5th Grade
Math Standards Help Sheets
Table of Contents

Websites

IXL – Math and Language both
khanacademy.org
learnzillion.com

https://www.teachingchannel.org
http://www.commoncoresheets.com
www.mathisfun.com

Aug 8th

[5.M.NBT.B.05] I can multiply multi-digit whole numbers.

Big Ideas

- Multiplication of two multi-digit numbers will result in a product larger than either number.
- When multiplying, the product can be found by using the standard algorithm.
- The standard algorithm for multiplication is shown here: 123 x 34. Students must decompose 34 into 30 + 4, then they multiply 123 x 4, the value of the number in the ones place, and then multiply 123 by 30, the value of the 3 in the tens place, and add the two products.

Common Misconceptions

- Students will forget their place holding zero.
- Students may forget to carry when adding.
- Students may have varying levels of mastery of multiplication facts.

Students need to find the product using the standard algorithm and describe the process by writing a short paragraph.

- 147 x 432
- 147 x (400 + 30 + 2)
- 147 x 400 = 58,800
- 147 x 30 = 4,410
- 147 x 2 = 294
- 58,800 + 4,410 + 294 = 63,504

Sample Problem: The town council wants to replace all of the light bulbs in the streetlights. Each light bulb costs $1. There are 6 streetlights on each street, and 8 streets in each neighborhood. How much will it cost to replace all the bulbs if there are 7 neighborhoods in the town? **Answer with justification:** 6 streetlights on each street x 8 streets in each neighborhood = 48 light bulbs in each neighborhood x 7 neighborhoods = 336 bulbs in town x $1 each = $336 to replace all the light bulbs in town.

Problem	Mathematical Solution	Written Justification
356 x 46=	**356x46** **356x (40 +6)** **356x40=14,240** **356x6=2,136** **14,240** **+ 2,136** **16,376**	**I lined up two numbers by place value. I began by breaking apart the smaller number 46 into place value (40+6). Then, I multiplied 356 by 40, 40 is the value in the tens place. I lined up the numbers according to place value and found the product of 14,240.** **Next, I multiplied 356 by 6 since 6 is the value in the ones place. I lined up the numbers according to place value and found the product to be 2,136.** **Finally, I added the two products together by lining up the digits by place value. My final answer was 16,376.**

Aug 15th

5.M.NBT.B.06 I can divide multi-digit whole numbers by whole number divisors with and without remainders using various strategies.

Big Ideas

- Division is the process of separating a number into smaller, equal groups.
- The quotient is the result of the dividend divided by the divisor.
- Division can be shown by using the expanded notation model, base 10 model, and the area model.

Common Misconceptions

- The models represent a higher level Bloom's.
- Students place the first digit in the wrong place value.

Sample Problems

Which equation correctly represents the division problem 2682 ÷ 25 **using expanded notation**?

a. 2682 ÷ 25 = (2000+600+25) ÷ 25 **b. 2682 ÷ 25= (2000+600+80+5) ÷ 25**

c. 2682 ÷ 25= (2600+80+5) ÷25 d. 2682 ÷ 25= (2000+1000+80+5) ÷25

Using the understanding of the relationship between 100 and 25. A student might think

- I know that 100 divided by 25 is 4 so 200 divided by 25 is 8 and 2000 divided by 25 is 80.
- 600 divided by 25 has to be 24.
- Since 3 x 25 is 75, I know that 80 divided by 25 is 3 with a remainder of 5
- I can't divide 2 by 25 so 2 plus the 5 leaves a remainder of 7

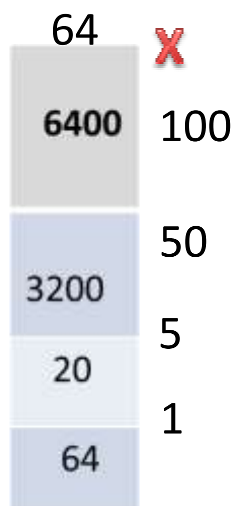
Solve using **repeated subtraction**. 432 ÷ 54

Answer: 432 - 54 = 378
378 - 54 = 324
324 - 54 = 270
270 - 54 = 216
216 - 54 = 162
162 - 54 = 108
108 - 54 = 54
54 - 54 = 0
Answer: 8

Using **the area model** for division to solve 9984 ÷ 64

64 will go into 9984 (100 times)

- 9984 – 6400 = 3584
- 64 will go into 3584 (50 times)
- 3584 – 3200 = 384
- 64 will go into 384 (5 times)
- 834 – 320 = 64
- 64 will go into 64 (1time)
- So 9984 ÷ 64 = 100 + 50 + 5 + 1 = 156



Solve using the **standard algorithm**. 4,920 ÷ 20

a. 282 b. 264 c. 228 **d.246**

```
    1  1  7  r.7
8 | 9  4  3
   -8
    1  4
      -8
       6  3
      -5  6
          7
```

How to solve: Students cover up all the numbers except the first one in the box. 9 is in the box so they look where it would fall if they were counting. It falls between 8 and 16. (They will always use the smaller numbers for their answer.) Then they put 1 up on top and 8 below the 9 and subtract. Then they bring the next number down. 14 falls between 8 and 16 so they use 1 up again and 8 down followed by subtracting. The beauty in this is they understand what numbers go up and what numbers are used to subtract. After completing these numerous times, and they have caught on, then we talk about why this works and what each number represents.

Solve the equation using the strategy **of separating a number into smaller groups** of. 374 ÷ 17

a. 21 b. 20 **c.22** d. 23

Aug 22nd

[5.M.NBT.A.03] I can read, write, and compare decimals to thousandths.

Big Ideas

- Decimals and fractions are part of a whole.
- Decimals can be converted into a fraction and vice versa to show equivalence.
- Place value determines which number has greater value.
- Expanded notation can be used to compare decimals.
- Expanded notation is taking a number and using place value to determine each digit's value.
- A digit in one place represents 10 times what is represents in the place to its right and 1/10 of what it represents in the place to its left.
- Every time a number is multiplied by 10, a zero is added to the end of the number.
- To make a digit 10 times larger, I have to move it one place to the left.

