Level 6 (Course 1) – Summer Math Packet

Incoming 7th Grade

Kids' Information Page

We're so proud of you for taking the time to work on math over the summer!

Here are some helpful hints for success:

- ☺ **It's ok to have parents and other adults help you!**
- ☺ **Find a quiet work space where you can get organized and stay focused.**
- ☺ **Pay close attention to the examples and vocabulary.**
- ☺ **Choose a unit that you like, and work through it completely before moving on to another unit.**
  - **Try to complete at least 2 pages per week. ~~1 worksheet per day~~.**
  - **Complete all of the problems on each worksheet.**
- ☺ **Calculators may ONLY be used when you see this symbol:** 
- ☺ **Remember to do a little work each week. DO NOT wait until the week before school starts to complete your packet!**
- ☺ **The packet should be returned to your math teacher during the first week of school.**

Have fun & we'll see you in [redacted] September!

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Write an algebraic expression to represent unknown quantities.

- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.

Examples:

The sum of 5 and some number is written as: **5 + n** because the operation that is associated with the word **sum** is addition.

The difference of a number and three tenths is written as: **n - .3** because the operation that is associated with the word **difference** is subtraction.

1.) a number plus $\frac{1}{2}$	**2.)** a number minus .7
3.) the difference of twenty-one hundredths and a number	**4.)** the sum of a number and forty-six

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Evaluate an algebraic expression.

- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.
- **Multiplication** in algebra can be shown as $4n$ or $4 \times n$
- The variables in an algebraic expression can be replaced with any number.
- Once the variables have been replaced, you can **evaluate**, or find the value of, the algebraic expression.

Examples:

Evaluate $44 + n$ if $n = 9$

$44 + n$	original expression
$44 + 9$	replace the variable with it's value
53	solution

1.)

Evaluate $150 + n$ if $n = 15$

2.)

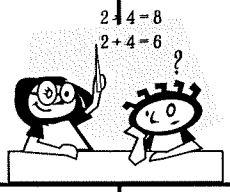
Evaluate $12n$ if $n = 9$

3.)

Evaluate $15n + 19$ if $n = \frac{1}{3}$

4.)

Evaluate $30n$ if $n = 2.5$



5.)

Evaluate $24n \div k$ if $n = 6$ and $k = 8$

6.)

Evaluate $nk - 2b + 8$ if $b = 1.5$, $k = 8$, and $n = 7$

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Evaluate numeric expressions using order of operations.

- A **numerical expression** is a combination of numbers and operations.
- The **Order of Operations** tells you which operation to perform first so that everyone gets the same final answer.
- The **Order of Operations** is: **Parentheses, Exponents, Multiplication or Division (left to right), and Addition or Subtraction (left to right.)**

Examples:

$48 \div (3 + 3) - 2^2$	original expression
$48 \div 6 - 2^2$	simplify the expression inside the parentheses
$48 \div 6 - 4$	calculate 2^2
$8 - 4$	divide 48 by 6
4	subtract 4 from 8

1.)

$(8 + 1) \bullet 12 - 13$

2.)

$13 \bullet 4 - 72 \div 8$

3.)

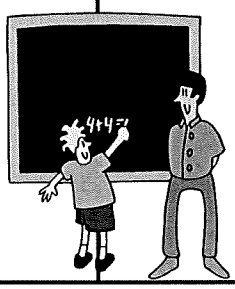
$88 - 16 \bullet 5 + 2 - 3$

4.)

$100 \div 5^2 \bullet 4^3$

5.)

$45 \div 9 - 3 + 2 \bullet 3$



6.)

$(5^2 + 3^3) \bullet (81 + 9) \div 10$

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Determine the unknown in a linear equation (addition & subtraction).

- **Addition equations**: Subtract the same number from each side of the equation so that the two sides remain equal.
- **Subtraction equations**: Add the same number to each side of the equation so that the two sides remain equal.

Examples:

b + 3 = 6	original equation
- 3 - 3	subtract 3 from each side
b + 0 = 3	solution
b = 3	simplify

b – 8 = 4	original equation
+8 +8	add 4 to each side
b + 0 = 12	solution
b = 12	simplify

1.)

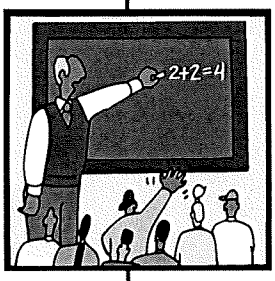
g + 5 = 12

2.)

s – 12 = 29

3.)

m + 3.5 = 10.5



4.)

k – 5.5 = 8.5

5.)

w + 6.25 = 22

6.)

g – 3.75 = 49.75

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Determine the unknown in a linear equation (multiplication & division).

- In a **multiplication equation**, the number by which a variable is multiplied is called the **coefficient**. In the multiplication equation 2x = 8, the coefficient is 2.
- **Multiplication equations**: Divide both sides by the coefficient so that the two sides remain equal.
- In a **division equation**, the number by which the variable is divided is called the **divisor**. In the division equation $\frac{x}{4}$, 4 is the divisor.
- **Division equations**: Multiply both sides of the equation by the divisor so that the two sides remain equal.

Examples:

$4b = 16$		original equation	$\frac{m}{6} = 11$		original equation
$\frac{}{4}$	$\frac{}{4}$	divide both sides by 4	$6 \bullet \frac{m}{6} = 11 \bullet 6$		multiply each side by 6
$1b = 4$		solution	$1m = 66$		solution
$b = 4$		simplify	$m = 66$		simplify

1.)

$7x = 63$

2.)

$\frac{k}{9} = 8$

3.)

$5b = 3.55$

4.)

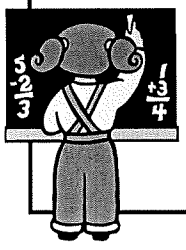
$\frac{n}{7} = 5.55$

5.)

$12m = 84.72$

6.)

