Grade 7 Common Core Vocabulary

A Story of Ratios

Grade 7 - Module 2

Properties of Operations and Integer Vocabulary

Properties of Operations

- **Additive Inverse** - the opposite of a number on the number line
  - the number and its additive inverse have a sum of 0

  Example: the additive inverse (opposite) of -3 is 3.
- **Additive Identity** - zero is the additive identity.
  - zero can be added to other numbers without changing their value

  Examples: 12 + 0 = 12

  x + 0 = x

  6y + 0 = 6y
- **Associative Property** – in addition and multiplication, no matter how the numbers are grouped, the answer will always be the same

  EXAMPLE:

  (4 + 2) + 6 = 6 + 6 = 12

  4 + (2 + 6) = 4 + 8 = 12
- **Commutative Property**– in addition and multiplication, numbers may be added or multiplied together in any order

  Example:

  6 + 2 = 8 and 2 + 6 = 8

  3 x 2 = 6 and 2 x 3 = 6
- **Distributive Property** - multiplying a number is the same as multiplying its addends by the number, then adding the products

  Example: 3(5 + 6)

  $3 \cdot 5 + 3 \cdot 6$
- **Multiplicative Inverse** - numbers whose product is 1 are multiplicative inverses of one another.

  Example: $\frac{3}{4}$ and $\frac{4}{3}$ are multiplicative inverses of one another because $\frac{3}{4} \times \frac{4}{3} = \frac{4}{3} \times \frac{3}{4} = 1$.

  Multiplicative inverses do not always have to be the reciprocal.

  Example: $\frac{1}{5}$ and $\frac{10}{2}$ both have a product of 1, which makes them multiplicative inverses.

- **Multiplicative Identity Property** -– any number time 1 equals itself
  The *multiplicative identity* is 1.
  Example: $12 \cdot 1 = 12$
  $a \cdot 1 = a$
  $6x \cdot 1 = 6x$
- **Absolute Value** – the distance the number is from zero on the number line
  Example: $|-5| = 5$
- **Credit** – money returned to an account, the opposite of a debit
- **Debit** – money deducted from a related bank account or taken out of the account
- **Deposit** – the act of putting money into a bank account
- **Distance Formula** - the length between two points or objects
  If p and q are rational numbers on a number line, then the distance between p and q is $|p - q|$.

- **Integer** - positive numbers, negative numbers, or zero but not fractions or decimals
  - whole numbers and their opposites
  $\{\ldots, -3, -2, -1, 0, 1, 2, 3, \ldots\}$
- **Inverse** - opposite
- **Loss** – a decrease in amount, as when the money earned is less than the money spent
- **Opposites** – two numbers that are the same distance from zero on a number line
  - additive inverses
  Example: -4, +4
- **Positives** – numbers greater than zero
- **Profit** - a gain
  - the positive difference between the money earned and spent
- **Negatives** - any number less than zero written with a minus sign
- **Withdraw** – to take money out of a bank account

Vocabulary that means subtract	Vocabulary that means add
debit	credit
withdraw	deposit
positive	negative
loss	profit

Some examples are from:

http://www.amathsdictionaryforkids.com/qr/i/inequality.html

Grade 7 - Module 2

Rational Number Vocabulary

- **Rational Numbers** - numbers that can be written as the ratio of two integers with a non-zero Denominator
  - all integers, fractions, repeating decimals and terminating decimals

- **Repeating Decimal** - the decimal form of a rational number, for example, $\frac{1}{3} = 0.\overline{3}$

- **Terminating Decimal** - a decimal is called terminating if the decimal ends and does not repeat

- **Complex Fraction**– fraction with a fraction in the numerator, denominator, or both

  Example: $\frac{\frac{1}{2}}{3}$, $\frac{2}{\frac{1}{4}}$, $\frac{\frac{1}{2}}{\frac{3}{4}}$

- **Multiplicative Identity Property** – any number time 1 equals itself

  The *multiplicative identity* is 1.

  Example: $12 \cdot 1 = 12$

  $a \cdot 1 = a$

  $6x \cdot 1 = 6x$

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  Example: $\frac{3}{4}$ and $\frac{4}{3}$ are multiplicative inverses of one another because $\frac{3}{4} \times \frac{4}{3} = \frac{4}{3} \times \frac{3}{4} = 1.$

  Multiplicative inverses do not always have to be the reciprocal.

