time" to you and "over time" to your students are completely different, so over time in relation to climate is usually no less than thirty years. Climate can tell us many things from seasonal information and planting zones to increases in global temperatures or carbon dioxide.

Preparation:

- You may want to check your note card stash and make sure you have enough for your students or you may need to cut paper in 4X6 rectangles; however you may wish this to be an opportunity for your students to measure and cut out the size paper needed for the ***Elaborate*** activity.

Helpful Hints:

- Depending on the proficiency of your students you may wish to-
  - pair a more proficient student with a less proficient student for computer work
  - pair a proficient reader with a less proficient reader.
- You will either need to-
  - reserve the computer lab,
  - reserve the mobile computer lab,

  for students to do the ***Explore.***

GRADE LEVEL

5-8

TIME TO COMPLETE

2-2.5 hours

PREREQUISITE KNOWLEDGE

Ability to quickly navigate between websites.

LEARNING OUTCOMES

- Utilize several online sources to investigate weather and climate
- Differentiate between weather and climate.

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ENGAGE	Student Grouping-Individual/Pairs/ Whole Group Time: 20 min. **Essential Question:** A. Explain the difference between weather and climate from what you see in the maps. B. Create a definition for weather and for climate based on what you already know about each word and from what you discovered after looking at the maps. **Directions:** 1. Distribute the weather and climate map per pair of students or display it on your screen or smart board. 2. Ask student pairs to create a t-chart in their science notebook, analyze the weather and climate maps, and list similarities and differences between the two. 3. Have student pairs discuss their findings with other pairs of students at their table or in close proximity. 4. Have students answer the Essential Questions. The t-chart will be used as a tool to help them construct a response.
EXPLORE	Student Grouping-Individual/Pairs Time: 30-40 min. **Essential Question:** C. Did you make changes to your original definition or did you stregthen your original definition? What prompted you to make these changes? Provide specific expamles. **Directions:** 1. Students will look at three sources to better make a determination as to the differences and similarities between weather and climate. a. Watch this National Geographic video, 3:22, Weather and Climate b. Analyze and Create a Weather Forecast c. Read: Climate Concepts 2. Have students modify their original definition or stregnthen their original definitions based on the work in number one in their science notebooks. 3. Allow students to do a gallery walk and compare their thoughts with thoughts of their peers as well as reflect on the quality of their work.

STUDENT OBJECTIVES

Students will-

- analyze weather and climate maps.
- analyze three sources and develop a working definition for weather and climate.
- design a weather and climate visual.

MATERIALS

- Science notebook
- Computer with internet access
- Paper
- Crayons/Map Pencils

ACADEMIC VOCABULARY

Weather, climate, green house gases, global, meteorologist, climatologist

LESSON LINKS can be found under ***Web References*** at the end of this lesson

- Weather and Climate Map – found on page 5 of this document
- Weather and Climate Video
- Weather Forecast
- Climate Concepts

EXPLAIN	Student Grouping-Whole Group Time: 15 min. **Essential Question:** D. What graphics (pictures) could be used to represent the differences between weather and climate? **Directions:** 1. As a class come up with a definition for weather and climate that will be the working definition for this assignment. Post these definitions in the class. 2. Have a discussion with students about how weather is a part of the climate portfolio. One aspect students need to understand in regards to climate is that decades of weather data are utilized to help tell the story of climate around the global; you can't have one without the other.
ELABORATE	Student Grouping-Individual Time: Good homework assignment – 30 min. **Essential Question:** E. Why do you think people often confuse weather and climate or think that the words can be used interchangeably? **Directions:** 1. Students will create a note card or a note card sized paper (4x6) that depicts what weather is on one side and what climate it on the other side. Students should utilize graphics more than text. Student's work should be a visual that quickly allows the reader to understand the difference. 2. Set your own expectations as to neatness, labeling, and color.
EVALUATE	Student Grouping-Individual Time: 20-30 min. **Directions:** You may choose to use the science notebook as an assessment tool or you may choose (or have students choose) the assessment tool from below. a. Concept Quiz – Found on pages 6-8 b. Essay – Found on page 9 c. Thinking Map-Double Bubble – Found on page 10