$\frac{p}{13} = 2.67$



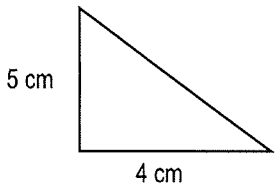
Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the area of a triangle with whole number dimensions.

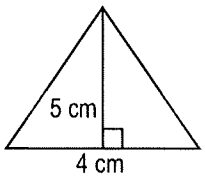
The area (**A**) of a triangle is one half the product of the base (**b**) and the height (**h**).
The formula for finding the area of a triangle is: **A = ½ bh** and is measured in square units.

Examples:



A = ½ bh A = ½ • 4 x 5 A = ½ • 20

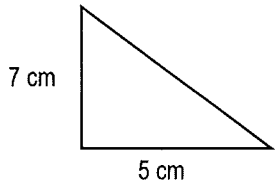
A = 10 cm²



A = ½ bh A = ½ • 4 • 5 A = ½ • 20

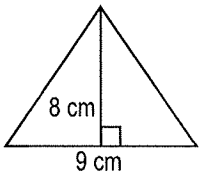
A = 10 cm²

1.) Determine the area of the triangle.



A = _____ cm²

2.) Determine the area of the triangle.



A = _____

3.) Determine the area of an obtuse triangle with a height of 11 cm and a base of 22 cm.

A = _____

4.) Determine the area of an isosceles triangle with a base of 13 cm and a height of 26 cm.

A = _____

5.) World famous pastry chef, Chen Lee, is designing a birthday cake for his son, who is a Geometry teacher. He has 4 layers, all triangles. He wants to put the largest layer (in area) on the bottom and the smallest layer on the top. Determine the area of each layer and order them from largest to smallest (4 = largest, 1 = smallest)

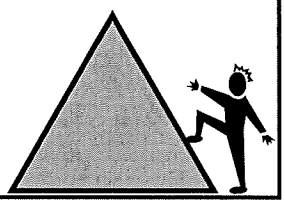
___ Milk Chocolate layer b = 12" h = 6" A =

___ Yellow cake layer b = 7" h = 11" A =

___ Dark Chocolate layer b = 4" h = 17" A =

___ White cake layer b = 9" h = 9" A =

6.) Natasha's dorm room is shaped like a triangle. The college brochure says it has an area of 875 square feet. The room is 35 feet long. Determine the width of the room at its widest point.



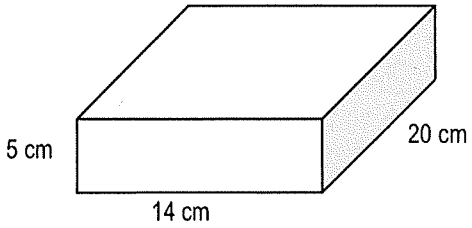
Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the volume of rectangular prisms with whole number dimensions.

The amount of space inside a three-dimensional figure is the **volume** of the figure.
Volume (**V**) is measured in **cubic units**.
The volume of a **rectangular prism** is related to its dimensions. **Volume (V) = length (l) x width (w) x height (h)**

Examples:

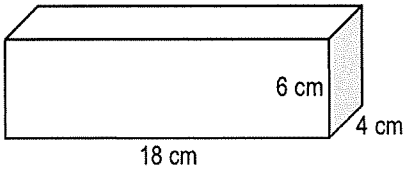


$V = l \bullet w \bullet h$

$V = 20 \bullet 14 \bullet 5$

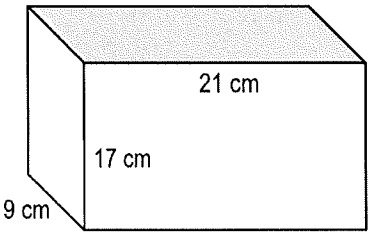
$V = 1400\ cm^3$

1.) Determine the volume of the rectangular prism. Please show your work.



V = _____

2.) Determine the volume of the rectangular prism. Please show your work.



V = _____

3.) Determine the volume of a rectangular prism with a length of 13 cm, a width of 55 cm, and a height of 65 cm. Please show your work.

4.) Determine the volume of a rectangular prism with a height of 35 cm, a length of 89 cm, and a width of 15 cm. Please show you work.

5.) Tyrone has a fish tank that measures 36 in. long, 24 in. high, and 18 in. wide. He wants to fill the fish to a height of 14 inches. What will be the volume of water in the tank? Please show your work.

V = _____

Draw the tank and label the dimensions. Draw the water level. This does not need to be drawn to scale.

6.) Shanika has a lamp that she wants to send to her sister in Baltimore. The lamp is in the shape of a rectangular prism. It measures 14" high, 9" wide, and 3" long. She wants to buy a box so that there is 1" all around the lamp for bubble wrap.

What should be the dimensions of the box?

What is the volume of the box? Please show your work.

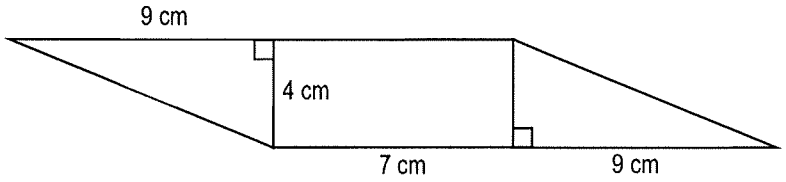
Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the area of composite figures using no more than four polygons (triangles or rectangles) with whole number dimensions.

A **composite figure** is made by **combining two different figures**.
The **area** of a composite figure is found by **adding the areas of the individual figures**.

