

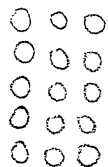
Looks like $4 \times 3 = 12$ → Product $\times 3$
 $4 \cdot 3 = 12$
 $4(3) = 12$ 4 times 3 equals 12

Models in Multiplication
 — purchased 5 packages of muffins. Each package contained 3 muffins. How many muffins did — purchase?

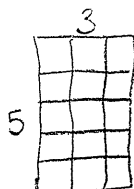
5 groups of 3 = 5×3



Array

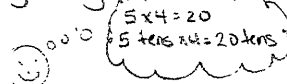


Area model



Multiplying by tens

$50 \times 4 = 200$



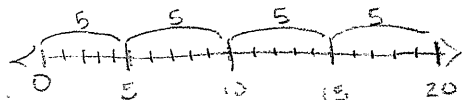
$5 \text{ tens} \times 4 = 20 \text{ tens}$

$20 \text{ tens} = 200$

Multiplication

Patterns in multiplication

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144



Multiples of 5
 $5: 5, 10, 15, 20, 25, 30, 35, 40$

Comparing in Multiplication

A blue hat costs \$6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost? The red hat costs \$18.

$\$6$

$\$6 \quad \$6 \quad \$6 = 6 \times 3$
 3 times as much

Properties of Multiplication

Commutative Property
 $5 \times 2 = 10$
 $2 \times 5 = 10$

Zero property
 $0 \times 7 = 0$
 $7 \times 0 = 0$

Associative property
 $(7 \times 5) \times 2 =$
 $2 \times 5 \times 7 =$

Distributive Property
 $7 \times 8 = (5 + 2) \times 8$
 $5 \times 8 + 2 \times 8 =$
 $40 + 16 = 56$

Identity Property of
 $1 \times 9 = 9$
 $9 \times 1 = 9$

Solving for an unknown

— has 6 bags with marbles, + has 24 marbles total. How many marbles are there in each bag?
 — there are 4 marbles in each bag.



Relationship to Division

$24 = 4 \times 6$
 $24 = 6 \times 4$
 $24 \div 6 = 4$
 $24 \div 4 = 6$

dividend \div divisor looks like quotient

$4 \overline{) 12}$



12 divided by 4 equals 3

fact family

Standards and Mathematical Practices

We will model with mathematics when using multiplication within 100 to solve word problems by using arrays, equal groups, and area models

We will look for and make use of structures of the Commutative, Associative, and Distributive properties of multiplication by using them as strategies to multiply.

We will find the unknown whole number in a multiplication equation by reasoning abstractly and creating a representation of a problem

What we know about multiplication? **Inquiry** What we want to learn about multiplication?

Chapters
Unit 5+6: Multiplication

UNIT PLANNING TOOL

1. Make sense of problems and persevere in solving them

2. Reason abstractly & quantitatively

4. Model with mathematics

7. Look for and make use of structure

CCSSM: 3.OA.1 - Interpret products of whole #'s Math Practices being emphasized:

3.OA.3 - Use multiplication to 100 to solve word problems
 3.OA.4 - Determine the unknown in a multiplication equation
 3.OA.5 - Apply properties of operations as strategies to multiply
 3.OA.7 - Fluently multiply and divide using relationship between both
 3.NBT.3 - Multiply 1-digit whole numbers by multiples of 10

Essential Questions

- What are different meanings of multiplication?
- How are addition and multiplication related?
- What patterns can be used to find certain multiplication facts.
- How can unknown multiplication facts be found using known facts.

Pre and Post Assessments

Pre - Teacher made to mirror post test
 or
 Envision topic 5+6 Multiple choice modified

Post - Envision Topic 5+6 Free Response

Key Concepts

- multiplication as repeated addition
- understand how to create and use models
- relationship to division
- properties of multiplication
- using patterns as a strategy

Visual Models of Concepts

2×3

• • •
 • • •

3

$3 \mid 3 \mid 3$

3 times as many

Algorithms/Diagrams

$3 \times 4 = 12$ $3 \times n = 12$
 $3 \cdot 4 = 12$ $12 = n \times 3$

$8 \times 4 = (5+3) \times 4$ $50 \times 4 =$
 $5 \times 4 + 3 \times 4$ $5 \text{ tens} \times 4 = 20 \text{ tens}$
 $20 + 12 = 32$ $50 \times 4 = 200$

$(7 \times 5) \times 2 = 70$
 $7 \times (5 \times 2) = 70$

Connections (Real World Applications)

Conversions - in measurement
 Construction - carpeting a room
 Shopping - # of objects in each pkg.
 Recipes - doubling a recipe

Language Functions/Structures

— is — times as many as —

The unknown in — is

— times — equals —.

— because —.

This array shows — rows of —.

multiplication

factor

product

array

area model

Properties

Associative

Commutative

Distributive

Zero

Identity of 1

Vocabulary

equal groups

unknown

variable

strategy

Focus and Motivation

Brain Pop Jr - Arrays

- repeated addition

www.brainpopjr.com

I have, who has - multiplication

Listen and respond - One Hundred Angry Ants
by Elinor J. Pinczes