

Weather and Climate

<p>Lesson Plan for Grades: Middle School Length of Lesson: 90 minutes</p>
<p>Authored by: UT Environmental Science Institute Date created: 05/10/2017</p>
<p>Subject area/course:</p> <ul style="list-style-type: none"> • Mathematics
<p>Materials:</p> <ul style="list-style-type: none"> • “Fun size” bags of M&M’s or Skittles; or beads - mix of colors/shapes (divided into small bags) • Poster board, markers
<p>TEKS/SEs:</p> <p>§111.26. Mathematics, Grade 6; §111.27. Mathematics, Grade 7; §111.28. Mathematics, Grade 8 (1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</p> <ul style="list-style-type: none"> • (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate; • (E) create and use representations to organize, record, and communicate mathematical ideas
<p>Lesson objective(s):</p> <ul style="list-style-type: none"> • Students will understand the difference between weather and climate. • Students will develop a graph that tracks the differences between weather and climate in an area.
<p>Differentiation strategies to meet diverse learner needs:</p> <ul style="list-style-type: none"> • The teacher should ask students whether they prefer to read or watch videos to learn about concepts; then have students learn in their preferred learning style. • ELL students and students with learning disabilities should have multiple forms of instruction including visual and written instruction sheets as well as a verbal instruction and demonstration.
<p>ENGAGEMENT (5 minutes)</p> <ul style="list-style-type: none"> • Teacher discusses with class “What is the difference between weather and climate?”. Watch <i>Hot Science – Cool Talks #105</i> highlight video (total time 3:33) or from the full video (from 10:14 – 10:43). • <i>Weather</i> is what is happening <i>right now</i>. <i>Climate</i> is <i>range in a given location</i>.
<p>EXPLORATION (20 minutes)</p> <ul style="list-style-type: none"> • As a class, go over the different colors available in the candy (or bead) bag and assign a different weather type for each color. Students will use their bags to describe the climate for a Texas city/town. • Teams develop a chart with the results and share their results in a brief 3 minute presentation.
<p>EXPLANATION (35 minutes)</p> <ul style="list-style-type: none"> • Each team presents their results in a brief 3-minute presentation sharing: <ul style="list-style-type: none"> ○ What is the name of their Texas city/town and time period? ○ Which weather type was most common in your city/town? Least common?
<p>ELABORATION (20 minutes)</p> <ul style="list-style-type: none"> • Teams calculate averages for each type of weather and create a graph comparing their city to the area.
<p>EVALUATION (10 minutes)</p> <ul style="list-style-type: none"> • Posters are displayed in a gallery walk. Each team evaluates two other posters using the included rubric.
<p>SOURCES AND RESOURCES</p> <ul style="list-style-type: none"> • Dr. Katharine Hayhoe’s <i>Hot Science – Cool Talks #105</i>, “Climate and Faith, Money and Politics”, www.hotsciencecooltalks.org • “What’s the Difference Between Weather and Climate?”, Little Shop of Physics, www.lsop.colostate.edu/lesson-plans-guides/

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EXPLORATION ACTIVITY (20 minutes):

Purpose: Students will understand the difference between weather and climate.

Materials:

- “Fun-sized” bags of M&M’s, skittles or other multicolored candy; or
- Small bags of assorted color and size beads

Safety Information:

- If you have students with food allergies (i.e. chocolate or peanuts) use the beads instead.

Procedure:

- Class is divided into different teams of 3-4 students. Assign each group a random Texas city/town and month. Provide one candy (or bead) bag per team.
- As a class, go over the different colors available in the candy (or bead) bags and assign a different weather type for each color. Purple may be cool and rainy; orange may stand for sunny and hot. Have students fill out the chart with the weather types for each color.
- Groups open their bags of candy (or beads) and take out **one candy (or bead)**. Have each team describe what the weather was like for that first day.
- Next, each team will pour out all the candies (or beads) in their bag and count how many times each kind of weather type appeared in their bag (weather in each city).
- **Remind students:** *Weather* is what is happening *right now*. *Climate* is *range in a given location* which may describe average weather over long periods of time.
- Each team create a chart which reports the weather in their Texas city/town for the given time month. Teams will have 3 minutes to provide a brief presentation and answer the following questions:
 - Texas city/town and time period.
 - Which weather type was most common in your city/town? Least common?

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EXPLORATION ACTIVITY (STUDENT HANDOUT):

1. You are a team of scientists researching weather trends in your area. As a class, assign the different colors of candy or beads a weather description (sunny and warm, cool, cloudy, rainy, etc.).

<i>Color</i>	<i>Weather Description</i>

2. Take out ONE PIECE out of your bag. What is the weather like for that day?

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3. Count the number of times each color appeared in your whole bag.

<i>Color</i>	<i>Number in Bag</i>

4. Answer the following questions about the weather in your Texas city/town. Your team will need to provide a brief 3-minute presentation with the information below.

- *Name your Texas city/town and time period.*

- *Which weather type was most common in your city/town? Least common?*

- *Do you think you could predict the weather on any given day?*

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EXPLORATION ACTIVITY (20 minutes):

Purpose: Students will create a graph comparing their city's weather with the climate in the area.

Materials:

- Poster boards
- Markers

Safety Information:

- N/A

Procedure:

- Each team calculates the average for each weather type in the area (whole classroom).
- As a class, go over how averages are calculated. For each weather type, add the number of times the corresponding color appeared in ALL the bags in the classroom. Then, divide by the number of bags in the classroom

$$\text{Weather Type Average} = \frac{\text{total number of candies (beads) of specific color in ALL bags}}{\text{number of bags in the classroom}}$$

- Teams calculate the averages for each type of weather. Then, fill out the chart comparing the averages for the area (climate) vs. the weather for their city.
- Teams create a graph comparing the two sets of data. Graphs should include:
 - Title
 - Labeled x and y axis
 - Legend
- Graphs will be evaluated in a gallery walk. Each team evaluates graphs of two other teams. Evaluation rubric is included at the end of the elaboration handout.

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ELABORATION ACTIVITY (STUDENT HANDOUT):

<p><i>5. Find the averages for each type of weather in all the bags in the classroom. Use the space below to calculate the averages.</i></p>	
<p><i>Weather Type Average = $\frac{\text{total number of candies (beads) of specific color in ALL bags}}{\text{number of bags in the classroom}}$</i></p>	
<i>Weather Type #1</i>	<i>Weather Type #2</i>
<i>Classroom Average:</i>	<i>Classroom Average:</i>
<i>Weather Type #3</i>	<i>Weather Type #4</i>
<i>Classroom Average:</i>	<i>Classroom Average:</i>
<i>Weather Type #5</i>	<i>Weather Type #6</i>
<i>Classroom Average:</i>	<i>Classroom Average:</i>

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6. Compare the weather in your city and the area (climate).

<i>Weather Type</i>	<i>Your City</i>	<i>Area (classroom average)</i>

7. Create a graph showing the weather in your city vs. the climate in the area (classroom average for each type of weather).

Include the following:

- **Graph Title**
- **Label x and y axis**
- **Legend**

Graphs are displayed in a gallery walk. Each team must evaluate two other posters using the rubric below.

1	2	3	4
Two or more of the following components are missing or incomplete – graph title, x and y axis, or legend. Averages not calculated correctly.	One of the following components are missing or incomplete – graph title, x and y axis, or legend. Averages not calculated correctly.	Graph labels (title, x and y axis, legend) correctly labeled. Averages not calculated correctly.	Graph labels (title, x and y axis, legend) correctly labeled. Averages correctly calculated.