Examples:



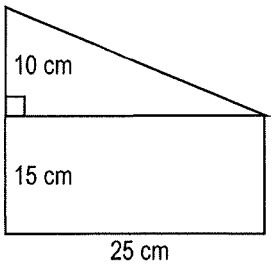
$A = \frac{1}{2}bh$
$A = \frac{1}{2} \bullet 4 \text{ v } 9$
$A = 18 \text{ cm}^2$

$A = lw$
$A = 7 \bullet 4$
$A = 28 \text{ cm}^2$

$A = \frac{1}{2}bh$
$A = \frac{1}{2} \bullet 4 \bullet 9$
$A = 18 \text{ cm}^2$

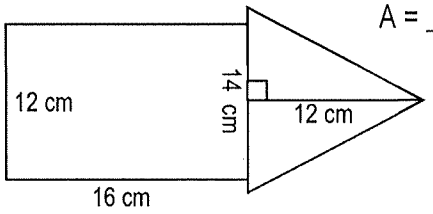
Area of composite figure = 18 + 28 + 18 = 64 cm^2

1.) Determine the area of the composite figure. Please show your work.



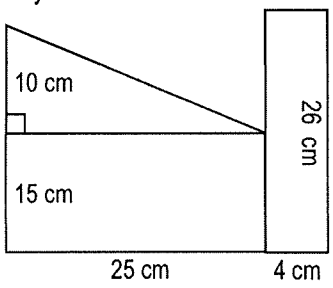
A = _____

2.) Determine the area of the composite figure. Please show your work.



A = _____

3.) Determine the area of the composite figure. Please show your work.



A = _____

4.) Determine the area of the composite figure that is made up of 1 square and 3 congruent right triangles. Each triangle shares its base with one side of the square. One side of the square measures 6cm. The height of each triangle is 4 times its base. Please show your work.

5.) Dallas is working on the decorations for the 8th grade dance. He is making a large composite wall decoration that is made of 2 congruent rectangles and 2 congruent triangles. The rectangles measure 5 ft by 7 ft. The triangles have a base of measurement of 7 ft and a height measurement of 9 ft. What is the composite area of the wall decoration?

What is the composite area of 4 of them?

6.) The 8th grade dance committee liked Dallas' decorations so much that they decided to paint a huge one on the floor. They tripled the dimensions of the rectangles and the triangles?

What is the area of the floor decoration?

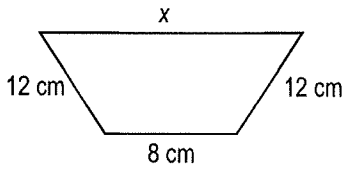
Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Determine the missing side of a quadrilateral given the perimeter using whole number dimensions.

A **quadrilateral** is any four-sided, closed, 2-dimensional figure.
The **perimeter (P)** of any quadrilateral is the sum of the lengths of its four sides.
The **missing side** of a quadrilateral can be found using addition and subtraction.

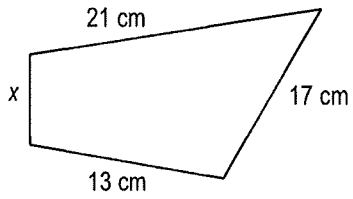
Examples:



P = 52 cm

$P = s + s + s + s$
$52 = 12 + 8 + 12 + x$
$52 = 32 + x$
$-32 \quad -32$
$20 = x$ The length of the missing side is 20 cm.

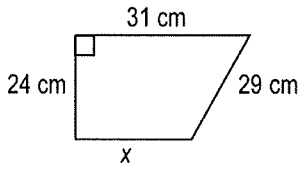
1.) Determine the missing side of the quadrilateral. Please show your work.



P = 60 cm

x = _____

2.) Determine the missing side of the quadrilateral. Please show your work.



P = 99 cm

x = _____

3.) Determine the missing side of the quadrilateral. Please show your work.

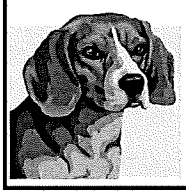
P = 124 cm

x = _____

4.) Determine the missing side of a quadrilateral that has a perimeter of 251 cm and three sides measuring 39 cm, 72 cm, and 89 cm. Please show your work.

5.) Heather wants to build a pen for her new beagle puppy. She is going to build it in the shape of a quadrilateral. She decides that she wants the perimeter to be 360 ft. She already has 360 feet of fence. She measures out the first side to be 90 ft, the second side to be 110 feet, and the third side to be 100 feet. She tells her friend to measure out the fourth side to be 80 feet.

Is this correct? Why or why not? Please show your work.



6.) Michael is designing a corn maze for his grandfather's farm. The general shape of the corn maze is a quadrilateral. The perimeter of the corn maze is 1,221 feet. The top measures 381 feet. The bottom measures 227 feet. One of the sides measures 294 feet.

Determine the length of the other side. _____

Is this missing side shorter or longer than the other side? Please show your work to prove your answer.

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Determine the missing measure of a square or rectangle given the area using whole number dimensions.

The **area (A)** of a **rectangle or square** can be found by **multiplying the length (l) by the width (w).** **A = l x w**
The **missing measure** of a square or rectangle can be determined by using **division**.

Examples:

$A = 64\ cm^2$

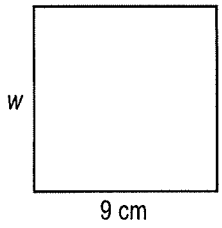
$A = l \bullet w$

$\frac{64}{16} = \frac{16}{16} \times w$

$4 = w$

The width of the rectangle is 4 cm.

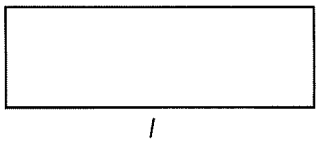
1.) Determine the missing side of the square. Please show your work.



$A = 81\ cm^2$

$w =$

2.) Determine the missing side of the rectangle. Please show your work.



$A = 65\ cm^2$

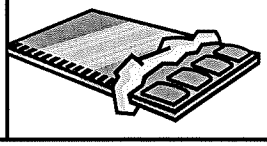
$l =$

3.) Determine the missing side of a rectangle with an area of 144 cm^2 and a width of 8 cm. Please show your work.

4.) Determine the missing side of a rectangle with an area of 480 cm^2 and a length of 32 cm. Please show your work.

