Indicator A

The teacher poses high-quality questions and problems that prompt students to share their developing thinking about the content of the lesson.

Students share their developing thinking about the content of the lesson.

Indicator B

The teacher encourages reasoning and problem solving by posing challenging problems that offer opportunities for productive struggle.

Students persevere in solving problems in the face of initial difficulty.

Indicator E

The teacher connects and develops students' informal language to precise mathematical language appropriate to their grade.

Students use precise mathematical language in their explanations and discussions.

Indicator F

The teacher establishes a classroom culture in which students choose and use a variety of appropriate tools when solving a problem.

Students use appropriate tools strategically when solving a problem.

Indicator C The teacher establishes a classroom culture in which students explain their thinking. Students elaborate with a second sentence (spontaneously or prompted by the teacher or another student) to explain their thinking and connect it to their first sentence.	**Indicator D** The teacher creates conditions for student conversations where students are encouraged to talk about each other's thinking. Students talk about and ask questions about each other's thinking, in order to clarify or improve their own mathematical understanding.
Indicator G The teacher asks students to explain and justify work and provides feedback that helps students revise their initial work. Student work includes revisions, especially revised explanations and justifications.	

As students are presented with a task to solve, Sanjana decides to pick up some base 10 blocks to build an array, Brooke begins drawing a tape diagram, and Carson grabs some graph paper and starts drawing an area model.	During math rotations students freely go to the shelves and select from snap cubes, base ten blocks, or square tiles to complete their practice.
Lindsey: To figure out the answer I took the 2 numbers and timesed them together. Teacher: So, you multiplied both factors (points to student work) and found the product.	Students are sitting at tables of four & the following is heard: S1: How did you know the sprockets were the cheapest? S2: Looking at the table I saw that the unit rate was only $3.50 S3: But how did you know it was the unit rate?

	S2: Since that was the cost of 1.

Meryl: The **volume** of the container is 36 **cubic inches** since that's how many cubes it took to fill it. That's different than **area** since area covers **2-dimensional** shapes.	Day 1 journal: It took 24 square tiles to cover the rectangle. Day 10 journal: The area of the rectangle is 48 sq cm since 48 is the product of the length of 6 cm and width of 8 cm.
Karen knows: 1. Each customer only ordered one type of product. 2. Sprockets cost more than widgets. Determine which product each customer ordered.	Robots, Inc. sells doodads. Can you tell without calculating if each doodad costs more or less than $5? 

Customer's Name	Number of Items	Total Cost
Jacobson	3	$13.50
Campbell	1	$4.50
Adams	5	$31.25
Smith	6	$37.50
Downey	4	$18.00

Purpose: The Prior Knowledge Connection activates students' prior knowledge by:

- Encouraging the use of estimation strategies.
- Using a context (price for one item) that is extended in the lesson.

Throughout the lesson, students will extend this knowledge to use combinations of items and prices to make decisions.

S1: I don't think you can use a double number line like that to solve this problem.
S2: But I'm comparing two amounts so why not?
S3: Well we are actually comparing 2 ratios so maybe we could use 2 double number lines.

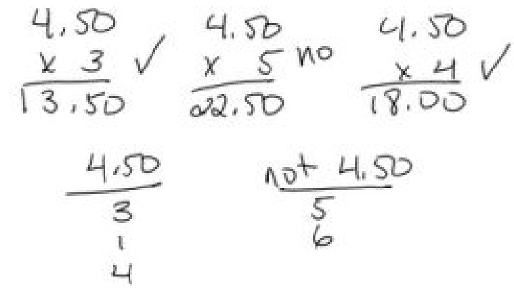
Kaleb: I noticed that in each row of the metric table the number on the left is ten times as much as than the one on the right, that's like our base ten system. It's 10 times more each time we shift a place left.

