

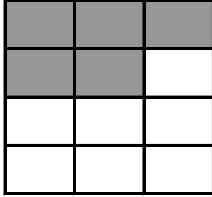
5th Grade Math Notes Common Core

Basic Fraction

numerator - (the # of pieces shaded or unshaded)

denominator - (the total number of pieces)

Example:



$$\frac{5}{12}$$

****Hint: Zero can NEVER be a denominator.****

Mixed Numbers and Improper Fractions

When converting a mixed number into an improper fraction you multiply the denominator by the whole number, then add the numerator.

Example:

$$3 \frac{5}{12} \longrightarrow 12 \times 3 + 5 = 41 \longrightarrow$$

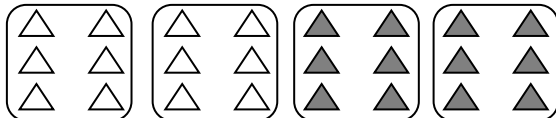
****Hint: The denominator does NOT change.****

When converting an improper fraction into a mixed number you divide the numerator by the denominator.

$$\frac{41}{12} \longrightarrow 12 \overline{)41} \begin{array}{r} 3 \text{ R}5 \\ -36 \\ \hline 5 \end{array} \longrightarrow 3 \frac{5}{12}$$

****Hint: The dividend becomes the whole number and the remainder becomes the numerator and your denominator does NOT change.****

Equivalent Fraction



$$\frac{12}{24} = \frac{2}{4}$$

The rule when converting fractions is that what ever you do to the top you must also do to the bottom.

$$\frac{12}{24} = \frac{\quad}{4}$$

- ~ If your denominator is 24 and it changes to 4 you have to determine which operation was used.
- ~ You divided 24 by 6 which equals 4.
- ~ Since you divided 24 by 6, you also have to divide 12 by 6.
- ~ 12 divided by 6 equals 2

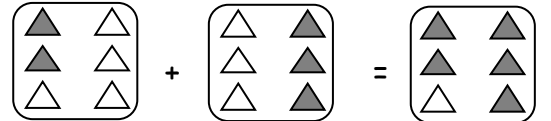
$$\frac{12}{24} = \frac{2}{4}$$

Adding Fractions

~ For the numerators add straight across.

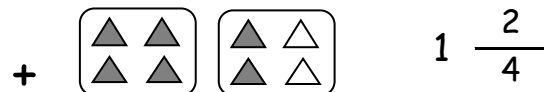
~ The denominator does not change.

Ex.



$$\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$$

Ex.



*** Hint: Make sure you have a common denominator before you add.**

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Adding & Subtracting with UNLIKE Denominators

$$\frac{1}{2} + \frac{2}{3}$$

1. Find the least common multiple (LCM) by listing the multiples of each denominator in the problem. Circle the least common multiple and use it as your common denominator. (Ex: the LCM of 2 and 3 is 6. Use 6 as your common denominator.)

2: 2, 4, 6,

3: 3, 6

2. Rename the fractions using the new common denominator.

$$\frac{1}{2} = \frac{3}{6} \quad \frac{2}{3} = \frac{4}{6}$$

3. Perform the operation & keep the new denominator.

$$\frac{3}{6} + \frac{4}{6} = \frac{7}{6}$$

4. Write the answer in simplest form.

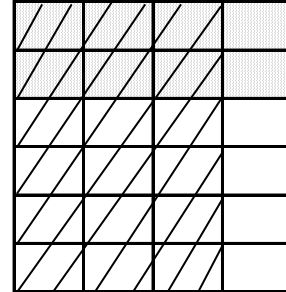
$$\frac{7}{6} = 1 \frac{1}{6}$$

Multiplying Fractions

~ Multiply the numerator by the numerator.

~ Multiply the denominator by the denominator.

Ex. $\frac{3}{4} \times \frac{2}{6} = \frac{6}{24}$



*HINT: remember to simplify your answer.

Ex. $\frac{6}{24} \times \frac{1}{4}$

Dividing Fractions

~ Invert the fraction

~ multiply the fractions

$$\frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \times \frac{4}{3} = \frac{4}{6}$$



$$\frac{4}{6} = \frac{2}{3}$$

~ Draw a picture to represent the first fraction and draw a picture beneath that to represent the second fraction.

~ Draw a line where the second fraction ends and that fraction has a new denominator.