5.) Marcus plans to paint a bright green rectangle on the bottom of his pool. He has enough paint to cover an area of 273 square feet. He wants the width of the rectangle to be 13 feet. Determine what the length of the rectangle should be. Please show your work.

6.) Brianna wants to put stickers, to celebrate her birthday, on top of chocolate bar wrappers. The bar is 48 mm wide and has an area of 4128 mm^2. What must be the length of the sticker to cover the top of the bar?



Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of STATISTICS

Objective: Organize and display data to make frequency tables with no more than 5 categories or ranges of numbers and total frequencies of no more than 25.

Statistics involves collecting, organizing, analyzing, and presenting data.
Data are pieces of information that are often numerical.
Data can be **organized** in a **frequency table**, which shows the number of pieces of data that fall within given intervals.

Examples: The grades scored on a geometry quiz are shown in the table. Make a frequency table of the data.

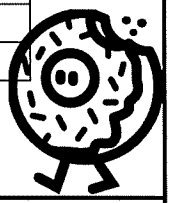
Geometry Quiz Scores				
99	83	92	52	75
90	99	65	80	85
53	80	75	85	85
70	75	90	95	75

Geometry Quiz Scores		
Scores	Tally	Frequency
51 – 60	II	2
61 – 70	II	2
71 – 80	𝍸 I	6
81 – 90	𝍸 I	6
91 - 100	IIII	4

1.) The owners of Donut Delight want to move their store to a new location. They asked their customers in which general direction they lived from the store. The data is shown in the table. Make a frequency table of the data.

Customer Locations					
N	S	E	S	N	W
E	N	W	S	N	N
W	E	S	E	N	E
S	N	N	W	S	E

Customer Locations		
Direction	Tally	Frequency
North		
East		
South		
West		



2.) Ms. Wolf asked her students to name their favorite food. The data is shown in the table. Make a frequency table of the data.

Favorite foods					
C	T	H	P	P	C
D	C	H	T	P	P
P	H	D	T	P	T
H	P	T	T	C	P

P = pizza T = taco H = hamburger
D =hot dog C = chicken

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of STATISTICS

Objective: Interpret frequency tables with no more than 5 categories or ranges of numbers and frequencies of no more than 25.

The **data** in a frequency table can be **analyzed and interpreted by comparing** the frequencies in each category.

Examples: Maria is counting three types of insects she finds under rocks in the park for an ecology survey. Her data is shown in the frequency table.

Insects Under a Rock		
Insects	Tally	Frequency
Beetle	𝍸 𝍸 𝍸 ||	17
Earwig	𝍸 𝍸 𝍸 𝍸 |	21
Spider	𝍸 |||	8

How many more Earwigs did Maria find than Beetles? **21 – 17 = 4 more Earwigs**

How many less spiders did Maria find than Beetles? **17 – 8 = 9 less Spiders**

In her report Maria is going to list the insects in order of most common to least common. What order should she write in her report? **Earwig (21), Beetle (17), Spider (8)**

1.) The frequency table shows the number of hours the band members in Mrs. Robinson's class practiced last week.

Practice Hours		
Hours	Tally	Frequency
0	||	2
1	𝍸 𝍸 𝍸 ||||	19
2	𝍸 𝍸 |	11
3	𝍸 ||	7
4	|||	3

a) How many students practiced more than 2 hours?

b) How many students practiced either 1 or 2 hours?

c) List the hours practiced from least common to most common.

2.) The frequency table shows Mr. Helta's students' favorite flavor if ice cream.

a) How many more students liked Chocolate than Chocolate Chip?

b) How many less students liked Strawberry than Chocolate and Vanilla?

c) The same amount of students liked Chocolate and Strawberry as did those who liked _____ and _____.

Favorite Flavors of Ice Cream		
Flavor	Tally	Frequency
Vanilla	𝍸 |	6
Chocolate	𝍸 ||||	9
Strawberry	|	1
Cookies 'n Cream	𝍸 𝍸 |	11
Chocolate Chip	||||	4

Level 6 (Course 1) – Summer Math Packet

Unit: KNOWLEDGE of STATISTICS
Objective: Determine the measures of central tendency (mean, median, and mode) and the range.

A number that helps **describe all of the data** in a data set is a **measure of central tendency**.
The **mean** is the sum of the data divided by the number of pieces of data.
The **median** is the middle number of the ordered data (least to greatest.)
The **mode** is the number or numbers that occur most often.
The **range** is the difference between the greatest and least values of the data set.

Examples:

Jacket Prices ($)			
25	34	39	41
45	52	27	22
56	61	15	27

Find the mean, median, mode, and range of the data.

$$\text{Mean} = \frac{25 + 34 + 39 + 41 + 45 + 52 + 27 + 22 + 56 + 61 + 15 + 27}{12}$$

$$= \frac{444}{12} = \mathbf{37}$$ The mean price of a jacket is $37.

Median = 15 22 25 27 27 34 39 41 45 52 56 61 (data ordered)

$$= \frac{34 + 39}{2} = \mathbf{36.5}$$ The median price of a jacket is $36.50.

Mode = **$27** because it is the only piece of data that occurs more than once.

Range = 61 – 15 = **$46**

1.) Find the mean, median, mode, and range for each set of data.

6, 9, 2, 4, 3, 6, 5

2.) Find the mean, median, mode, and range for each set of data.

13, 7, 17, 19, 7, 15, 11, 7, 21

3.) Find the mean, median, mode, and range for each set of data.

28, 32, 23, 43, 32, 27, 21, 34

4.) Find the mean, median, mode, and range for each set of data.

