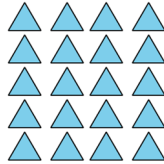


Let's Do Some Math	How Many Do You See? 		
Standards Unpacking	Key	Standard	Prerequisites/Vocabulary
	Put a box around the conceptual component of the standard.	3.NBT.3 - <u>Multiply</u> one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80, 5×60) <u>using strategies</u> based on place value and properties of operations.	What prior knowledge should my students have?
			What vocabulary/ notation should students know for this standard?
	Underline the <u>procedural/fluency component</u> of the standard. Put a cloud around the application component of the standard.	3.OA.3 - Use multiplication and division within 100 to solve <u>word problems</u> 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.	What prior knowledge should my students have?
			What vocabulary/ notation should students know for this standard?
		3.OA.5 - <u>Apply properties of operations as strategies</u> to multiply and divide.2 Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative 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.)	What prior knowledge should my students have?
			What vocabulary/ notation should students know for this standard?

Grade 3 – Multiplication

		3.OA.9 - Identify arithmetic patterns (including patterns in the addition table or multiplication table), and <u>explain</u> them using properties of operations. <i>For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</i>	What prior knowledge should my students have?
			What vocabulary/ notation should students know for this standard?

LESSON 9: Multiplication of Whole Numbers with Property Application

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

Marcel’s mother is buying gum for his soccer team. The cost of gum is \$2.39 per package. She buys 3 packages of gum. Each package has 5 packs of gum. Each pack of gum has 10 pieces in it. How many pieces of gum are in all 3 packages?

S Underline the question.

This problem is asking me to find _____
_____.

Directions: Complete this page with your teacher and partner.

A.

B.

1. What does the first grid represent?

_____.

What is the number fact? _____

2. What does the second grid represent?

_____.

What is the number fact? _____

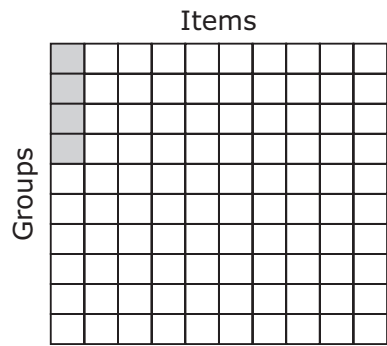
3. Compare the grids. _____
_____.

4. $3 \cdot 10 = 10 \cdot \underline{\hspace{1cm}}$

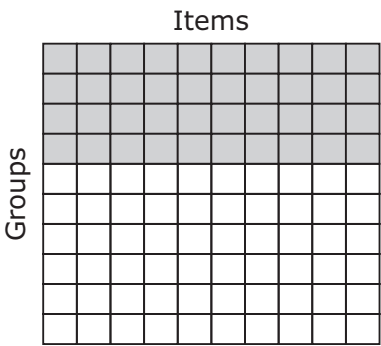
LESSON 9: Multiplication of Whole Numbers with Property Application

Directions: Complete this page with your teacher and partner.

Grid 1



Grid 2



What is the meaning of the math fact modeled in the first grid? Write the math fact below Grid 1.

What is the meaning of the math fact modeled in Grid 2? Write the math fact below Grid 2.

Multiplying by 10:

Let’s look at the patterns in the examples below.

$3 \bullet 1 =$

$7 \bullet 1 =$

$5 \bullet 1 =$

$6 \bullet 1 =$

$3 \bullet 10 =$

$7 \bullet 10 =$

$5 \bullet 10 =$

$6 \bullet 10 =$

What do you notice about each product when we multiplied by 10? Our answer ended in a _____ because the product was groups of ____.

How can we apply what we know about our basic facts to multiply by multiples of 10?

Fact	What is the place value of the digits in our items ?	What does this mean?	Product
3 • 6			
Can we have 18 in the ones column? ____ This means that we have to regroup ____ ones and write our product as one group of ten and 8 ones which is ____.			
3 • 60			
Can we have 18 in the tens column? ____ This means that we have to regroup ____ tens and write our product as one group of hundreds and 8 tens which is ____.			
5 • 40			

1. $3 \bullet 20 =$

2. $7 \bullet 50 =$

3. $4 \bullet 30 =$

4. $6 \bullet 80 =$

5. $9 \bullet 60 =$

6. $5 \bullet 40 =$

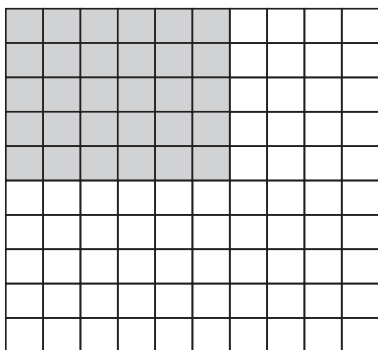
7. $2 \bullet 70 =$

When I multiply by a multiple of _____, my product represents _____.