  Example: $\frac{1}{5}$ and $\frac{10}{2}$ both have a product of 1, which makes them multiplicative inverses.

Grade 7 - Module 1

Proportional Relationships Vocabulary

- **Ratio** – a comparison of two quantities which may be written as a to b, a:b or as a fraction $^{a}/_{b}$

  Example:

  four to six, 4 to 6, 4:6 or $\frac{4}{6}$

- **Rate** – a ratio with different units of measurement

  Example: births per year, cost per pound, words per minute, miles per hour

- **Unit Rate** - comparison of two measurements (rate) in which the second term is 1

  Common Unit Rates: dollars per hour, miles per hour, heartbeats per minute

  Example: If Nancy earns $180 in 20 hours, then the unit rate is

  $$^{\$180}/_{20\text{ hours}} = \$9 \text{ per hour}$$

- **Equivalent Ratios** - ratios with the same value

  Equivalent ratios are made by multiplying or dividing the numerator and the denominator by the same non-zero number.

  Equivalent Ratios

  Michelle: $\frac{48}{64} \div \frac{16}{16} = \frac{3}{4}$ | Erik: $\frac{72}{96} \div \frac{24}{24} = \frac{3}{4}$ | Equivalent: $\frac{3}{4} = \frac{3}{4} \rightarrow \frac{48}{64} = \frac{72}{96}$

  Examples:

- **Ratio Table –** a table that shows a comparison of two quantities

  Example:

  Ratio Table

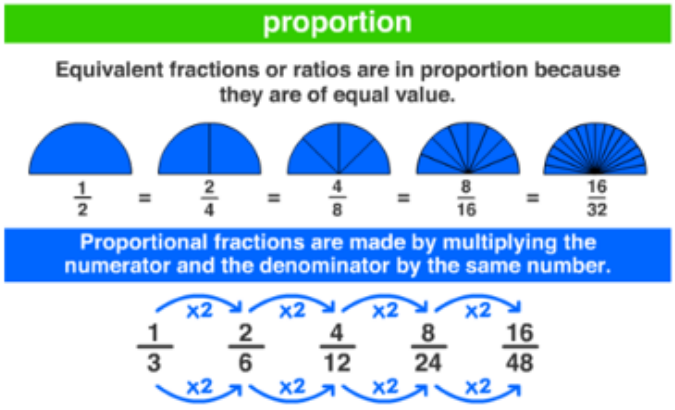
Sugar	*Flour*
2	3
4	6
6	9

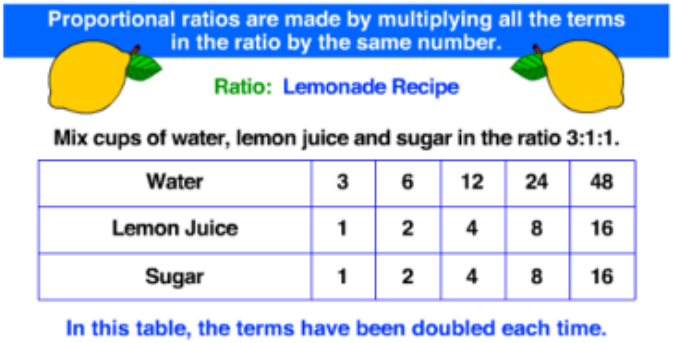
- **Proportional –** being in proportion means that two ratios or fractions are of equal value.

  Example: 1:3 = 2:6 so they are in proportion,

  ½ = $^{2}/_{4}$ so they are in proportion.

  (A visual is on the next page.)





- **Proportional Relationship** - When two quantities always have the same size in relation to each other. In other words they have the same ratio.

