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# Weather or Not We Should Go Outside [3rd grade]

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# UNDERSTANDING BY DESIGN

## Unit Cover Page

Unit Title: **Weather or Not We Should Go Outside** (Adapted from the TEKS Resource System TEKS Resource System - Texas Curriculum Management Program Cooperative (TCMPC) "Unit 03: Investigating Weather" Instruction Focus Document located on the web at:

<http://www.teksresourcesystem.net/module/content/search/item/1882/viewdetail.ashx>)

Grade Level: **Third Grade**

Subject/Topic Area(s): **Science**

Designed By: **Stephen Sackett**

Time Frame: **6 Days**

School District: **San Antonio Independent School District**

School: **Lamar Elementary**

School Address and Phone: **201 Parland Place, San Antonio, Texas 78209 210-738-9800**

**Brief Summary of Unit** (Including curricular context and unit goals):

The purpose of this unit is for students to understand that daily weather conditions at a particular time and place can be observed, measured, and inform our decisions. This unit

focuses of developing the skills to observe, measure, record, and compare weather conditions in different locations at the same time using meteorologists' instruments and technology. The unit also focuses on recording and comparing weather data in graphs, tables, charts, and maps using a spreadsheet or presentation software.

**Technology**

This unit will require full class access to computers, internet connection, and spreadsheet or presentation software (i.e., Microsoft Excel and PowerPoint).

**Materials**

This unit will have a two-day lab that will require construction materials and tools to build homemade meteorologists' instruments (i.e., cups, straws, soda bottles, clay, tape, pins, ribbon, construction paper, card stock, food coloring, rubbing alcohol, compass, ruler, clock, stop watch, scissors, thermometer, etc.). The two-day lab will also require testing stations that will require a box fan, oscillating fan, watering can with bucket, ice water, and warm water.

