Mason City Community Schools
Summer Math Activities
For Students Entering Grade 7

Our sixth graders had a busy year learning new math skills. **Mastery of all these skills is extremely important in order to develop a solid math foundation.** The seventh grade math program will **add onto these skills,** so any time spent learning or reinforcing these concepts will be very beneficial for your child. Each year builds upon the previous year's skills in math. Any areas your child has difficulty, you may want to give them additional practice at some of the websites listed. **Student mastery of the basic math skills is as important to success in future mathematical procedures and reasoning, as learning the alphabet is to reading and writing.**

Directions:

Create a personal Math Journal by stapling several pieces of paper together or use a spiral notebook or binder with paper. Complete the items on the "June, July, August Chart and Activities 1 - 6, in your journal, show all of your work. Once you have completed an activity, have an adult family member initial the box on the chart.

- Each journal entry should:
  - Have the chart number or activity number and name
  - Have a clear and complete answer that explains your thinking
  - Be neat and organized.

Try to play a board game or card game at least one day each week. Write about the game in your journal. Be sure to title the page with the name of the game. Here are some suggestions of games for you to play: Monopoly, Stratego, Othello, Connect Four, Chess, War, Battleship, Risk, Mancala, Yahtzee and Mastermind.

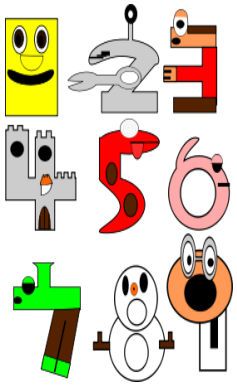
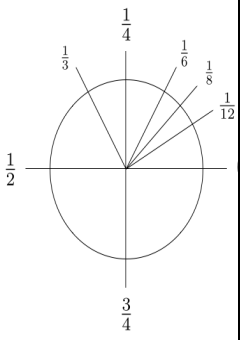
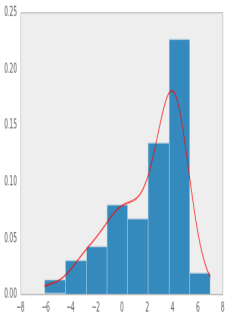
Don't forget to bring your chart to school on the first day of seventhgrade. Your new teacher will be impressed with your summer math work!

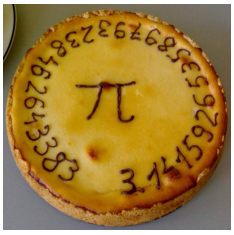
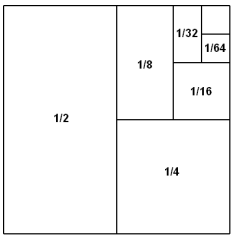
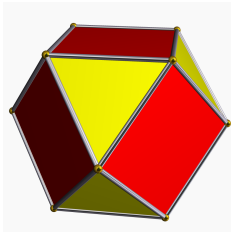
Happy Thinking!

June, July, and August

Students, remember - show your work and answers in your Math Journal!

Parents/Guardians, please confirm completion of each task by writing your initials in the appropriate box.

