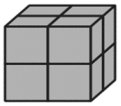
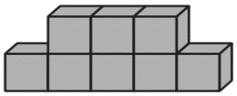
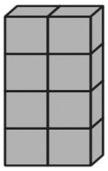
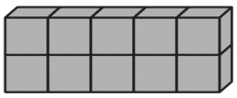
Let's Do Some Math Which One Doesn't Belong?	A  B  C  D 

Standards Unpacking		
Key	**Standard**	**Prerequisites/Vocabulary**
Put a box around the conceptual component of the standard. Underline the procedural/fluency component of the standard. Put a cloud around the application component of the standard.	**5.NBT.5 -** With accuracy and efficiency, multiply multi-digit whole numbers using the standard algorithm.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

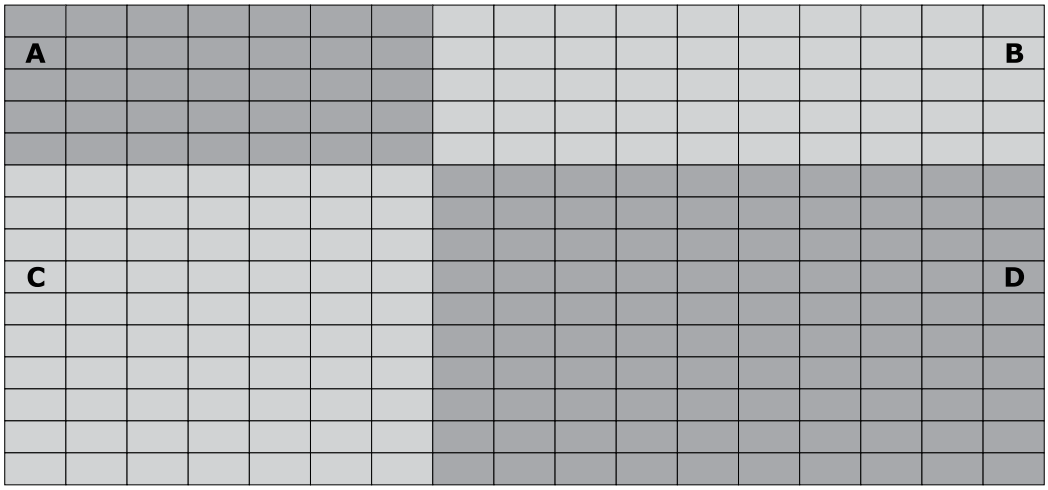
Michael works for a company that packs cards in boxes for stores. He has worked there for 15 years. Every day he packs 24 boxes with 36 cards in each box. How many cards does he pack in the boxes in one day?

S Underline the question.
This problem is asking me to find _____

_____.

Directions: Complete this page with your teacher and partner.

15 • 17 = Factors:
Distribute Factors for Double Digits:



Open Array

A	B
C	D

Directions: Complete this page with your teacher and partner.

1. 32
x 4

Factors:

Distributed Factors:

Open Array

A	B

Moving Toward the Multiplication Algorithm

T	H	T	O	
x				
				A
				B

Multiplication Algorithm

T	H	T	O
x			

Steps for Solving:

Directions: Complete this page with your teacher and partner.

2.
$$\begin{array}{r} 23 \\ \times\ 43 \\ \hline \end{array}$$

Factors:

Distributed Factors:

Open Array

A	B
C	D

Moving Toward the Multiplication Algorithm

T	H	T	O	
x				
				A
				B
				C
+				D

Multiplication Algorithm

T	H	T	O
x			
+			

Steps for Solving:

Directions: Complete this page with your partner.

3.
$$\begin{array}{r} 32 \\ \times\ 24 \\ \hline \end{array}$$

Factors:

Distributed Factors:

Open Array

A	B
C	D

Moving Toward the Multiplication Algorithm

T	H	T	O	
x				
				A
				B
				C
+				D

Multiplication Algorithm

T	H	T	O
x			
+			

Steps for Solving:

Directions: Complete this page with your teacher and partner.

1. 136
x 23

Steps for Solving:	Multiplication Algorithm
	T H T O x +

2. 413
x 24

3. 81
x 27

Multiplication Algorithm	Multiplication Algorithm
T H T O x +	

Directions: Complete this page with your partner.