Web References

Climate Wizard
http://www.climatewizard.org/#

The Weather Channel
http://www.weather.com/maps/satelliteusnational.html

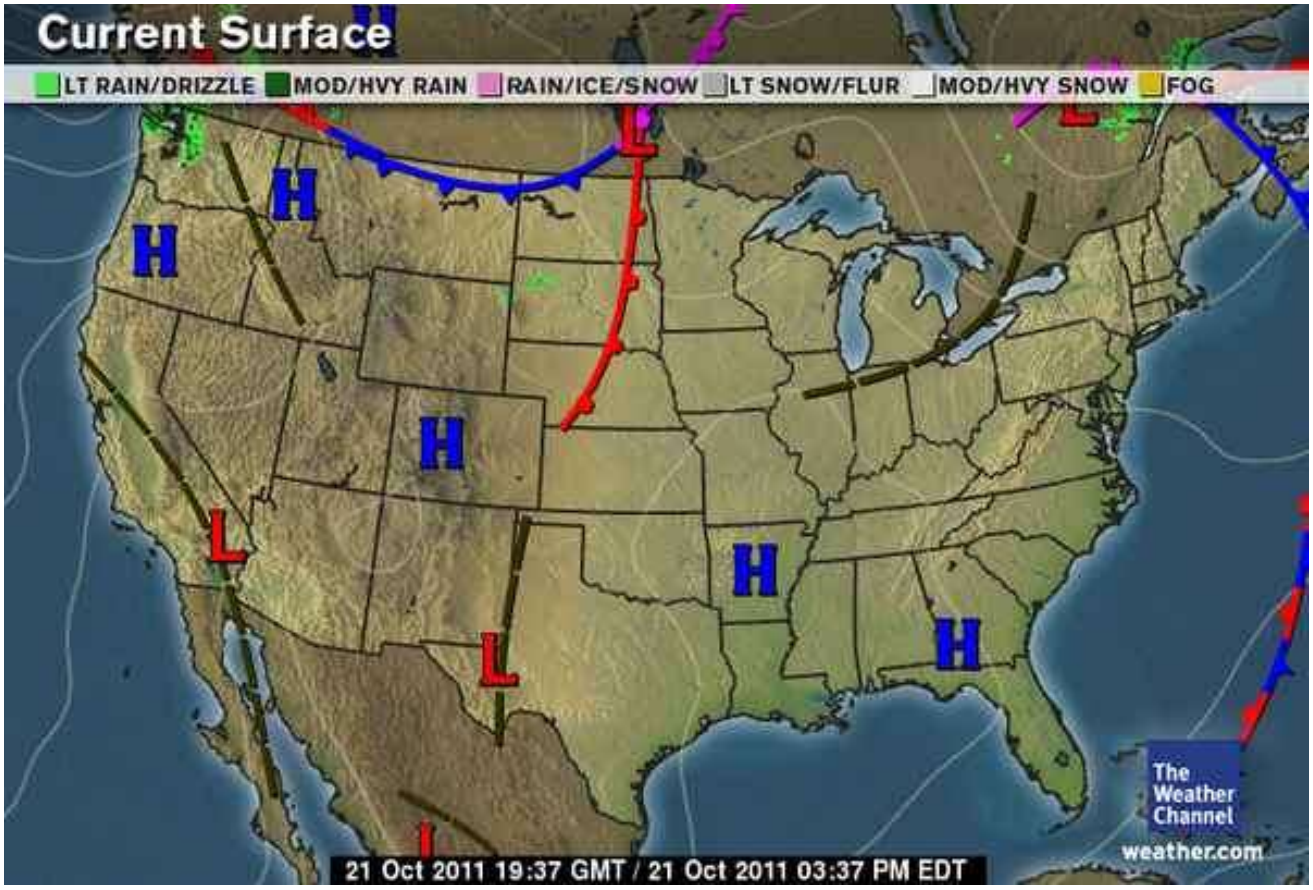
Weather and Climate
http://video.nationalgeographic.com/video/player/science/earth-sci/climate-weather-sci.html

Weather Watch-Scholastic-Analyze: Forecast the Weather
http://teacher.scholastic.com/activities/wwatch/analyze/