PLACE VALUE 	#1 Make a number line from 100 - 110, Place these numbers on it. 100.5 101.2 104.65 106.9 107.11 107.3 109.75	#2 Each year over 179.63 million tons of garbage are generated. What is this number rounded to the **NEAREST** tenth? Write the number $60{,}000 + 8{,}000 + 900 + 7 + 0.6$ in standard notation. 8,592.37 rounded to the nearest hundred is what number?	#3 What is 35.04 written in expanded form? Word form? Then round the number to the nearest tenth.	#4 In Monica's school, semester grade averages are computed to two decimal places. Last semester, Monica's grade average was 83.34. This semester, her grade average was 0.01 higher. What was her grade average this semester?	#5 What is 4.97×10^6 in standard form and word form? What is the easiest way to get the answer in standard form? What does 10^6 equal?
FRACTIONS, DECIMALS & PERCENTS 	#6 Kim finished only $\frac{3}{5}$ of the questions on her written test for a driver's license. What percent did she finish?	#7 What improper fraction is equal to $2\frac{3}{8}$? What mixed number is equal to 54/5? Add $2\frac{3}{8} + 54/5$. Show all your work.	#8 How do you find 60% of 120? If Jack's team lost 30% of their 20 games, what fraction did they lose? How many games did Jack's team win?		#9 Chicken was on sale for $7.95 per pound. Laurie bought a small package that weighed 0.8 pound. How much did Laurie pay for the chicken?
ESTIMATION 	#10. Mr. Finn buys 29 portfolios for his office. Each portfolio costs $18.99, including tax. Is Mr. Finn's estimate of $400 a **reasonable** estimate of the total cost of the 29 portfolios? Show and explain your thoughts	#11 Which expression would provide the closest estimate of $129.8 - 38.56$? a. 120 – 40 b. 130 – 30 c. 130 – 39 d. 150 – 38 Write an expression that could be used to estimate the sum of 403.6 + 89.1.	#12 A bean plant is growing at a rate of 2 inches per month. What expression could be used to best estimate how many inches the plant will grow in 6 months? Using your expression, how much will the plant grow in 6 months?	#13 The length of a rectangular room is 12.8 meters and the width is 10.9 meters. Will 145 square meters of carpeting be enough to completely cover the floor? Explain or show how you determined your answer.	#14 Tanya practices piano every day for 1 hour and 15 minutes. What is a reasonable estimate for the total number of hours Tanya practices each week?

WHOLE NUMBERS & DECIMALS 	#15 Chris wrote this number sentence: 6.2 – 1.05 = 5.25 Is he correct? Show your thoughts or explain how you determined whether or not his answer was correct.	#16 A puppy weighs 6.5 pounds. The puppy's mother weighs 10 times as much as that. What does the puppy's mother weigh?	#17 Do the following problems: (show all work) 47.3 x 16 $7.40 ÷ 4 986 x 2.4 3214 ÷23	#18 Kevin lives 0.5 mile from school. Dana lives 0.7 mile from school. How many miles farther from school does Dana live than Kevin. Express your answer in terms of a decimal and a fraction in simplest form.	*Explore some of the websites listed below!*
Ratios and Proportions 	#19 The cost of a tent rental is $160 for 5 days. Write and solve a proportion to find the cost of renting the same tent for 8 days. Write the ratio 3 ways. 7 dogs for every 3 cats.	#20 There are 40 members in the school computer club. Eighteen of the members are boys. What is the ratio of girls to boys in the computer club? 20 red tiles in a box of 32 tiles. Write the ratio in simplest form.	#21 Tom answered 22 questions in 20 minutes. Terri says that's a ratio of 2:1. Is Terri correct? Explain why she is, or is not correct.	#22 A smoothie recipe calls for 4 bananas for every 3 cups of yogurt added. If 16 bananas are used, how many cups of yogurt should be added?	#23 Justin can read 12 pages in 20 minutes, How many pages can he read in 50 minutes? What's the difference between a ratio and a proportion?
GEOMETRY 	#24 Explain why all squares are rectangles, but not all rectangles are squares. If you have a square with a side length of 12 inches, what is the area?	#25 A triangle has one 30^0 angle, one 75^0 angle. What is the measure of the 3rd angle. Explain how you know. Do you think the above is an equilateral triangle? Why?	#26 Write the formulas for the following: <u>area of rectangle</u> <u>area of a triangle</u> <u>volume of a rectangular prism</u> <u>perimeter of a square</u>	#27 Draw, label, and define 4 types of quadrilaterals.	#28 Draw, label and define these triangles: <u>scalene</u> <u>isoceles</u> <u>equilateral</u> <u>right</u> <u>acute</u> <u>obtuse</u>

Activity 1

Measure the perimeter of your kitchen. Draw a rough sketch of your kitchen below. Label the length and width of each side of the room. Then calculate the perimeter and area of the kitchen.

