RETHINK EDUCATION
North Carolina Department of Public Instruction

An At-Home Guide for Families

5th Grade Math in North Carolina Public Schools

Course Outline

At the end of the course, my child will know how to:

- Determine whether a data is categorical/numerical or data that changes over time.
- Observe and collect data that changes over time.
- Understand the features of coordinate grids.
- Graph points.
- Solve problems related to identifying the location of graphed coordinates.
- Plot coordinates on a coordinate grid
- Solve one and two step problems using the information on the graph.
- Identify ordered pairs from a line graph.
- Determine the relationship between ordered pairs.
- Generate two numerical patterns using two given rules.
- Use the area model to multiply two whole numbers up to a three-digit number by a two-digit number.
- Understand the relationship between partial products in area model and the standard algorithm of multiplication.
- To find partial products using expanded form to multiply two whole numbers up to a three-digit number by a two-digit number.
- Understand the relationship between partial products and the standard algorithm of multiplication.
- Use the standard algorithm to multiply two whole numbers up to a three-digit number by a two-digit number.
- Explore strategies (repeated subtraction) to find quotients when dividing whole numbers with up to four-digit dividends and two-digit divisors.
- Put remainder into context for interpretation.
- Explore strategies (Area model, rectangular array) to find quotients when dividing whole numbers with up to four-digit dividends and two-digit divisors.
- Explore strategies (Partial Quotients) to find quotients when dividing whole numbers with up to four-digit dividends and two-digit divisors.
- Explain division as it relates to multiplication using models.
- Define expression.
- Understand the order of operation.
- Understand the properties of operations.
- Develop relationship between expressions.
- Write and evaluate expressions using order of operations and properties.
- Solve two step word problems involving four operations.
- Use area models to add and subtract fractions with unlike denominators.
- Use benchmark fractions and number sense of fractions to estimate mentally.
- Use number lines to add and subtract fractions with unlike denominators.
- Use area models to add and subtract mixed numbers.

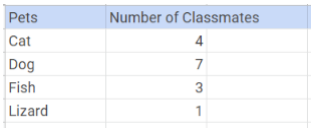
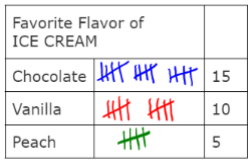
- Write an equation to represent word problems.
- Solve one and two step word problems using area models to add and subtract fractions including mixed numbers.
- Use a variety of models (Area model, length model) to multiply a whole number by a fraction including mixed numbers.
- Write generalizations about the magnitude of multiplying by a fraction greater than, less than, and equal to 1.
- Solve word problems that involve multiplying fractions.
- Use models to develop algorithms.
- Use models and equations to begin to develop an understanding of a fraction as the division of the numerator by the denominator.
- Write and solve story contexts to match expressions that involve dividing fractions and whole numbers.
- Use models (area and length model) to solve one-step word problems involving the division of unit fractions by whole numbers (including non-zero)
- Identify patterns in the place value system from one million to the thousandths place.
- Identify the patterns in products when multiplying by 10, 100, and 1000.
- Identify patterns in quotients when dividing by 10 and 100.
- Explain the relationships between numbers based on powers of 10.
- Discuss the value of each digit in a multi-digit number.
- Explain the relationship between the value of digits in multi-digit numbers.
- Identify and apply patterns in products and quotients when numbers are multiplied by 1,000, 100, 10, 0.1, and 0.01 and/or divided by 10 and 100 in the context of grams and kilograms.
- Expand decimal numbers by showing decimal representations of each decimal place value and by showing fractional representations of each decimal place value.
- Compare numbers using greater than, less than, or equal to symbols.
- Use place value to determine how to compare numbers.
- Use models such as base-ten grids to solve addition and subtraction word problems involving decimals.
- Use strategies based on place value to add and subtract decimals.
- Use an open number line to add and subtract decimals.
- Apply knowledge of decomposing numbers to add and subtract decimal numbers.
- Multiply and divide whole numbers by decimals using the area model.
- Multiply decimals by decimals using the area model.
- Multiply whole numbers by decimals using previous knowledge about place value.
- Multiply decimals by decimals using previous knowledge about place value.
- Use repeated subtraction to divide whole numbers by decimals.
- Use models and place value strategies to divide decimals by whole numbers.
- Convert between measurements in the metric system.
- Write expressions using order of operations and properties.
- Explain expressions using order of operations and properties.
- Solve two step word problem involving four operations.
- Explain volume as the number of cubes that fill a 3-D figure.
- Understand and explain that there should not be overlaps or gaps when filling the 3-D figure.

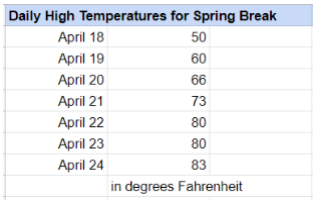
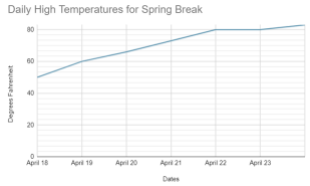
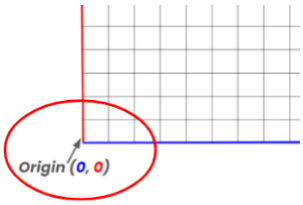
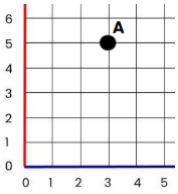
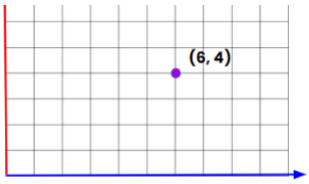
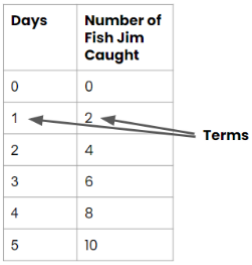
- Explain that the volume is an extension of the area because they are covering an area (the bottom of cube) with a layer of unit cubes and then adding layers of unit cubes on top of bottom layer.
- Find the volume of a rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths.
- Make connections between modeling volume (using cubes to determine volume) and the formula for finding volume.
- Calculate volume using the algorithm.
- Decompose 3-D figures into rectangular prism to find the volume of entire 3-D figure.
- Identify and describe quadrilaterals in groups and subgroups based on their attributes.
- Sort quadrilaterals in groups and subgroups based on their attributes.
- Explain the properties of quadrilaterals.

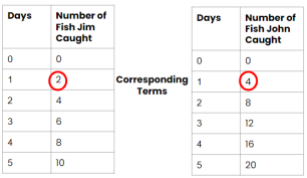
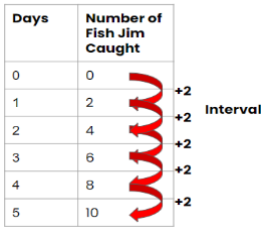
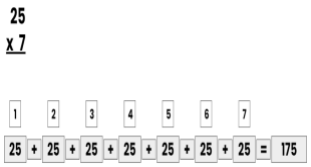
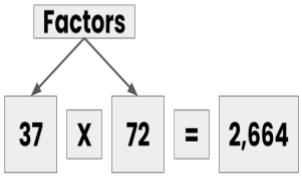
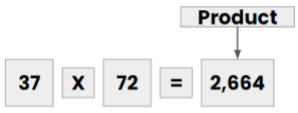
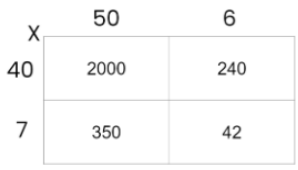
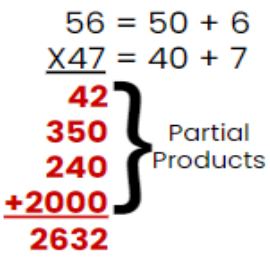
Curious what the specific standards are for 5th Grade Math in North Carolina?