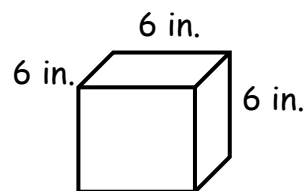
~ See how many squares on the bottom picture match the top picture and that is the new fraction.

Geometry Formulas

P = perimeter (The distance around a figure.)

A = area (The measure, in square units, of the inside of a plane figure.)

V = volume (The number of cubic units a space of a solid figure takes up, count the cubes needed to fill a figure.)



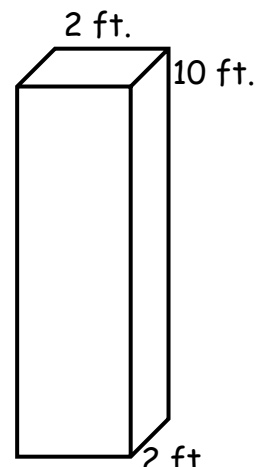
$$V = l \times w \times h$$

$$V = 6 \times 6 \times 6$$

$$V = 216 \text{ in.}^3$$

$$V = \text{area of the base} \times \text{height}$$

$$V = B \times h$$



$$V = l \times w \times h$$

$$V = 2 \times 2 \times 10$$

$$V = 40 \text{ ft.}^3$$

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Operations With Decimals

Adding Decimals:

1. Line up the decimal points and add as usual.
2. Drag the decimal straight down.

Subtracting Decimals:

1. Line up the decimal points and subtract as usual.
2. Drag the decimal point straight down.

Multiplying Decimals:

1. Multiply as usual.
 2. Count the digits behind the decimals.
 3. Place your decimal point in the product (answer).
- Make sure the product and the original problem have the same number of digits behind the decimal.

Dividing Decimals:

1. Move the decimal in the divisor so it is a whole number. Move the decimal in the dividend the same number of spaces.
3. Divide as usual.
4. In your answer, place the decimal directly above the decimal in the dividend.

Measurement Conversions

12 inches = 1 foot

3 feet = 1 yard

1,760 yard = 1 mile

5,280 feet = 1 mile

distance

1 kilometer = 1,000 meters

1 gallon = 4 quarts

1 quart = 2 pints

1 pint = 2 cups

1 cup = 8 ounces

capacity

16 oz. = 1 lb.

8 oz. = $\frac{1}{2}$ lb.

4 oz. = $\frac{1}{4}$ lb.

weight

Measurement

Metric System

three basic units

- gram measures weight
- meter measures length
- liter measures capacity

thousands	hundreds	tens	basic unit	tenths	hundredths	thousandths
1,000	100	10	1	0.1	0.01	0.001
kilo-	hecto-	deca-	meter gram liter	deci-	centi-	milli-

A millimeter is about how thick a dime is.

A centimeter is how wide one of your fingers is.

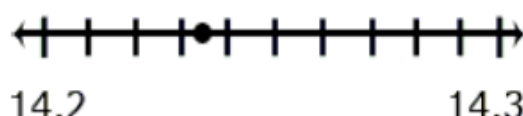
A kilometer is a little more than half a mile.

Measurement

Gallon Land



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<p style="text-align: center;"><u>Place Value</u></p> <div style="text-align: center;"> hundred millions ten millions millions , hundred thousands ten thousands thousands hundreds tens ones </div> <p style="text-align: center;">Whole Numbers</p> <hr/> <div style="text-align: center;"> hundred thousands ten thousands thousands hundreds tens ones ● tenths hundredths thousandths </div> <p style="text-align: center;">Whole Numbers Parts of a Whole</p>	<p style="text-align: center;"><u>Rounding Rap</u></p> <p style="text-align: center;">Yo, find that place value Circle that digit Move to the right, underline get it. 0-4 circle stays the same 5-9 add one is the game Now flex your muscles like a hero Digits to the right change to zero All the other digits stay the same Yo! You're the winner of the rounding game!</p>
<p style="text-align: center;"><u>Place Value</u></p> <p>347 .392</p> <p>Three hundred forty seven <u>and</u> three hundred ninety two thousandths</p> <p>$(3 \times 100) + (4 \times 10) + (7 \times 1) + (3 \times \frac{1}{10}) + (9 \times \frac{1}{100}) + (2 \times \frac{1}{1000})$</p> <p>$(3 \times 10^2) + (4 \times 10^1) + (7 \times 1) + (3 \times 0.1) + (9 \times 0.01) + (2 \times 0.001)$</p>	<p style="text-align: center;"><u>Rounding</u></p> <p>This standard refers to rounding. Students should go beyond simply applying an algorithm or procedure for rounding. The expectation is that students have a deep understanding of place value and number sense and can explain and reason about the answers they get when they round. Students should have numerous experiences using a number line to support their work with rounding.</p> <div style="text-align: center;">  <p>14.2 14.3</p> </div> <p>Example: Round 14.235 to the nearest tenth. Students recognize that the possible answer must be in tenths thus, it is either 14.2 or 14.3. They then identify that 14.235 is closer to 14.2 (14.20) than to 14.3 (14.30).</p>