4. 41 • 26 =

5. 19 • 21 =

6. 712 • 13 =

7. 123 • 52 =

8. 75 • 14 =

9. 521 • 12 =

Understanding Modeling Questions Use this sheet as a reflection tool to support the understanding of the modeling questions. After you engage/learn about the questions, use the tool to make notes around your take aways, implementation ideas, and ways to incorporate the rubric		
	Takeaways About the Questions	**Reflections on Implementation Ideas and the Rubric**
Takeaways About the Questions		
Understanding of How They Are Scored		
Reflections on Implementation Ideas and the Rubric		

Think Quantities!	**Think Structure!**	**Think Repetition!**
What can I count? **What can I measure?** **How are the quantities related?** **How can I represent the quantities so I can see relationships?**	**How is this situation behaving?** **What kind of problem is this?** **Does the problem remind me of another I've solved?** **Will changing the form help?** **How can I chunk this expressions/number/visual?**	**Is there a process that keeps repeating?** **Am I counting /building/drawing in the same way each time?** **Do I keep repeating the same calculations?** **How can I use repetition to write a rule?**

Modeling Question – D.2

Used from: NJ Released Questions – D.2 – Operations and Algebraic Thinking - 2018 – 0083-M0045

Part A

A parking garage has a total of 87 parking spaces. If there are 3 levels in the garage, and each level has an equal number of parking spaces, how many parking spaces are on each level?

Part B

The parking garage will add 2 new levels of parking spaces. Each new level will have twice the number of parking spaces as the old levels. How many parking spaces in all will be on these 2 new levels?

Part C

After the 2 new levels of parking spaces are complete, the garage will gain 98 new customers. The garage will then have a total of 171 customers.

- Write an equation to find the number of customers the garage had before the 2 new levels were added. Use the letter c to stand for the unknown number in your equation.
- How many customers did the garage have before the 2 new levels were added?
- About how many empty parking spaces will the garage have after the 2 new levels are completed and all its customers have parking spaces? Round your answer to the nearest ten. Explain your thinking using numbers and/or words.
- Show all your work.

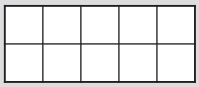
Standards Unpacking		
Key	**Standard**	**Prerequisites/Vocabulary**
Put a box around the conceptual component of the standard. Underline the procedural/fluency component of the standard. Put a cloud around the application component of the standard.	**5.M.2 (Old 5.MD.3) -** Recognize volume as an attribute of solid figures and understand concepts of volume measurement	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	5.M.2a - A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	5.M.2b - A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	5.M.3 (Old 5.MD.4) - Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?

Standards Unpacking		
Key	**Standard**	**Prerequisites/Vocabulary**
Put a box around the conceptual component of the standard. Underline the procedural/fluency component of the standard. Put a cloud around the application component of the standard.	**5.M.4 (Old 5.MD.5) -** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?
	5.M.4a - Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?
	5.M.4b - Apply the formulas V = l x w x h and V= B x h for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?
	5.M.4c - Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?

Warm–Up

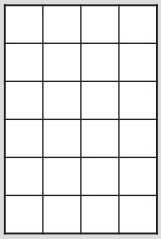
Directions: Find the area of each rectangle or square below.

1.



_____

2.



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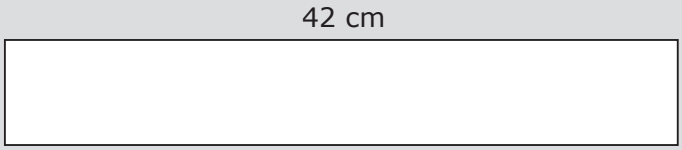
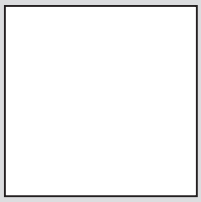
3.



_____

4.



_____

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Tamara has a box in the shape of a rectangular prism that she uses for her doll clothes. The prism is 18 inches tall, 8 inches long, and 5 inches wide. How many cubic inches of doll clothes can fit inside the box?

S Underline the question.
This problem is asking me to find _____

_____.

Directions: Complete this page with your teacher and partner.

1. In the Warm-Up, you found the area of rectangles and squares. How do you find the area of a rectangle or square? _____

2. How do you write the units when finding the area? Why? _____

_____

_____

3. What shape is this?  _____

4. Like a square, a cube has length and width, but it also has a third dimension. What is the third dimension? _____

5. Because it has three dimensions, we are going to call the cube a _____

6. Use cubes to create a rectangle that is 4 cubes long and 3 cubes wide.

7. What is the area of the base of your rectangular prism? _____

Directions: Complete this page with your teacher and partner.