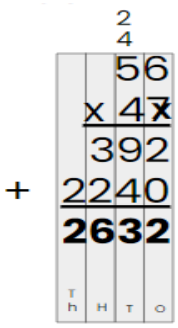
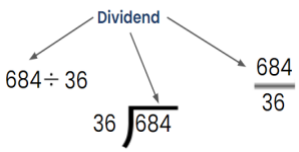
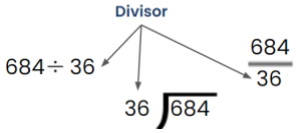
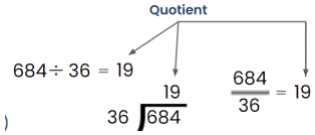
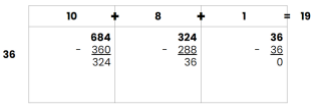
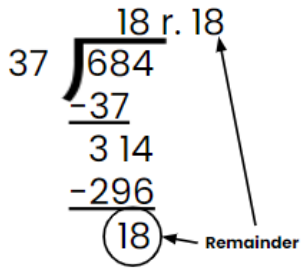
Check out the **North Carolina Standard Course of Study** to learn more. Looking for additional explanations about what students should be able to do at the end of this course? Check out **NC DPI's unpacked contents document** aligned to the course standards.

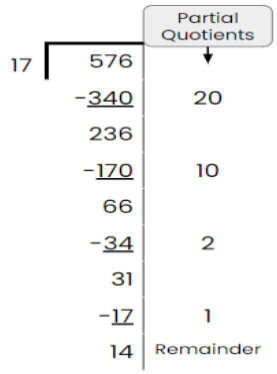
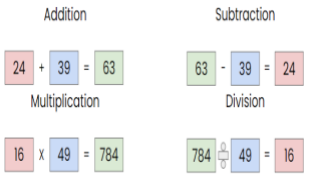
Key Vocabulary

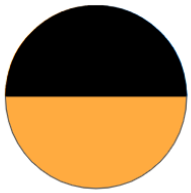
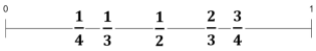
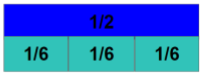
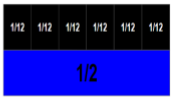
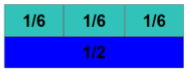
Visual	Term	Definition
	Data	A collection of facts, such as numbers, words, measurements, observations or just descriptions of things.
	Survey	To gather information by individual samples so we can learn about the whole thing.
	Categorical Data	Data that can be divided into specific groups, such as favorite color, age group, type of food, sport, etc.

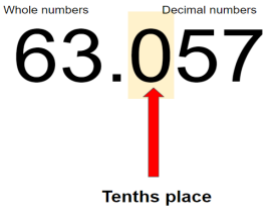
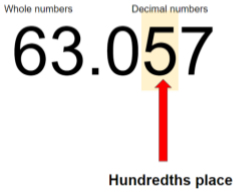
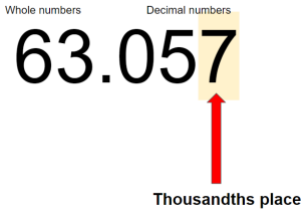
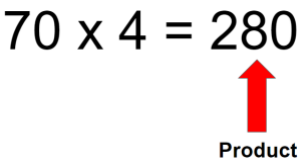
Visual	Term	Definition
	Numerical Data	Data that is measurable and expressed numerically.
	Line Graph	A graph that shows data that is connected in some way (such as change over time).
	origin	The starting point. On a two-dimensional graph it is where the x-axis and y-axis cross.
	point	A point is an exact location, shown using the coordinate grid. They usually have a name, often a letter like "A".
	Ordered pair	Two numbers written in a certain order. Usually written in parentheses like this: **(6, 4)** which can be used to show the position on a graph, where the "x" (horizontal) value is first, and the "y" (vertical) value is second.
	Terms	A single number or variable.

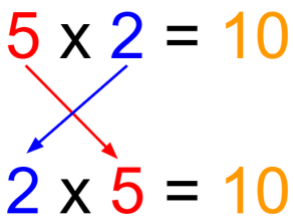
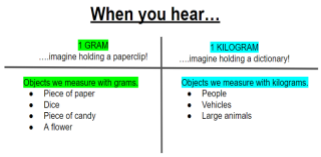
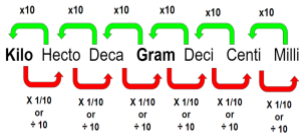
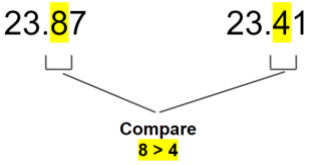
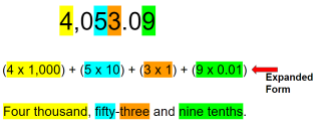
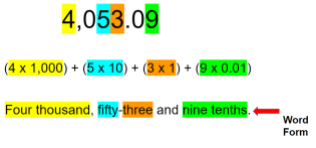
Visual	Term	Definition
	Corresponding terms	Numbers in patterns that show up in the same position.
	Interval	All the numbers between two given values.
	Multiplication	The process of repeated addition.
	Factors	The numbers multiplied together to get a product.
	Product	The answer to a multiplication problem.
	Area Model	A rectangular diagram used to multiply multi-digit numbers.
	Partial Product	The product of the parts of the expanded form of numbers.

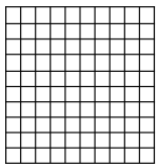
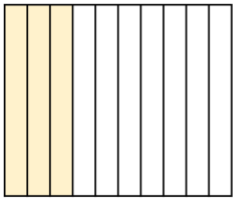
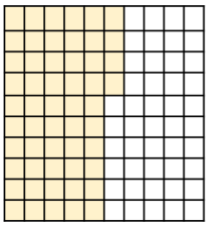
Visual	Term	Definition
729	Whole number	Any number without decimals or fractions.
$(30 + 5) + 4 \times 6 + 6 \div \dot{2}$	Expression	A group of numbers and symbols that show the value of something.
	Standard Algorithm	A way to multiply numbers by place value.
	Dividend	The number being divided in a division problem.
	Divisor	The number dividing into the dividend of a division problem.
	Quotient	The answer to a division problem.
	Area model / Rectangular Array	A rectangular diagram used to divide multi-digit numbers.
	Remainder	The amount left over in a division problem.

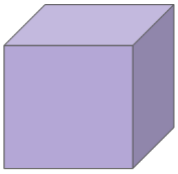
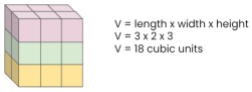
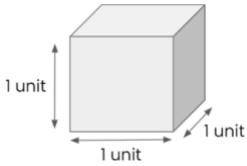
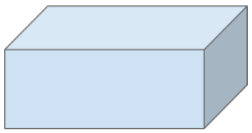
Visual	Term	Definition
	Partial quotients	A method of division using multiples that are easily calculated and subtraction.
	Inverse operations	Two operations that are opposites or complement each other. For example, addition and subtraction are inverse operations, while multiplication and division are inverse operations.
	Order of operations	A set of rules that show the sequence of steps used to solve math expressions.
$a + b = b + a$ $4 + 5 = 5 + 4$	Commutative property of addition	A rule that states that the order of numbers being added does not change the sum.
$a * b = b * a$ $6 * 2 = 2 * 6$	Commutative property of multiplication	A rule that states that the order of numbers being multiplied does not change the product.
$(a + b) + c = a + (b + c)$ $(7 + 3) + 9 = 7 + (3 + 9)$	Associative property of addition	A rule that states that the way addends are grouped does not change the sum.
$(a * b) * c = a * (b * c)$ $(2 * 4) * 6 = 2 * (4 * 6)$	Associative property of multiplication	A rule that states that the way factors are grouped does not change the product.
$a (b + c) = a * b + a * c$ $5 (8 * 3) = 5 * 8 + 5 * 3$	Distributive property	A rule that states when multiplying the numbers inside of parentheses, the result is the same as if you complete the operation inside of the parentheses and then multiply.