157, 124, 157, 124, 157, 139

Unit: KNOWLEDGE OF STATISTICS
Objective: Create box-and-whisker plot from a given set of data

- A **box-and-whisker plot** shows variability of a data set by using quartiles
- This graphical display shows how data are clustered around the median and spread out along a number line.
- In a set of data, **quartiles** are values that divide the data into four equal parts.
- Has five values known as the **5-point summary**:
    - Lower extreme value, lower quartile (LQ), median, upper quartile (UQ), upper extreme value
- Each box-and-whisker section represents **25% of the data**.
- The **interquartile range (IQR)** is the range of the middle half of the data and contains 50% of the data in the set.
    - Interquartile range = UQ- LQ
- An **outlier** is any element of a set that is at least 1.5 interquartile ranges less than the lower quartile or greater than the upper quartile.

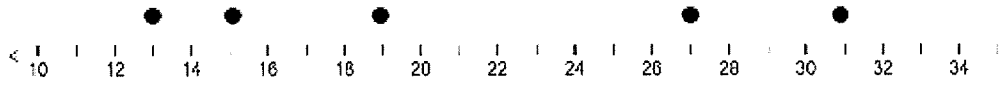
Constructing a box-and-whisker plot:
Examples: Odd number of data points
15, 24, 19, 13, 27, 16, 31

Step 1: Arrange the data in order from least to greatest. 13, 15, 16, 19, 24, 27, 31

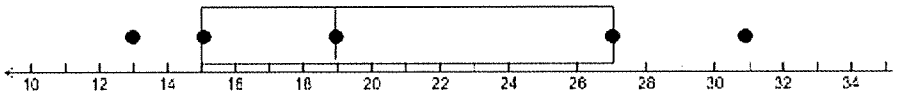
Step 2: Find the median of the data set.
median/Q_2= 19
Find the median of the numbers on the left for the lower
lower quartile/Q_1= 15
Find the median of the numbers on the right for the upper quartile/Q_3.
upper quartile/Q_3= 27

13, 15, 16, 19, 24, 27, 31

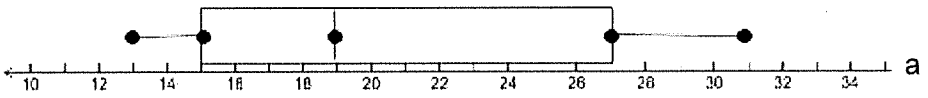
Step 3: Draw a number line with a scale that extends from the least to the greatest values.
Place a dot for each value from the 5-point summary.



Step 4: Draw a box above the number line with ends of the box at Q_1 and Q_3. Also, draw a vertical line through the box at Q_2.



Step 5: Draw a whisker from the Q_1 end of the box to the least value. Draw whisker from the Q_3 end to the greatest value.



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Constructing a box-and-whisker plot cont'd:

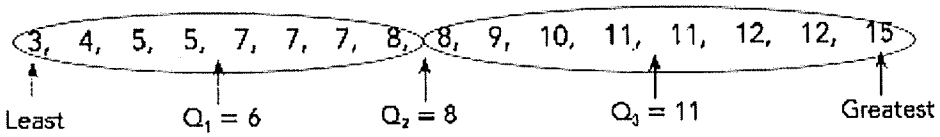
Examples: Even number of data points

16 students took a quiz and their scores were 3, 8, 7, 11, 11, 5, 12, 12, 8, 7, 7, 9, 5, 10, 15 and 4. Draw a box plot for the data and label it with the 5-point summary.

Step 1: Arrange the data in order from least to greatest.

3, 4, 5, 5, 7, 7, 7, 8, 8, 9, 10, 11, 11, 12, 12, 15

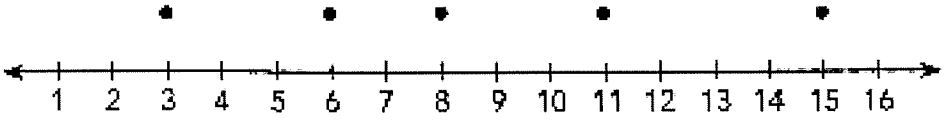
Step 2: Find the median of the data set. (***Median/Q_2 is 8 + 8 = 16/2 = 8. This number is NOT included in calculating the Q_1 and Q_3.).



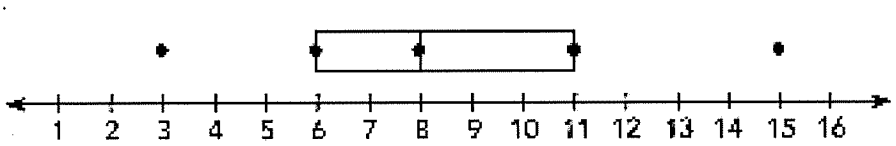
Find the median of the numbers on the left for lower quartile/Q_1.

Find the median of the numbers on the right for the upper quartile/Q_3.

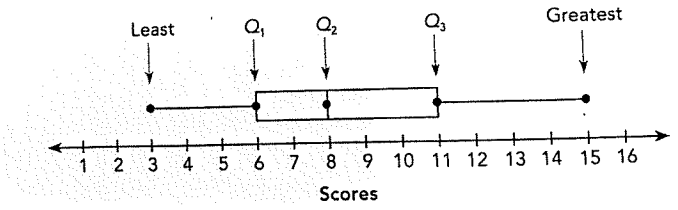
Step 3: Draw a number line with a scale that extends from the least to the greatest values. Place a dot for each value from the 5-point summary.



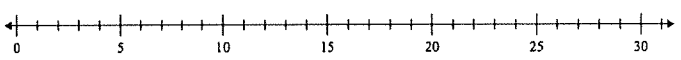
Step 4: Draw a box above the number line with ends of the box at Q_1 and Q_3. Also, draw a vertical line through the box at Q_2.



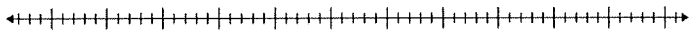
Step 5: Draw a whisker from the Q_1 end of the box to the least value. Draw a whisker from the Q_3 end to the greatest value.



