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| Title | Measuring Runner Lengths |
| Overview | Students will select the appropriate tool to use when measuring runners on a strawberry plant. They will estimate the lengths of three runners and measure to get an exact measurement. They will also write statements comparing their estimated lengths to their actual lengths. |
| Standards | * M.2.MD.1: measure the length of an object by selecting and using appropriate tools, such as rulers, yardsticks, meter sticks, and measuring tapes. * M.2. MD.3: estimate lengths using units of inches, feet, centimeters, and meters. * M.2.MD.4: measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. * M.2.OA.1: use addition and subtraction within 100 to solve 1 and 2 step word problems. * ELA.2.R.C1.4: Ask and answer such questions as who, what, where, when, why and how to demonstrate understanding of key details in informational texts. * ELA.2.R.C2.6: identify the main purpose of informational texts, including what the author wants to answer, explain or describe. |
| Materials/Advance Preparation Needed | * Books: Me and the Measure of Things by Joan Sweeney and Length (Math Counts) by Henry Pluckrose.   Pluckrose, Henry. *Length (Math Counts).* Children’s PR, Reprint Edition.  September 1995.  Sweeney, Joan. *Me and the Measure of Things*. Random House  Children’s Book 2002. Reprint.   * tape measure * ruler * yard stick * Runner Length Handout (included) * Cut runners the morning of lesson using scissors. One set of runners need to include a runner shorter than a ruler, a runner longer than a ruler but shorter than a meter stick, a runner longer than a meter stick but shorter than a measure tape. One set of runners is needed per pair of students. * Have tape measure, ruler and yard stick together so they are easily accessible for introduction |
| Procedures/Steps:  (Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions) | **Driving Question:**   * What is the best tool to use when measuring a certain object or length?   **Introduction:**   * Ask students, “What do you think we can do with these materials? (tape measure, ruler, yard stick) Share and discuss. * Tell students we will be doing math with the runners and see what they think we will do with them. * Read these books as a class read aloud: Me and the Measure of Things and Length (Math Counts). Make sure to have students ask and answer who, what, where, when, why and how questions about each book. Students also need to identify the author’s purpose for each book. * Mini Math Lesson: Review estimating and the unit; centimeters.   **Lesson:**   * **Whole Class:** Pass out the teacher made handouts for students to record their data on. Discuss each section and what they will be expected to have completed today. Have them draw a line or star where they should stop at for the day. The rest will be completed tomorrow. * **Gro:** Teacher should model estimating three objects of different lengths. Students will then receive their runners. They will begin by estimating & recording the length of each runner in cm by putting them in order from shortest to longest. * Then students will choose the appropriate tool to measure each runner. * Teacher should model measuring the actual length of objects. Then students will record their actual length of each runner on their data sheet. * Students need to write why they chose the tool they did for each runner. * Teacher will model writing a comparison statement between the estimated and actual length. Then students will write a statement comparing the estimated length to the actual length. They will write one statement for each runner. (This is as far as we expect students to get the first day.)   **Day 2:**   * Students will continue to write two word problems using their actual runner lengths. One problem will need to be addition and the other one will need to be subtraction. * Students will then have another group solve their problems.   **Closure:**   * Class discussion about the activity. Ask: “How did it go? What did you learn?” * Collect data sheet for assessment. |
| Assessment (What will be the evidence of student learning?) | Students will record their estimations and actual lengths on the data sheet. They must also record the tool they chose to use with justification to measure the runners. They will write comparison statements between the lengths and solve each other’s problems. |

Runner Lengths

1. Estimate the length of your runners by putting them in order from shortest to longest. Estimate the shortest runner first and the longest runner last. Estimate the length in centimeters (cm).  
    Runner estimate

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| Runner A (shortest) |  |
| Runner B |  |
| Runner C (longest) |  |

1. Now measure the length of your runners from shortest to longest. You may select the tool you think will be the best tool to get the most accurate measurement. Tools: meter stick, tape measure or ruler. You may need to use a different tool for each runner, or you may need to use the same tool. Decide which tool will work best for each separate runner. Cooperate with your group to decide which tool to use. Measure to the nearest ½ (half) centimeter.

Runner Actual length Tool used:

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| Runner A (shortest) |  |  |
| Runner B |  |  |
| Runner C (longest) |  |  |

Explain why you chose the tool used to measure each runner:  
Runner A: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Runner B: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Runner C: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Now you need to write a statement comparing your estimated length to the actual length you measured. Write one statement for each runner.

Runner A: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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Runner B:  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Runner C:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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For Problems 4 & 5 you will write word problems. One problem needs to compare the length of two of the runners. (You will determine how much longer one runner is than another.) The other problem needs to combine the lengths of 2 or more of your runners. Don’t forget units with your answers.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     
   Number Model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     
   Number Model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_