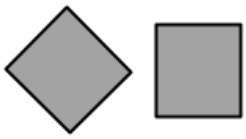
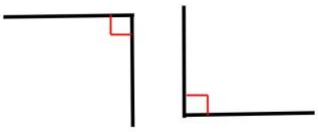
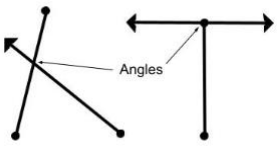
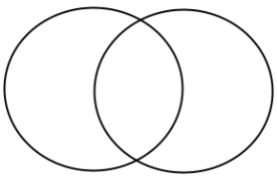
Visual	Term	Definition
$\frac{1}{2}$ 	Fractions	Values that come between whole numbers.
 $\frac{1}{2}$	Numerator	The top number in a fraction. It shows how many parts we have related to the number of parts in the denominator.
 $\frac{1}{2}$	Denominator	The bottom number in a fraction. It shows how many equal parts the item is divided into.
 $\frac{3}{4}$	Proper Fraction	A fraction where the numerator (the top number) is less than the denominator (the bottom number).
 $\frac{7}{4}$	Improper Fraction	A fraction where the numerator (the top number) is greater than or equal to the denominator (the bottom number).
	Benchmark Fractions	Recognizable fractions used to compare other fractions to for estimating or determining value or size.
$\frac{1}{2} = \frac{3}{6}$ 	Equivalent Fractions	Fractions which have the same value, even though they may look different.
$\frac{6}{12} \div \frac{6}{6} = \frac{1}{2}$ $6 \times 1, 2 \times 3$ $12 \times 1, 3 \times 4, 2 \times 6$ 	Simplest Form	The equivalent form of a fraction for which the numerator and denominator share only one as a common factor.
$\frac{3}{6} \div \frac{3}{3} = \frac{1}{2}$ 	Simplify	To rename a fraction to lowest terms, making it as simple as possible.
$2\frac{4}{8}$ 	Mixed Number	A whole number and a fraction combined.

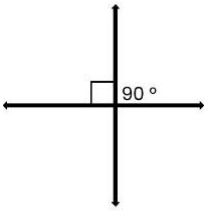
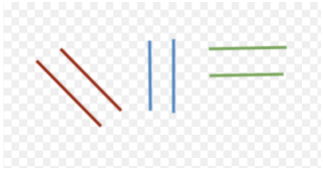
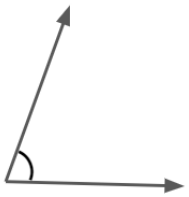
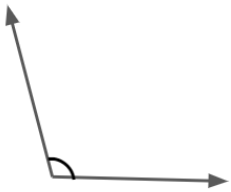
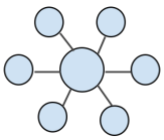
Visual	Term	Definition
	place value	This is the system that tells us the value of a digit based on its position. For example; the 5 in 650 represents 5 tens which has a value of 50, but the 5 in 5,397 represents 5 thousands, which is worth 5,000.
	decimal point	A point which separates whole numbers and fractional parts.
	Tenths place	The name of the place to the right of the decimal (the first decimal place).
	Hundredths place	The name of the place to the right of the tenths place (the second decimal place).
	Thousandths place	The name of the place to the right of the hundredths place (the third decimal place).
	product	The answer that results when 2 or more numbers are multiplied.

Visual	Term	Definition
	Commutative property	A math rule that says that the order in which we multiply numbers does not change the product.
	value	The worth of each digit depends on its position in a number.
	gram	A Metric system word used to measure smaller units of weight.
	kilogram	A Metric system word used to measure larger units of weight.
	convert	Using multiplication or division to change the value of one form to another.
	compare	To find the larger and smaller decimal number in a given set of numbers.
	expanded form	A way to write a number by separating and adding the value of each of its digits.
	word form	A way to write a number by spelling it out in words rather than numbers.

Visual	Term	Definition
4,053.09 ← Standard Form (4 x 1,000) + (5 x 10) + (3 x 1) + (9 x 0.01) Four thousand, fifty-three and nine tenths.	standard form	A way to write a number using number digits..
<	Less than symbol	The symbol used to show that the number on the left is smaller than the number on the right.
>	Greater than symbol	The symbol used to show that the number on the left is greater than the number on the right.
=	Equal to symbol	The symbol used to show that both the numbers have the same (equal) value.
	base ten grid	A grid of units that can be used to show decimal numbers in tenths, hundredths and thousandths. The grid can be shaded to show a specific decimal number.
 = 3/10 =30/100 = 0.3	decimal model for tenths	A grid that has a value of 1, and cut into ten equal parts. Each part is worth 0.10.
 = 54/100 = 0.54	decimal model for hundredths	A grid that has a value of 1, and cut into 100 equal parts. Each part is worth 0.01.
⟷	open number line	A continuous line without any intervals, this is left blank for the user to add in their own intervals as needed.
$\frac{1}{10}$	one-tenth	The fractional form of the decimal 0.1

Visual	Term	Definition
$\frac{1}{100}$	one-hundredth	The fractional form of the decimal 0.01
$\frac{1}{1000}$	one-thousandth	The fractional form of the decimal 0.001
	Plane Figure	A two-dimensional figure
	Solid Figure	A three-dimensional figure; such as cubes, prisms, pyramids, cylinder, and sphere.
	Volume	The number of cubic units that can fit in a figure.
	Cubic Unit	A cube with edge lengths of 1 unit that is used to measure the volume of solid figures
	Rectangular Prism	A solid, three-dimensional shape with six rectangular faces.
	quadrilateral	A closed polygon with four sides and four angles

Visual	Term	Definition
	parallelogram	A parallelogram is a quadrilateral with two pairs of parallel sides.
	rhombus	a quadrilateral with opposite sides that are parallel and all sides are congruent forming two acute angles and two obtuse angles.
	square	a quadrilateral with opposite sides that are parallel and all sides are congruent forming four right angles
	trapezoid	A trapezoid is a quadrilateral with only 1 pair of parallel sides
	rectangle	a quadrilateral with opposite sides that are parallel and congruent that create four right angles
	Right angle	An angle that measures exactly 90 degrees. It can also be called a square corner.
	angle	A figure created by two lines, line segments, or rays that share one common endpoint called a vertex
	classify	To sort or put into groups based on shared attributes.

Visual	Term	Definition
	Perpendicular	An intersection of lines that creates a 90-degree angle
	Parallel	Two lines that are always the same distance apart and never intersect
	Acute Angle	An angle that is greater than zero degrees and less than 90 degrees
	Obtuse Angle	An angle that is greater than 90 degrees and less than 180 degrees
	attribute	a property or feature that describes something
	congruent	equal in size or length

Learning in Action: Grade Level Skills

Examples of Grade Level Skills

Categorical Data

This data can be grouped or categorized. Often the question used to gather categorical data will ask

about preferences or favorites. The survey may also ask a “yes” or “no” question.