  Example: When 20m of rope weighs 1kg, then:
  - 40m of that rope weighs 2kg
  - 200m of that rope weighs 10kg

- **Constant of Proportionality -** the constant ratio between two quantities

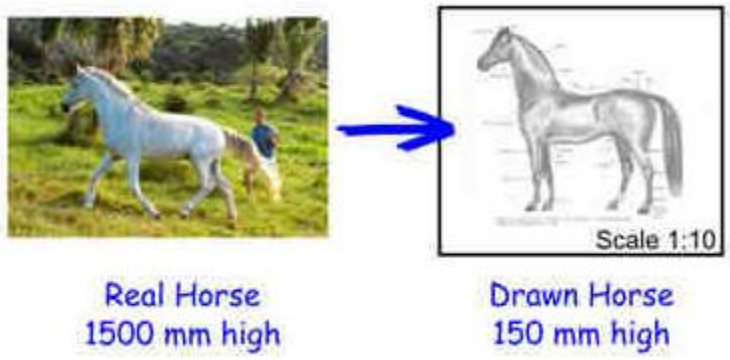
  If x is proportional to y, then $k = {}^{y}/_{x}$. k = the constant of proportionality.

  The constant of proportionality can never be zero.

Example: If the ratio of y to x is 2 to 3, then the constant of proportionality, k, is $\frac{2}{3}$ and $y = \frac{2}{3}x$

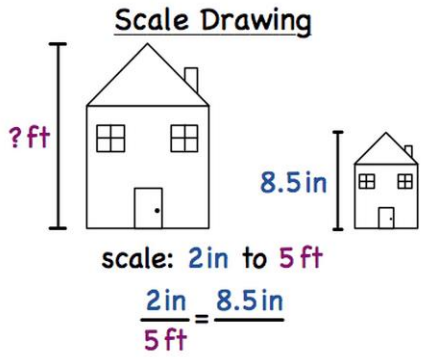
- **Scale Drawing -** A drawing that shows a real object with **accurate sizes reduced or enlarged** by a certain amount

  Example:

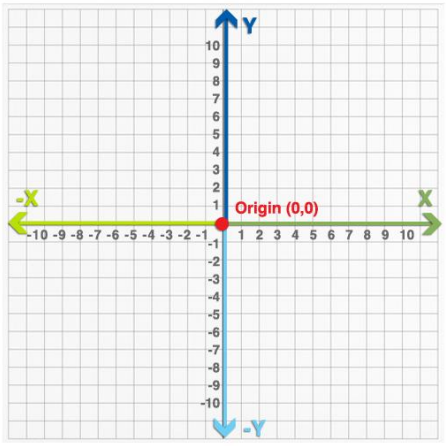


- **Scale Factor –**the ratio of measurement of the drawing compared to the measurement of the original figure

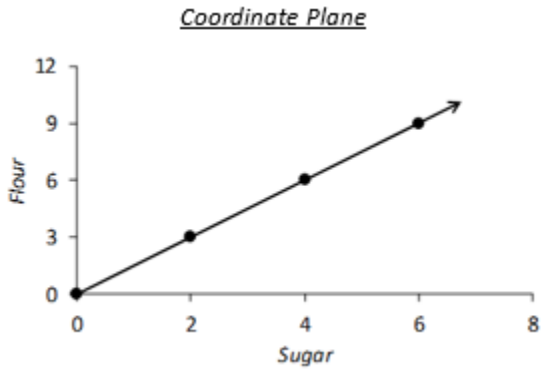
  Example:



- **Coordinate Plane** - a plane containing two perpendicular axes (x and y) intersecting at a point called the origin (0,0)



- Graphs with equations in the form of $y = kx$
  - Example:



Some examples are from:

http://www.amathsdictionaryforkids.com/qr/i/inequality.html

Grade 7 - Module 3

Expressions and Equations Vocabulary

- **Term** - one part of an algebraic expression which may be a number, variable, or product of both
  Example: 8, x, 2a

terms in algebraic expressions

Expression	Terms
$2a + b^2$	$2a$ and b^2
$4x^3 + 3xz - 5$	$4x^3$, $3xz$ and 5
$9x^3 + 5x^3 + x + 16$	$9x^3$, $5x^3$, x and 16