## Weather or Not We Should Go Outside

| Stage 1 – Desired Results  |   |  |  |
|--|---|--|--|
| <p><b>Established Goals</b></p> <p><b>TEKS:</b><br/>3.8A observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation;</p> <p><b>Process TEKS:</b><br/>3.2 D, F<br/>3.4 A</p>  | <b>Transfer</b>   |  |  |
|  | <p><i>Students will independently use their learning to...</i></p> <ul style="list-style-type: none"> <li>• use meteorologists’ instruments and technology to collect, record, and compare data related to day-to-day weather conditions in different locations.</li> <li>• use the information and data obtained to write about which location would be the better place for a field trip of their choice.</li> </ul>  |  |  |
|  | <b>Meaning</b>  |  |  |
|  | <table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Understandings</b></p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> <li>• daily weather conditions at a particular time and place can be observed, measured, and inform our decisions</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Essential Questions</b></p> <ul style="list-style-type: none"> <li>• In what ways can weather conditions be described and measured?</li> <li>• How does weather affect you?</li> </ul> </td> </tr> </table>  | <p><b>Understandings</b></p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> <li>• daily weather conditions at a particular time and place can be observed, measured, and inform our decisions</li> </ul>  | <p><b>Essential Questions</b></p> <ul style="list-style-type: none"> <li>• In what ways can weather conditions be described and measured?</li> <li>• How does weather affect you?</li> </ul> |
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| <b>Acquisition</b>   |   |  |  |
| <table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Knowledge</b></p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> <li>• weather may be different in different locations at the same time</li> <li>• the difference between weather and climate</li> <li>• the following vocabulary terms:                             <ul style="list-style-type: none"> <li>○ Atmosphere – air that surrounds the Earth; made of a mixture of gases</li> <li>○ Cloud cover – the amount of sky covered by clouds</li> <li>○ Compass – an instrument containing a magnetized pointer, showing the direction of magnetic north; used to get bearings</li> <li>○ Meteorologist – a scientist who studies the weather</li> <li>○ Precipitation – water that falls to the Earth’s surface as rain, snow, sleet, or hail</li> <li>○ Rain gauge – a tool for collecting and measuring the amount of precipitation that falls</li> <li>○ Temperature – a way of measuring how hot or cold something is; temperature is measured using either the Fahrenheit (F) or Celsius (C) scale</li> <li>○ Weather – day-to-day condition of the atmosphere in an area; weather has short-term variations (minutes to weeks)</li> <li>○ Wind speed – how fast the air is moving; wind speed is commonly measured with an anemometer</li> </ul> </li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Skills</b></p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> <li>• observe the weather</li> <li>• use weather instruments to measure the weather                             <ul style="list-style-type: none"> <li>○ Air temperature (thermometer)</li> <li>○ Wind direction (wind vane)</li> <li>○ Wind Speed (anemometer)</li> <li>○ Precipitation (rain gauge)</li> </ul> </li> <li>• record weather data in a graph, table, chart, or map</li> <li>• compare recorded weather observations and measurements</li> </ul> </td> </tr> </table> | <p><b>Knowledge</b></p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> <li>• weather may be different in different locations at the same time</li> <li>• the difference between weather and climate</li> <li>• the following vocabulary terms:                             <ul style="list-style-type: none"> <li>○ Atmosphere – air that surrounds the Earth; made of a mixture of gases</li> <li>○ Cloud cover – the amount of sky covered by clouds</li> <li>○ Compass – an instrument containing a magnetized pointer, showing the direction of magnetic north; used to get bearings</li> <li>○ Meteorologist – a scientist who studies the weather</li> <li>○ Precipitation – water that falls to the Earth’s surface as rain, snow, sleet, or hail</li> <li>○ Rain gauge – a tool for collecting and measuring the amount of precipitation that falls</li> <li>○ Temperature – a way of measuring how hot or cold something is; temperature is measured using either the Fahrenheit (F) or Celsius (C) scale</li> <li>○ Weather – day-to-day condition of the atmosphere in an area; weather has short-term variations (minutes to weeks)</li> <li>○ Wind speed – how fast the air is moving; wind speed is commonly measured with an anemometer</li> </ul> </li> </ul> | <p><b>Skills</b></p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> <li>• observe the weather</li> <li>• use weather instruments to measure the weather                             <ul style="list-style-type: none"> <li>○ Air temperature (thermometer)</li> <li>○ Wind direction (wind vane)</li> <li>○ Wind Speed (anemometer)</li> <li>○ Precipitation (rain gauge)</li> </ul> </li> <li>• record weather data in a graph, table, chart, or map</li> <li>• compare recorded weather observations and measurements</li> </ul> |  |
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|  |   |  |
|--|---|--|
|  | <ul style="list-style-type: none"> <li>○ Wind vane – a weather instrument used to show the direction of the wind</li> </ul> <p>The vocabulary words and definitions for this unit are derived from the TEKS Resource System - Texas Curriculum Management Program Cooperative (TCMPC) website and can be referenced at: <a href="http://www.teksresourcesystem.net/module/content/search/item/1882/viewdetail.aspx">http://www.teksresourcesystem.net/module/content/search/item/1882/viewdetail.aspx</a></p> |  |
|--|---|--|

**Stage 2 – Evidence**

| CODE<br>(M or T) | Evaluative<br>Criteria<br>(for rubric) |  |
|------------------|--|--|
| M, T<br><br>M, T | (See Performance Task Rubric)          | <p><b>Performance Task(s)</b><br/><i>Students will demonstrate meaning-making and transfer by...</i></p> <ul style="list-style-type: none"> <li>• use meteorologists’ instruments and technology to collect, record, and compare data related to day-to-day weather conditions in different locations.</li> <li>• use the information and data obtained to write about which location would be the better place for a field trip of their choice. (See Performance Task Assignment Sheet)</li> </ul> <hr style="border-top: 1px dashed black;"/> <p><b>Other Evidence (e.g., formative)</b></p> <ul style="list-style-type: none"> <li>• Think-Pair-Share</li> <li>• Framing Weather Activity</li> <li>• Discussion</li> <li>• Class Chart</li> <li>• Stem Lab Observations</li> <li>• Group Presentations</li> <li>• Exit Ticket</li> <li>• Computer Lab Observations</li> <li>• Weather Comparison Spreadsheet or Presentation</li> <li>• Student Writing</li> </ul> |