Some examples:

- What is your favorite flavor of ice cream?
- Which school subject do you prefer?
- Do you own a laptop?
- What is the color of your family members’ eyes?

Numerical Data

This is data that can be measured or counted.

Some examples:

- What is the number of each pet in my classmates’ families?
- How many days do you eat a sandwich for lunch?
- What is the height of each flower in the garden?
- How many of each type of bug in your yard?

Data that Shows Change Over Time

This is a specific kind of numerical data that shows change taking place over time.

Some examples:

- Recording your height each week or month for the year.
- Keeping track of the number of absences each week or month.
- Recording the number of weeds in the garden each week.
- Measuring the rainfall each month.

Solve the following problems based on the graphed coordinates.

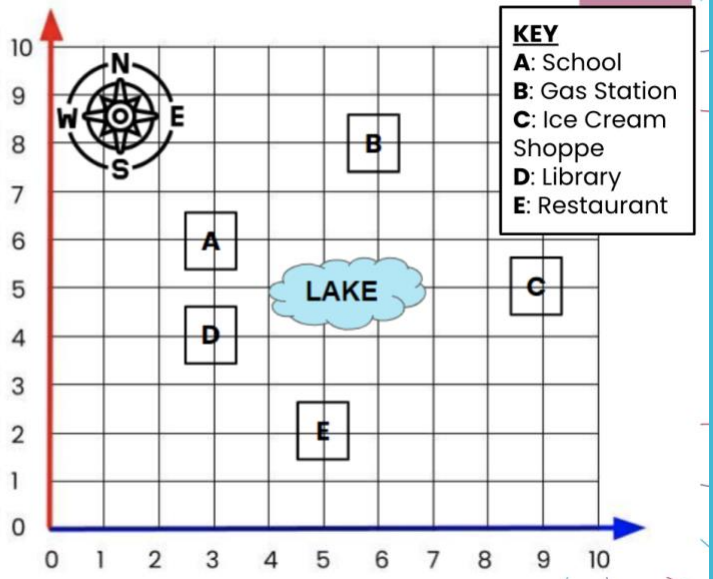
WE DO

Solve the following problems based on the graphed coordinates.

1. What building is located at (5, 2) on the grid?

2. What is located 3 units west and 2 units south of the Gas Station.

3. The city council voted to build a new school at (3, 6) on the map. The new school will be directly north of which building?



Answers:

1) Restaurant 2) School 3) Library

Example of Data Points:

Plotting Points on a Graph- Ordered Pairs- Solution

SOLUTION

1. How do you know this data measures change over time?

   The column labeled months.

2. What would be a good title for this data?

   Monthly Savings

3. What do you notice about the data from the table?

   It seems random.

Month x-axis	Savings in Dollars y-axis	Ordered Pair
January	$5	(Jan, 5)
February	$10	(Feb, 10)
March	$5	(Mar, 5)
April	$15	(Apr, 15)
May	$5	(May, 5)
June	$20	(Jun, 20)
July	$5	(Jul, 5)
August	$10	(Aug, 10)

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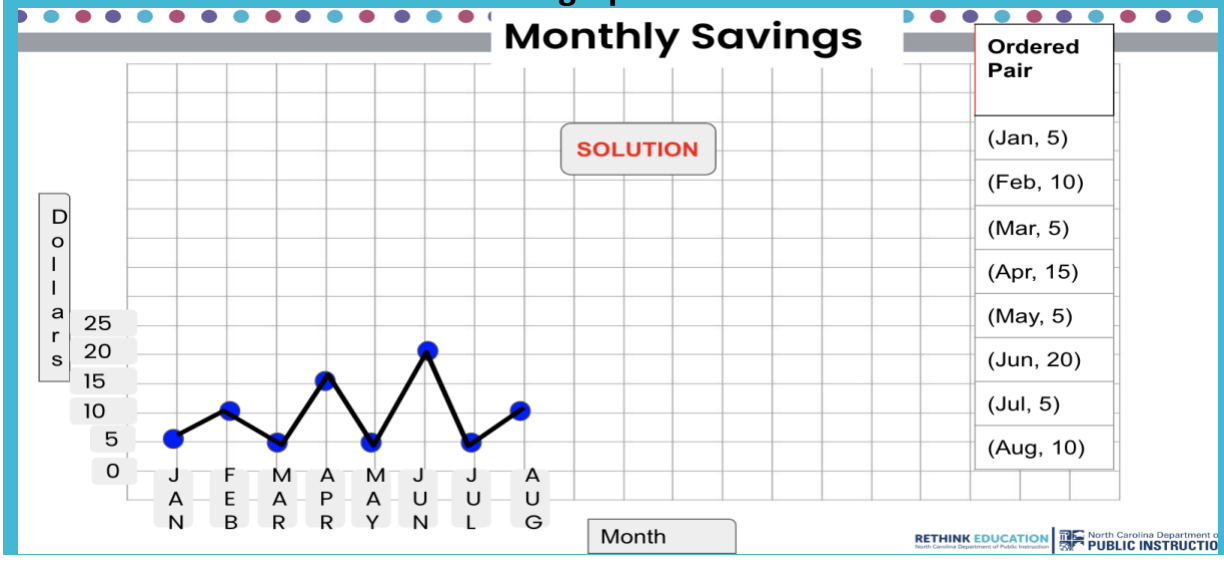
This image shows how we can use data to answer questions.
How do you know these data measures change over time? Because of the column labeled "months."

What would be a good title for this data? "Monthly Savings" is a possibility, you may have something better. As long as it represents what we see here in our data labels, then it is acceptable.

What do you notice about the data from the table? Seems kind of random to me.

Above data is used to create a line graph:



Steps for Area Model:

- Draw a rectangular diagram with two columns of two rows.
- Write the whole numbers in expanded form and use the parts to label the columns and rows.
- The amount of parts of numbers represents how many columns and rows the area model will need.
- 2-digit by 2-digit = 2 columns and two rows
- 3-digit by 2-digit = 3 columns and two rows
- In the top left box, multiply the tens of each number, putting the product in the box.
- In the top right box, multiply the ones of the first number by the tens of the second number, putting the product in the box.
- In the bottom left box, multiply the tens of the first number by the ones of the second number, putting the product in the box.
- In the bottom right box, multiply the ones of each number, putting the product in the box.
- Add the numbers in each of the four boxes of the area rectangle.

56 = 50 + 6
X47 = 40 + 7
2632

X	50	6
40	2000	240
7	350	42

2000
240
350
+ 42
2632

Steps for Partial Products:

- Write the whole numbers in expanded form.
- Multiply the ones together, starting to stack the products under the factors.
- Multiply the tens of the first number by the ones in the second number, putting the product under the first one.
- Multiply the hundreds of the first number by the ones of the second number, putting the product under the second product.
- Multiply the ones of the first number by the tens of the second number, putting the product under the third product.
- Multiply the tens of the first number by the tens of the second number, putting the product under the fourth product.
- Multiply the hundreds of the first number by the tens of the second number, putting the product under the fifth and final product.
- Add the partial products to get the product of the two multi-digit numbers.

$$\begin{array}{rrl} 148 = & 100 + & 40 + 8 \\ \underline{\times\ 25 =} & & \underline{20 + 5} \\ & & 40 \\ & & 200 \\ & & 500 \\ & & 160 \\ & & 800 \\ & + & \underline{2000} \\ & & \mathbf{3700} \end{array}$$

Partial Products

Repeated Subtraction:

$$684 \div 36 = \mathbf{19}$$

1	2	3	4	5	6	7	8	9	10
684	648	612	576	540	504	468	432	396	360
− 36	− 36	− 36	− 36	− 36	− 36	− 36	− 36	− 36	− 36
648	612	576	540	504	468	432	396	360	324

