

Anchor Paper Scoring and Rationales

Task: Room for Shoes

Student A

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Developing	<ul style="list-style-type: none"> • The student demonstrates an understanding of whole number repeated addition but not decimal computation. • The student applies the concept of repeated addition correctly but leads to an incorrect solution of 120.
Problem Solving	Developing	<ul style="list-style-type: none"> • The student’s problem solving strategy displays an understanding of repeated addition to solve the problem, however the student ignored the decimal in 0.8 and counted by 8 instead. • The student produces a solution relevant to the problem but inaccurate because of the misconception of adding 8 instead of 0.8.
Communication and Reasoning	Developing	<ul style="list-style-type: none"> • The student’s reasoning is limited to “I counted by 8” and “I used repeated addition”. • The student uses limited mathematical language to communicate thinking such as meters.
Representations and Connections	Developing	<ul style="list-style-type: none"> • The student uses a number line to represent their thinking with misconceptions. • The student could move to a score of Proficient by labeling each numbered section as “pairs of shoes” and correctly labeling tenths showing groups of 0.8.

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Student B

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	<ul style="list-style-type: none"> • The student demonstrates an understanding of decimal multiplication. • The student applies his understanding of multiplication to lead to a valid and correct solution.
Problem Solving	Proficient	<ul style="list-style-type: none"> • The student’s problem solving strategy displays an understanding of the underlying mathematical concept. • The solution is relevant to the problem and the student states that 12 meters is “the total amount of space that will be taken up or is needed” proving the solution’s reasonableness.
Communication and Reasoning	Advanced	<ul style="list-style-type: none"> • The student’s reasoning and justification is comprehensive. • The student uses precise mathematical language to communicate thinking such as meters, multiply, product, and total wall space.
Representations and Connections	Proficient	<ul style="list-style-type: none"> • The student uses a representation of thinking with accurate labels such as “shoes – 0.8m, 15 pairs of shoes, 12 meters of total wall space”. • The student could move to a score of Advanced by making a mathematical connection to other concepts that deepens understanding.

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Student C

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	<ul style="list-style-type: none"> • The student demonstrates an understanding of decimal multiplication by finding a pattern in repeated addition. • The student applies his understanding of using repeated addition to find a whole number, and then multiplying, to lead to a valid and correct solution.
Problem Solving	Advanced	<ul style="list-style-type: none"> • The student's problem solving strategy displays an understanding of finding a friendly whole number. The student adds 0.8 five times to get to the sum of 4. Next, the student recognizes 3 groups of 5 in 15. So, the student multiplies 4 and 3 to correctly solve. • The solution is relevant to the problem.
Communication and Reasoning	Developing	<ul style="list-style-type: none"> • The student's reasoning is limited and could move to a score of Proficient if the student communicated evidence to support strategy. • The student uses limited mathematical language to communicate thinking such as meters and pair.
Representations and Connections	Developing	<ul style="list-style-type: none"> • The student uses a representation of thinking with partial accurate labels of 0.8. • The student could move to a score of Proficient by labeling each section and showing how each group of 0.8 created a sum of 4.0, clearly displaying 3 groups of 4.

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Student D

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	<ul style="list-style-type: none"> • The student demonstrates an understanding of decimal multiplication by using repeated addition and finding a pattern to solve. • The student applies his understanding of using repeated addition to find a whole number, and then adding that number three times to lead to a valid and correct solution.
Problem Solving	Proficient	<ul style="list-style-type: none"> • The student's problem solving strategy displays an understanding of finding a friendly whole number. The student adds 0.8 five times to get to the sum of 4. Next, the student recognizes 3 groups of 5 in 15. So, the student adds 4 three times to correctly solve. • The solution is relevant to the problem.
Communication and Reasoning	Developing	<ul style="list-style-type: none"> • The student's reasoning is limited and could move to a score of Proficient is the student communicated evidence to support strategy such as recording their reasoning. • The student uses limited mathematical language to communicate thinking such as meters.
Representations and Connections	Proficient	<ul style="list-style-type: none"> • The student represents their thinking by adding 0.8 five times. The student records a 4 in the ones place above the first number. The student records the sum of three 4's as 12. • The student could move to a score of Advanced by labeling representation and creating a model to extend thinking.