**Stage 3 – Learning Plan**

| CODE<br>(A, M, T) | Pre-Assessment   |  |
|-------------------|--|--|
|                   | <p><i>How will you check students’ prior knowledge, skill levels, and potential misconceptions?</i></p> <ul style="list-style-type: none"> <li>• Think-Pair-Share – Ask students “What do you know about weather?”</li> <li>• Framing Weather Activity- “How do we observe, measure, and compare weather?”               <ul style="list-style-type: none"> <li>○ Step 1: Arrange students in groups of four.</li> <li>○ Step 2: Independently students will answer “How do we observe, measure, and compare weather?” on their section of the frame.</li> <li>○ Step 3: As a group, students will answer “How do we observe, measure, and compare weather?” in the center of the frame.</li> <li>○ Step 4: Each group will present their ideas to the class. (See Framing Weather Student Worksheet)</li> </ul> </li> </ul> |  |
| A                 | <p><b>Learning Activities</b></p> <p><b>Lesson 1: What is Weather? (45 minutes)</b></p> <ul style="list-style-type: none"> <li>• Conduct the pre-assessment</li> <li>• Discussion: The teacher will facilitate a discussion and will chart ideas as student use that they have learned from each other from the pre-</li> </ul>  | <p><b>Progress Monitoring (e.g., formative data)</b></p> <ul style="list-style-type: none"> <li>• Think-Pair-Share</li> <li>• Framing Weather Activity</li> <li>• Discussion</li> <li>• Class Chart</li> </ul> |

|                |   |   |
|----------------|---|---|
| <p>A, M, T</p> | <p>assessment to answer “What do you know about weather?” and “How do we observe, measure, and compare weather?”</p> <ul style="list-style-type: none"> <li>• Vocabulary: Review vocabulary that students mention during the lesson.</li> <li>• Read Aloud: <i>What Will the Weather Be?</i> by Lynda DeWitt</li> </ul> <p><b>Lessons 2-3: How does a meteorologist observe and measure the weather?</b><br/>(45 minutes each day)</p> <ul style="list-style-type: none"> <li>• Think-Pair-Share: “What are the daily weather conditions meteorologists observe, measure and record?” Teacher will chart the responses.</li> <li>• Discussion: “In what ways can these weather conditions be observed and measured?”</li> <li>• STEM Lab – Develop instruments to measure weather conditions       <ul style="list-style-type: none"> <li>○ Objective: Students develop instruments to measure the following weather conditions:           <ul style="list-style-type: none"> <li>▪ Air temperature (thermometer)</li> <li>▪ Wind direction (wind vane)</li> <li>▪ Wind Speed (anemometer)</li> <li>▪ Precipitation (rain gauge)</li> </ul> </li> <li>○ Set-up:           <ul style="list-style-type: none"> <li>▪ Testing stations for each weather condition (i.e. box fan, oscillating fan, watering can with bucket, ice water, and warm water)</li> <li>▪ Various materials to build each instrument (i.e. cups, straws, soda bottles, clay, tape, pins, ribbon, construction paper, card stock, food coloring, rubbing alcohol)</li> <li>▪ Various tools to build each instrument (i.e. compass, ruler, clock, stop watch, scissors, thermometer)</li> <li>▪ Examples of homemade instruments:               <ul style="list-style-type: none"> <li>➤ Thermometer: <a href="http://www.scientificamerican.com/article/measure-up-with-a-homemade-thermometer/">http://www.scientificamerican.com/article/measure-up-with-a-homemade-thermometer/</a></li> <li>➤ Wind Vane: <a href="http://www.education.com/activity/article/wind_vane_first/">http://www.education.com/activity/article/wind_vane_first/</a></li> <li>➤ Anemometer: <a href="https://www.sercc.com/education_files/anemometer.pdf">https://www.sercc.com/education_files/anemometer.pdf</a>Homemade</li> <li>➤ Rain Gauge: <a href="http://achieve.weatherbug.com/brainstorm/activities/makingaraingauge.pdf">http://achieve.weatherbug.com/brainstorm/activities/makingaraingauge.pdf</a></li> </ul> </li> </ul> </li> <li>○ Lab Instructions           <ul style="list-style-type: none"> <li>▪ Students will work in small groups and will develop an instrument to measure one weather condition.</li> <li>▪ Groups will be given time to brain storm solutions and must complete a diagram with labels of how they plan to build their instrument. Each team will have one logistics person that will create the supply list and pick up supplies from the “store”. Unused items will be returned.</li> <li>▪ Each group will be encouraged to continue to test and modify their instrument.</li> <li>▪ Extension: As groups finish they will calibrate their instrument and demonstrate how to accurately measure their weather condition.</li> </ul> </li> <li>○ Presentation: Groups will present/demonstrate their instrument and explain their concept behind how their instrument works.</li> </ul> </li> <li>• Discussion: Show students examples of meteorologist’s instruments and review the names of each instrument. Review the remainder of the vocabulary words.</li> <li>• Demonstration: Demonstrate how to use each instrument correctly</li> <li>• Practice: Students will record data from each instrument</li> <li>• Exit Ticket</li> <li>• Read Aloud: <i>Oh Say Can You Say What's the Weather Today</i> by Tish Rabe</li> </ul> | <ul style="list-style-type: none"> <li>• Think-Pair-Share</li> <li>• STEM Lab Observations</li> <li>• Group Presentations</li> <li>• Exit Ticket</li> </ul> |
|----------------|---|---|