Rough Sketch:

Perimeter:
Area:

Activity 2

Measure the height of each of your family members using metric measures (**centimeters** and **meters**). Write the names of each family member below and their height. Then order your family members from tallest to shortest.

Family Member	Height

Activity 3

Decide on a recipe you would like to cook or bake. Rewrite the recipe **tripling** it. How much of each ingredient do you need now?

Ingredients	Amount Needed

Activity 4

Look through a grocery store flyer. Find the cost of 3 different items that are sold by weight (fruits, vegetables, deli meats). Decide with a family member how much of each item you need for your family. How much will each item cost? What will be the total cost for all 3 items?

Item	**Amount Needed**	**Cost**	**Total Cost Per Item**
Total			

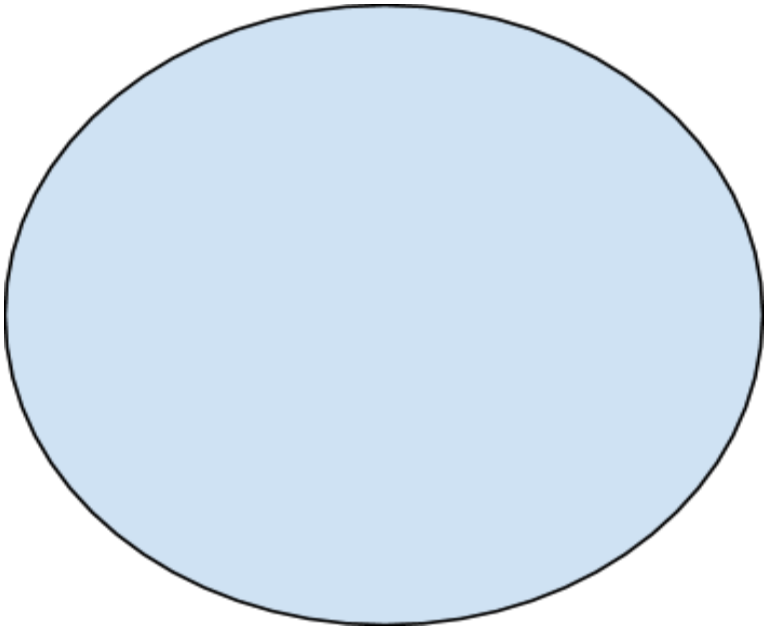
Activity 5

Use a package of M&Ms to determine the probability of picking out each color from the bag. Count and list the different colors. Then list the probability of picking out each color if they were all put back in the bag together. Write the probability as a fraction, and then use a calculator to write it as a percent.

Color	Number	Probability as a Fraction
TOTAL		

Activity 6

Keep track of the time you spend on different activities for one day (24 hours). Make a circle graph showing how you spent your day.



Here are some fun and exciting websites to visit over the summer for practice.

At the time this was created, the websites listed were checked by teachers and deemed child appropriate. However, parents should always monitor their child's use of any Internet site.

http://www.khanacademy.org

http://www.mathisfun.com/

http://www.funbrain.com/brain/MathBrain/MathBrain.html

http://www.aplusmath.com/Games/index.html

http://mrnussbaum.com/mathcode/

www.mathforum.org

www.aaamath.com

Fun Summer Math Books for 7th Graders!