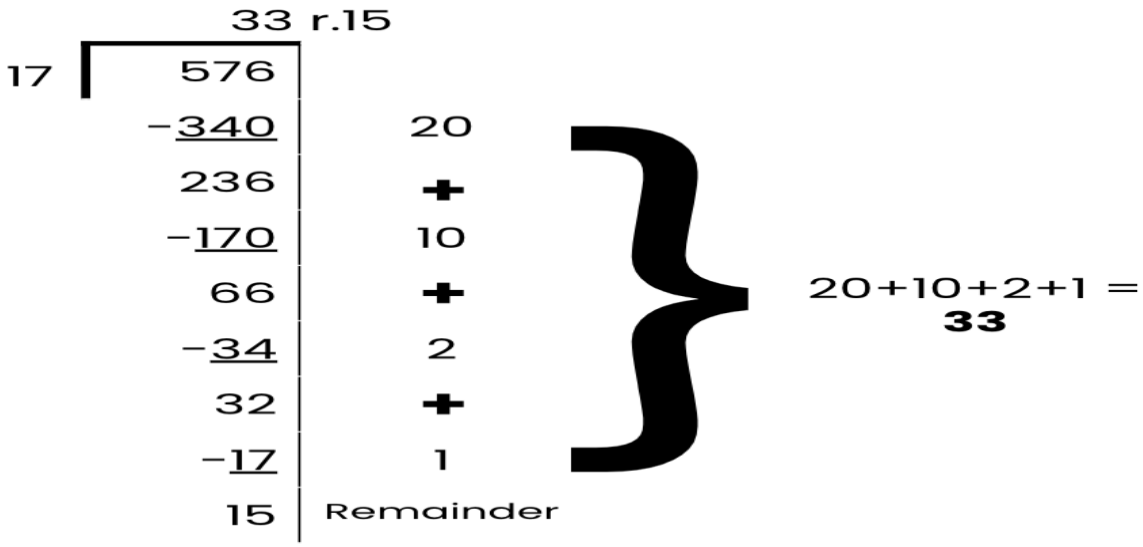
11	12	13	14	15	16	17	18	19
324	288	252	216	180	144	108	72	36
− 36	− 36	− 36	− 36	− 36	− 36	− 36	− 36	− 36
288	252	216	180	144	108	72	36	0

Area Model Division:

$684 \div 36 = \mathbf{19}$

	10	+	8	+	1	=	19
36	**684** − 360 = 324		**324** − 288 = 36		**36** − 36 = 0		

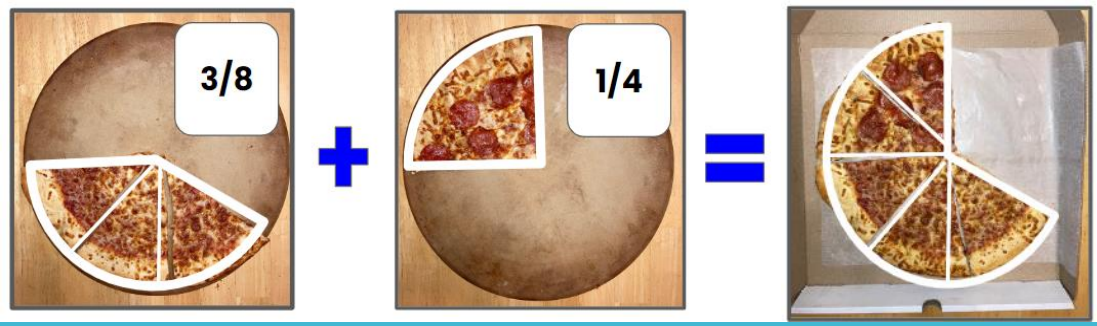
Partial Quotient:



Order of Operation Chart :

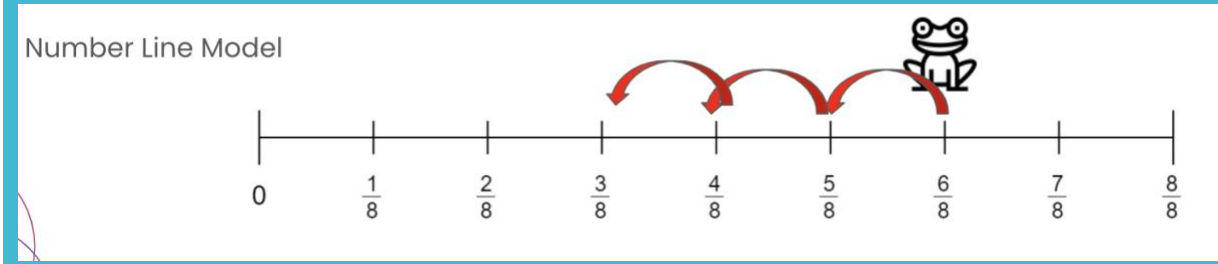
Step 1: P (parentheses)	**( )**
Step 2: E (exponents)	4^x
Step 3: M/D (multiplication and division, left-to-right)	Whichever comes first LEFT -> RIGHT **X and/or ÷**
Step 4: A/S (addition and subtraction, left-to-right)	Whichever comes first LEFT -> RIGHT **+ and/or -**

Adding Fractions:



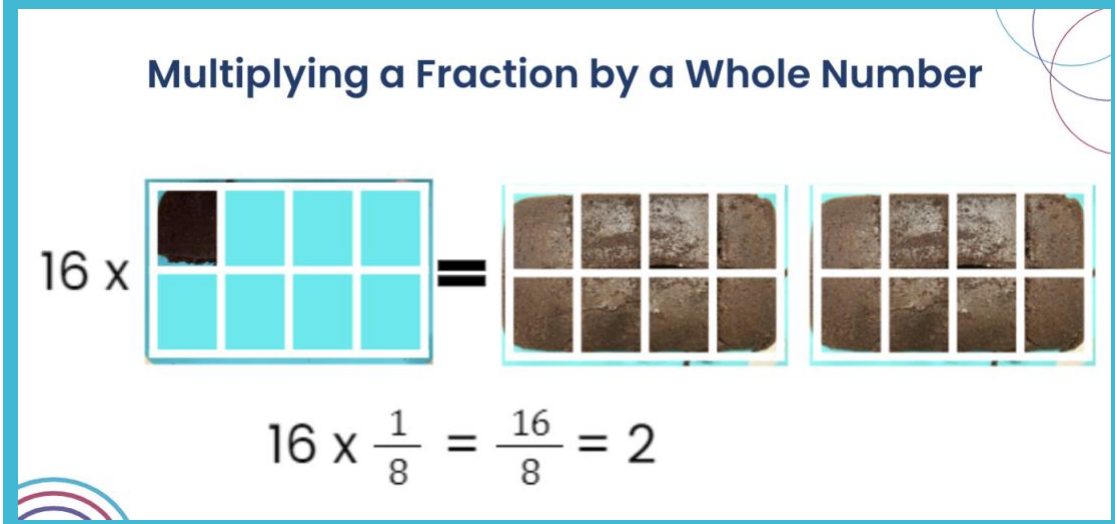
When adding and subtracting fractions with unlike denominators, we have to rename fractions to equivalent fractions that have the same denominator, making all parts are the same size.

Subtracting Fractions:



On top are the area models for solving expression, we renamed 3/4 to 6/8 so we could subtract with parts the same size. Below we see a number line that we can also use to solve this problem. Once again, we will need to rename the fourths to eighths using that multiplicative relationship: 4 x 2 = 8 and divide each fourth into two more parts. Now that the number line model has been repartitioned to represent parts the same size as the subtrahend, we are ready to place the frog at his starting point, the minuend, 3/4, now named as the equivalent form 6/8. We will now represent moving left across the number line with these red arrows. This shows the action of subtracting the subtrahend from the minuend.