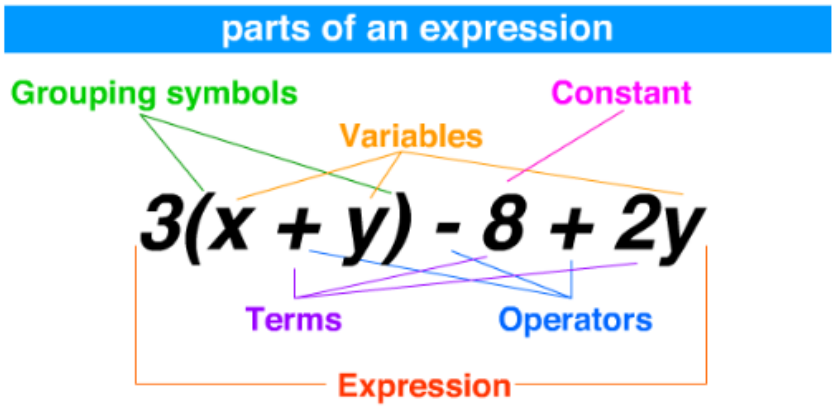
- **Variable** - a letter that represents a number
  Example: n in 10 + n

- **Coefficient** - a number which multiplies a variable
  Examples:

3 is the coefficient in $3x$

4 is the coefficient in $4y^2$

- **Expression** - one or a group of terms and may include variables, constants, and operations



= ≠ expressions DO NOT contain equality or inequality signs > <

- **Numerical Expression** - only numbers and operations

  Examples:

  6 $\quad 6+6$ $\quad 6+6-3$

- **Algebraic Expression** – contains at least one variable

  Examples:

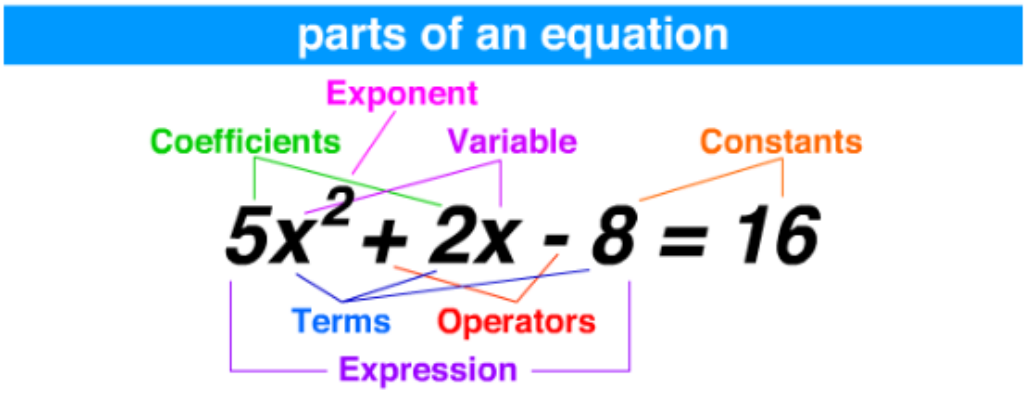
  $6x^2$ $\quad 6x+6$

- **Equivalent Expressions** - two algebraic expressions are said to be equivalent if their values are the same when substituting the values of the variables are same

  Example: $3(x + 3)$ and $3x + 9$ are equivalent expressions, for $x = 4$

$$
\begin{aligned}
3(x + 3) &= 3x + 9 \\
3(4 + 3) &= 3 \text{ x } + 9 \\
3(7) &= 3 \cdot 4 + 9 \\
21 &= 12 + 9 \\
21 &= 21
\end{aligned}
$$

- **Equation** - a mathematical statement containing an equals sign, to show that two expressions are equal



- **Factor** - a whole number that divides exactly into another number

  Example: Factors of 15 are 1, 3, 5, 15.

- **Greatest Common Factor** - the largest number that two or more other numbers are divisible by

  One way to determine GCF:

  1. List the factors for each number. 24: 1, 2, 3, 4, 6, 8, 12, 24; 36: 1, 2, 3, 4, 6, 9, 12, 18, 36.
  2. List the common factors. (the ones they both have) 1, 2, 3, 4, 6, 12
  3. Circle the greatest common factor. 1, 2, 3, 4, 6, (12)

     GCF = 12

- **An Expression in Expanded Form** - An expression that is written as sums (and/or differences) of products whose factors are numbers, variables, or variables raised to whole number powers

  A single number, variable, or a single product of numbers and/or variables is also considered to be in expanded form.