Math Made Fun by Lisa Palmer

Sideways Arithmetic from Wayside School by Louis Sachar

A Grain of Rice by Helena Clare Pittman

Counting on Frank by Rod Clement

7th Grade Vocabulary

absolute value: The distance a number is from zero
additive inverse: The additive inverse of a number is the opposite of that number, that is, the additive inverse of a number x is -x. The sum of a number and its additive inverse is always zero, that is, x + (-x) = 0.
algebraic expression: an expression that is written using one or more variables.
algorithm: A finite number of steps or routines that detail how to solve a particular problem.
For example, a mechanical procedure for performing the multiplication of any multiple-digit numbers is an algorithm.
angles: The figure formed by two rays from the same initial point. The two rays are called the sides of the angle and the initial point is called the vertex of the angle. The symbol for angle is $\angle$.
Types of angles:
adjacent angles: angles that share a common side, have the save vertex, and do not overlap.
supplementary angles: 2 angles whose sum equals 180 degrees.
vertical angles: a pair of opposite congruent angles formed by intersecting lines.
arc: A section of a circle that lies between two points on the circle. Any two points on a circle divide that circle into two arcs; the longer one is called the major arc and the shorter one is the minor arc.
axis: A line about which a curve or an object may rotate or revolve.

central tendency: any of 3 measures (mean, median, mode) that represent a type of average of a set of data.
circumference: The boundary line of a circle or the length of such a boundary line.
coefficient: The number part in front of the non-numerical symbol(s) in an algebraic expression, signifying multiplication. For example, the number 4 in the expression 4xy is a coefficient.
commission: A fee (either a fixed amount or a percentage) paid to a person for making a sale or for work done.
complementary angles: 2 angles whose measures have a sum of 90 degrees.
coordinate plane: A plane formed by two intersecting and perpendicular number lines used to help locate the position of any point on a map or graph.
coordinates: A pair of numbers that describe the position of a point on a coordinate plane by using the horizontal and vertical distances from the two reference axes.
cube (in algebra): The third power of a number or variable, written as x^3, in which x is the number or the variable. For example, $2^3 = 2 \times 2 \times 2 = 8$.
cube (in geometry): A solid figure that has six square faces.

data: Usually raw, unprocessed facts and figures collected about people or things.
diagram: A drawing or graphical representation used to illustrate mathematical relationships.
distributive property: The distributive property states that multiplying a sum by a number gives the same result as multiplying each addend by the number and then adding the products together.

$4 \times (2 + 3) = 4 \times 2 + 4 \times 3$

equation: a mathematical sentence that shows 2 expressions are equivalent.
estimate: Roughly calculate an amount or round the number to obtain a quick answer. For example, this baby is about 2 feet high.
evaluate: the process of putting an expression into its simplest numerical form, as a single number.
event: Any of the possible outcomes of an experiment.
expression: A combination of numbers, symbols, and operations to represent a certain quantity.
For example, $x^2 + 2x + 3$ is a quadratic expression.

factor (in algebra): One of the expressions that are multiplied together.
factor (in arithmetic): A number that can divide into another number with no remainder. For example, 6 has the factors 1, 2, 3, and 6.
fraction: A number that represents part of a whole or part of a group.
frequency: The number of times an event happens or the numbers of scores in a range.
function: a relation in which each element in the domain is matched with only one element of the range.

geometric figure: A **geometric figure** is a set of one or more points in n-space, for example a rectangle.
Golden Rectangle: any rectangle with a length-to-width ratio of approximately 1.61 to 1.
graph: The collection of all points whose coordinates satisfy a given relation, which shows the relationship between different quantities. It can also use lines, line segments, curves, or areas to represent the variation of a quantity in comparison with that of one or more other quantities.
gratuities: a gift of money, over and above payment for services.

inequality: a mathematical sentence that shows the relationship between quantities that are not equivalent using <,>,<, >, or not equal.
inferences: The process of reaching a conclusion about a population based on a sample.
integer: one of the set of whole numbers and their opposites.
irrational number: a number that cannot be expressed as a repeating or terminating decimal.

lateral surface: in a cylinder, the curved surface connecting the circular bases.
likely event: the event that is most likely to happen
linear equation: an equation that can be represented by a line on the coordinate plane.
long division: the process of dividing one number by another, showing all the steps.

markup: the difference between the retail price and the wholesale price.
mean absolute deviation: A measure of the dispersion of a set of numbers, which can be obtained by computing the mean of the absolute values of the differences between these numbers and their mean.
measure of variation: a **measure** that describes how spread out or scattered a set of data is.