Common Misconceptions

- Students may not realize when placing a zero after the decimal, the value does not change (0.8= 0.80= 0.800)
- Students may not realize when placing a zero in front of another digit, the value does change. (0.9 does not equal 0.09)

Express 72 hundredths 3 different ways: as a decimal, as a fraction, and in expanded form.
0.720 720/1000 7 x (1/10) + (2 x 1/100) + 0 x (1/1000)
Compare 0.207 to 0.26
207/1000 < 260/1000

Place Value Chart

millions	9,000,000.0
hundred thousands	900,000.0
ten thousands	90,000.0
thousands	9,000.0
hundreds	900.0
tens	90.0
ones	9.0
tenths	0.9
hundredths	0.09
thousandths	0.009
ten thousandths	0.0009
hundred thousandths	0.00009
millionths	0.000009

Steps to comparing decimals
54.78 > 54.623
1) Line up the decimals.
2) Fill in any place holder zeroes.
3) Compare left to right.

54.780
54.623

Put the following values in order from LEAST to GREATEST:
7.98, 7.89, 7.089, 78.9

	7	.	9	8	0	#3
	7	.	8	9	0	#2
	7	.	0	8	9	#1
7	8	.	9	0	0	#4

Aug 29th

[5.M.NBT.A.04] I can round decimals to a given place value

Big Ideas

- A decimal is part of a whole.
- When given a number, find the value above and below to determine the most appropriate way to round.
- When rounding, if a value is 5 or greater, round to the next number. If the value is below 5, round to the number below.

Common Misconceptions

- Students often round to the wrong place value.
- Students may round without identifying the two possible answers.

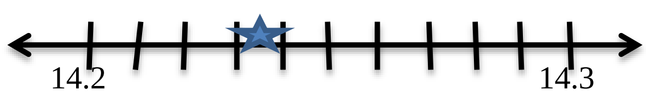
Helpful hints for rounding: Find your place. Go next door. If it's five or more, add one more. Less than 4, just ignore. 0,1,2,3, and 4, don't change that number anymore 5,6,7,8, or 9 change that number every time.

Helpful hints for rounding: Underline the digit, Look next door, If it is 5 or higher, Add 1 more, If 4 or less, just ignore

9.<u>3</u>18 → 9.3 If you are rounding to the nearest tenth you underline the digit in the tenths place (the3). Look next door and you have a 1. If it is larger than 5 you add one and if it is 4 or less you just ignore. You can ignore because 1 is 4 or less.

Sample Problem: 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)



Sample Problem: Sally is given a number on a piece of paper to round to the nearest tenth. The number she is given is 4.66.

8.44 rounded to the nearest tenth will be between which two numbers?

a) 4.00-4.30 **b) 4.6-4.7** c) 4.66-5.00 d) 4.5-5.00

Sample Problem: Which number rounds to 303?

A. 302.095 **B. 303.905** C. 303.2 D. 30.30

Sept 5th

[5.M.NBT.B.07] I can add, subtract, multiply and divide decimals to hundredths place using models or drawings.

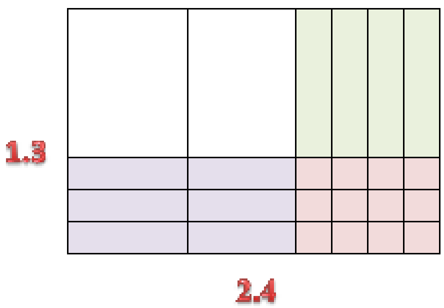
Big Ideas

1. Decimal numbers represent part of a whole number.
2. Using models and partial products:
    a. In addition, more is added to the model
    b. In subtraction, units are taken away from the model
    c. In multiplication, units overlap to show joined groups
    d. In division, units are separated to equal groups

Common Misconceptions
1. Students may struggle with understanding the relationships with parts of a whole
(ex. 3.4 is equivalent to .34)

Sample Problem: Mrs. Fontes is going to the Phoenix Suns game with $200. She buys 3 hot dogs, 2 waters, and 4 pretzels (for her family). If the hot dogs cost $5.39 each, the waters cost $4.87 each, and the pretzels cost $3.65 each, how much did she spend? How much will she leave the game with?
Answer with justification: She buys 3 hot dogs for $5.39 each (3 x 5.39 = $16.17) + 2 waters for $4.87 each (2 x 4.87 = $9.74) + 4 pretzels for $3.65 each (4 x $3.65 = $14.60). 1st question: she spent $16.17 + $9.74 + $14.60 = **$40.51**. 2nd question $200.00 - $40.51 = $159.49. **She will leave with $159.49**.

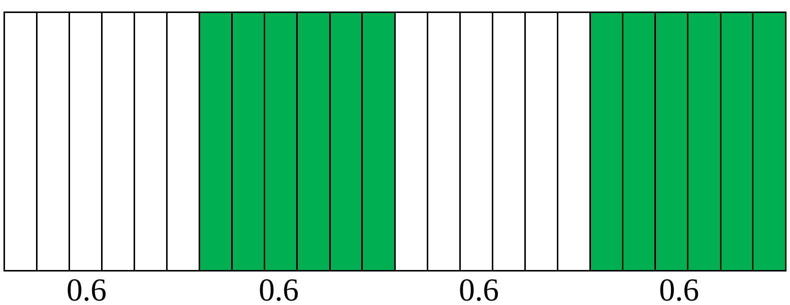
Multiplication example:
Solve 2.4 x 1.3 using an **area model** and **partial products**




```
   2.4
X 1.3
   .12  (.3x.4)
   .60  (.3x2.0)
   .40  (1.0x4)
+2.0  (1.0x2.0)
    3.12
```

An explanation of the **partial product** could be:
3/10 times 4/10 is 12/100
3/10 times 2 is 6/10 or 60/100
1 group of 4/10 or 40/100
1 group of 2 is 2

Division example:
Solve 2.4 ÷ 4 using an area model and partial products.
(Note: 2.4 is equivalent to 24 tenths)



Sample Problem: The price of one ticket for a dinner theater is $45.75. How much would a family of four pay for four tickets?

a.) $100.00
b.) $48.75
c.) $183.00
d.) $138.75

Benchmark Review **Sept 19th**

Benchmark #1 Test **Sept 26th**

Oct 3rd – two weeks

[5.M.NF.A.01] I can add and subtract fractions with unlike denominators including mixed numbers. Students will show their work and justify their answer by writing out the steps taken.

Big Ideas
1. A fraction represents a part of a whole number.
2. Fractions can be added or subtracted.
3. In order to add or subtract fractions, the fractions must have like denominators.
4. Like denominators are found by determining the LCD.
5. Answers must be reduced to lowest terms.
6. Improper fractions but be converted to mixed numbers.

Common Misconceptions
1. Regrouping is not base 10, it is based on the value of the denominator.
2. Students often forget to convert their value into lowest terms.

