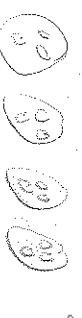


45 students
3 cookies each
How many cookies altogether?



4 x 3 = 12 → Product

Multiplication and Division →

How are X and Y related?

equal-size groups
inverse operations
opposite



2 x 9 = 18
9 x 2 = 18
18 ÷ 9 = 2
18 ÷ 2 = 9



Model: (below is intuitive)



$\frac{18}{9} = 2$
 $\frac{18}{2} = 9$

How many groups of 9?



What times is 18?

24 ÷ 7 = 6

Unknown → what we are finding
letters or symbols
+ 4 = 12 - = 8
? - 10 = 22 ? = 32
9 x Δ = 36 Δ = 4
8 - M = 4 M = 4
12 ÷ 6 = 7 7 = 2

Mathematical Standards and Practices

1) We will multiply and divide using different strategies and mathematical models.

2) We will make sense of word problems and persevere in solving them.

12 cookies
45 students
How many cookies does each get?
12 ÷ 4 = 3
4) 12
 8
 4
 0

How many groups?
How many in each group?

Ways to model X and ÷

array
picture or manipulatives



number line



bar model

Inquiry Chart

What we know about X and ÷ ?

What we want to learn about X and ÷ ?

UNIT PLANNING TOOL

Planning Focus: Division and it's connection to Multiplication **Module(s)/Unit(s)** 3rd, Unit 3, Norwalk PS
CCSSM:

See Unit 3 Curriculum Map pages 1 and 2 for specific standards

Mathematical Practices being emphasized:

- 1) Make sense of problems and persevere in solving them.
- 4) Model with mathematics – represent problem situations in multiple ways (numbers, words, pictures, objects, chart, list, equations....)

Essential Questions

- How are multiplication and division related?
- How can what I know about multiplication help me solve division problems?
- How do estimation, multiplication, and division help us solve problems in everyday life?
- How do we solve word problems using multiplication and division?

Key Concepts

Conceptual understanding of division and multiplication
 Understand multiplication and division as inverse operations
 Sequence counting
 Understanding word problems
 Properties of multiplication (not specific language but the ideas behind them)

Pre and Post Assessments

Preassessment – teacher made based
 Post assessments – Chapter 6 and 7 Go Math
 summative assessments plus open-ended question with multiple possible answers

Note: I would do a preassessment and a summative assessment for each chapter and have a Compendium that went across both.

Visual Models/ Algorithms/ Diagrams for Compendium

related facts

fact family

factors product

$4 \times 3 = 12$

quotient divisor dividend

$12 \div 4 = 3$

number line

array

bar model

UNKNOWN → letters or symbols

$- + 4 = 12$ $= = 8$
 $? - 10 = 22$ $? = 32$
 $9 \times \Delta = 36$ $\Delta = 4$
 $8 - M = 4$ $M = 4$
 $12 \div 6 = T$ $T = 2$

Estimation

What is a reasonable answer?

strategies

- friendly numbers
- rounding

Connections (Real World Applications)

Dividing into teams for games
 To figure out how much something costs (4 for \$20)
 Figuring out how many cookies/ candies/ books... each person will get
 Figuring out how many boxes of tiles, bags of cups... to buy
 How many chairs in each row for a presentation

Big ideas with division – How many groups? How many in each group?

Language Functions/Structures

___ multiplied by ___ is ___.
 ___ divided by ___ is ___.
 How many groups of ___ are in ___?
 The unknown is ___.
 Multiplication and division are related because...
 My/our estimate is ___ because ...
 First I, Then I Next I ...

Vocabulary

equal group	equations	groups of	unknown	
array	strategy	inverse	relationship	estimation
dividend	division	divisor	quotient	
factor	product	multiplication		

Focus and Motivation

Literature ideas: *Divide and Ride* by Stuart J. Murphy
Bean Thirteen by Matthew McEllicott
The Great Divide - A Mathematical Marathon by Dayle Ann Dodds
The Doorbell Rang (Llaman a la puerta) by Pat Hutchins – Great activity and extension to do with book at
<https://www.georgiastandards.org/Georgia-Standards/Frameworks/3rd-Math-Unit-2.pdf>

Chant: Multiplication and Division Bugaloo

You Tube song: *Division Song – My Dog Division* <https://www.youtube.com/watch?v=J0lsX2d7y08> (good intro to unit)
Division song <https://www.youtube.com/watch?v=slez17loMvU> (good after some hands-on experiences)

Norwalk Public Schools
Curriculum Map



Grade Level/Course: Grade 3 Math Unit 3
Unit Title: Unit 3: <i>Division</i>
Pacing: 30-35 days including Reteaching / Enrichment / Assessment
Approximate Dates: See Pacing Guide

Priority Standards:
<p>3.OA.A.3- <u>USE multiplication and division within 100 to SOLVE word problems 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.</u></p> <p>3.OA.C.7- Fluently <u>MULTIPLY and DIVIDE within 100, USING strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, KNOW from memory all products of two one-digit numbers.</u></p> <p>3.OA.D.8- <u>SOLVE two-step word problems USING the four operations. REPRESENT these problems using equations with a letter standing for the unknown quantity. ASSESS the reasonableness of answers USING mental computation and estimation strategies including rounding.</u></p>
Supporting Standards:
<p>3.OA.A.2- Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.</i></p>

3.OA.A.4- Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$*

3.OA.B.5- Apply properties of operations as strategies to multiply and divide. *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).*

3.OA.B.6- Understand division as an unknown-factor problem. *For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.*

3.OA.D.9- Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *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.*

Multiplication and Division Bugaloo

by Lisa Meyer

I'm a mathematician and I'm here to say,
I use multiplication and division every day.
Once I understand their important relationship,
There are lots of problems I can flip.

*Pictures, arrays, equations too,
Doing the multiplication and division bugaloo.*

Fact families are a strategy that can be stated,
They help me understand how math is related.
Division can do a quick turnaround,
Now with multiplication, the answer can be found.

*Manipulatives, sequence counting, contexts too,
Doing the multiplication and division bugaloo.*

- For teachers a challenge: a third verse that talks about their inverse relationship