Student : The fizzy orange tastes the same because 1 more liter of orange and 1 more liter of soda has been added & these just 'cancel each other out'

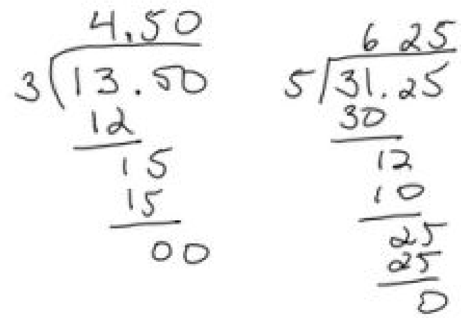
Lauren: I first had the answer 3/8 but looking back over my work I see my

Teacher response: How could you use math to check that the addition of a liter of orange and a liter of soda has no effect on the taste? • What would happen to the taste if a liter of orange and a liter of soda were added to 1 liter of soda?	mistake. I'm going to try again changing how I divided my tape model.

Carter: If Sam mixes 2 liters of orange with 3 liters of soda, the mixture will be orange, which is slightly less orangey than Friday's and Saturday's mixture. This means that for every liter of orange, 1 liters of soda should be added to the mixture.	Maria: Maddie's answer is correct since her partial products match what I have in my area model. Lydia forgot to adjust for place value when she used the standard algorithm so her answer isn't right.
Grant: Is this problem asking	Alex: I tried to see which options would work if the

us to find the partial volumes and add them together? Is that what we need to do?	price was $4.50 using multiplication: 

S1: This is really tough S2: I know, but we have the 1st part figured out and I bet if we used a tape diagram with that info we can get the rest. S1: True, I really want to find out which option is cheapest so we can use that to plan a real party!	Lauren: Now I see how finding area is helpful. That's what my dad was doing when trying to figure out how many tiles to buy to cover our bathroom floor.
Teacher: Why should we expect all	We can see from Tyrell's work that

<table>
<tr>
<td>the quotients for each type of item to be the same?
Does this strategy tell you the cost of each item?
How is “scaling up” connected to finding the price for 1 item?</td>
<td>finding the unit rate for each item using division allows us to compare which is less expensive.

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<td>Teacher: I see you are stuck. Let’s think, does Friday’s fizzy orange contain more orange than soda or more soda than orange? How can you compare the taste of Saturday’s fizzy orange to the taste of Friday’s fizzy orange?</td>
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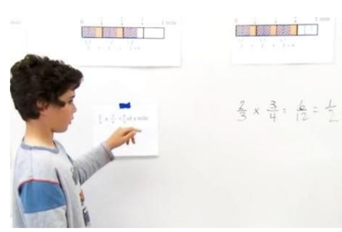</td>
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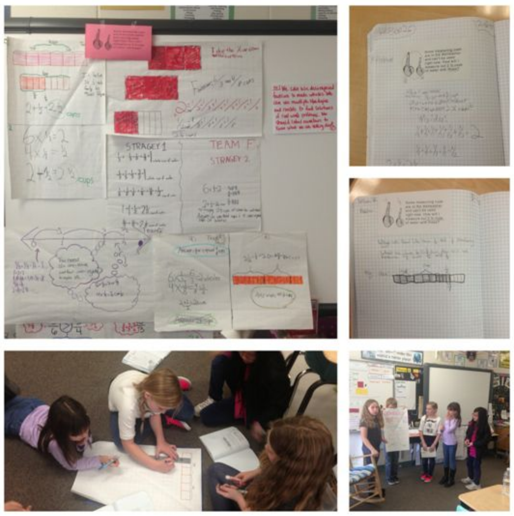
Varoon: This algorithm isn't working for me … I'm going to try again using the area model.	Jennifer: Hmm,, I'm not sure how to do this – but it reminds me of the Wubbles problem we did. I wonder if I made a table and looked for patterns like we did for that if it would help.
Teacher Plan: **Purpose**: This task is comparable to the opening launch. It introduces a similar scenario that complicates the problem by presenting two items with unknown unit	The teacher models less complete responses followed by appropriate

prices in an engaging situation.	updating of first thinking.
	Students view the class as a learning community where the responsibility for learning is shared by the teacher and all the other students.