Sample Problem: $^{2}/_{5} + {}^{7}/_{8} = {}^{16}/_{40} + {}^{35}/_{40} = {}^{51}/_{40}$ = since 51 is larger than 40 you can make it a mixed number $= 1\ {}^{11}/_{40}$

Sample Problem: $4\ {}^{3}/_{8} – 2\ {}^{5}/_{6} =$

$4\ {}^{9}/_{24} – 2\ {}^{20}/_{24}$ = because $^{9}/_{24}$ is less than $^{20}/_{24}$ you must use a whole and convert it to 24th therefore
$3\ {}^{33}/_{24} – 2\ {}^{20}/_{24} =$
3-2 =1 and 33-20 = 13 therefore
$4\ {}^{3}/_{8} – 2\ {}^{5}/_{6} – 1\ {}^{13}/_{24}$

Oct 17th

[5.M.NF.A.02] I can solve word problems involving addition and subtraction of fractions and mixed numbers.

Big Ideas
1. A fraction represents a part of a whole number.
2. Fractions can be added or subtracted.
3. In order to add or subtract fractions, the fractions must have like denominators.
4. Like denominators are found by determining the LCD.
5. Answers must be reduced to lowest terms.
6. Improper fractions but be converted to mixed numbers

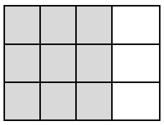
Common Misconceptions
1. Regrouping is not base 10, it is based on the value of the denominator.
2. Students often forget to convert their value into lowest terms.

Steps to Solving Word Problems:
- ✓ Read the word problem
- ✓ Circle important numbers

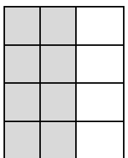
- ✓ Underline or highlight the question
- ✓ Pick out the keywords to determine equation
- ✓ Set up problem to solve

Sample Problem: Jerry was making two different types of cookies. One recipe needed ¾ cup of sugar and the other needed $^{2}/_{3}$ cup of sugar. How much sugar did he need to make both recipes?

Can be expressed in an area model: $^{3}/_{4} + ^{2}/_{3} =$

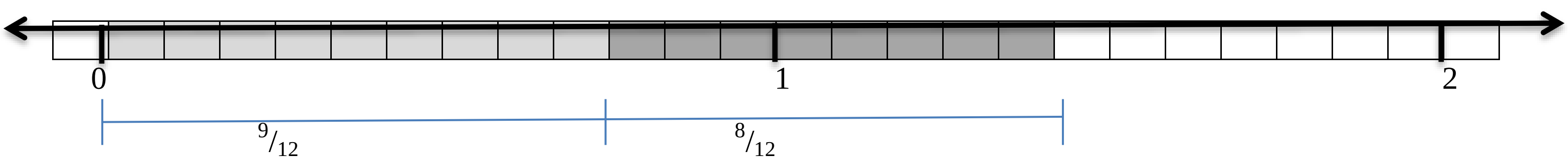


¾ cup of sugar = $^{9}/_{12}$



$^{2}/_{3}$ cup of sugar = $^{8}/_{12}$

Use a **number line** to solve: ¾ + $^{2}/_{3} = ^{9}/_{12} + ^{8}/_{12} = ^{17}/_{12} = 1\ ^{5}/_{12}$



Oct 24th

[5.M.NF.B.05] I can interpret multiplication as scaling.

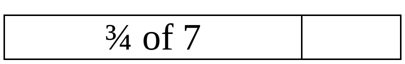
Big Ideas

1. Multiplying a fraction by a whole number will result in a product that smaller than whole number.
2. Multiplying a fraction by a fraction will result in a product that is smaller than either factor.
3. Multiplying a mixed number by a whole number will result in a product that is larger than the mixed number.

Common Misconceptions

Students don't always understand what happens when you multiply a fraction by a whole number when using a algorithm.

Explain with a model why ¾ x 7 is less than 7.
3/4 x 7 is less than 7 because 7 is multiplied by a factor less than 1 so the product must be less than 7



¾ x $^{7}/_{1} = ^{21}/_{4} = 5$ ¼

Sample Problem: Caroline got a cake for her birthday. The cake is divided into 8 pieces. She has eaten $^{3}/_{4}$ of the cake. How many pieces has she eaten?

Let's scale this problem down.
One of our factors is LESS THAN 1. This means the product will be LESS THAN 8

$^{8}/_{1}$ x ¾ =

Steps to Solve: Multiply the numerators 8 x 3 = 24 Multiply the denominators1 x 4 = 4

$^{8}/_{1}$ x ¾ = $^{24}/_{4}$ reduce by dividing 24 by 4 = 6 pieces of cake have been eaten

Oct 31st

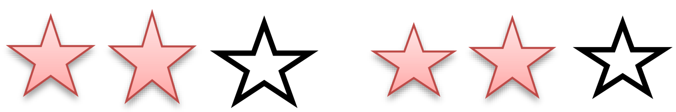
[5.M.NF.B.06] I can solve fraction word problems with multiplication using models or equations.

Big Ideas
1. Multiplication is combining equal groups together.
2. Mixed numbers must be converted into improper fractions before multiplying.
3. Equations or models can be created to solve fraction word problems.

Common Misconceptions
1. Students often forget to change improper fractions to lowest terms.
2. Students may choose the incorrect numbers for the equation.

Sample Problem: Jon's mom is going to make him a quilt. It needs to be 2 ¼ by 1 1/3.
Multiply 2 ¼ by 1 and then by $^{1}/_{3}$
2 ¼ x 1 = 2 ¼ and 2 ¼ x $^{1}/_{3}$ = $^{9}/_{12}$
$^{1}/_{3}$ x 2 = $^{2}/_{3}$ and $^{1}/_{3}$ x ¼ = $^{1}/_{12}$
2 ¼ + $^{2}/_{3}$ + $^{1}/_{12}$ = 2 $^{3}/_{12}$ + $^{8}/_{12}$ + $^{1}/_{12}$ = 2 $^{12}/_{12}$ = 3

Sample Problem: Kim bought 6 stars for her mom. 2/3 of them were red. How many red stars were there?



Nov 7th

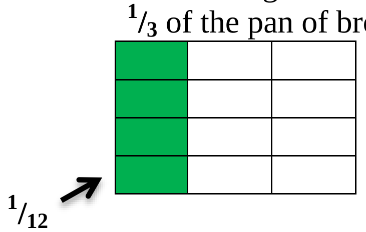
[5.M.NF.B.07] I can create and solve real world problems by dividing fractions and whole numbers in lowest terms.