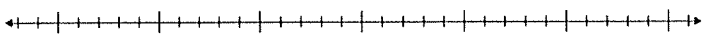
1.) 19, 13, 12, 19, 9, 5, 13, 18, 8



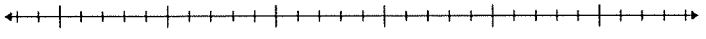
2.) 69 , 32 , 49 , 24 , 58 , 29 , 54 , 66 , 35 , 31



3.) 16 , 18 , 13 , 15 , 19 , 12 , 15 , 18 , 5



4.) 9 , 13 , 19 , 16 , 14 , 19



★Try this for a challenge★

Unit: KNOWLEDGE OF STATISTICS

Objective: Finding and interpreting Mean Absolute Deviation (MAD) for data sets.

The mean absolute deviation is a measure of the variability of a data set by finding the average distance of the data values from the mean of the data.

Example: {3, 7, 7, 4, 6, 9}

Step 1: Find the mean of your given data set

3+7+7+4+6+9 = 36
36/6 = 6

Step 2: Subtract each number in the data set from the mean and find the absolute value of the difference

$|6 - 3| = |+3| = 3$
$|6 - 7| = |-1| = 1$
$|6 - 7| = |-1| = 1$
$|6 - 4| = |+2| = 2$
$|6 - 6| = |0| = 0$
$|6 - 9| = |-3| = 3$

Step 3: Find the mean of the differences

3 + 1 + 1 + 2 + 0 + 3 = 10

This is your Mean Absolute Deviation (MAD)!

$10 \div 6 = 1\frac{2}{3}$

The MAD is $1\frac{2}{3}$

1.) 3, 6, 6,7,8,11,15,16

2.) 121, 75,125, 100, 83, 96

3.) Ten friends scored the following marks in their end-of-year math exam:
23%, 37%, 45%, 49%, 56%, 63%, 63%, 70%, 72% and 82%

What was the mean deviation of their marks?

4.) You and your friends have just measured the heights of your dogs (in millimeters). The heights (at the shoulders) are 600mm, 470mm, 170mm, 430mm and 300mm.

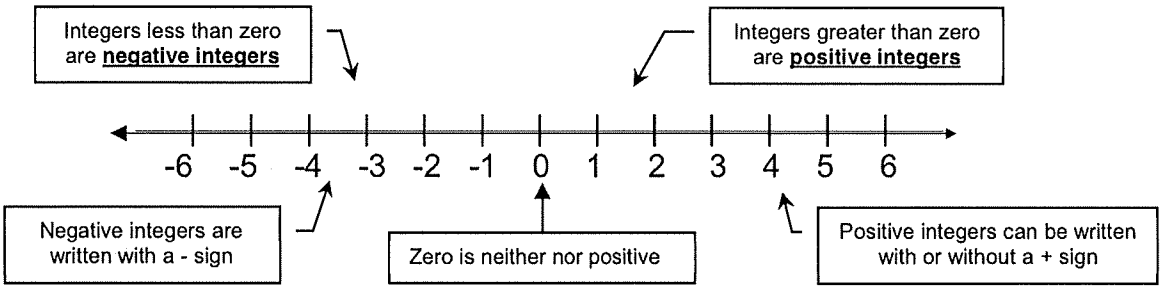
What was the mean deviation of their heights?

Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Read, write, and represent integers.

Examples:

Integer: Any number from the set {... -3,-2,-1,0,1,2,3...}



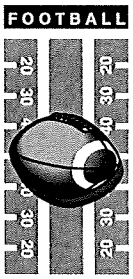
Write an integer to describe each situation

EX: a height increase of 3 inches
The word increase represents positive. The integer is 3 or +3.

EX: 50 feet below sea level
The word below represents negative. The integer is -50.

1.) Write an integer to describe:
The stock market increased 75 points

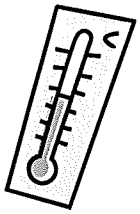
2.) Write an integer to describe:
A loss of 15 yards



3.) Write an integer to describe the situation:
Nancy owes her friend $10

4.) Write an integer to describe:
Frederick is located 290 feet above sea level.

5.) Write an integer to describe:
The temperature was 3° below zero



6.) Write an integer to describe:
The 6th grade has 12 fewer students than last year

Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Identify and determine equivalent forms of proper **fractions** as **decimals**, percents, and ratios - **A**.

Examples: Write $\frac{21}{25}$ as a decimal

Method 1:

Change $\frac{21}{25}$ to a fraction with a denominator of 10, 100, or 1000

EX: $\frac{21}{25} = \frac{?}{100}$

(Use 100, since 25 divides into 100 evenly)

$\frac{21}{25} = \frac{\bullet 4}{\bullet 4} = \frac{84}{100}$ $\frac{84}{100} = 0.84$ as a decimal

Method 2: Divide 21 by 25

$\frac{21}{25} \rightarrow 25\overline{)21.00}$

-200

100

-100

Therefore: $\frac{21}{25} = 0.84$

1.) Write $\frac{19}{20}$ as a decimal. Use method 1

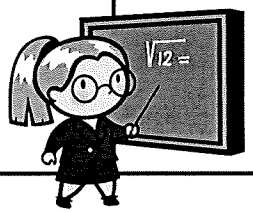
2.) Write $\frac{7}{8}$ as a decimal. Use method 2.

3.) Write $\frac{3}{16}$ as a decimal. Use method 2

4.) Write $\frac{27}{40}$ as a decimal. Use method 2

5.) Write $\frac{3}{4}$ as a decimal. Use method 1

6.) Write $\frac{3}{5}$ as a decimal. Use method 1



Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Identify and determine equivalent forms of proper **fractions** as decimals, **percents**, and ratios - **B**.

