



4<sup>th</sup> Grade – Mathematics and Physical Education

Going the Distance: “How are the different units of measurement used to measure length and distance alike and different?”

<p><b><u>Standard(s)</u></b></p>	<p><b><u>CCSS: MATHEMATICS: Measurement and Data:</u></b> Solve problems involving measurement and conversion of measurement from a larger unit to a smaller unit.  <b><u>CCSS: MATHEMATICS: MD.1:</u></b> Know relative sizes of measurement units within one system of units. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit.</p>
<p><b><u>Objective(s)</u></b></p>	<ul style="list-style-type: none"> <li>● Students can work together collaboratively to plan, carry out, and share investigations that test and answer the question: “How are the different units of measurement used to measure length and distance alike and different?”  <b>(NGSS: ETS 1-3)</b></li> <li>● Students will use the Vine Trail as a resource to estimate and determine the similarities and differences between the different units of measurement that are used to determine length and distance.</li> <li>● Students will be able to use real-life examples and experiences in order to compare, contrast, and conceptualize different lengths and distances.</li> </ul>
<p><b><u>4 Cs</u></b>  <i>Just a few examples of how this activity connects to the 4Cs</i></p>	<p><b><u>Communication/Collaboration:</u></b> At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs <b>(NGSS:3-5-ETS1-2)</b>.  <b><u>Critical Thinking/Collaboration:</u></b> Students will plan and conduct an investigation collaboratively to answer questions or test solutions to problems <b>(NGSS:3-5-ETS1-3)</b>.</p>
<p><b><u>Materials</u></b></p>	<ul style="list-style-type: none"> <li>● Measurement Devices: Ruler, Yardstick, Measuring Tape, Pedometer, GPS, Measuring Wheel (for long distances)</li> <li>● Recommended Books: <u>How Tall, How Short, How Faraway</u> by David A. Adler or <u>Hottest, Coldest, Highest, Deepest</u> by Steve Jenkins</li> <li>● Sidewalk Chalk: Two different colors per small student group</li> <li>● Clipboards/Pencils</li> <li>● Student notes/graphic organizer from anchor chart/pictorial</li> <li>● Stopwatch</li> </ul>
<p><b><u>Prerequisite Knowledge (Vocab.)</u></b></p>	<ul style="list-style-type: none"> <li>● Customary System of Measurement</li> <li>● Metric System of Measurement</li> <li>● distance</li> <li>● length</li> <li>● Inches</li> </ul>



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	<ul style="list-style-type: none"> <li>● Feet</li> <li>● Yards</li> <li>● Miles</li> <li>● Centimeters</li> <li>● Meters</li> <li>● Kilometers</li> <li>● <u>Extension Activity</u>: Seconds, Milliseconds, Minutes</li> </ul>
<p><b><u>Lesson Summary</u></b></p>	<p><u>Prior to Visiting the Vine Trail:</u></p> <ol style="list-style-type: none"> <li>1. Opener: Using your chosen Language Arts classroom practices, introduce the idea around similarities and difference between units of measurement using either of the following two books: <u>How Tall, How Short, How Faraway</u> by David A. Adler or <u>Hottest, Coldest, Highest, Deepest</u> by Steve Jenkins.</li> <li>2. Create an anchor chart/pictorial to communicate the meanings, examples of, and comparisons between the different units of measurement indicated in the “Prerequisite Knowledge” section.</li> </ol> <p><u>Vine Trail Field Trip:</u></p> <ol style="list-style-type: none"> <li>3. Student Groups will be provided with 2 colors of sidewalk chalk and all of the measurement tools that are listed above. .</li> <li>4. Using the “Measurement Activity” worksheet, students will use their chalk and tools to first estimate and then accurately measure and mark the indicated distances along the Vine Trail using two different colors of sidewalk chalk.  <a href="#">Going the Distance Measurement Activity Worksheet</a></li> </ol> <p><u>Field Trip Follow- Up Classroom Activity:</u></p> <ol style="list-style-type: none"> <li>5. Using the data gathered on the field trip as well as anchor charts/pictorials in the classroom, students will be provided with the length of the entire Vine Trail in miles and work together to convert units and determine its length in yards, feet, kilometers, and meters. Maybe even inches and centimeters for fun!</li> </ol> <p><u>PE/Measurement Extension:</u></p> <ol style="list-style-type: none"> <li>6. Students will use a stopwatch to measure how long it takes each of them to run the following distances: <math>\frac{1}{4}</math> of a mile, <math>\frac{1}{2}</math> of a mile, 1 mile (students will first need to determine and measure those distances and mark them - this would be a great whole class activity). Data will be recorded on a graphic organizer and can be put into a Whole Class Line Plot and analyzed.</li> </ol>
<p><b><u>Part of Trail</u></b></p>	<ul style="list-style-type: none"> <li>● Any portion of the Vine Trail can be used for this activity</li> </ul>
<p><b><u>Additional Resources</u></b></p>	<ul style="list-style-type: none"> <li>● <a href="https://www.brainpop.com/math/numbersandoperations/metricvscustomary/">https://www.brainpop.com/math/numbersandoperations/metricvscustomary/</a> (Resources that compare and contrast Customary and Metric Systems of Measurement)</li> </ul>



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|  | <ul style="list-style-type: none"><li>• <a href="https://www.youtube.com/watch?v=OTQfqQjmLow">https://www.youtube.com/watch?v=OTQfqQjmLow</a> Video: Bill Nye the Science Guy explores measurement!</li></ul> |
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