Big Ideas
1. Division is creating smaller, equal groups.
2. Division is the inverse operation of multiplication.
3. Division of fractions is the multiplication of a number by its reciprocal.

Common Misconceptions:
Students will forget to multiply by the reciprocal.

Given a whole number and a fraction, students will create a real world problem and solve with a fraction model.
Sample problem: Four students sitting at a table were given $^{1}/_{3}$ of a pan of brownies to share. How much of a pan will each student get if they share the pan of brownies equally?

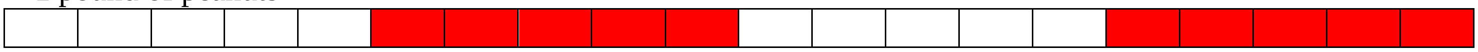
$^{1}/_{3}$ of the pan of brownies is shaded



The diagram above shows the 1/3 pan divided into 4 equal shares with each share equaling $^{1}/_{12}$ of the pan.

Sample Problem: Angelo has four pounds of peanuts. He wants to give each of his friends 1/5 of a pound. How many friends can receive 1/5 of a pound of peanuts?

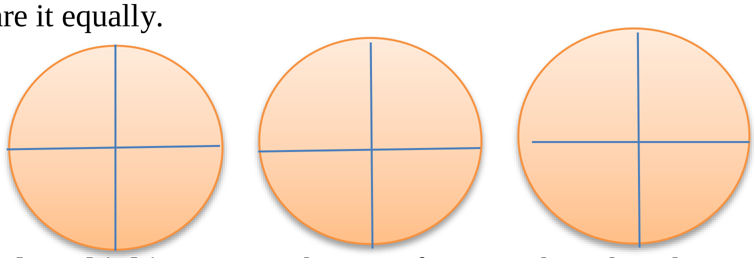
1 pound of peanuts



1/5 of a pound of peanuts

A diagram for $4 \div {}^{1}/_{5}$ is shown above. Students explain that since there are 5/5 in 1 whole, there must be 20 fifths in 4 pounds

Sample Problem: If I have 2 cookies and 4 people to share the cookies. How much will each person get if I share it equally.



Student thinking: Since there are fewer cookies then there are people. Each person will get less than a whole cookie. I can divide each cookie into 4 pieces and each person will get one section from each cookie. Therefore each person will get ¼ of three cookies and ¼ three times is ¾ of a cookie each. 3 cookies ÷ 4 people = ¾ of a cookie each.

Sample problem: Kayla worked on a drawing for 4 hours. In that time she completed ¾ of the drawing. If she completed an equal amount of the drawing each hour how much did she complete each hour?

> ¾ ÷ 4 =
> ¾ ÷ $^{4}/_{1}$ = (to divide you multiply by the reciprocal
> ¾ ÷ ¼ = $^{3}/_{16}$

Nov 14th

[5.M.NF.B.03] I can solve word problems involving division of whole numbers with answers in the form of fractions or mixed numbers

Big Ideas

1. A fraction represents division of two whole numbers.
2. Information from a word problem can be used to create an equation.

Common Misconceptions

1. Students often switch the divisor and the dividend when dividing.
2. Students often choose the wrong information or operation from a word problem to set up their equation.
3. Students often forget to change the improper fraction to a mixed number.

Sample Problem: Two afterschool clubs are having pizza parties. For the Math Club, the teacher will order 3 pizzas for every 5 students. For Student Council, the teacher will order 5 pizzas for every 8 students. Since you are in both groups, you need to decide which party to attend. How much pizza would you get at each party? If you want to have the most pizza, which party should you attend?

*Students will make a model, write an equation, and explain their thinking to solve the problem.

Compare: $^{3}/_{5}$ and $^{5}/_{8}$

$^{3}/_{5} = {}^{24}/_{40}$ and $^{5}/_{8} = {}^{25}/_{40}$; therefore $^{3}/_{5}$ less than $^{5}/_{8}$

Sample Problem: Five sisters went to the store and bought twelve candy bars. They took the candy bars home and started to divide the candy bars up equally. They could not figure out how to divide the candy bars evenly between them. Can you help the sisters each get a fair share of the candy bars?

Questions

1. Why is it difficult for the sisters to split the candy bars evenly? Students should be able to explain that the 12 is not evenly divisible by 5, so that makes it hard to split them evenly.
2. What is the solution to dividing the candy bars evenly among the five sisters? Write the answer as an equation with the answer.

$12 \div 5 = 2\,{}^{2}/_{5}$

Sample Problem: A sky tram set has five cars and each car seats 4 people. There are thirty people in line for the sky tram ride at the San Diego Zoo. How many sky tram sets will it take for all 30 people to ride?





XXXX XXXX XXXX XXXX XXXX





XXXX XXXX XX

X = 1 PERSON

30/20 = 1 10/20 = 1 ½ Sky Tram Sets

Review for Benchmark Test Nov 21st (2 Weeks)

Benchmark 2 Test Dec 5th (1 Week)

Dec 12th

[5.M.MD.C.05] I can calculate the volume of a rectangular prism using a model and algorithm.

Big Ideas

- Volume is length x width x height
- When calculating volume, you can divide an original shape into smaller shapes, and add the volumes together.

Common Misconceptions

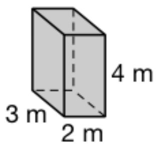
- Students may struggle with dividing the individual shape into smaller shapes.
- Students may choose the incorrect measurement to represent length, width, height.

A homeowner is building a swimming pool and needs to calculate the volume of water needed to fill the pool. The design of the pool is shown in the illustration below. What is the volume of water needed to fill the pool?

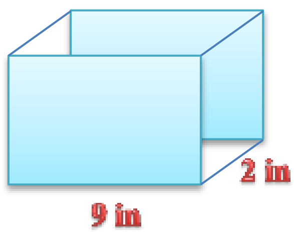
Volume - Volume is the space that is takes to fill something up

A **rectangular prism** is a solid figure that has three sets of parallel congruent sides shaped like rectangles. The **volume** of a solid figure is the measure of the space it occupies. You can find the volume of a rectangular prism with the following formula.

Volume of a Rectangular Prism	Find the volume (V) of a rectangular prism by multiplying the length (ℓ), the width (w), and the height (h). $V = \ell wh$



$3 \times 4 \times 2 = 24\ m^3$



V = L x W x H
72 =2 x 9 x h
$^{72}/_{18} = {}^{18h}/_{18}$
H = 4 in

Dec 19th

[5.M.G.B.03] I can describe the attributes of 2 dimensional figures.

