

# Unit 8: Measurement, Data & Multi-Digit Computation with Marble Rolls



In this unit, your child will:

- Measure length to the nearest inch
- Collect, organize, and display data on a line plot and on a bar graph
- Analyze data to solve problems, draw conclusions, and make predictions
- Add, subtract, order, and compare 3-digit numbers

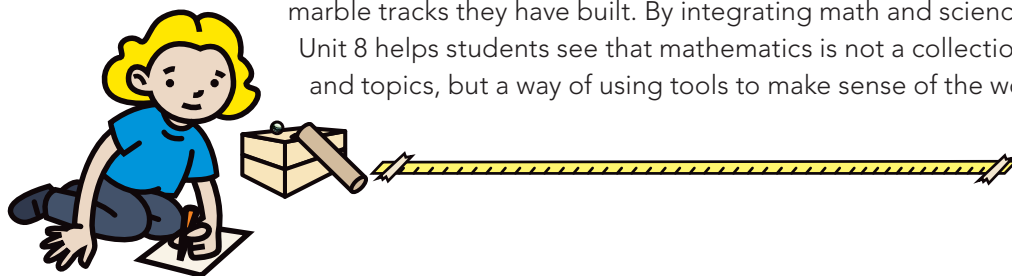
Your child will learn and practice these skills by solving problems like those shown below. Keep this sheet for reference when you're helping with homework.

PROBLEM	COMMENTS
<p>Use a block, cardboard tube, and tape to build a marble track. Measure the distance the marble travels.</p>	<p>This unit combines math with physical science concepts. Students create marble tracks and adjust three variables (ramp height, marble mass, tube length) to make their marbles roll farther after exiting the track. They collect and graph data and use it to adjust their designs. Later, they work in pairs to solve a variety of marble ramp challenges.</p>
<p>Make a line plot using the data collected from the class experiments.</p> <p>How far do you think a marble would roll from 4 blocks high? Explain your thinking using the information on the graph.</p> <p><i>"I think it would go more than it did from 3 blocks. Maybe it would go about 45 inches. Each time a block is added, it goes farther."</i></p>	<p>A line plot shows data on a number line with an X to show frequency. After rolling the marble down the ramp, students record their distance on a sticky note and post it on a class line plot. They then transfer the information to their own line plots (shown left) and discuss the results with their classmates.</p> <p>To answer the question below the graph, students must interpret what the graph shows. This student saw that when the marble was rolled from greater heights, it rolled farther after exiting the track.</p>
<p>Eric and his family are driving 450 miles to Grandma's house. Sara and her family are driving 294 miles to a theme park. Which family has farther to drive? How many miles farther?</p> <p><i>"Eric's family has farther to drive. I found the difference by adding up. I added 6 to get up to 300. Then I went by 50s... see? 300, 350, 400, 450. It's 156 miles farther."</i></p>	<p>During the year students have developed strategies for adding and subtracting. Using a variety of strategies strengthens their number sense and allows them to approach a wide range of problems flexibly. In this example, the student efficiently used the open number line model to find the difference between the two numbers by first moving to a helpful landmark number (300) and then skip-counting by 50s to reach 450: <math>6 + 50 + 50 + 50 = 156</math>.</p> <p>This approach shows an understanding of place value and accurately determines the difference.</p>

## FREQUENTLY ASKED QUESTIONS ABOUT UNIT 8

**Q:** Why are students doing math and science at the same time in this unit?

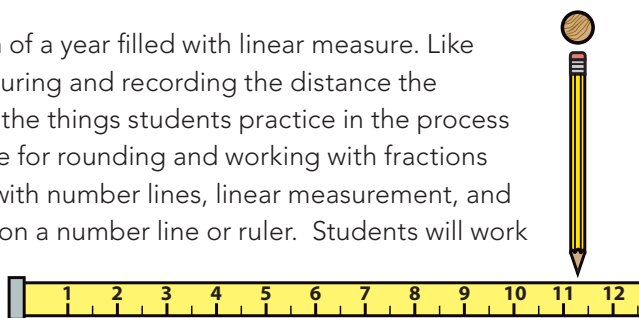
**A:** Math and science are closely related. Scientists use mathematics to make sense of data they collect through experiments. In this unit, students use mathematics to analyze and interpret data they collect about marble tracks they have built. By integrating math and science in a purposeful way, Unit 8 helps students see that mathematics is not a collection of disconnected skills and topics, but a way of using tools to make sense of the world around them.



**Q:** It seems like students are doing a lot of measuring length and distance.

**Why? What about different types of measurement?**

**A:** The marble roll project is, in a sense, the culmination of a year filled with linear measure. Like scientists everywhere, students run multiple trials, measuring and recording the distance the marble rolls from each ramp height three times. One of the things students practice in the process is measuring to the nearest whole inch, setting the stage for rounding and working with fractions on a number line in Grade 3. The work they have done with number lines, linear measurement, and fractions is preparing them for understanding fractions on a number line or ruler. Students will work with other types of measurement like temperature, mass (weight), and volume (capacity) in future grades.



**Q:** What can I do over the summer to keep my child's math skills sharp?

**A:** Summer is a perfect time to show your child how math is used in everyday life. Telling time, counting money, linear measurement, and mastering basic addition and subtraction facts are key skills that they developed during the second grade year. Activities that reinforce these lifelong concepts are good choices.

Travel brings many opportunities to practice math skills: Restaurant menus are great for finding the most and least expensive items or determining the total cost or difference in price of two selections. Your second grader can estimate the total cost of a meal by rounding the cost of each item ordered and adding them together. When the check comes, compare the estimate to the actual bill.

On road trips, have your child keep track of time by noting when you leave and when you arrive at different destinations. Your child can answer "How much longer?" for the family if she figures out ahead of time roughly when you should arrive. Read the numerals on license plates as numbers (e.g., read 327 as three hundred twenty-seven). Who can find the number with the greatest value? Rearrange the numbers. What is the greatest number or least number you can make using the digits? Write down three sets of numbers. Add the numbers together. Who has the sum closest to 1,000?

The grocery store is a great place to find numbers and make comparisons. Your child can compare the costs of different brands of items and decide which is the better deal for the money. When making a purchase, you might ask your child to estimate the total or calculate how much change you should receive and count to make sure it's correct.

Play games like Yahtzee, cribbage, and Tri-Ominos with your child. Even practicing math facts with cards, spinners, and dice is fun when a grown-up and child take turns using strategies like Making Ten, Doubles, Doubles Plus One, and so on.

Plant something together; then measure and record its growth over time. Race toy cars down ramps or make paper gliders and measure the distance they travel. Most importantly, have fun using math with your child!