  Example: $2a + 3b + 2c + 6a - b + 4c$ is in expanded form

- **An Expression in Standard Form -** An expression that is in expanded form where all like terms have been collected

  Example: $8a + 2b + 6c$ is in standard form

- **An Expression in Factored Form** - An expression that is a product of two or more expressions

  Example: $2(6a + b + 3c)$ is in factored form

Some examples are from:

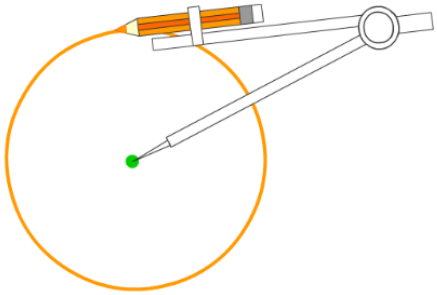
http://www.amathsdictionaryforkids.com/qr/i/inequality.html

Grade 7 - Module 3

Circle Vocabulary

- **Circle** - a shape formed by the set of all points which are the same distance from the center

EXAMPLE:



- **Diameter of a Circle** – a line segment that passes through the center of a circle whose endpoints lie on the circle.

  diameter is twice the radius or d = $2r$

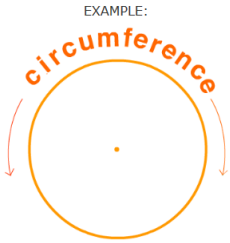
- **Radius** – a line segment connecting the center of a circle and a point on the circle

  - half the diameter or $r = {}^{d}/_{2}$

- **Circumference** – distance around a circle

  Circumference = diameter times pi or $C = \pi d$

EXAMPLE:



- **Area** – number of square units to cover a surface

  Area of circle = πr^2

- **Pi** - the irrational number *pi*, denoted π

  $\pi = \frac{\text{circumference}}{\text{diameter}}$

Some examples are from:

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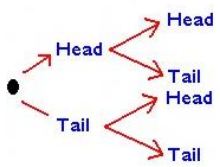
Grade 7 - Module 5

Probability Vocabulary

- **Probability** - a number between 0 and 1 that represents the likelihood that an outcome will occur.

- **Compound event** - an event consisting of more than one outcome from the sample space of a chance experiment.

- **Tree diagram** - a way of representing the outcomes of an experiment that consists of a sequence of steps, such as flipping a coin twice



- **Theoretical Probability** – a comparison of favorable outcomes to the number of possible equally likely outcome

  Example:

  From the letters A, E, I, O, U the theoretical probability of selecting the letter E is $^1/_5$.

- **Experimental Probability** - The number of times the outcome occurs compared to the total number of trials.

  Example: If a coin lands on heads three times out of five flips then the experimental probability is $^3/_5$.

- **Simulation** - the process of generating "artificial" data that are consistent with a given probability model

Some examples are from:

http://www.amathsdictionaryforkids.com/qr/i/inequality.html

Grade 7 - Module 5

Statistics Vocabulary

- **Random sample** - a group selected in a way that gives every different possible sample of the same size an equal chance of being selected

- **Inference** - using data from a sample to draw conclusions about a population.
- **Measures of center** – mean, median, mode

Mean - the total of all the scores or amounts, divided by how many scores there were

- also called the average

Example: $\frac{\text{sum of the numbers}}{\text{how many number were added}}$

Monday	35°
Tuesday	30°
Wednesday	32°
Thursday	29°
Friday	27°
Saturday	37°
Sunday	34°
Total:	224°
Divide	224° ÷ 7
Mean:	= 32°

Median - the middle value of an ordered set of data values

Example:

How to determine the median in a set of values.

Order the values from least to greatest.
Locate the middle value.

3, 4, 5, 5, 5, 6, 6, 7, 8, 8, 9

If the number of values is even, the median is the average of the two middle values.

Mode - the value that occurs the most in a set of data values

Example:

How to determine the mode in a set of scores.

Order the scores from least to greatest.
Locate the score that occurs the most.