Big Ideas

- Examples of 2D figures are: parallelogram, square, rectangle, trapezoid, triangle, rhombus and all regular polygons.
- Side properties include parallel, perpendicular, intersecting, and congruent.
- Angle properties include acute, obtuse, and right.
- Symmetry properties include point and line.

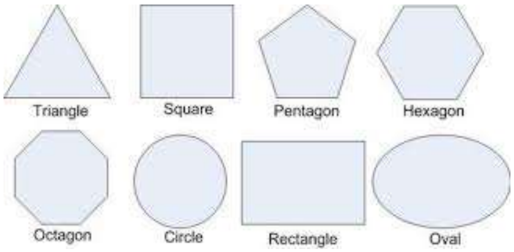
Common Misconceptions

- Students struggle with perpendicular lines make right angles.
- Students struggle with regular and irregular polygons.

Geometric properties include properties of sides (parallel, perpendicular, congruent), properties of angles (type, measurement, congruent), and properties of symmetry (point and line).

Example:
- If the opposite sides on a parallelogram are parallel and congruent, then rectangles are parallelograms.

A **sample of questions** that might be posed to students include:
- A parallelogram has 4 sides with both sets of opposite sides parallel. What types of quadrilaterals are parallelograms?
- Regular polygons have all of their sides and angles congruent. Name or draw some regular polygons.
- All rectangles have 4 right angles. Squares have 4 right angles so they are also rectangles. True or False?
- A trapezoid has 2 sides parallel so it must be a parallelogram. True or False?



List as many 2-D figures you can think of: YES! 2-D Shapes include: Triangles, Squares, Rectangles, Circles, Pentagons, Hexagons, Heptagons, Octagons, Nonagons, and Decagons

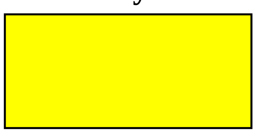
What is a Polygon? A **polygon** is a plane (2D) shape with straight sides. To be a **regular polygon** all the sides and angles must be the same. These are polygons: Triangles, Squares, Pentagons, Hexagons, Heptagons, Octagons, Nonagons, and Decagons

Other polygons include: Quadrilaterals. A **quadrilateral** is a 4 sided figure. The sides have to be straight, and it has to be 2-dimensional. examples of quadrilaterals are: square, rhombus, rectangle, trapezium, and a kite

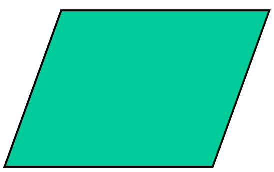
2-D Shapes

- These shapes are flat and can only be drawn on paper.
- They have two dimensions – length and width.
- They are sometimes called plane shapes.

Vocabulary:

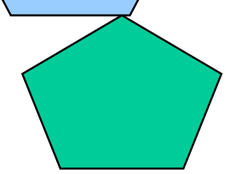


Rectangle - A four sided two-dimensional shape with two pairs of parallel sides that meet at right angles.

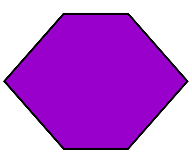


Rhombus - A two-dimensional four sided shape with opposite sides that are parallel and all the sides are the same length

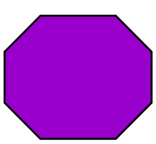
Trapezoid - A two-dimensional shape with four sides. One pair of sides is parallel with one side longer than the other.



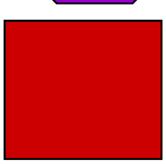
Pentagon - A two-dimensional shape with five straight sides and five angles.



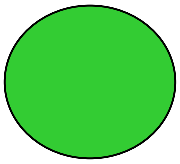
Hexagon - A two-dimensional shape with 6 straight sides and 6 angles.



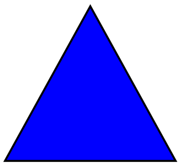
Octagon - A two-dimensional shape with 8 straight sides and 8 angles



Square - Two dimensional shape with 4 sides of the same length and 4 90° angles.

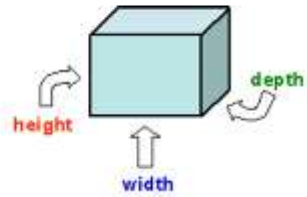


Circle - A round flat two-dimensional shape.

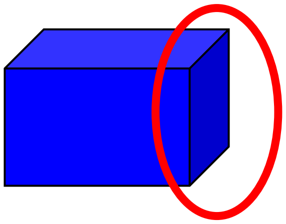


Triangle - Two-dimensional shape with three straight sides and three angles.

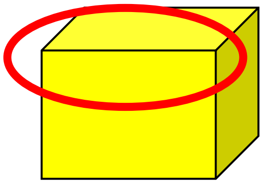
3-D Shapes



- 3-D Figures: A shape is considered three dimensional if it can be measured in 3 directions.
- Three dimensional shapes can be measured by height, width, and depth.
- Can be hollow or solid

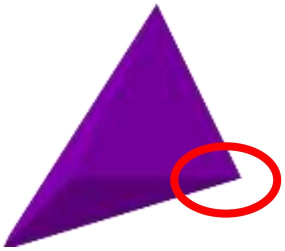


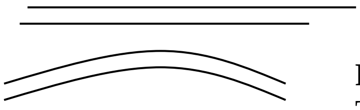
Face – Part of the shape that is flat. (or Curved. A cube has 6 faces.



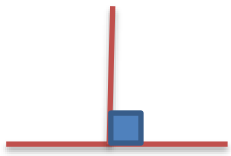
Edge – The line where two faces meet. A cube has 12 of these.

Vertex (Vertices) – The place where three or more edges meet. This pyramid has 4 vertices.

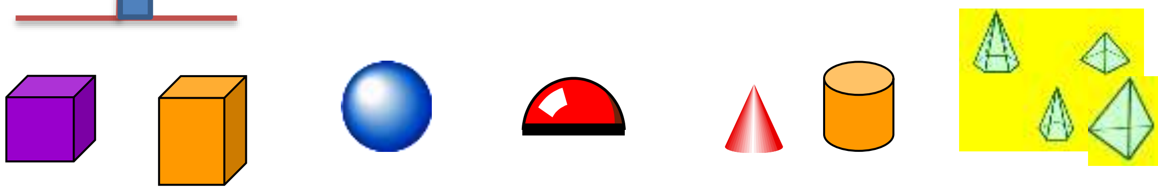


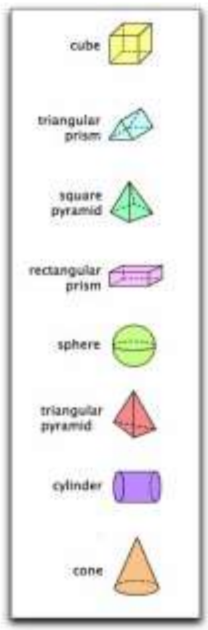


Parallel – These types of lines stay the same distance apart for their whole length. They do not need to be straight or the same length.