|         |   |   |
|---------|---|---|
| A, M, T | <p><b>Lesson 4: “How do you compare the weather conditions in different locations at the same time?” (45 minutes)</b></p> <ul style="list-style-type: none"> <li>• Think-Pair-Share: “How do you determine the weather conditions in different locations at the same time?” Teacher will chart the responses.</li> <li>• Demonstration: Demonstrate how to determine the weather conditions in locations other than our own.</li> <li>• Computer Lab: Students will visit various weather sites to determine the local and a distant locations weather. Only provide students with a white sheet of paper to record data.</li> <li>• Discussion: “What is a better way to record our data?” Chart Student responses.</li> <li>• Demonstration: Demonstrate recording weather in a graph, table, chart, or map</li> <li>• Think-Pair-Share: “In what ways could you compare the weather conditions in different locations at the same time?”</li> <li>• Technology: Students will work in small groups using previously learned knowledge about MS Excel or PowerPoint to create charts and graphs to compare weather in two different locations at the same time.</li> </ul>  | <ul style="list-style-type: none"> <li>• Think-Pair-Share</li> <li>• Computer Lab Observations</li> <li>• Weather Comparison Spreadsheet or Presentation</li> </ul> |
| A, M, T | <p><b>Lesson 5: How does weather affect you? /Review (45 minutes)</b></p> <ul style="list-style-type: none"> <li>• Note: Teacher may choose to use the writing block for this lesson.</li> <li>• Story: The teacher will tell a story of a time when weather impacted their life.</li> <li>• Think-Pair-Share: “How does the weather effect you?” Teacher will chart the responses.</li> <li>• Writing <ul style="list-style-type: none"> <li>○ Prompt: “Write about a time when weather effected your plans. What did you have planned? How did it change your plans? What did you do to overcome some of the weather conditions? What could you do in the future when taking a trip to help reduce the impact of weather on your trip?”</li> <li>○ The teacher will provide a word bank of weather related words.</li> <li>○ Students will think about the prompt then share their ideas with a partner.</li> <li>○ Student will then be given time to organize their ideas and begin writing.</li> <li>○ Teacher will check-in with students and monitor progress.</li> </ul> </li> <li>• Review: The teacher will conduct a brief review as needed.</li> </ul> <p><b>Lesson 6: Student Performance Task (45-90 Minutes)</b></p> <ul style="list-style-type: none"> <li>• Note: Teacher may choose to add the writing block to complete this assessment.</li> <li>• (See Performance Task Assignment Sheet)</li> </ul> | <ul style="list-style-type: none"> <li>• Think-Pair-Share</li> <li>• Student writing</li> </ul>   |

**Useful Links:**

- USA Weather: <http://www.weather.gov/>
- Global Weather: <http://www.intellicast.com/Global/Default.aspx>
- Global Wind Currents: <https://earth.nullschool.net/>
- NOAA/NASA Simulators: <http://scijinks.jpl.nasa.gov/menu/games/>
- PBS NOVA Cloud Lab <http://www.pbs.org/wgbh/nova/labs/lab/cloud/>
- CMISS Simulators: <http://cimss.ssec.wisc.edu/wxfest/explore.html>
- Weather Wise: <http://profhorn.meteor.wisc.edu/wxwise/>
- UCAR Simulators: <http://scied.ucar.edu/games-sims-weather-climate-atmosphere>