3, 4, 5, 5, 5, 6, 6, 7, 8, 8, 9

mode = 5

3, 4, 5, 5, 5, 6, 6, 6, 8, 8, 9

modes = 5 and 6

two modes are called bimodal

- **Measures of variability** –refers to how spread out a group of data is
  - measures how much your scores differ from each other
  - the most frequently used measures are the standard deviation and range

Range - is the difference between the largest and smallest values

Example: take this set of numbers: 13, 18, 13, 14, 13, 16, 14, 21, 13

The largest value in the list is 21, and the smallest is 13,

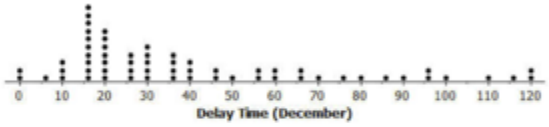
so the range is 21 – 13 = 8.

- **Mean absolute deviation (MAD)** - the mean of the distances of each value from the mean of the set of data values

Three steps to calculate:

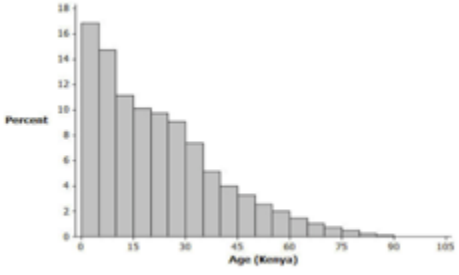
1. Find the **mean** of all values.
2. Find the **distance** of each value from that mean (subtract the mean from each value, ignore negative signs).
3. Then find the **mean of those distances**.

- **Dot plots** (see example below)



Dot Plot

- **Histograms** (see example below)



Histogram

Some examples are from:

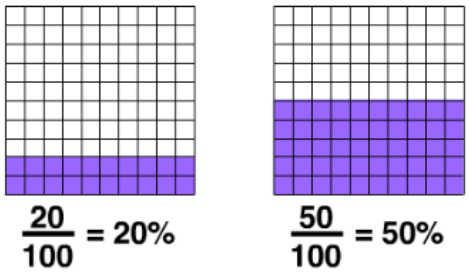
http://www.amathsdictionaryforkids.com/qr/i/inequality.html

Grade 7 - Module 4

Percent Vocabulary

- **Percent** - is a fraction expressed as a number out of 100 followed by the % symbol

  Examples: $^{20}/_{100}$ = 20%, $^{50}/_{100}$ = 50%, ½ = 50%



- **Discount** - a reduction in the normal price

- **Discount Price** – the lower price once the discount is subtracted

- **Original Price** – beginning price

- **Commission** - a fee paid for services, usually a percentage of the total cost

  Example: Jack's Gallery sold Amanda's painting for $500,
  so Amanda paid them a 10% commission which was $50.

- **Gratuity (tip)** – a fancy word for a tip

  - a gift of money for service, as to a waiter or hairdresser

  Example: A tip or gratuity is the amount of money a customer at a restaurant pays to the server in addition to the cost of the meal.

- **Tax** – money that the government collects based on income, sales, etc.

  Example: Alex earned $300 but had to pay $42 of that to the government as tax.

  .

- **Markup** - the amount added by a seller to the original cost to create a new higher selling price

  Example: If the original cost is $4.00 and the markup is 25%,
  then the sales price should be $4.00 + $4.00 · $^{25}/_{100}$ = $5.00.

  A faster way - to calculate the sale price is to make the original cost equal to 100%.
  The markup is 25% so the sales price is 125% of the original cost.
  In the example, $4.00 · $^{125}/_{100}$ = $5.00.

- **Absolute Error** – given the exact value x of a quantity and an approximate value a of it, the absolute error is $|a - x|$

- **Percent Error -** the percent the absolute error is of the exact value

  Example:
  $\left(\frac{|a-x|}{|x|}\right)(100\%)$, where x is the exact value, and a is an approximate value

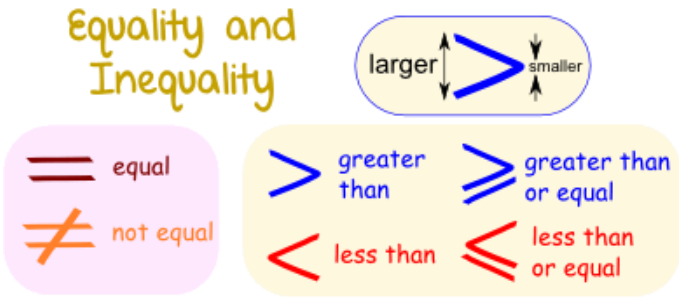
Some examples are from:

http://www.amathsdictionaryforkids.com/qr/i/inequality.html

Grade 7 - Module 3

Inequality Vocabulary

- **Inequality** – two values that are not equal
  - opposite to equality



Some examples are from:

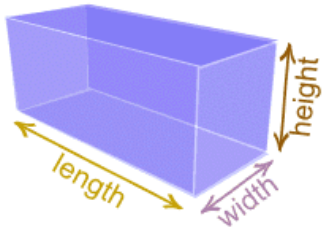
http://www.amathsdictionaryforkids.com/qr/i/inequality.html **© Jenny Eather 2014. All rights reserved.**

Grade 7 - Module 6

Surface Area/Volume Vocabulary

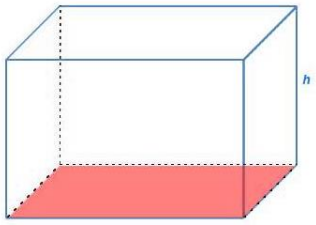
- **Right rectangular prism** - a prism with two identical, rectangular bases

  Example:



- **Surface of a Prism** – side of the prism

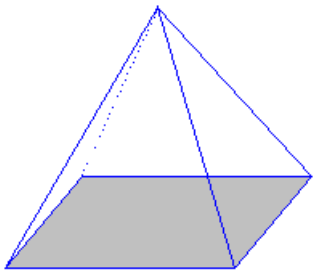
  Example: one surface of the prism is red as shown below



- **Right rectangular pyramid**

  - a three- dimensional figure with four faces that are triangles and a base that is a rectangle

  Example:



Some examples are from:

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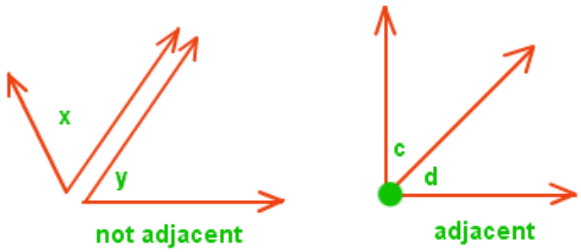
Grade 7 - Module 6

Angle Pairs Vocabulary

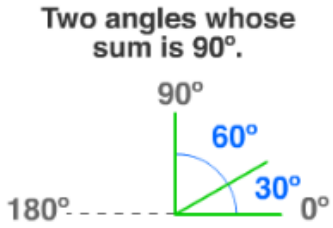
- **Adjacent angles** – two angles with a shared vertex and side (ray)

  Example:



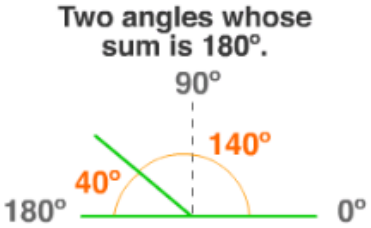
- **Complementary angles** - two angles whose sum is 90º

  Example: 30º and 60º



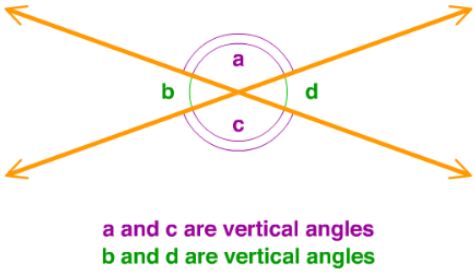
- **Supplementary angles** – two angles whose sum is 180º

  Example: 40º and 140º



- **Vertical Angles** - pair of angles directly opposite each other, formed by the intersection of straight lines and may also be called opposite angles

  Example:



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Grade 7 - Module 6

Triangle Vocabulary

- **Identical (Congruent) Triangles** - if there are corresponding angles of equal measure and corresponding sides of equal length

- **Three sides condition** - side, side, side method
  - all three pairs of corresponding sides of a triangle are equal length

- **Two angles and the included side condition** – angle, side, angle method
  - two pairs of corresponding angles and the included side of one triangle have equal measures

- **Two sides and the included angle condition –** side, angle, side method
  - two pairs of corresponding sides and the included angle of the triangle are equal measure