Perpendicular – A line that is drawn in a right angle to another line. In solid shapes edges can be at the right angle to one another. Faces could also be at right angles to one another.





Cube – a 3-d shape which has 6 square faces all the same size. Some faces are parallel, some edges are parallel. Some faces are perpendicular and some edges are perpendicular.

Cuboid – A 3-d shape which has 6 rectangular faces. Some faces and edges are parallel. Some faces and edges are perpendicular.

Sphere: - A perfectly round 3-d shape, like a ball. Has only one curved face. No parallel or perpendicular faces or edges.

Hemisphere – a 3-d shape that is half a sphere. It has no parallel or perpendicular faces or edges

Cone – a 3-d shape with a circle at its base and a pointed vertex. It has no parallel or perpendicular faces or edges.

Cylinder – A 3–d shape with circular ends of equal size. It has some parallel faces and edges. It has some perpendicular faces and no perpendicular edges.

Pyramids – a 3-d shape which has a polygon for its base and triangular faces which meet at one vertex.

Jan 9th

[**5.M.G.B.04**] I can classify 2d figures in a hierarchy.

Big Ideas

- Quadrilaterals are classified by their angles and sides.
- Quadrilaterals have four sides.
- A square is a rectangle but a rectangle is not a square.
- Triangles are classified by their angles and sides.
- Triangles have three sides.

Common Misconceptions

- Students have a hard time understanding the relationship between squares and rectangles.
- Students have a hard time classifying due to the amount of vocabulary.
- This particular concept is reading based and a solid understanding of vocabulary is necessary for mastery.

Properties of figures may include:

- Properties of sides – parallel, perpendicular, congruent, number of sides
- Properties of angles – types of angles and are they congruent
  - a **right triangle** can be both scalene and isosceles, but not equilateral
  - a **scalene triangle** can be right, acute, and obtuse

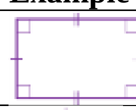
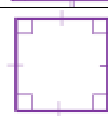
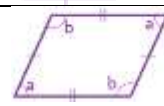
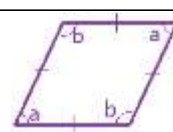
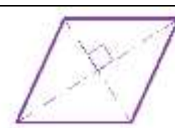
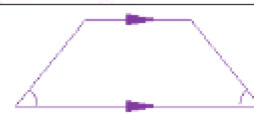
Triangles can be classified by:

- **Angles**
  - **Right** – the triangle has one angle that measures 90^{O}
  - **Acute** – the triangle has exactly three angles that measure between 0^{O} and 90^{O}
  - **Obtuse** – the triangle has exactly one angle that measures greater than 90^{O} and less than 180^{O}
- **Sides**
  - **Equilateral** – all sides of the triangle are the same length
  - **Isosceles** – at least two sides of the triangle are the same length
  - **Scalene** – no sides of the triangle are the same length

Hierarchy of Quadrilaterals and Triangles

- Polygon
  - Quadrilateral
    - Parallelogram
      - Rectangle
        - Square
      - Rhombus
        - Square
    - Trapezoid
    - Kite
  - Triangle
    - Scalene
    - Isosceles
      - Equilateral

Types of Quadrilaterals

Quadrilateral	Properties	Example
Rectangle	4 right angles and opposite sides are parallel and equal	
Square	4 right angles and 4 equal sides. Opposite sides are parallel and equal	
Parallelogram	Two pairs of parallel sides and opposite sides equal. This shape also has opposite equal angles.	
Rhombus	Parallelogram with 4 equal sides, opposite sides parallel and equal and opposite angels equal.	 
Trapezoid	Two sides are parallel. Two obtuse angles and two acute angles When a trapezoid's sides that aren't parallel are equal, it is called an isosceles trapezoid	 
Kite	Two pairs of adjacent sides of the same length	

If a parallelogram is a quadrilateral with two pairs of parallel sides and opposite sides are equal length ...

- is a rectangle a parallelogram? Yes
- is a square a parallelogram? Yes
- is a kite a parallelogram? No
- is a rhombus a parallelogram? yes
- is a trapezoid a parallelogram? No

Triangles

Interior Angles = 180^O - Triangles have different angles; however, interior angles always add up to 180^O.

You can classify triangles by their inside angles AND by the length of their sides

Angles

Right – the triangle has one angle that measures 90^O
Acute – the triangle has exactly three angles that measure between 0^O and 90^O
Obtuse – the triangle has exactly one angle that measures greater than 90^O and less than 180^O

Sides

Equilateral – A triangle with all sides congruent (or equal)
Isosceles –A triangle with exactly two congruent (or equal) sides
Scalene – A triangle with no congruent sides

Sometime a triangle can have two different names:

- **A right triangle is a triangle that has a right (= 90°) angle in it.**
  - **Scalene Right Triangle** – One right angle with two other unequal angles and NO equal sides
  - **Isosceles Right Triangle -** One right angle with two other equal angles and these angles are always 45^0
- **Acute Angled Triangles**
  - **Acute Scalene Triangle** – all angles are less than 90 degrees and NO equal sides or angles
  - **Acute Isosceles Triangle** – all angles are less than 90 degrees with two equal sides and angles opposite the equal sides are also equal
  - **Equilateral Acute Triangle** – all 3 angles equal exactly 60 degrees. Since 60 is less than 90, an equilateral triangle is technically an acute triangle as well
- **Obtuse Angled Triangles**
  - **Obtuse Scalene Triangle** – one obtuse angle with two other unequal angles and NO equal sides
  - **Obtuse Isosceles Triangle** – one obtuse angle with two equal sides and the angles opposite the equal sides are also equal

Jan 16th

[5.M.NF.B.04b] I can find the area of a rectangle with fractional sides using a model or algorithm.