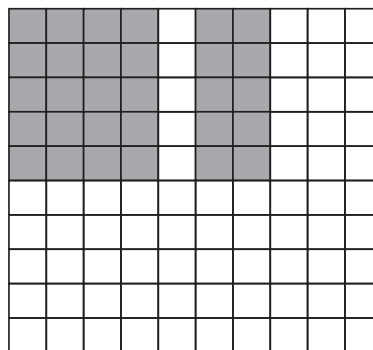
LESSON 9: Multiplication of Whole Numbers with Property Application

Directions: Complete this page with your teacher and partner.

1. A.



B.

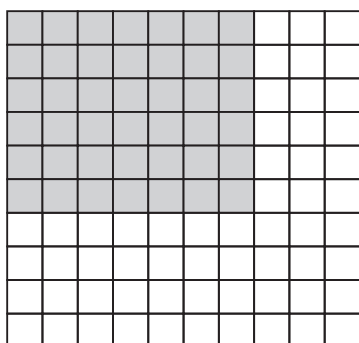


Are both sets of arrays equal? _____ How do you know? _____

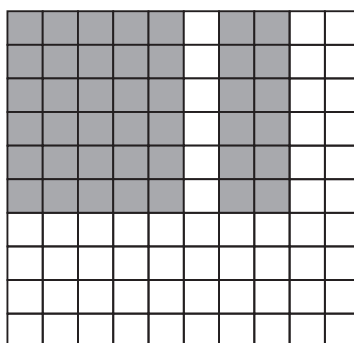
Number Sentences: $5 \cdot \underline{\quad} = 30$ $(5 \cdot \underline{\quad}) + (5 \cdot \underline{\quad}) = 30$

$5 \cdot \underline{\quad} = (5 \cdot \underline{\quad}) + (5 \cdot \underline{\quad})$

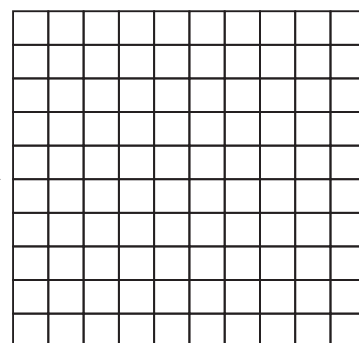
2. A.



B.



C.



Are both sets of arrays equal? _____ How do you know? _____

Number Sentences: $6 \cdot \underline{\quad} = 42$ $(6 \cdot \underline{\quad}) + (6 \cdot \underline{\quad}) = 42$

$6 \cdot \underline{\quad} = (6 \cdot \underline{\quad}) + (6 \cdot \underline{\quad})$

What happened to the 5 and 2 in $6 \cdot 5$ and $6 \cdot 2$? _____

Understanding Reasoning and Modeling Questions

Use this sheet as a reflection tool to support the understanding of the evidence statement around the reasoning questions. After you engage/learn about the questions, use the tool to make notes around your take aways and implementation ideas.

Current Unit Topics:**Evidence Statement for Reasoning**

What Content Standards
Are Addressed in This
Evidence Statement
from the Current Unit?

Takeaways About the
Statement – What Do
Students Need to Be
Able to Do

What Should Be Evident
in a Student Response

Reasoning Question – 3.C.4 – 1

Used from: NJ Released Questions – 3.C.4-1 – Operations and Algebraic Thinking – 0190-M01039P

Part A

Ms. Williams asked Carlos and Sara to show different ways to find the value of this expression:

$$4 \times 2 \times 3$$

Carlos decided to multiply 2×3 first. Which expression shows what Carlos should multiply next to find the correct value of $4 \times 2 \times 3$.