non-zero divisor: A **non-zero** element such that the product with some **non-zero** element is **zero**.
number line: A straight line on which each point represents a real number. It is a geometric representation of numerical values.

ordered pair: A set of two numbers arranged in a particular order, normally written as (1st-number, 2nd-number), in which both the order and the values have agreed-upon meanings.
For example, the coordinates of a point on a Cartesian coordinate plane is written as (x,y), in which x is the horizontal coordinate and y is the vertical coordinate.
origin: The point where the reference axes in a coordinate system meet. The values of coordinates are normally defined as zero.

percent: ratio of a number to 100; per one hundred.
percent decrease: measure of **percent** change, which is the extent to which a variable loses intensity or magnitude.
percent error: A measure of how innaccurate a measurement is.
percent increase: measure of **percent** change, which is the extent to which a variable gains intensity or magnitude.
perfect square: a number that has an integer as its square root.
prediction: A future event foretold by using a trend formed from the collected historical data.
population: the total or entire group to be studied.
principal: the amount of money borrowed or saved.
prism: A space figure with two parallel polygonal bases that are the same shape and the same size.
probability: The likelihood or chance of a given event happening. It is often expressed as a fraction or decimal. The probability that m particular events will occur out of a total of n possible events is m/n. A certainty means that, out of n possible events, all the events (n events) will happen. Therefore, a certainty has a probability of 1 (n/n = 1). Similarly, an impossibility has a probability of 0 because none will happen out of the total n possible events (0/n = 0).
For example, the chance of getting heads is the same as the chance of getting tails when tossing a coin. That is, it is reasonable to expect heads once and tails once for every two tosses. Hence, the probability of getting heads (or tails) is 1/2 or 0.5.
Types of probability:

experimental probability: the ratio of the number of times the event occurs to the total number of trials or time the activity is performed.
geometric probability: a probability calculated by comparing the area of a specific part to that of a total region.
compound events: An event that includes two or more independent events. The event of obtaining the same side (both heads or both tails) when tossing a coin twice is such an example. The result from the first toss does not affect the second result. Both results need to be considered together to determine the final outcome.
mathematical probability: the ratio of the number of favorable outcomes to the number of all possible outcomes.

proportion: an equation which states that 2 ratios are equivalent.
proportional: 2 ratios that are equivalent.
proportional relationship: A number sentence or an equation that states that two ratios are equal.
protractor: An instrument for measuring the size of an angle.
pyramid: A polyhedron whose one face is a polygon and the other faces are triangles with one common vertex. This polygon is the base of the pyramid. The other triangles are the lateral faces. The common vertex of these lateral faces is the vertex of the pyramid. The segment from the vertex perpendicular to the base is called the altitude of the pyramid. The length of the altitude is called the height of the pyramid. The intersections of the adjacent lateral faces are called the lateral edges of the pyramid.

quadrants: One of the four sections of a rectangular coordinate plane.
quadrilateral: Any four-sided plane figure. (examples: square, rectangle, rhombus, trapezoid)
quotient: the answer to a division problem

random sample: Taking a sample in such a way that every member from the population has an equal chance of being selected.
rate: a ratio that compares quantities of different units, such as miles per hour, price per pound, students per class.
ratio: The comparison when two (or more) numbers are compared by division.
Ratios are generally written as a:b or a/b. The ratio "a:b" is read "a is to b." The number that comes after the "to" goes second or at the bottom of the fraction.
rational number: any number that can be expressed as a ratio *a/b* where *a* and *b* are integers & *b is not equal to 0.*
rational coefficient: coefficients that are **rational**. For example, (25 / 3)x^2 + ... then we called it as **rational coefficient**.
reciprocal: one of 2 numbers whose product is 1.
relative frequency: the ratio of the number of times an event occurs to the number of occasions on which it might occur in the same period.
retail price: the sum of the wholesale price and markup.
right prism: a **prism** that has two bases, one directly above the other, and that has its lateral faces as rectangles.
right rectangular prism: A solid (3-dimensional) object which has six faces that are rectangles.
right rectangular pyramid: A **rectangular pyramid** is built on a **rectangular** base, with two sets of triangles forming the sides. Each set of triangles will be equal in side length and height.