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Multiplying & Dividing Whole Numbers

Standard Algorithm

$$\begin{array}{r}
 4, 3 2 7 \\
 \times 3 4 \\
 \hline
 1 7 3 0 8 \\
 + 1 2 9 8 1 0 \\
 \hline
 1 4 7, 1 1 8
 \end{array}$$

Multiple Towers

36	27
32	24
28	21
24	18
20	15
16	12
12	9
8	6
4	3

Algebraic Thinking

Order of Operations

P	()	$(14 + 2) \times 12 - 5^2$
E	x^2	$16 \times 12 - 5^2$
M	\times	$16 \times 12 - 25$
D	\div	$192 - 25$
A	$+$	
S	$-$	

Simple Expressions

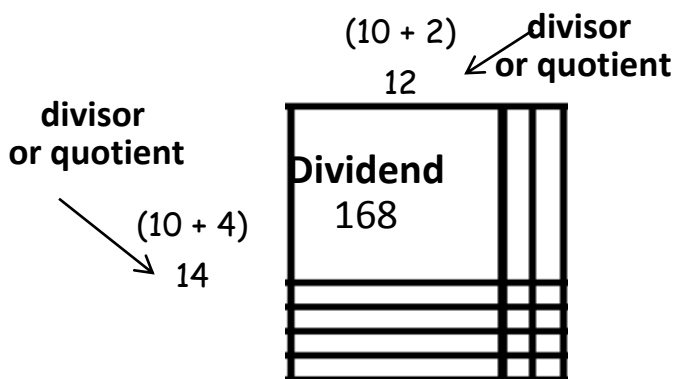
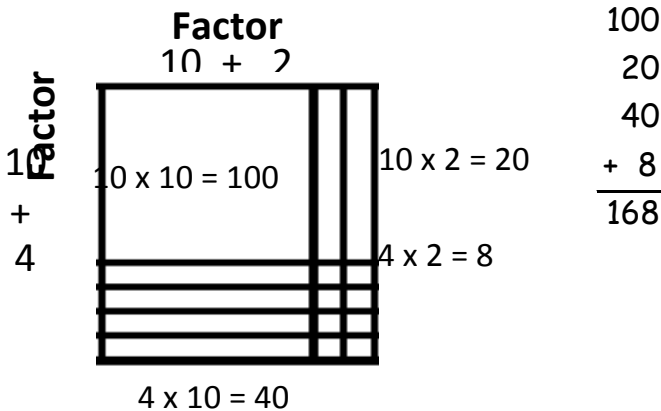
Johnny had 12 apples that he gave to Susan.
He then picked some more.