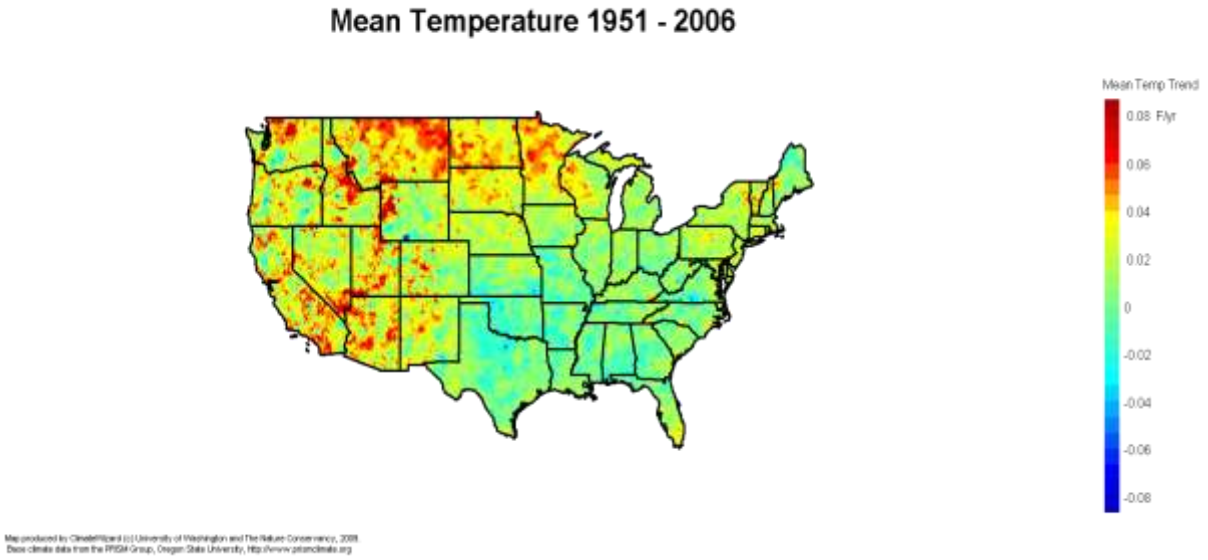
EPA-Climate Concepts
http://epa.gov/climatechange/kids/basics/concepts.html

Gallery Walk Definition
http://serc.carleton.edu/introgeo/gallerywalk/

Weather Map

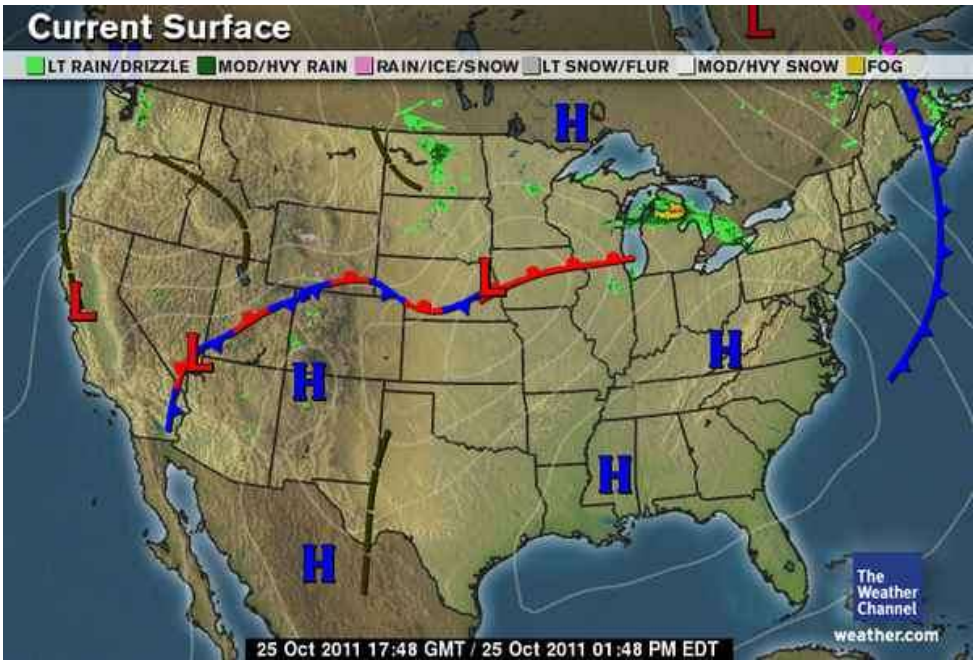


Climate Map



Science Concept Quiz
Lesson 8: It's All In a Name: Weather versus Climate

Use the map below to answer the question.



Why is the map above considered a weather map and not a climate map?

A. Weather maps show a variety of variables such as temperature and precipitation where climate maps focus only on temperature
B. Weather maps and climate maps show the exact same information.
C. Weather maps create a picture over a short period of time, 1-10 days while climate maps create a picture over a long period of time, 30 years or more.
D. Weather maps only show what is happening locally and climate maps can show us what is happening globally.

_____ points out of 20

I. Answer

A.○ B.○ C.○ D.○

_____ points out of 15

II. What is the main concept behind the question?

1. Reading Maps
2. Predicting Weather Patterns
3. Change Over Time
4. Difference between Weather and Climate

_____ points out of 25

III. Provide the reasoning for choosing your answer in part II.

_____points out of 40

IV. Why are the other responses in part I not the best answer choice?

1.

2.

3.

4.

Use the rest of this page if more room is needed to fully communicate your thoughts.

Teacher Answer Key

1. C

2. D

3. Answers will vary. The question is stated in a way that I have to be able to differentiate between weather and climate to answer the question correctly.