Big Ideas

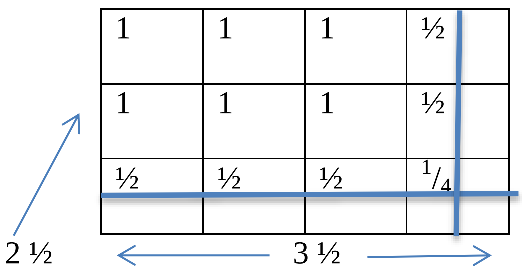
1. Mixed numbers must be converted into improper fractions before multiplying.
2. When multiplying fractions to find area, convert to improper fractions and multiply the numerators across, and the denominators across, then simplify.
3. Area is the space that a shape takes up or covers.
4. Area is found by multiplying length and width.
5. Area can also be found by creating an array, or model of the length and width.

Common Misconceptions

1. Students often forget to change improper fractions to lowest terms.

2. Students may label the units incorrectly, forgetting to square the answer.
3. Students may find perimeter by adding the sides.
4. When using the model method, students often miss-label the fractional portions of the rectangle or square.

Sample Problem: Johnny wants to tile his closet. How many square units of tile is required if the length is 3 ½ ft. and the width is 2 ½ ft?



3 ½ x 2 ½ = $\mathbf{{}^{7}/_{2} \times {}^{5}/_{2} = {}^{35}/_{4}}$ **= 8 ¾**

Jan 23rd

[5.M.OA.A.01] I can solve numerical expressions following the rules of order of operations.

Big Ideas

1. There is an order when solving numerical expressions: Parentheses (including brackets and braces), Exponents, Multiplication & Division (from left to right), Addition & Subtraction (from left to right). PEMDAS
2. When solving problems, brackets and braces are equivalent to parentheses.
3. Create and read numerical expressions.

Common Misconceptions

1. Students often have trouble grouping or clustering.
2. Students struggle with remembering to work from the left to the right (with addition & subtraction and multiplication & division).

PEMDAS

Please — **parentheses** – ***first*** solve anything inside The parentheses

Excuse — **exponents** – ***second*** solve all exponents

My **D**ear — **Multiplication & Division** – ***third*** solve All Multiplication or division in order from left to right

Aunt **S**ally — Addition & Subtraction – fourth solve all addition or subtraction in order from left to right.

(26 + 18) ÷ 4	answer: 11
{[2 x (3 + 5) – 9} + [5 x (23 – 18)]	answer 32
12 – (0.4 x 2)	answer: 11.2
(3 + 2) x (1.5 – 0.5)	answer: 5
{80 [2 x (3 ½ + 1 ½)]} + 100	answer 108
6 – (½ + $^{1}/_{3}$)	answer: 5

Sample Problem: Which comes third in the order of operations?

A. Parenthesis **B. Multiplication** C. Exponents D. Addition

Let's take a look at the symbols used with PEMDAS	
	Symbols
Parentheses includes brackets and braces	**( ) [ ] { }**
exponents	2^2
Multiplication	2(2), 2 · 2, or 2x2
Division	**÷ or /**
Addition	**+**
Subtraction	**-**

Sample Problem: 2 x (10-2) + 3^2 ***Write each step out.***

Parentheses 2 x 8 + 3^2

Exponents 2 x 8 + 9

Multiplication 16 + 9

Addition 25

Jan 30th

[5.M.G.A.02] I can graph points on a coordinate plane using real-world situations

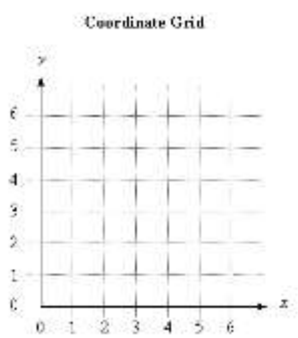
Big Ideas

- The horizontal axis is the x-axis. The vertical axis is the y-axis.
- If a graph is rising, the rate of change is increasing. If a graph is falling, the rate of change is decreasing.
- Walk along the x-axis to find the 1st number in the pair.
- Walk up the y-axis to find the 2nd number in the pair.

Common Misconceptions

- Students may not analyze the scale of the graph.
- Students may reverse the x and y-axis when graphing points.

Coordinate Grid

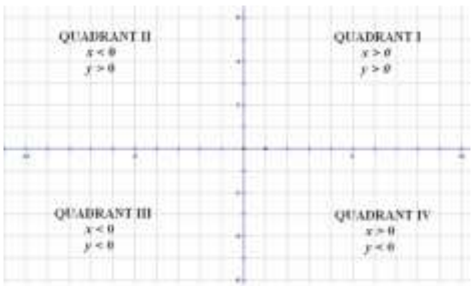


A coordinate grid has two perpendicular lines, or axes, labeled like number lines.

The horizontal axis is called the x-axis. The vertical axis is called the y-axis.

The point where the x-axis and y-axis intersect is called the origin.

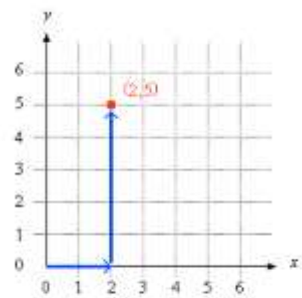
Quadrant



A Quadrant is each of four parts of a plane, sphere, space, or body divided by two lines or planes at right angles

Ordered Pairs - The numbers on a coordinate grid are used to locate points. Each point can be identified by an ordered pair of numbers; that is, a number on the x-axis called an x-coordinate, and a number on the y-axis called a y-coordinate. Ordered pairs are written in parentheses (x-coordinate, y-coordinate). The origin is located at (0,0). Note that there is no space after the comma.

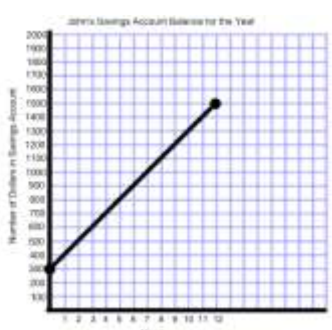
Graphing Coordinate Pairs



The location of (2,5) is shown on the coordinate grid below. The x-coordinate is 2. The y-coordinate is 5. To locate (2,5), move 2 units to the right on the x-axis and 5 units up on the y-axis.

To help students remember which coordinate is named first, tell them that, just as x comes before y in the alphabet, the x-coordinate comes before the y-coordinate in an ordered pair.

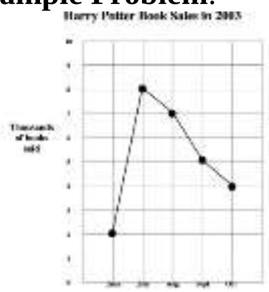
Rate of Change
The speed at which a variable changes over a specific period of time.
The rate of change is represented by the slope of a line. The slope of a line tells us how something changes over time. If we find the slope we can find the rate of change over that period.