Multiplying Fractions:

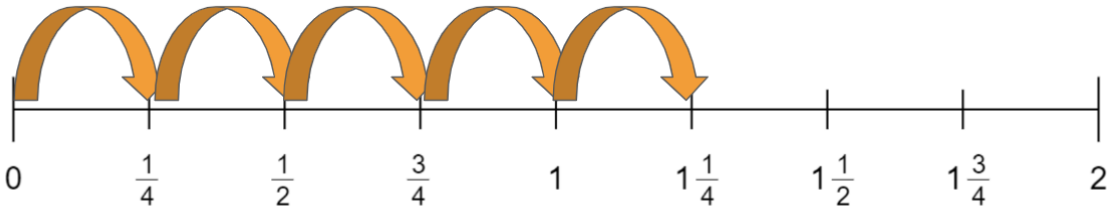


One meaning of multiplying fraction is repeated addition. If I have 16 one-eighth portions of chocolate cake, how much chocolate cake do I have? 16 times ⅛ results in 16/8. This can be simplified to 2 whole cakes as shown in the image.

Multiplying a Fraction by a Whole Number Using a Number Line:

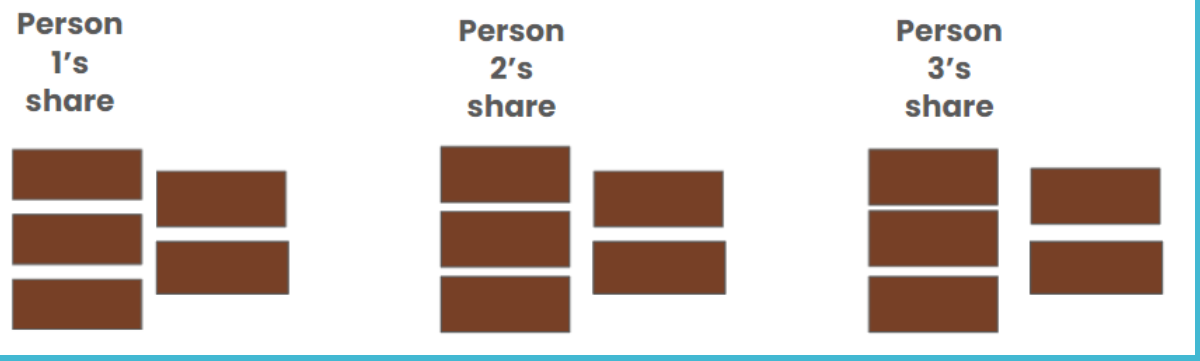
Let's use a number line to represent the same expression:

$5 \times \frac{1}{4} = 1\frac{1}{4} = \frac{5}{4}$



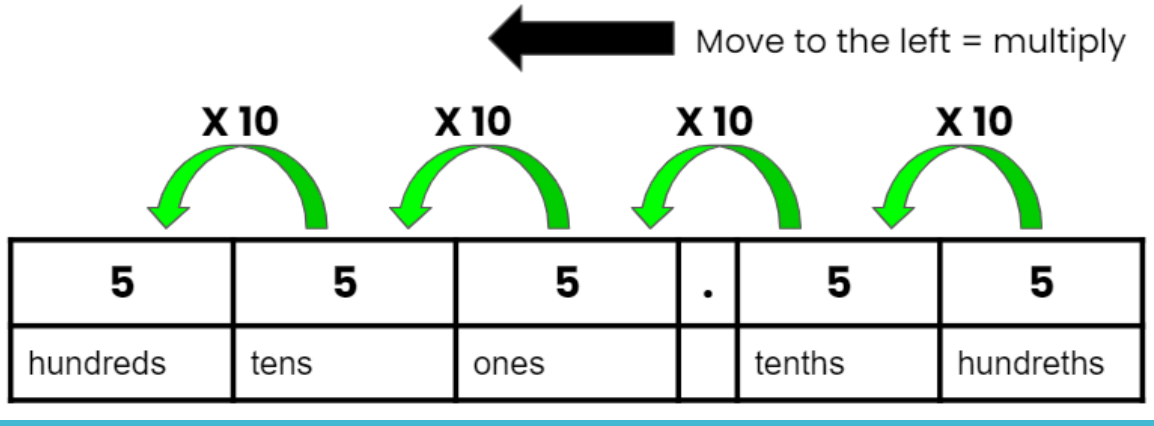
Division of Fractions:

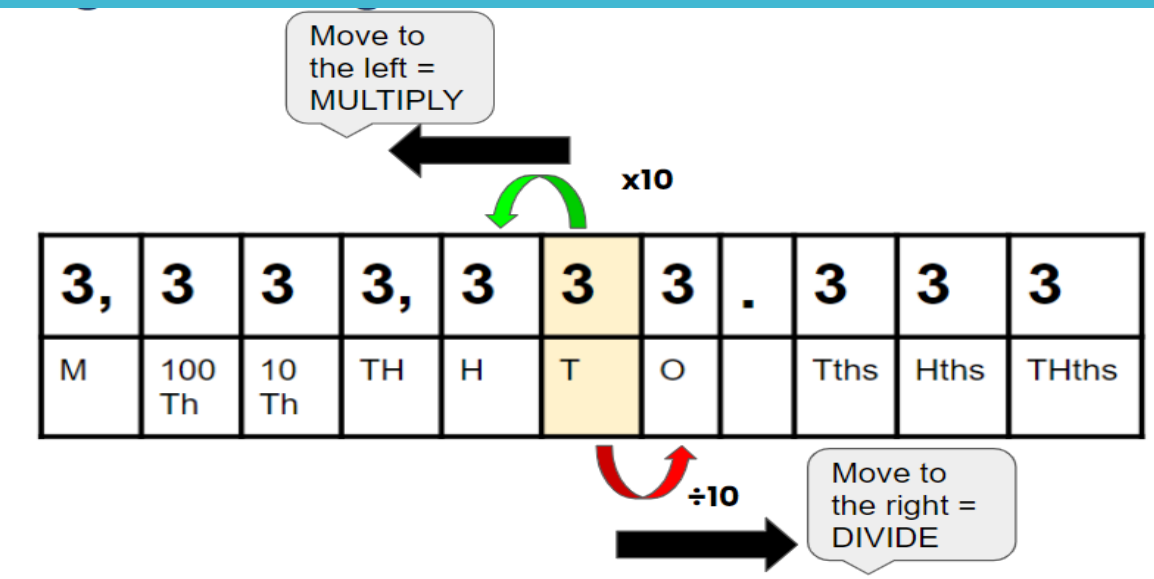
$$5 \div 3 = \frac{5}{3} = 3\overline{)5} = 1\frac{2}{3}$$



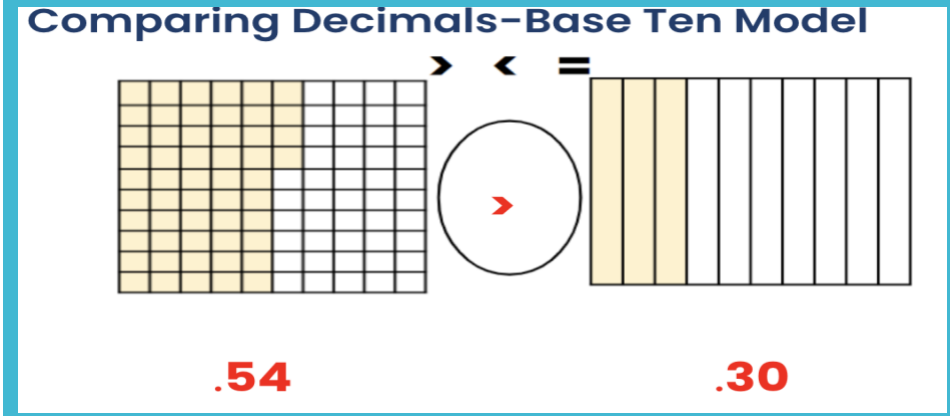
Five chocolate bars shared with 3 people. Each of the five whole bars has been divided into thirds. By distributing the thirds evenly, we can see that each person will get 5/3 or 1 and ⅔ of a chocolate bar. We can represent the division expression five divided by three with the fraction 5/3.

