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| **NC.4.NBT.5**  **Multiplication Strategies** | |
| **Domain** | Numbers and Operations in Base Ten |
| **Cluster** | Generalize place value understanding for multi-digit whole numbers. |
| **Standard(s)** | **NC.4.NBT.5** Multiply a whole number of up to three digits by a one-digit whole number, and multiply up to two two-digit numbers with place value understanding using area models, partial products, and the properties of operations. Use models to make connections and develop the algorithm. |
| **Materials** | pencil, activity sheet |
| **Task** | **Multiplication Strategies**  In the cafeteria, each row seats 22 students. There are 12 rows. How many students can be seated?  Part 1: Solve this problem using an area model.  Part 2: Solve this problem using partial products.  Part 3: Solve this problem using the standard algorithm.  Part 4: Describe the connections you see between the area model you made in Part 1 and the way you solved the problem using the standard algorithm in Part 3.  This standard calls for students to understand and use a variety of strategies for multiplying multi-digit numbers.  *Possible strategies:*  Traditional Algorithm:  22  x 12  44  +220  264  Area array model:   |  |  | | --- | --- | | **20 x 10 = 200** | **20 x 2 = 40** | | **2 x 10 = 20** | **2 x 2 = 4** |   Partial Products:  20 x 10 = 200 22 x 2 = 44  20 x 2 = 40 22 x 10 = 220  2 x 10 = 20 220 + 44 = 264  2 x 2 = 4  200 + 40 + 20 + 2 = 264 |

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| **Rubric** | | |
| **Level I**  **Not Yet** | **Level II**  **Progressing** | **Level III**  **Meets Expectation** |
| Students are unable to use a strategy to solve the multiplication problem.  OR  Student may be able to use the algorithm to find an answer but cannot explain why it works. | Student answers 2-3 parts of the problem completely and correctly. | Student answers all 4 parts of the problem completely and correctly. |

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| **Standards for Mathematical Practice** |
| **1. Makes sense and perseveres in solving problems.** |
| **2. Reasons abstractly and quantitatively.** |
| 3. Constructs viable arguments and critiques the reasoning of others. |
| **4. Models with mathematics.** |
| 5. Uses appropriate tools strategically. |
| 6**.** Attends to precision. |
| 7. Looks for and makes use of structure. |
| 8. Looks for and expresses regularity in repeated reasoning. |

**Multiplication Strategies**

In the cafeteria, each row seats 22 students. There are 12 rows. How many students can be seated?

Part 1: Solve this problem using an area model.

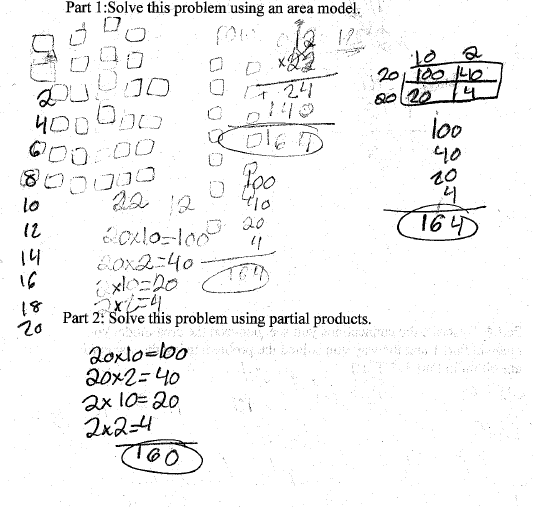
Part 2: Solve this problem using partial products.

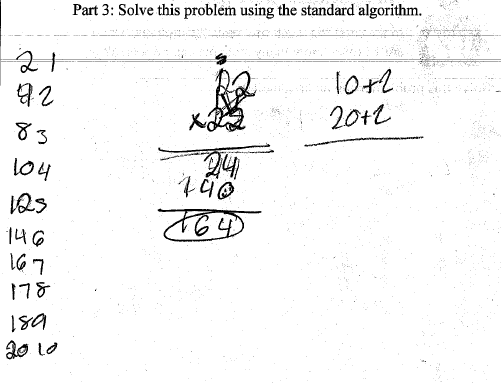
Part 3: Solve this problem using the standard algorithm.

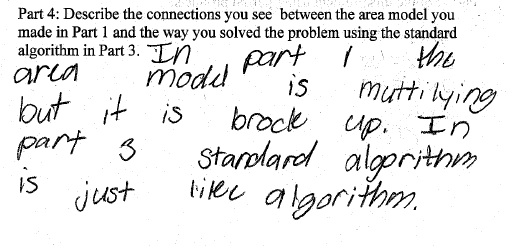
Part 4: Describe the connections you see between the area model you made in Part 1 and the way you solved the problem using the standard algorithm in Part 3.

**Scoring Examples**

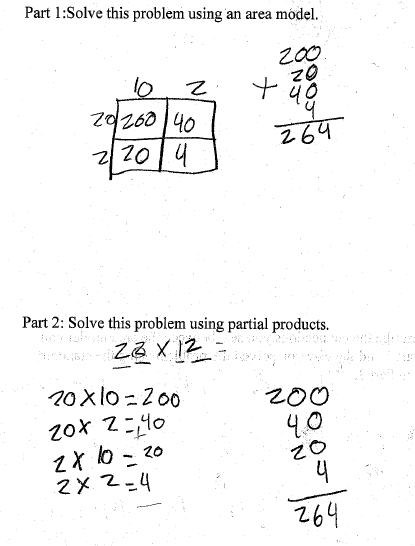
**Not Yet:** This student was unable to solve the problem using correctly using any strategy.

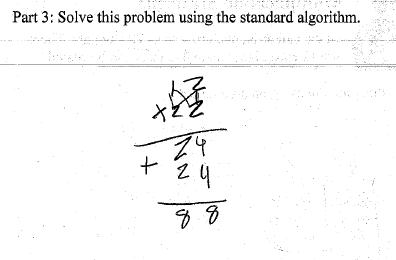


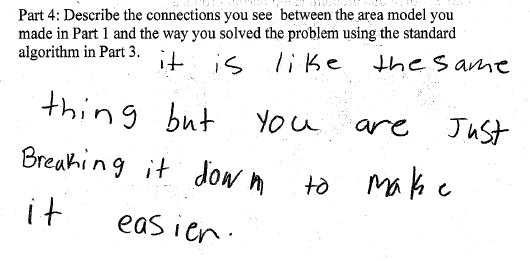




**Progressing:**  The student solved the problem correctly using two different strategies and could make connections between strategies, but was unable to solve using the algorithm.







**Meets Expectation:** The student was able to correctly solve the problem three different ways and explain how the strategies were related.

