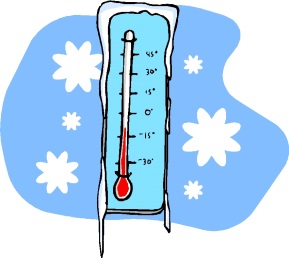
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| **Lesson Title: Thermometer STEM Challenge** | |
| **Grade Level:** 1st | **Quarter:** 1 |
| **Standards:**  **Science:**  **S1E1. Obtain, evaluate, & communicate weather data to identify weather patterns.**  a. Represent data in tables &/or graphs to identify & describe different types of weather & characteristics of each type.  b. Ask questions to identify forms of precipitation such as rain, snow, sleet & hailstones as either solid (ice) or liquid (water).  c. Investigate current weather conditions by observing, measuring with simple weather instruments (thermometer, wind vane, rain gauge), and recording weather data (temperature, precipitation, sky conditions, and weather events) in a periodic journal or on a calendar seasonally & graphically.d. Analyze data to identify seasonal patterns of change  **Math:**  **MGSE1.MD.4**  Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.  **MGSE1.MD.2**  Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same size length units that span it with no gaps or overlaps | |
| **Lesson Essential Question:**  How can I use instruments to measure weather?  How can I organize data? | **Vocabulary:**  temperature  non-standard measurement |
| **Lesson Materials:**  *One Hot Summer Day* by Nina Crews  tape  straws  pencils  hundred chart  construction paper | **Lesson Assessment:**  Model of a thermometer |
| **STEM Challenge Overview:**  Students will be designing a model of a thermometer. | |
| **Teacher Background:**  This is 1 of the 3 STEM Weather Challenges. Prior to completing this challenge, teachers should cover different types of weather (S1E1a). Students should have had prior lessons where they have used and seen how each weather instrument works. Students will collect data weather data for two weeks. During the two weeks of collection the teacher can pick when to do any of the below STEM challenges. Prior to completing the final STEAM challenge (End of unit assessment) students should have completed all 3 challenges. | |
| **INSTRUCTION** | |
| 1. **Ask/Engage** | |
| *How will you engage students? Introduce design challenge in general terms- what problem will students need to solve? Review any STEM Content that students will need to apply to solve design challenge.*  Meteorologists are scientists that use tools to study and predict the weather. Over the next two week period, your class will be making a class weather chart indicating daily temperature, how windy it is outside, which direction the wind is blowing, the sky conditions and amount of precipitation, if any. While you are recording different types of weather you will be learning all about different weather instruments that meteorologist use. We will learn how to use them and we will even get to create our own thermometers, wind vanes, and rain gauges. When we are done learning about all of these we will have a challenge unlike any that you have had before!  **Thermometer Ask/Engage:** Read *One Hot Summer Day* by Nina Crews or YouTube read aloud (Here is one version) <https://www.youtube.com/watch?v=tOn9OsDOPYU>  or a similar book about a hot day. Discuss with students what tool meteorologist use to measure the temperature. Take students outside with thermometers if they have not yet use them. When introducing the challenge remind students they are creating a model of a thermometer.  **Art Connection:** Have students write a narrative story about their own Hot Summer Day. After students go through the writing process let students act out their stories in small groups. | |
| 1. **Imagine/Brainstorm** | |
| *Introduce the constraints of the design plan. Define the criteria for success. Ask each student to work independently to come up with 1-2 possible design solutions. Students should draw/label their designs.*  **Challenge:**  You have been learning all about the weather. You have learned that thermometers tell you how hot or cold it is outside. Today our school’s Kindergartners need your help. They have yet to learn about the weather and need you to teach them about temperature. Your challenge is to create a model of a thermometer that has a scale of 10 that goes all the way to 100 degrees Fahrenheit. When you complete your model you will then have to teach a Kindergarten Buddy all about thermometers and temperatures!  **Criteria/Constraints**  1. Your thermometer should be a model of what a real thermometer looks like.  2. Your scale must count by 10’s to 100.  3. You must be able to teach a Kindergarten Buddy about what a thermometer is and how and why meteorologists use them. | |
| 1. **Plan/Design** | |
| *Each student presents their ideas to their team. Student teams collaborate to come up with final design plan. Students draw final design plan and make a list of needed supplies.* | |
| 1. **Create / Test** | |
| *Student teams build their design according to their design plan. Students test their design plan and record data.*  After students have created their model of a thermometer, the students will then teach a kindergarten buddy all about thermometers and how they are used by meteorologist. | |
| 1. **Evaluate/Improve –** and repeat Steps 1-5 | |
| *Students evaluate their design for success. Did it meet the established criteria? Did their final design match their planned design? How would students improve their design?* | |

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Thermometer Model**

**1st Grade**

**Challenge**:

You have been learning all about the weather. You have learned that thermometers tell you how hot or cold it is outside. Today our school’s Kindergartners need your help. They have yet to learn about the weather and need you to teach them about temperature. Your challenge is to create a model of a thermometer that has a scale of 10 that goes all the way to 100 degrees Fahrenheit. When you complete your model you will then have to teach a Kindergarten Buddy all about thermometers and temperatures!

**Criteria/Constraints**

1. Your thermometer should be a model of what a real thermometer looks like.

2. Your scale must count by 10’s to 100.

3. You must be able to teach a Kindergarten Buddy about what a thermometer is and how and why meteorologists use them.

**Materials:**

* tape
* straws
* pencils
* hundred chart
* construction paper

**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Date** | **Temperature** | **Precipitation** | **Windy (yes or no)**  **Direction of wind** |
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**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Draw a picture of what the sky conditions are.**

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| **Date** | **Sky Conditions** |
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