- A. 4×2
- B. 4×2
- C. 4×2
- D. 4×2

Part B

Sara explained the way she found the value of $4 \times 2 \times 3$ as follows:

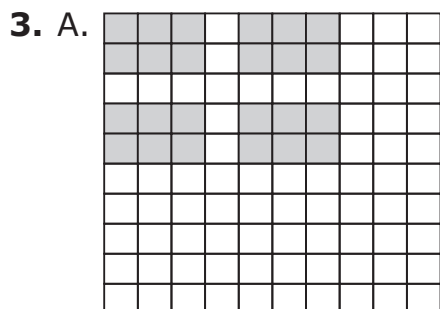
- Multiply 4×2 .
- Multiply 4×3 .
- Add the two products.

Sara made a mistake. Describe Sara's mistake.

What is the correct value of $4 \times 2 \times 3$?

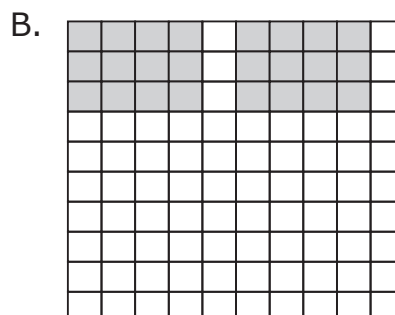
LESSON 9: Multiplication of Whole Numbers with Property Application

Directions: Complete this page with your teacher and partner.



Fact: _____

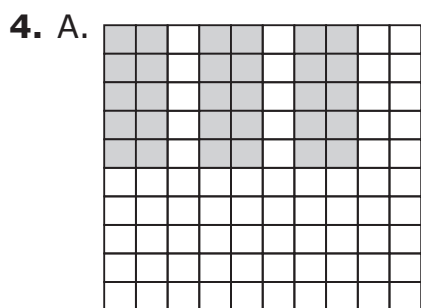
Way to Multiply



Fact: _____

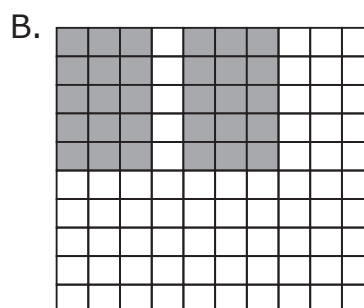
Way to Multiply

If $(2 \cdot 3) \cdot 4 = 6 \cdot 4 = 24$ and $2 \cdot (3 \cdot 4) = 2 \cdot 12 = 24$, then what can you conclude about these facts? _____



Fact: _____

Way to Multiply



Fact: _____

Way to Multiply

If $5 \cdot 2 \cdot 3 = 30$ and $5 \cdot 3 \cdot 2 = 30$, then what can you conclude about these facts?
 $5 \cdot 2 \cdot 3 = \underline{\quad} \cdot 3 \cdot \underline{\quad}$

LESSON 9: Multiplication of Whole Numbers with Property Application

Directions: Complete this page with your teacher and partner.

Steps for Multiplying

- _____ the problem.
- Circle the _____ to be multiplied first.
- _____ the two circled factors.
- Multiply the _____ of the circled factors by the _____ factor.

Let's Review

1. $(6 \bullet 2) \bullet 3$
Way to Multiply

2. $6 \bullet (2 \bullet 3)$
Way to Multiply

If $(6 \bullet 2) \bullet 3 = 6 \bullet (2 \bullet 3)$, then _____.

3. Show two ways to multiply $4 \bullet 3 \bullet 2$ by changing the order of the factors.

Way to Multiply

Way to Multiply

If $4 \bullet 3 \bullet 2 = 4 \bullet 2 \bullet 3$, then $12 \bullet \underline{\hspace{1cm}} = 8 \bullet \underline{\hspace{1cm}}$.

4. Show how to solve the problem $9 \bullet 16$.

$$9 \bullet 16 = (9 \bullet \underline{\hspace{1cm}}) + (9 \bullet \underline{\hspace{1cm}}) = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

What happened to the 10 and 6 in $9 \bullet 10$ and $9 \bullet 6$? _____

LESSON 15: Patterns

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

A jeweler has purchased stones to make several necklaces. He has purchased 37 stones and 5 clasps to fasten the necklaces. Will the jeweler have any stones left over after making 5 identical necklaces? If so, how many stones will be left over?

S Underline the question.

This problem is asking me to find _____

_____.

Addition Chart

+	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18

LESSON 15: Patterns

Directions: Complete this page with your teacher and partner.