4. Answers will vary.

   A. Both weather and climate maps can show many variables; climate maps do not focus only on temperature.
   B. Yes both maps can appear to show the same information but weather maps show for instance temperature highs and low for the day whereas climate maps will show average temperature highs and lows over many decades.
   C. This is the correct answer. Weather maps tell us a variety of information over a period of days where as climate maps show us patterns over decades.
   D. Both weather and climate maps can show us current or long range patterns at the local and global level.

Student Name
Teacher/Class
Date

Lesson 8: It's All in a Name
Weather versus Climate

Mark Twain is one of America's most beloved American authors and thought by some to be the father of American literature. He wrote such classics as, *The Adventures of Tom Sawyer* and the *Adventures of Huckleberry Finn.* Twain was fascinated by science and scientific inquiry.[1] He is quoted as saying,
"Climate is what we expect, weather is what we get." Using your knowledge of weather and climate explain what Mark Twain is saying.

What Is the Expectation?

Use new lesson knowledge and/or student readings to support your position

Visual representations if applicable

Key vocabulary

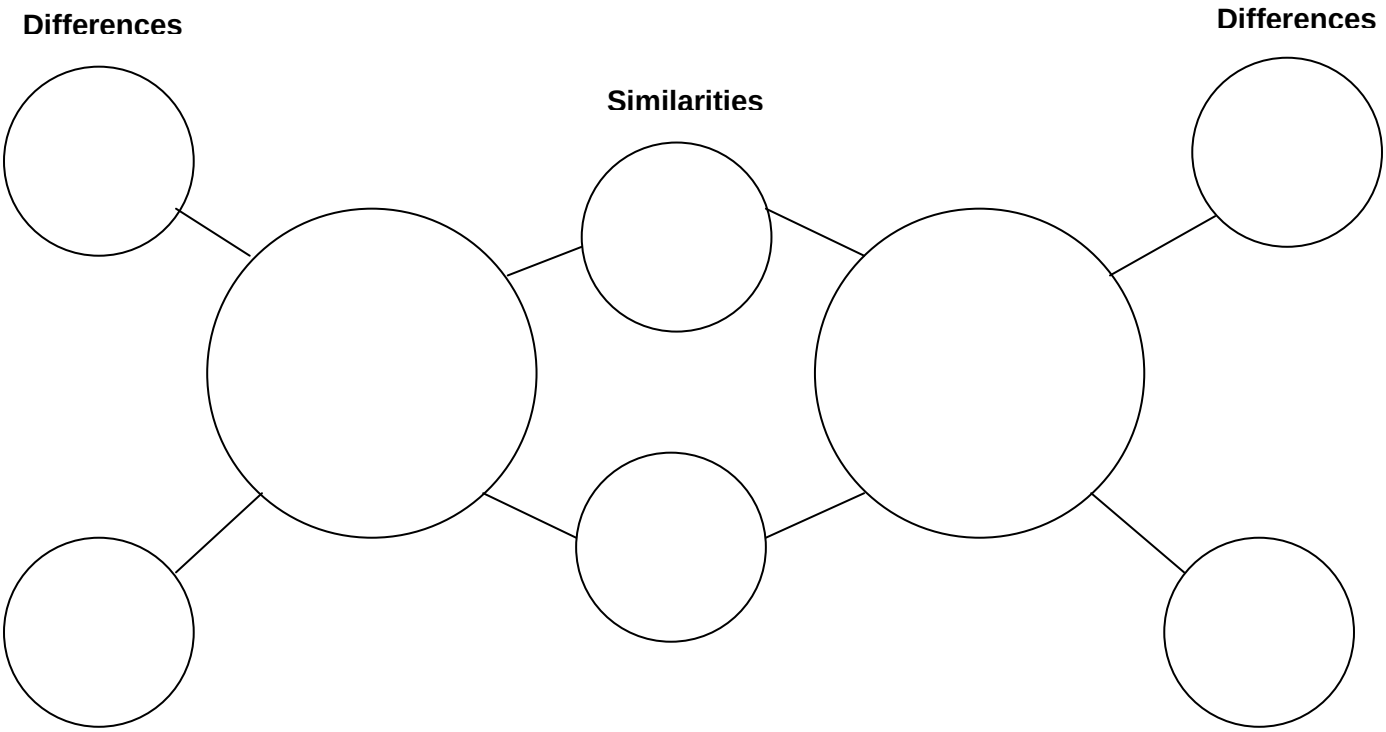
Evidence of on grade level spelling and grammar usage

[1] http://en.wikipedia.org/wiki/Mark_Twain#Love_of_science_and_technology

NAME:

DATE:

Double Bubble Thinking Map
Lesson 8: Weather Versus Climate



Put your Thinking Map into words-