Key Concept: Percent (%) is a ratio that compares a number to **100**

Fraction to Percent:

EX: Change $\frac{19}{25}$ to a percent

Since % means out of 100, $\frac{19}{25} = \frac{?}{100}$

$\frac{19}{25} = \frac{\bullet 4}{\bullet 4} = \frac{76}{100}$

$\frac{76}{100} = 76\%$

Percent to fraction:

EX: Change 75% to a fraction in simplest form

75% means *75 out of 100*

$75\% = \frac{75}{100}$ **Write the percent as a fraction with a denominator of 100**

$\frac{75}{100} \frac{\div 25}{\div 25} = \frac{3}{4}$ **Simplify**

1.) Change $\frac{17}{20}$ to a percent

2.) Change 84% to a fraction in simplest form

3.) Change $\frac{3}{4}$ to a percent

4.) Change 90% to a fraction in simplest form

5.) Juan answered $\frac{24}{25}$ questions correctly on his quiz. What percent of the questions did he get correct?

6.) 78% of the class completed their homework last night. What fraction of the class completed their homework?

Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Identify and determine equivalent forms of proper **fractions** as decimals, percents, and **ratios - C.**

Key Concept: **Ratio**: a comparison of two numbers

A ratio can be written in 3 ways: a:b

a to b **or**

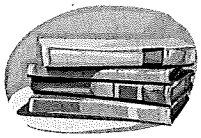
$\frac{a}{b}$

EX: Write the ratio as a fraction simplest form: **4 wins to 6 losses**

Since the ratio can be written as: $\frac{4}{6}$ **we can the simplify to** $\frac{2}{3}$ or 2:3 or 2 to 3

1.) Write the ratio as a fraction simplest form:
12 boys to 15 girls

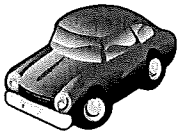
2.) Write the ratio as a fraction simplest form:
20 books to 24 magazines



3.) Write the ratio as a fraction simplest form:
10 circles to 15 triangles

4.) Write the ratio as a fraction simplest form:
8 cups to 2 servings

5.) Write the ratio as a fraction simplest form:
50 cars to 100 trucks



6.) Write the ratio as a fraction simplest form:
9 pencils to 11 pens

Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Compare and order fractions and decimals.

Ordering fractions only:

1) determine the least common denominator (LCD) of the fractions
2) rewrite each fraction as an equivalent fraction using the LCD
3) Compare the numerators

EX: order the fractions $\frac{1}{2};\frac{3}{8};\frac{7}{12}$ **from least to greatest**

1) **LCD of 2, 8, and 12 is 24**
2) $\frac{1}{2}=\frac{12}{24}$
   $\frac{3}{8}=\frac{9}{24}$
   $\frac{7}{12}=\frac{14}{24}$
3) **Comparing the numerators:**
   $\frac{3}{8}<\frac{1}{2}<\frac{7}{12}$

Ordering fractions and decimals:

1) Change the fractions to decimals
2) Compare the decimals

EX: order the numbers 0.3; $\frac{3}{8}$; and 0.38 **from least to greatest**

1) $\frac{3}{8}=0.375$
   $\frac{3}{8}=\frac{9}{24}$
   $\frac{7}{12}=\frac{14}{24}$

$$8\overline{)3.000}\quad 0.375$$
$$-24$$
$$60$$
$$-56$$
$$40$$
$$-40$$

2) **Compare the decimals:**
   $0.3 < 0.375 < 0.38$

Therefore: $0.3<\frac{3}{8}<0.38$

1.)
Order the fractions $\frac{2}{3};\frac{5}{6};\frac{3}{4}$ from least to greatest

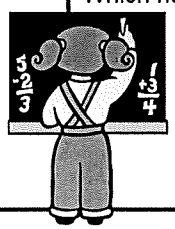
2.)
Order the numbers 0.78; $\frac{3}{4}$; and 0. 8 from least to greatest

3.)
Order the fractions $\frac{3}{5};\frac{7}{10};\frac{5}{6}$ from least to greatest

4.)
Order the numbers $\frac{3}{10}$; $\frac{1}{5}$; and 0.25 from least to greatest

5.)
Order the fractions $\frac{1}{2};\frac{5}{9};\frac{5}{6}$ from least to greatest

6.)
Which number has the greatest value? 0.94; $\frac{19}{20}$; or $\frac{24}{25}$



Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Add and subtract fractions and mixed numbers and express answers in simplest form.

Adding and Subtracting Fractions:

1) determine the least common denominator (LCD) of the fractions
2) rewrite each fraction as an equivalent fraction using the LCD
3) Add or subtract the fractions
4) Simplify if necessary

EX: Add $\frac{1}{2}+\frac{3}{8}$

1) **LCD of 2 and 8 is 8**
2) $\frac{1}{2}=\frac{4}{8}$
   $+\frac{3}{8}=\frac{3}{8}$
3) $\frac{7}{8}$
4) (can't be simplified)

EX: Subtract $3\frac{3}{5}-1\frac{1}{6}$

1) **LCD of 5 and 6 is 30**
2) $3\frac{3}{5}=3\frac{18}{30}$
   $-1\frac{1}{6}=-1\frac{5}{30}$
3) $2\frac{13}{30}$
4) (can't be simplified)

1.) $\frac{4}{6}+\frac{1}{3}=$

2.) $\frac{11}{12}-\frac{5}{8}=$

3.) $1\frac{3}{8}+2\frac{3}{4}=$

4.) $3\frac{5}{6}-1\frac{4}{5}=$

5.) Shelly has two pieces of yarn. One is $1\frac{1}{2}$ yards long and the other is $2\frac{3}{4}$ yards long. How much yarn does she have altogether?

6.) Marty weighs 64 ¼ pounds and Nathan weighs 76 ½ pounds. How much more does Nathan weigh than Marty?

Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Multiply fractions and mixed numbers and express answers in simplest form.

