

Task: Lunch Money Task		3rd Grade
<p>On Monday morning as Sam was leaving to get on the bus for school, his mother gave him \$12.00 and told him, “This will buy you lunch for the week!” One lunch at Sam’s school costs \$2.25. Sam is wondering if his mother gave him enough money to eat lunch every day this week. Show how you can help Sam decide if he has enough money.</p>		
Common Core State Standards for Mathematical Content		Common Core State Standards for Mathematical Practice
<p>(2.MD.8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?)</p> <p>3.OA.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i></p> <p>3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.5. Apply properties of operations as strategies to multiply and divide. <i>Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</i></p>		<ol style="list-style-type: none"> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.
Essential Understandings		
<ul style="list-style-type: none"> • A situation that can be represented by multiplication has an element that represents the scalar and an element that represents the quantity to which the scalar applies. • Each multiplicative expression developed in the context of a problem situation has an accompanying explanation, and different representations and ways of reasoning about a situation can lead to different expressions or equations. • When multiplying two factors, either factor can be partitioned (or both). For example, $6 \times 7 = (1 + 5) \times 7$ or $6 \times (2 + 5)$. 		
Explore Phase		
Possible Solution Paths		Assessing and Advancing Questions
<p><u>Repeated addition:</u> $\\$2.25 + \\$2.25 + \\$2.25 + \\$2.25 + \\$2.25 = \\11.25. Yes, Sam has enough money.</p>		<p><u>Assessing Questions</u> Why did you choose to add? (MP1, MP2) How did you decide Sam has enough money? (MP3)</p> <p><u>Advancing Questions</u> Can you write your equation another way using multiplication? (MP4, MP7)</p>

<p><u>Partitioning the five days:</u> Students may try to group two days of lunch money at a time (they may then combine those sums):</p> $\begin{array}{r} \$2.25 \\ +\$2.25 \\ \hline \$4.50 \end{array} \quad \left. \vphantom{\begin{array}{r} \$2.25 \\ +\$2.25 \\ \hline \$4.50 \end{array}} \right\} \9.00 $\begin{array}{r} \$2.25 \\ +\$2.25 \\ \hline \$4.50 \end{array}$ <p>Plus \$2.25 for another day, gives $\\$9.00 + \\$2.25 = \\$11.25$. Yes, Sam has enough money.</p> <p>$2 \times \\$2.25 + 2 \times \\$2.25 + \\$2.25 = (2 + 2 + 1) \times \\$2.25 = \\$11.25$ $4 \times \\$2.25 + \\$2.25 = (4 + 1) \times \\$2.25 = \\11.25 OR $\\$2.25 \times (2 + 2 + 1) = \\$2.25 \times (4 + 1) = \\$11.25$</p> <p><i>Partitioning the week of 5 days into groups of 2, 2, and 1 or 4 and 1 is making use of the distributive property for multiplication. Multiplying the money and days in either order is making use of the commutative property.</i></p>	<p><u>Assessing Questions</u> Why did you decide to group the \$2.25s the way you did? (MP1, MP7) What can you tell me about this group – how many \$2.25s are in this group?</p> <p><u>Advancing Questions</u> How can you represent this group of \$2.25s with an equation? Are there other ways to group the \$2.25s? (MP4, MP7)</p>
<p><u>Partitioning the money:</u> Students may partition the lunch money for one day into \$2.00 and \$0.25, two dollars and one quarter. From here, students could use repeated addition $\\$2.00 + \\$2.00 + \\$2.00 + \\$2.00 + \\$2.00$ or multiplication $5 \times \\$2.00$ to get \$10.00. They may then add 5 quarters to make \$1.25 more for a total of $\\$10.00 + \\$1.25 = \\$11.25$. In all, lunch for a week will cost \$11.25, so Sam has enough money.</p> <p>$(\\$2.00 + \\$2.00 + \\$2.00 + \\$2.00 + \\$2.00 + \\$0.25 + \\$0.25 + \\$0.25 + \\$0.25 + \\$0.25) = 5 \times \\$2.00 + 5 \times \\$0.25 = 5(\\$2.00 + \\$0.25) = \\$11.25$</p> <p><i>Partitioning the money into two dollars and a quarter is making use of the distributive property for multiplication. Multiplying the money and days in either order is making use of the commutative property.</i></p>	<p><u>Assessing Questions</u> Why did you split the money into dollars and a quarter? How did that help you? (MP1, MP3, MP7)</p> <p><u>Advancing Questions</u> When you split the money into dollars and quarters, how many dollars do you have for the week? Can you write an equation for that? (MP4) How many quarters do you have for the week? Can you write an equation for that? (MP4) Can you write an equation that shows how to combine the dollars and quarters? (MP4, MP7)</p>
Possible Student Misconceptions	
<p>Students may not understand the prompt that they are supposed to determine if Sam has enough money to eat lunch for five days. They may think that \$2.25 is less than \$12.</p> <p>Students may add \$12 and \$2.25 because they did not make sense of the task.</p>	<p><u>Assessing Questions</u> Let's read the task together. How much money does Sam have? How much does one lunch cost? How many days will Sam buy lunch this week? What are we trying to figure out? (MP1)</p> <p><u>Advancing Questions</u> If lunch costs \$2.25 for one day, how could you decide how much lunch will cost for two days? What operation will you use? Why? (MP1, MP2)</p>

Entry/Extensions	Assessing and Advancing Questions
<p>If students can't get started....</p>	<p><u>Assessing Questions</u> How much money does Sam have? How many days will Sam buy lunch at school this week? How much does lunch cost for one day? (MP1)</p> <p><u>Advancing Questions</u> If lunch costs \$2.25 for one day, how could you decide how much lunch will cost for two days? (MP2)</p>
<p>If students finish early....</p>	<p><u>Assessing Questions</u> How do you know your work is correct? (MP3, MP6)</p> <p><u>Advancing Questions</u> How much money does Sam have left over? Can you help Sam decide another way? (MP3, MP7)</p>
Discuss/Analyze	
Whole Group Questions	
<p><u>Using the 5 as a scalar</u> Tell me what are trying to determine? What are some different strategies that we can use to help Sam decide? Who can help me write the repeated addition of \$2.25 as a multiplication equation? What does the 5 represent?</p>	
<p><u>Partitioning the five days</u> Someone took the cost for lunch and grouped them into 2, 2, and 1. How did this help? Can we group the money in different ways? Will that change the value? If we already have $5 \times \\$2.25$ for repeated addition, how can we write an expression if the money was grouped? How are those expressions related? Where is the 5 in this expression?</p>	
<p><u>Partitioning the money</u> I noticed that some of you decided to take \$2.25 and look at it as \$2.00 and \$0.25. How did this help you? How many groups of \$2.00 did you have and how many quarters did you have? If we already have $5 \times \\$2.25$, how can we write an expression with multiplication for the dollars and quarters? How is this related to the other expressions that we have? Where is the \$2.25 in this expression?</p>	