$$12 - 6 + a$$

Multiplying & Dividing Whole Numbers

Relating Division to Multiplication

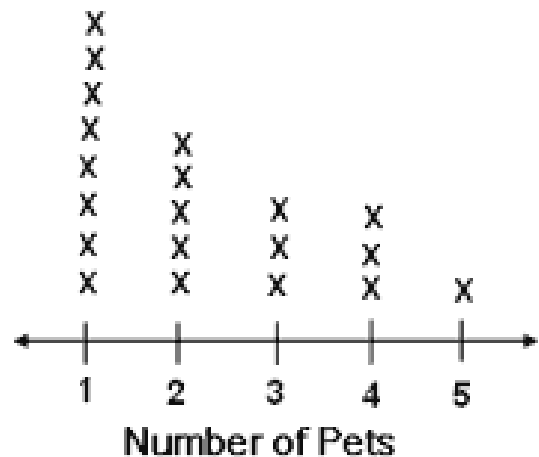
$$14 \times 12 = 168$$



Data Analysis

Line Plot

Shows frequency of data along a number line



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Division Strategies

Partial Quotient

$$36 \div 4$$

$$3 \times 4 = 12$$

$$3 \times 4 = 12$$

$$3 \times 4 = 12$$

4	36	
-	12	3
	24	
-	12	3
	12	
-	12	3
	0	9

$$156 \div 5$$

$$20 \times 5 = 100$$

$$10 \times 5 = 50$$

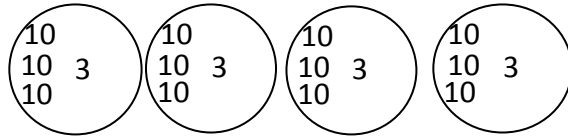
$$1 \times 5 = 5$$

5	156	
-	100	20
	56	
-	50	10
	6	
-	5	1
	1	31 r 1

Division Strategies

Dealing Out

$$135 \div 4$$



$$135 - 40 = 95$$

$$\begin{array}{r} 95 \\ -40 \\ \hline 55 \\ -40 \\ \hline 15 \\ -12 \\ \hline 3 \end{array}$$

Division Strategies

Breaking the Dividend into Multiples of the divisor

$$84 \div 4$$

$$80 \div 4 = 20$$

$$4 \div 4 = 1$$

$$20 + 1 = 21$$

$$135 \div 4$$

$$80 \div 4 = 20$$

$$40 \div 4 = 10$$

$$12 \div 4 = 3$$

$$\underline{33 \text{ r } 3}$$

Division Strategies

Breaking Dividend Apart

$$135 \div 4$$

$$100 + 30 + 5$$

$$100 \div 4 = 25$$

$$30 \div 4 = 7 \text{ r } 2$$

$$5 \div 4 = 1 \text{ r } 1$$

$$\underline{33 \text{ r } 3}$$

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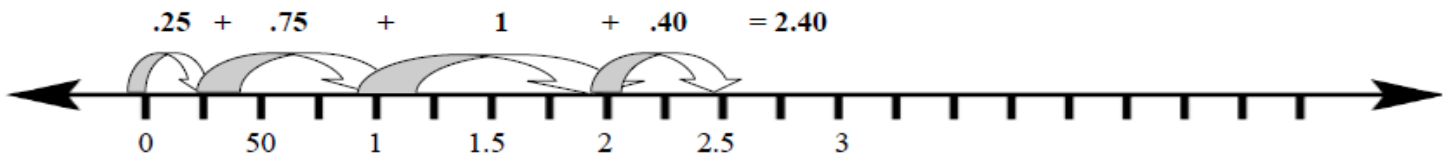
Comparing

$$0.207 \quad (2 \times 0.1) + (0 \times .01) + (7 \times 0.001)$$

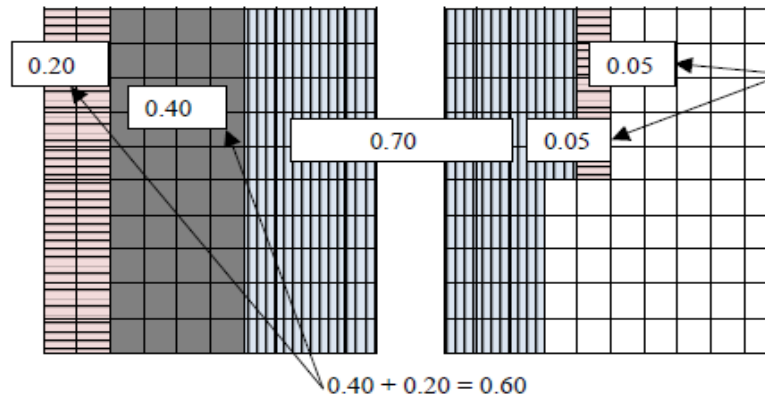
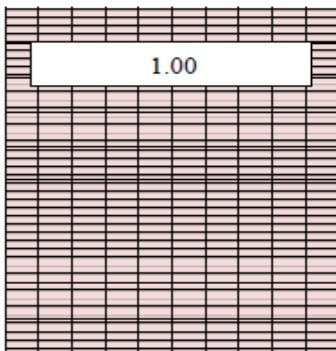
$$0.26 \quad (2 \times 0.1) + (6 \times 0.1)$$

The digit 6 in the hundredths place is larger than the 0 digit.