8. What is the height of your rectangular prism? _____ The length? _____ The width? _____

9. How many cubes did it take to make your rectangular prism? _____

10. On top of the cubes, add another layer of cubes that is the exact same size.

11. What is the area of the base of your rectangular prism? _____

12. What is the height of your rectangular prism? _____ The length? _____ The width? _____

13. How many cubes did it take to make your rectangular prism? _____

14. On top of your cubes, add another layer of cubes that is the exact same size.

15. What is the area of the base of your rectangular prism? _____

16. What is the height of your rectangular prism? _____ The length? _____ The width? _____

17. How many cubes did it take to make your rectangular prism? _____

List the height, length, and number of cubes for each prism in the chart below.

#	Height	Length	Width	#	# of Cubes
8.				**9.**	
12.				**13.**	
16.				**17.**	

18. Do you see a relationship between the dimensions and the number of cubes?

_____

_____

Directions: Complete this page with your teacher and partner.

1. List the base area, height, and number of cubes for each prism in the chart below.

#	Base Area	#	Height	#	# of Cubes
7.		**8.**		**9.**	
11.		**12.**		**13.**	
15.		**16.**		**17.**	

2. Do you see a relationship between the base area, height, and the number of cubes? _____

_____

3. Filling a prism with sand to see how much it would hold is the same thing as finding the number of cubic units in a prism. This is called the _____ of the prism.

4. There are two formulas that can be used to find the volume of a rectangular prism. Based on the relationships we looked at in numbers 7 – 17, can you come up with the two formulas? _____

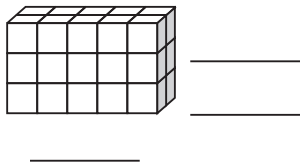
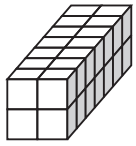
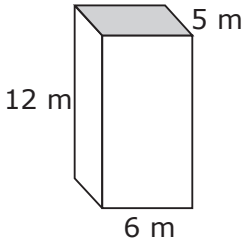
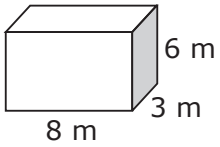
_____

5. Volume is measured in cubic units. Explain why. _____

_____

_____

Directions: Complete this page with your teacher and partner.

Example 1:	**Volume Formula:**	**Problem 1:**
		
Example 2:	**Volume Formula:**	**Problem 2:**
		
Example 3: A wooden cabinet has a length of 40 in., a height of 25 in., and a width of 8 in. What is its volume?	**Volume Formula:**	**Problem 3:** A shoebox has a length of 22 inches, a height of 12 inches, and a width of 10 inches. What is its volume?
Example 4: A rectangular prism has a base area of 18 m^2 and a height of 4 m. What is the volume of the prism?	**Volume Formula:**	**Problem 4:** A rectangular prism has a base area of 15 m^2 and a height of 5 m. What is the volume of the prism?

Directions: Complete this page with your teacher and partner.

1. Partner A, use your cubes to build Prism A. Partner B, use your cubes to build Prism B.

	Length	Width	Height	Volume
Prism A	3	2	4	
Prism B	2	3	3	
Prism A and B				

2. Find the volume of each prism and fill in the volume column. How did you find the volume? _____

_____

3. Place both prisms next to each other, so that they are touching. This is called a complex figure. What is the volume of the prisms combined? _____

_____

4. How were you able to find the volume? _____

_____

5. Could you multiply all the dimensions of both prisms together to get the volume?

_____

6. Could you add the lengths, widths, and heights, and then multiply to get the volume?

_____

7. If you did not have cubes to count, how could you find the volume of the complex figure? _____

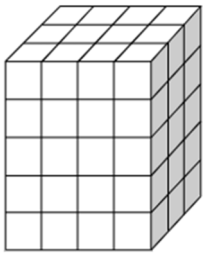
_____

Understanding Reasoning Questions Use this sheet as a reflection tool to support the understanding of the reasoning questions. After you engage/learn about the questions, use the tool to make notes around your take aways, implementation ideas, and ways to incorporate the rubric		
	Takeaways About the Questions	**Reflections on Implementation Ideas and the Rubric**
Takeaways About the Questions		
Understanding of How They Are Scored		
Reflections on Implementation Ideas and the Rubric		

Reasoning Question – 5.C.1 – 3

Used from: NJ Released Questions – 5.C.1-3 – Measurement and Data – M01278

In this right rectangular prism, each small cube measures 1 unit on each side.



What is the volume of the prism?

Explain how you found the volume. You may show your work in your explanation.

What would be the dimensions of a new right rectangular prism that has 20 fewer unit cubes than the original prism?

Explain how you determined the dimensions of the new right rectangular prism.

Training Reflection			
What are your takeaways?			
Reasoning	**Modeling**	**Context**	**Precision**
What are your next steps as a result of this training?			