Multiplying Fractions and Mixed Numbers:

1) Change Mixed numbers to improper fractions
2) Multiply numerators
3) Multiply denominators
4) Simplify if necessary

EX: multiply $\frac{1}{2}\times\frac{3}{8}$

1) **No mixed numbers**
2) $\frac{1}{2}\times\frac{3}{8}=\frac{3}{\ }$
3) $\frac{1}{2}\times\frac{3}{8}=\frac{3}{16}$
4) (can't be simplified)

EX: Multiply $\frac{1}{3}\times 6\frac{3}{7}$

1) $6\frac{3}{7}=\frac{45}{7}$ as an improper fraction
2) $\frac{1}{3}\times\frac{45}{7}=\frac{45}{\ }$
3) $\frac{1}{3}\times\frac{45}{7}=\frac{45}{21}$
4) Simplified: $\frac{45}{7}=2\frac{1}{7}$

1.) $\frac{5}{6}\times\frac{1}{2}=$

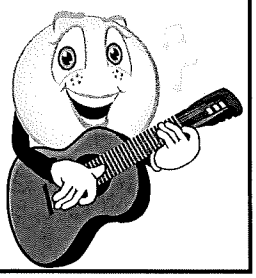
2.) $\frac{9}{10}\times\frac{2}{3}=$

3.) $2\frac{1}{2}\times 1\frac{2}{5}=$

4.) $2\frac{1}{4}\times 3\frac{1}{3}=$

5.) Belinda lives 1 ½ times further from school than Jamie does. If Jamie lives 4 1/5 miles from school, how far does Belinda live?

6.) Mario practices his guitar every day for ¾ of an hour. How long does he practice for week?



Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Multiply decimals.

Examples: Multiply 3.4 • 1.2

```
  3.4
X 1.2
  68   ← multiply 34 by 2 (ignore the decimal point)
+340   ← multiply 34 by 10 (the 1 is in the tens place)
 408   ← add 68 and 340
```

Count the number of decimal places in the original problem. Since there are 2 total decimal places, the answer should also have 2 decimal places.

```
  3.4   (1 decimal place)
X 1.2   (1 decimal place)
 4.08   2 total decimal places
```

Answer 4.08

1.) 1.2 • 0.5

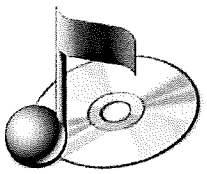
2.) 3.3 • 4.6

3.) 0.4 • 0.6

4.) 7.89 • 5

5.) Turkey cost $5.79 a pound. How much will 2.9 pounds of turkey cost? Round to the nearest cent.

6.) Ralph bought 6 CDs at a cost of 17.75 each. How much did the CDs cost altogether?



Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Divide decimals.

Example: Divide 45.9 ÷ 3

$$\begin{array}{r} 15.3 \\ 3\overline{)\,45.9} \\ -3 \\ \hline 15 \\ -15 \\ \hline 9 \\ -9 \\ \hline \end{array}$$

Place decimal directly above the decimal point in the dividend

Divide as with whole numbers

1.) $4\overline{)12.5}$

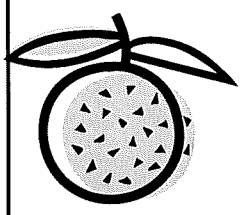
2.) $5\overline{)32.12}$

3.) 215 ÷ 10

4.) 3 ÷8

5.) Maria and two of her friends shared the cost of their lunch. If the lunch cost $15.90, how much would each one have to pay?

6.) If seven oranges cost $4.13, how much would one orange cost?



Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Determine 10, 20, 25, or 50 percent of a whole number.

Example: Determine 25% of 40

Method 1:
Change the percent to a fraction and multiply

25%= ¼

$$\frac{1}{4} \times 40 = 10$$

Therefore 25% of 40 is 10.

Method 2:
Change the percent to a decimal and multiply

25%= 0.25

0.25 • 40 = 10.00

Therefore 25% of 40 is 10.

$$\begin{array}{r} 40 \\ \times\ 0.25 \\ \hline 200 \\ +800 \\ \hline 10.00 \end{array}$$

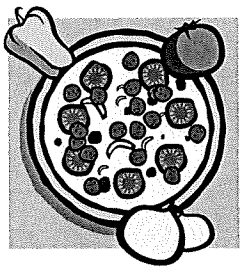
1.) Determine 20% of 65.

2.) Determine 50% of 120.

3.) Determine 25% of 20.

4.) Determine 10% of 35.

5.) 20% of the 250 students ate pizza for lunch. How many students ate pizza?



6.) Nia saved 10% on her CD purchase. If the CD originally cost $24.90, how much did she save?

Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Estimate to determine the product of a decimal and a whole number

Example: Multiply 6.45 • 7

1. Round to the nearest whole numbers. 6.45 rounds to 6
   Since 7 is already a whole number, it stays the same.

2. Multiply the rounded numbers 6 • 7

3. Answer 42

Estimate each of the following multiplication problems. Round all decimals to the nearest whole number.

1.) 6 • 1.65	2.) 0.82 • 4
3.) 3 • 9.95	4.) 12.9 • 7
5.) Three pairs of shoes are priced at $39.95 each. Estimate the total cost for the all 3 pairs of shoes.	6.) If you work 6 hours at $6.35 an hour, estimate how much you would make?

Level 6 (Course 1) – Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Estimate to determine the quotient of a decimal.

Example: Divide 45.9 ÷ 10

1. **Estimate using compatible numbers.**
   45.9 rounds to 46
   10 stays the same
2. **Divide** and round
3. **Answer.** 4.6

$$10\overline{)46.0} = 4.6$$

-40
60
-60
0

Estimate each of the following division problems. Round all numbers to the nearest ~~tenth~~ hs

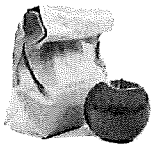
1.) $35\overline{)207.66}$

2.) $14\overline{)43.6}$

3.) $14.33 \div 7$

4.) $29.32 \div 3.8$

5.) Maria and twelve of her friends shared the cost of their lunch. If the lunch cost $75.90, estimate how much would each one have to pay?



6.) Brianna and 15 of her friends bought sodas after their lacrosse game. If the drinks cost $46.29, estimate how much each person would owe if the cost is divided equally?