Adding Decimals Model



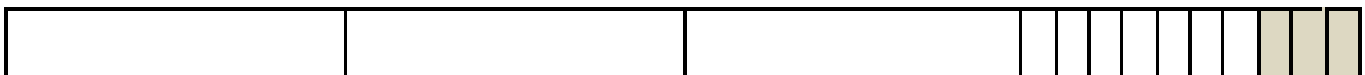
$$1.25 + 0.40 + 0.75$$



I ended up with 1 whole, 6 tenths, 7 more tenths and 1 hundredth.
 $0.05 + 0.05 = 0.10$ Is 2.40

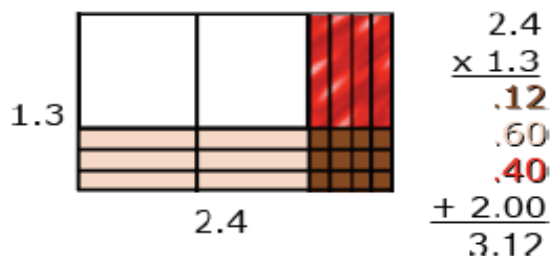
Subtracting Decimals with Models

$$4 - 0.3$$



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Multiplying Decimals



Students should be able to describe the partial products displayed by the area model.

For example,

"3/10 times 4/10 is 12/100.

3/10 times 2 is 6/10 or 60/100.

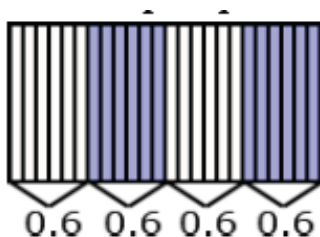
1 group of 4/10 is 4/10 or 40/100.

1 group of 2 is 2."

Divide Decimals

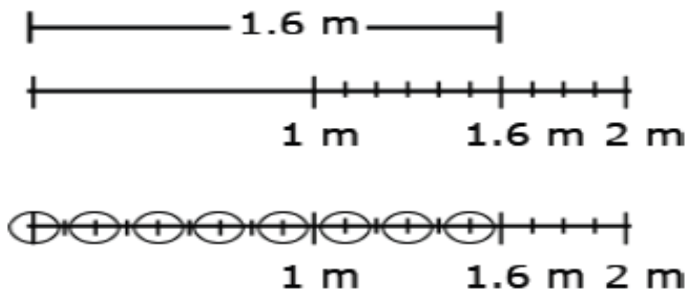
Example of division: finding the number in each group or share.

Students should be encouraged to apply a fair sharing model separating decimal values into equal parts such as $2.4 \div 4 = 0.6$



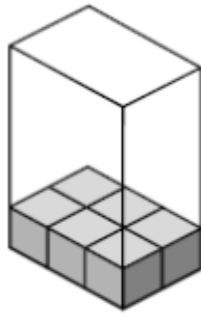
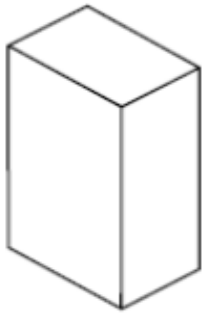
Example of division: finding the number of groups.

Students could draw a segment to represent 1.6 meters. In doing so, s/he would count in tenths to identify the 6 tenths, and be able identify the number of 2 tenths within the 6 tenths. The student can then extend the idea of counting by tenths to divide the one meter into tenths and determine that there are 5 more groups of 2 tenths.