Patterns in the place value system:



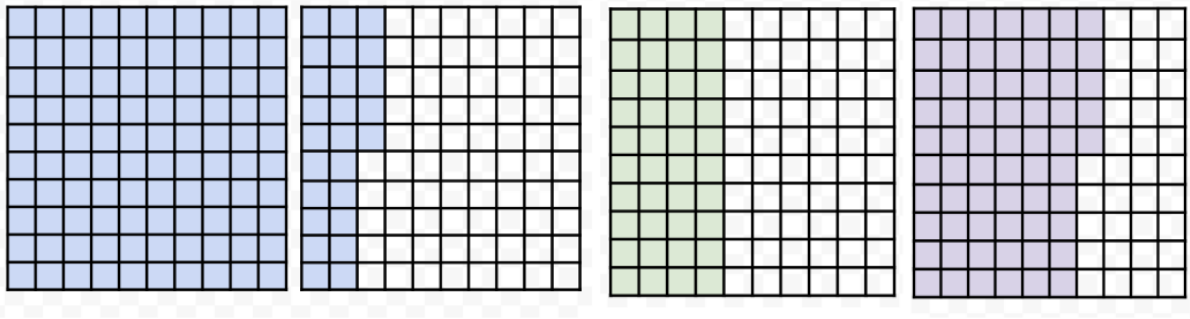


Comparing Decimals:



Adding Decimals:

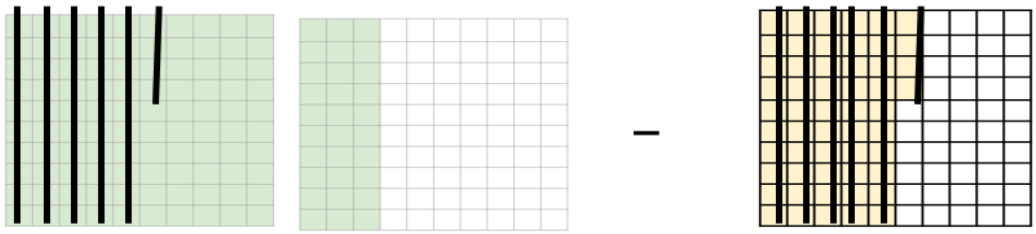
A recipe for a cake requires 1.25 cups of milk, 0.40 cups of oil, and 0.75 cups of water. How much liquid is in the mixing bowl?



1 .25 + .40 + .75

Use models to represent numbers and then combine models to fill the whole 100 grid. That will equal the total amount of 2.40 cups.

Subtracting Decimals:



1.3 0.54

1.3 – .54 = .76

Multiplying Decimals:

	2	0.3	0.04
1	1 x 2 = 2	1 x 0.3 = 0.3	1 x 0.04 = 0.04
0.7	0.7 x 2 = 1.4	0.7 x .3 = 0.21	0.7 x 0.04 = 0.028

2
0.3
0.04
1.4
0.21
+ 0.028
3.978

Multiplying whole number by a decimal:

5 x .12 = 5 x .10 + 5 x .02
= .50 + .10
=.60

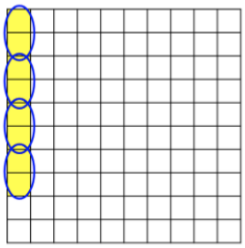
=.6

Multiplying decimal by a decimal:

.5 x .12 = .5 x .10 + .5 x .02
=.050 + .010
=.060
=.06

Divide decimals:

- Determining the size of each group.
- Determining how many equal-sized groups can be made.



8	7.6	7.2	6.8	6.4	6	5.6	5.2	4.8	4.4
-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4

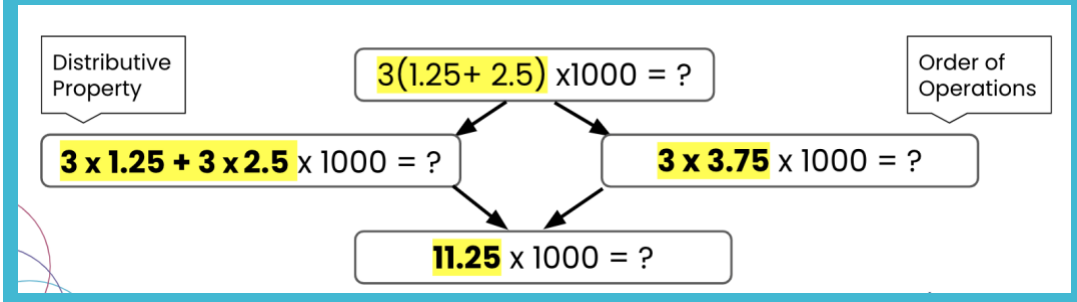
4	3.6	3.2	2.8	2.4	2	1.6	1.2	0.8	0.4
-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4

0.08 ÷ 4 = 0.02
in each group

8 ÷ 0.4 = 20 groups

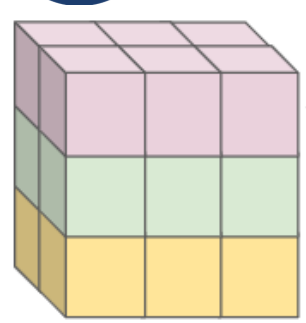
Expression in the Context of the Properties of Operations:

I walk 1.25 km in the morning and 2.5 km in the afternoon each day, I wonder how many meters I will have walked in 3 days?

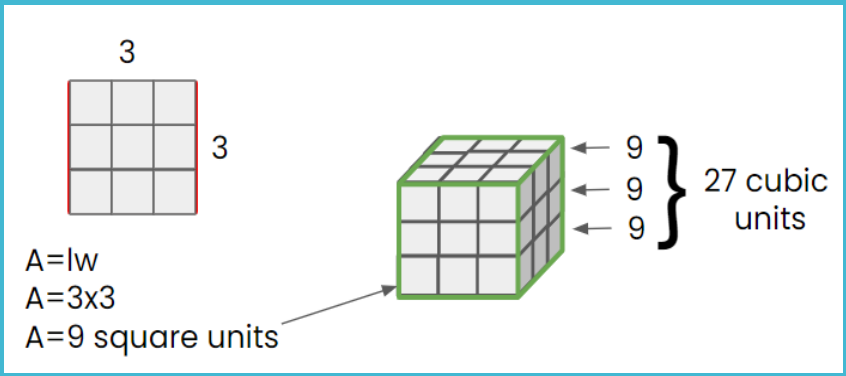


Volume

Count the unit cubes in the bottom layer first. Count the layer and add all layers to find the volume. This figure has 6 unit cubes at the bottom layer and there are a total of three layers. The volume of this figure is 6 + 6 + 6 = 18 unit cubes or 6 X 3 = 18 unit cubes.