sample: a smaller group of people or objects chosen from a larger group or population.
sample space: all possible outcomes in a given situation.
Types of samples:

biased sample: a sample that does not fairly represent the population.
random sample: a population sample for which every individual in the population had an equal chance of being chosen.
systematic sample: a sample of a population that has been selected using a pattern.
stratified sample: a sample of a population that has been divided into subgroups.

scale: A series of marks at regular interval along a line or curve that helps you measure things. Examples include the scales on a ruler or a protractor.
scale drawing: a drawing that has its dimensions related by a scale factor to the dimensions of the object it represents.
scale factor: the common ratio for pairs of corresponding sides of similar figures.
signed number: A number that is specifically denoted as positive or negative.
similar figures: figures with the same shape but not necessarily the same size.
simulation: a model of an experiment that would be too difficult or too time-consuming to actually perform.
simple interest: the amount obtained by multiplying the principal by the rate of the time; $i=prt$.
solution: the value that makes 2 sides of an equation equal.
solution of an inequality: The answer to an expression with an inequality symbol, such as < (less than).
solution set: The **set** of values that satisfy a given **set** of equations or inequalities.
spread: The range of data.
square number: a number that can be represented with a square array.
statistical variability: a measure that describes how spread out or scattered a set of data is.
statistics: The branch of mathematics that deals with the collection, organization, analysis and interpretation of numerical data.
substitution: To replace the variable(s) in an algebraic expression or a formula with concrete number(s).
It is often used to check the correctness of an algebraic expansion or simplification. By substituting an easy or a simple value for each variable, if both sides are not the same, then we know that the algebraic expansion or simplification is not correct.
surface area: the sum of the areas of the faces, or surfaces, of a solid figure.

tax: a compulsory financial contribution.
term: A number in a sequence or the numerator or denominator of a fraction. In a proportion, a term is any one of the means or extremes. A term of an equation or inequality is the entire quantity on one (or the other) side of the sign of equality or inequality.
terminating decimal: A decimal that ends. For example, 0.4 is a terminating decimal.
total amount: in the formula $A=p+i$, A is the sum of the principal and the interest.
tree diagram: A chart that organizes possible outcomes for a process to make it easy to count.

triangle: A closed plane figure formed by connecting the endpoints of three line segments endpoint to endpoint. A triangle is denoted by the symbol $\triangle$, and it is always named by the three letters of its vertices.
Types of triangles:
acute triangle: A triangle in which all three interior angles are acute (less than 90°).

equilateral triangle:A triangle that has all three sides congruent(equal).
isosceles triangle: A triangle in which at least two sides are congruent. The congruent sides are called legs. The angle formed by the legs is the vertex angle. The other two angles are base angles. The base is the side opposite the vertex angle.
obtuse triangle: A triangle that has an obtuse angle (greater than 90°) in its interior.
right triangle: a triangle with a right, interior angle.
scalene triangle: A triangle with no equal sides.
Triangle terms:
hypotenuse: in a right triangle, the side opposite the right angle.
leg: in a right triangle, either of the 2 sides that intersect to form the right angle; in an isosceles triangle, one of the 2 congruent sides.

unit rate: a rate in which the second term is 1.
unlikely event: An event with a low probability of happening.

variable: a letter used to represent one or more numbers in an expression, equation, or inequality.
volume: the number of cubic units needed to occupy a given space.

x- axis: Usually the horizontal axis in a Cartesian coordinate system.
x- coordinate: The first number in an ordered pair that represents the distance of the point on the x-axis.
x- intercept: The value of x when a given curve crosses the x-axis.
y- axis: Usually the vertical axis in a Cartesian coordinate system.
y- coordinate: The second number in an ordered pair that represents the distance of the point on the y-axis.
y- intercept: The value of y when a given curve crosses the y-axis.