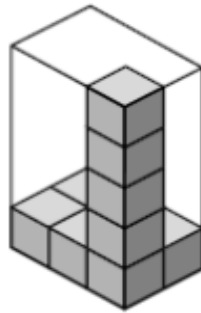


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Volume



one layer



five layers
fill the box

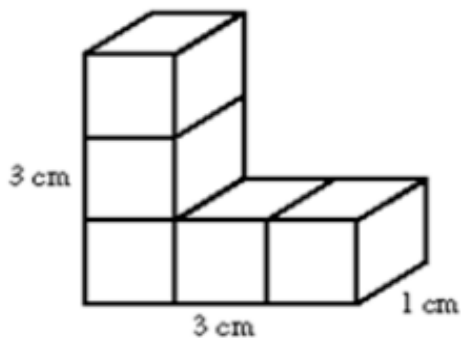
(3×2) represented by first layer

$(3 \times 2) \times 5$ represented by number of
 3×2 layers

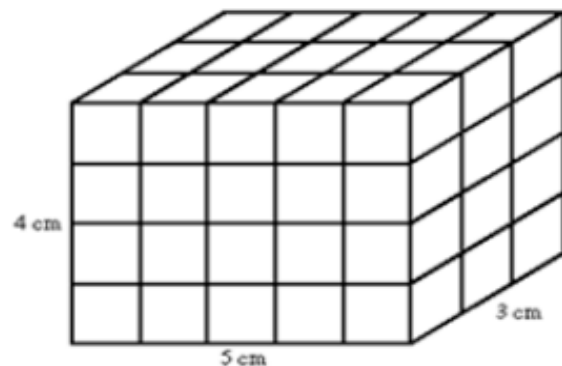
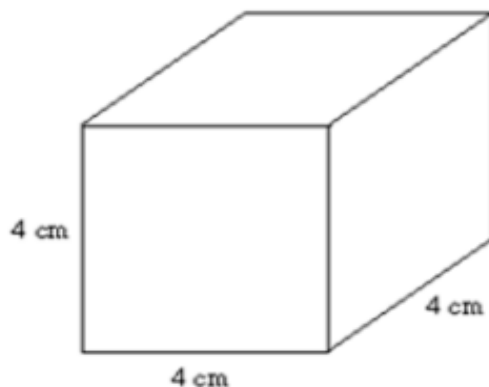
$$(3 \times 2) + (3 \times 2) + (3 \times 2) + (3 \times 2) + (3 \times 2) = \\ 6 + 6 + 6 + 6 + 6 = 30$$

6 representing the size/area of one layer

Students will extend their work with the area of composite figures into the context of volume. Students will break apart (decompose) 3-dimensional figures into right rectangular prisms in order to find the volume of the entire 3-dimensional figure.

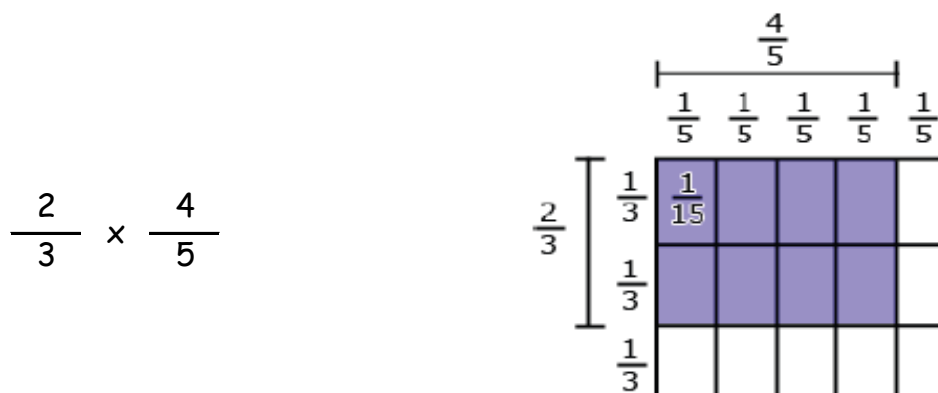
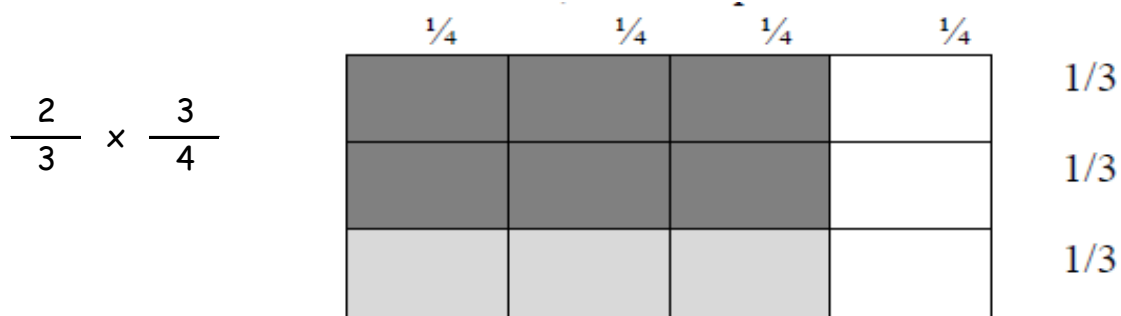


decomposed figure



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Multiplying Fractions Models



$\frac{2}{3} \times 7$ is less than 7 because 7 is multiplied by a factor less than 1 so the product must be less than 7.