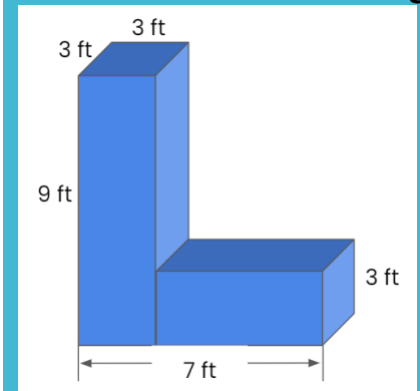


Connecting Area with Volume



The area of the bottom of the box is 3 X 3 + 9 sq units. Once you have the area, count the layers and multiply them with the base (area) to find the volume.

Volume of Rectilinear figures:



Prism A
V = l x w x h
V = 3 x 3 x 9
V = 81 cubic feet

Prism B
V = l x w x h
V = 4 x 3 x 3
V = 36 cubic feet

81 Prism A
+36 Prism B
117 cubic feet

Separate/decompose the two rectangles and determine the sides of the rectangles.

Find the volume of the first rectangle and second rectangle separately, then add the volume of both figures to find the volume of the whole figure.

Attributes of Quadrilaterals:

Square

- All 4 sides are congruent
- 4 right angles that add up to 360°
- Two pairs of parallel sides which are congruent
- Opposite angles are also congruent

Rectangle

- 2 pairs of opposite sides which are parallel and congruent.
- 4 right angles that add up to 360°

Parallelogram

- 2 pairs of opposite, parallel sides
- Opposite angles are congruent, add up to 360°

Rhombus

- 2 pairs of opposite, parallel sides
- All 4 sides are congruent
- Opposite angles are congruent, add up to 360°

Trapezoid

- one pair of parallel sides
- opposite angles are not congruent

Resources

Links and online resources to allow you to support your child's learning.

- Khan Academy
- Fluency Games
- Fraction Multiplication with Area Model
- Dividing Fractions
- Fraction Moonshoot Game

- Multiplication Error Analysis
- Division with partial quotients
- Multiplying Fractions by Fractions using Area Models
- Multiplication of Fractions Part One
- Multiplication of Fractions Part Two
- Using Models for Division of Fractions
- More Division of Fractions with Models
- Are These Equivalent to 9.52?
- Comparing Decimals on the Number Line
- Finding Common Denominators to Add
- Quadrilateral Properties
- Hierarchy of Quadrilaterals
- Different Hierarchy of Quadrilaterals
- Introduction to the coordinate plane
- How do I know where to plot the coordinates on a plane?
- Identifying the relationship of points on a coordinate plane

At-Home Connections

Tell me how statements

- Tell me how you solved a problem in math class today.
- Tell me how your teacher taught you to (insert skill here)
- Tell me about what you are learning in math class.
- Tell me what is still confusing to you.
- What are some jobs you think might require you to use addition and subtraction?
- Let's have a scavenger hunt to see if we can find word form and standard form on a label in our house, or in the grocery store!
- Use your place value chart and understanding of unit form to figure out how much money you would have if you earned 9 ten thousands + 2 thousands + 8 hundreds + 5 tens + 3 ones. What would you do with that much money?
- Tell me the largest/smallest number you can make using the digits 8, 5, 1, 9, 3, and 7
- Tell me how to find the area of your bedroom, or a tabletop and see if you can find all the factors that give you that area.
- Tell me two ways you can solve the multiplication problem 34 x 65. Measure our kitchen counter and tell me how many square feet it is.
- Tell me two strategies you can use to divide 128 pieces of candy up equally with yourself and three friends.
- Tell me what you are learning about interpreting remainders. If you invited 38 people to your birthday party and one pack of plates had 5 plates in it, how many full packs would you need to

buy for everyone? How many leftover plates would you have? How many plates would be in the pack that is not full?

- How can you use ½ as a benchmark fraction to help you order and compare fractions? If you were running a race and got to pick a head start would you get a head start of 3/5, 1/3, or 5/10?
- How do you use multiples to help you find common denominators and common numerators?
- If we had a race, I had a head start 5/6, your best friend had a head start of 11/12, and you had a head start 7/8 of the way down the track, who would be closer to the finish line? How do you know?
- How many different types of quadrilaterals always have two pairs of parallel sides? have four perpendicular intersections? Have both obtuse and acute angles? Can you find a road sign that is a square, a rectangle, and another that is a rhombus? What about a trapezoid?
- If you start school at 7:30 and stay there for 8 hours 45 minutes, what time would you get to come home?
- If you go to the store and buy a 2-liter bottle of soda, how many milliliters would it be? What about running a 10-kilometer race, how many meters would that be? Would your weight be a bigger number if you weighed yourself in kilograms, or grams?
- Tell me how can I find the volume of a (add an object)?
- Tell me how area and volume are connected?

Parent connections to course content

- What are some jobs you think might require you to use multiplication and division? Addition and subtraction?
- If I were to buy twelve bottles of soda and each bottle had 32 ounces, how many total ounces of soda would I have? Can you solve it in more than one way?
- If I get the same total amount of soda, is it less expensive to buy a pack of 6 sodas that each cost $1.34 or 12 sodas that each cost 63 cents? How much money will I save by buying the less expensive pack?
- What kind of graph should we use to show this data?
- Tell me how we could use area and perimeter to construct the new dog fence?
- How many quadrilaterals can you find around our house?
- If you had 175 slices of pizza and one box could hold 7 slices, how many boxes would you need? Can you solve it in more than one way?
- How would you use your division skill that requires you to interpret remainders if you had a bag with 45 pieces of candy in it and wanted to share it equally with 7 people and yourself?
- Look at fractions in a recipe and find ways to determine which are greater or less than ½. Compare different fractional amounts by finding common denominators. Convert mixed numbers into improper fractions.
- Being fluent with addition, subtraction, multiplication, and division facts will help your child feel more confident. Try this research based intervention to promote their mastery of math facts.

Challenges to Anticipate

It is hard to watch our children struggle but this is an important part of the learning process. Be supportive and encouraging when struggles happen. It is proven that struggling can better develop a deeper understanding in math.

Without the mastery of facts your child will struggle with area, factors, multiples, multiplication of 2-digit by 2-digit numbers and 1 digit by up to 3-digit numbers, division, equivalent fractions, converting fractions, multiplying fractions, and multiplicative comparison just to name the big ones. It takes less time to practice and learn the facts than it does to complete assignments if you don't know them.

Many students struggle with two step problems because they stop after the second step. Encourage them to reread the problem before they choose an answer and make sure they are giving the answer it is asking for instead of only the first step.

When comparing fractions, students might struggle to draw area models that have the same size pieces.

Remember that your child will learn how math works before they learn the algorithm. In fourth grade they use area models, repeated addition and subtraction, place value strategies, etc. to learn division and multiplication, which is not what we learned when we were in school. In fifth grade we connect these strategies with standard algorithms. It helps students build conceptual understanding which in turns helps them apply these strategies in real world situations. Please remember to be supportive of these strategies.

When your child is struggling with a skill, find a math game to make learning fun. Use this link to help you find one that matches the math skill that your child is struggling with: Math Games

Communicating with Your Child's Teacher

Still feeling stuck? Reach out to your child's teacher to discuss what you can do further your child's learning. Some questions that might guide your discussion:

- What resources would you suggest I use to support my child?
- Where do you see my child struggling? What can we do together to help?
- What should my child practice at home?
- What collective message can we send together to help my child learn?

Need Technical Help?

Reach out to your student's home school for technical assistance. Include the type of device (PC, Mac, Chromebook, etc.) and browser (Chrome, Firefox, Safari, etc.).