This graph shows how John's savings account balance has changed over the course of a year. We can see that he opened his account with $300 and by the end of the first month he had saved $100. By the end of the 12 month time span, John had $1500 in his savings account.

John may want to analyze his finances a little more and figure out about how much he was saving per month. This is called the rate of change per month.

Sample Problem:



What will the rate of change be with the sale of Harry Potter books?

Feb 6th

[5.M.OA.B.03] I can identify and form new ordered pairs and graph them on a coordinate plane

Big Ideas

- Identify the rule within a sequence of numbers.
- Create and ordered pairs from the pattern.
- Use created ordered pair to graph on a coordinate plane.

Common Misconceptions

- Students may not recognize the rule within sequence of numbers, not seeing the pattern between numbers.
- Students may reverse x and y axis when graphing points

Review for Benchmark Test   Feb 13th

Benchmark #3   Feb 20th (2 Weeks)

March 6th

[5.M.MD.B.02] I can create and analyze information on a line plot using measurement data.

Big Ideas

- A line plot shows data on a number line with x or other marks to show frequency.
- Fractions can be used in data sets. The x on the number line shows the frequency that the fraction occurs.
- Multiple fraction operations can be used to solve line plot problems.

Common Misconceptions

- Students will misinterpret the frequency represented on the number line.
- In creating the line plot, students will struggle labeling the fractional increments on the number line.
- Students will struggle with applying knowledge of adding and multiplying fractions.
- Students will struggle with multi-step procedures in 2 part problems.

March 20th (2 Weeks)

[5.M.MD.A.01] I can solve word problems by using metric or customary conversions.

Big Ideas

- When given a measurement, students need to decide if the conversion is larger or smaller than the beginning measurement.
- If converting to a larger unit, division is required. 48 feet = 16 yards
- If converting to a smaller unit, multiplication is required. 5 meter = 500 centimeters

Common Misconceptions

- Students will have varying levels of understanding of measurement.
- Students will choose to multiply instead of divide or vice versa.

Important Note: ***<u>Students are required to explain their answers in words or with a model.</u>***

Sample Problem: How many quarts of lemonade are needed to make 40 one cup servings?
40 cups = _____ quarts
4 cups = 1 quart
40 ÷ 4 = 10 quarts

Sample Problem: Ryan is planting grass for his front lawn. Each patch of grass will need to be 5 meters. He buys 3,000 centimeters of grass. How many patches can he use?
5 meters = 500 centimeters
3,000 centimeters ÷ 500 centimeters = 60 patches of grass

Sample Problem: Convert 42 inches to feet
I know that there are 12 inches in a foot.
Since I am changing a smaller unit (in.) to a larger unit (ft.), I need to divide.

- 42/12 = 3 r. 6
- There is a remainder of 6. This means there are 6 inches left over. Therefore, I have 3 feet 6 inches.
- I can also write the remainder as a fraction or a decimal. The fraction of a foot is 6/12 or 1/2. I know the fraction 1/2 can also be written as .5. Therefore, I could also say there are 3 1/2 feet, or 3.5 feet.

Sample Problem: Convert 62 yd. into ft.
I know there are 3 feet in every yard.
Since I am changing a larger unit into a smaller unit, I will need to multiply.

- 62 x 3 = 186
- My answer is 186 feet.

When converting there are 3 steps to follow:
Step 1: Look at the units and decide if you are converting big units to small units or small units to big units.
Step 2: Decide whether you have to multiply or divide. **Remember big to small = multiply and small to big = divide
Step 3: Solve

Sample Problem: Sammi and Bo went on a road trip, ok, they went to the mall, it is a four mile drive to the mall. How many yards did they drive?

- Let think about what we know...
- Each mile equals 1760 yards, and since we are going from a big to a small unit so we must multiply. Our problem will look like this:
- 4 x 1760=7040 yards

Customary Measurement

Length	Conversions	Weight & Mass	Conversions
Inch (in)	12 in =1 ft	Ounces (oz)	16 oz= 1 lb
Feet (ft)	36 in = 1 yd	Pounds (lb)	2,000 lb= 1 Ton
Yard(yd)	3 ft = 1 yd	Ton	
Mile (mi)	5280 ft= 1 mi		
	1760 yd =1 mi		

Liquid Capacity	Conversions
Teaspoon (tsp)	3 tsp= 1 Tbl
Tablespoon (Tbl)	2 Tbl= 1 fl oz
Fluid Ounces (fl oz)	8 fl oz = 1 c
Cup (c)	2 c = 1 pt
Pint (pt)	2 pt =1 qt
Quart (qt)	4 qt = 1 gal
Gallon (gal)	

Metric Measurement - Weight & Mass: Grams (g) - Volume: Liters (l) - Length & Distance: Meters (m)

K	H	D	U	D	C	M
King	Henry	Dreamed	Under a	Dark	Misty	Cloud
King	Henry	Died	Unexpectedly	Drinking	Chocolate	Milk
Kilo	Hector	Deca	Unit	Deci	Centi	Milli
km	hm	dam	Meter	dm	cm	Mm
kg	hg	dag	Gram	dg	cg	Mg
kL	hL	daL	Liter	dL	cL	mL

Metric Conversions
1 cm= 10 mm
10 cm= 1 dm
100 cm= 1 m
1000 mm =1 m
1 km= 1000 m
10 dam= 1km
100m= 1 hm
100000 cm =1 km

The metric system is a decimal system of measurement. When we convert metric units, we multiply or divide by powers of 10.

Mass: the mass of an object is the amount of matter it has.

Examples of Metric Units
1 milligram (mg) = .001 g = .000001 kg = a bread crumb
1 gram (g) = 1,000 mg = .001 kg = a paper clip
1 kilogram (kg) = 1,000 g = 1,000,000 mg = loaf of bread
Sample Problem: Convert 1,500 grams to kilograms
I know there are 1,000 grams in a kilogram.
Since I am changing a smaller unit (in.) to a larger unit (ft.),
I need to divide.

- 1500/1000= 1 r. 500
- The remainder means there are 500 grams left over.

- The decimal part of a kilogram is .5
- I now know that 1,500 grams = 1 1/2 kg or 1.5 kg

Sample Problem: Convert 6 g to mg
I know there are 1,000 milligrams in a gram
Since I am changing a larger unit into a smaller unit,
I will need to multiply

- 6 x 1,000= 6,000
- My answer is 6,000 milligrams