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Student E

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Developing	<ul style="list-style-type: none"> • The student applies limited mathematical understanding to find a correct solution using a calculator. • The student could move to a score of Proficient by recording mathematical understanding related to the problem that lead to multiplication.
Problem Solving	Emerging	<ul style="list-style-type: none"> • The student's problem solving strategy is not evident since they did not record what was typed into calculator. • The student could move to Proficient by recording problem solving process and reasonableness of solution.
Communication and Reasoning	Emerging	<ul style="list-style-type: none"> • The student does not provide any reasoning or justification. • The student uses limited mathematical language to communicate thinking such as meters.
Representations and Connections	Developing	<ul style="list-style-type: none"> • The student uses an incomplete representation to model the problem. • The student could move to a score of Proficient by labeling the model and length of each pair of shoes on the wall section drawn to connect to 12 meters as an accurate solution.

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Student F

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	<ul style="list-style-type: none">• The student demonstrates an understanding of decimal multiplication by using repeated addition and multiplication to solve.• The student applies their understanding of whole number computation to estimate 0.8 as 1 whole and multiply by 15 to get an estimate of 15.
Problem Solving	Proficient	<ul style="list-style-type: none">• The student's problem solving strategy displays an understanding of multiplication as repeated addition, evident in the model drawn of 15 groups of 0.8 in rows of five.• The student produces a solution relevant to the problem and confirms the reasonableness of the solution with estimation.
Communication and Reasoning	Proficient	<ul style="list-style-type: none">• The student's reasoning justifies the solution steps.• The student uses precise mathematical language to communicate thinking such as meters, product, estimation, ones, tenths, hundredths and thousandths.
Representations and Connections	Proficient	<ul style="list-style-type: none">• The student represents their thinking by creating 15 groups of 0.8 tenths in rows of 5. The student also uses a number line to represent the estimation of 0.8 as 1 whole.

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Student G

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	<ul style="list-style-type: none">• The student demonstrates an understanding of 15 groups of 0.8 tenths as multiplication.• The student applies their understanding of multiplication to lead to a correct and valid solution of 12 meters of wall space.
Problem Solving	Proficient	<ul style="list-style-type: none">• The student's problem solving strategy displays an understanding 15 groups of 0.8 as multiplication.• The student produces a solution relevant to the problem and confirms that the wall needs to be 12 meters in length.
Communication and Reasoning	Proficient	<ul style="list-style-type: none">• The student's reasoning justifies the solution steps.• The student uses precise mathematical language to communicate thinking such as meters, product and length.
Representations and Connections	Proficient	<ul style="list-style-type: none">• The student represents their thinking by writing the equation $0.8 \times 15 = 12$ meters.• The student connects the product of 12 meters to the amount of wall space needed in the problem.

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Student H

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Developing	<ul style="list-style-type: none"> • The student demonstrates a partial understanding of multiplication of decimals. • The student attempts to apply their understanding of multiplication of whole numbers to multiplication of decimals to lead to an incorrect solution.
Problem Solving	Developing	<ul style="list-style-type: none"> • The student's problem solving strategy displays a limited understanding of decimal multiplication. The student decomposes 15 into a group of 10 and a group of 5. When finding the product of 10 and 0.8, the student arrives at an incorrect solution. The same occurs when finding the product of 0.8 and 5. However, the process of multiplying and adding the products for the solution is valid.
Communication and Reasoning	Developing	<ul style="list-style-type: none"> • There is limited evidence of the student's reasoning. • The student uses limited mathematical language to communicate thinking such as meter.
Representations and Connections	Developing	<ul style="list-style-type: none"> • The student represents their thinking by writing the equation $0.8 \times 10 + 5$ in a box. Next the student writes the equation $0.80 + 0.40 = 1.20$ vertically. • The student could move to a score of Proficient by modeling what is inside of each box with repeated addition (build from 4th grade understanding) and connecting with multiplication of decimals.