Patterns with Addition Chart - Even Numbers			
Value	Number to Add	Sum	Odd or Even
2	2		
2	4		
2	6		
2	8		
4	2		
4	4		
4	6		
4	8		

1. With your partner, make a prediction about the sum of 6 and any even number. Now place the beans on the sums of 6 and the even numbers. Is the sum even or odd? _____
2. With your partner, make a prediction about the sum of 8 and any even number. Now place the beans on the sums of 8 and the even numbers. Is the sum even or odd? _____

LESSON 15: Patterns

Directions: Complete this page with your teacher and partner.

Patterns with Addition Chart - Odd Numbers			
Value	Number to Add	Sum	Odd or Even
1	1		
1	3		
1	5		
1	7		
3	1		
3	3		
3	5		
3	7		

3. With your partner, make a prediction about the sum of 5 and any odd number. Now place the beans on the sums of 5 and the odd numbers. Is the sum even or odd? _____
4. With your partner, make a prediction about the sum of 7 and any odd number. Now place the beans on the sums of 7 and the odd numbers. Is the sum even or odd? _____

LESSON 15: Patterns

Directions: Complete this page with your teacher and partner.

- 1. What is the sum of $1 + 2$? _____
Is the sum odd or even? _____
- 2. What is the sum of $4 + 5$? _____
Is the sum odd or even? _____
- 3. With your partner, list 10 addition facts where 1 addend is odd and 1 is even.

Addition Fact	Sum	Odd or Even?

- 4. What can you conclude about adding two even numbers? _____
Why? _____.
- 5. What can you conclude about adding two odd numbers? _____
Why? _____.
- 6. What can you conclude about the sum of an odd and an even number? _____
Why? _____.

LESSON 15: Patterns

Multiplication Chart

x	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

LESSON 15: Patterns

Directions: Complete this page with your teacher and partner.

Patterns with Multiplication Chart - Even Numbers			
Value	Number to Multiply By	Product	Odd or Even
2	2		
2	4		
2	6		
2	8		
4	2		
4	4		
4	6		
4	8		

1. With your partner, make a prediction about the product of 6 and any even number. Now place the beans on the products of 6 and the even numbers. Are the products even or odd? _____
2. With your partner, make a prediction about the product of 8 and any even number. Now place the beans on the products of 8 and the even numbers. Are the products even or odd? _____

LESSON 15: Patterns

Directions: Complete this page with your teacher and partner.

Patterns with Multiplication Chart - Odd Numbers			
Value	Number to Multiply By	Product	Odd or Even
1	1		
1	3		
1	5		
1	7		
3	1		
3	3		
3	5		
3	7		

3. With your partner, make a prediction about the product of 5 and any odd number. Now place the beans on the products of 5 and the odd numbers. Are the products even or odd? _____
4. With your partner, make a prediction about the product of 7 and any odd number. Now place the beans on the products of 7 and the odd numbers. Are the products even or odd? _____

LESSON 15: Patterns

Directions: Complete this page with your teacher and partner.

1. Using your multiplication table, find the product of $3 \bullet 2$. _____
Is the product odd or even? _____
2. Using your multiplication table, find the product of $4 \bullet 7$. _____
Is the product odd or even? _____
3. With your partner, list 10 multiplication facts where 1 factor is odd and 1 is even.

Multiplication Fact	Product	Odd or Even?

4. What can you conclude about multiplying two even numbers? _____
Why? _____.
5. What can you conclude about multiplying two odd numbers? _____
Why? _____
6. What can you conclude about the product of an odd and an even number?
_____. Why? _____

Understanding Reasoning and Modeling Questions Use this sheet as a reflection tool to support the understanding of the evidence statement around the reasoning questions. After you engage/learn about the questions, use the tool to make notes around your take aways and implementation ideas.	
Current Unit Topics:	
	Evidence Statement for Modeling
What Content Standards Are Addressed in This Evidence Statement from the Current Unit?	
Takeaways About the Statement – What Do Students Need to Be Able to Do	
What Should Be Evident in a Student Response	

Modeling Question – 3.D.1

Used from: NJ Released Questions – D.1 – Operations and Algebraic Thinking – M00819

Mr. Haley bought a total of 36 pictures. The pictures are only sold in packages. Each package came with 4 small pictures, 3 medium pictures, and 2 large pictures.

How many pictures were in each package? Show your work.

How many packages did he buy? Show your work.

Enter your answers and your work in the space provided.