

Summer Math Learning Packet

Students Entering Grade 8

Discover mathematics all around you this summer!!! Just as with reading, regular practice over the summer with problem solving, computation, and math facts will maintain and strengthen the mathematical gains you made over the school year.

Attached to this letter, you will find creative mathematics activities to explore at home. The goal is for you to have fun thinking and working collaboratively to communicate mathematical ideas. While you are working, ask how the solution was found and why a particular strategy was chosen.

The Summer Math Learning Packet consists of 2 calendar pages, one for July and one for August, as well as directions for math games to be played at home. Literature and websites are also recommended to explore mathematics in new ways. We encourage you to complete at least 15 math days each month. Keep track of your math in a journal.

Fun math books to read	Fun websites to explore
<u>Evil Genius</u> by Catherine Jinks <u>Forever Changes</u> by Brendan Halpin <u>Geek Abroad</u> by Piper Banks <u>All of the Above</u> by Shelley Pearsall <u>Hannah Divided</u> by Adele Griffin <u>A Higher Geometry</u> by Sharelle Byars Moranville <u>Guinness Book of Records</u> by Time Inc <u>Mathematicians are People Too</u> by Luetta Reimer & Wilbert Reimer	http://www.ixl.com/ http://www.figurethis.org/index.html http://nrich.maths.org/frontpage http://www.khanacademy.org/ http://mathforum.org/index.html http://www.coolmath4kids.com/ http://www.figurethis.org/index.html http://www.thinkingblocks.com/ http://mathplayground.com/ http://illuminations.nctm.org/activitysearch.aspx

Student Accountability

The intention is that your child spends at least 10 minutes a day, 4 to 5 times a week, practicing math. Your child should aim to complete at least 250 minutes of math practice over the course of the summer. When your child has completed the math requirements, please sign and return this paper to the sixth grade teacher with his/her journal.

Parent's signature

Date

Grade 7 Learning Goals

*In grade seven, students will further develop their understanding of rates and ratios, using tables, graphs, and equations to solve real-world problems involving proportional relationships. Students will also work on quickly and accurately solving multi-step problems involving positive and negative rational numbers—any number that can be made by dividing one integer by another, such as $\frac{1}{2}$, 0.75, or 2. Additionally, students will expand their knowledge of geometry and apply the properties of operations to solve real world problems involving the measurement of multi-dimensional objects. Activities in these areas will include:

- Determining whether two quantities are in a proportional relationship and using knowledge of rates, ratios, proportions, and percentages to solve multi-step problems
- Identifying the unit rate of change (the constant rate at which the value of a variable changes) in tables, graphs, equations, and verbal descriptions
- Calculating the unit rates associated with ratios of fractions, including quantities measured in different units (for example, the ratio of $\frac{1}{2}$ a mile for every $\frac{1}{4}$ of an hour means that you travel 2 miles in an hour)
- Solving problems using equations to find the value of one missing variable
- Applying the properties of operations to generate equivalent mathematical expressions
- Solving multi-step word problems by adding, subtracting, multiplying, and dividing positive and negative rational numbers in any form (including whole numbers, fractions, or decimals)
- Understanding that numbers cannot be divided by 0
- Converting rational numbers to decimals using long division
- Describing situations in which positive and negative quantities combine to make 0
- Finding the area of two-dimensional objects and the volume and surface area of three-dimensional objects

Looking Ahead to Eighth Grade

*In grade eight, students take their understanding of unit rates and proportional relationships to a new level, connecting these concepts to points on a line and ultimately using them to solve linear equations that require them to apply algebraic reasoning as well as knowledge of the properties of operations. Students will also expand their understanding of numbers beyond rational numbers to include numbers that are irrational— meaning that they cannot be written as a simple fraction, such as the square root of 2 or $2\sqrt{2}$. Activities in these areas will include:

- Understanding that every rational number (such as $\frac{1}{2}$, 0.3, 2, or -2) can be written as a decimal, but that the decimal form of an irrational number (such as $2\sqrt{2}$) is both non-repeating and infinite
- Applying the properties of exponents to generate equivalent numerical expressions
- Determining the value of square roots of small perfect squares (such as $49=7^2$) and cube roots of small perfect cubes (such as $3^3=27$)
- Graphing proportional relationships and interpreting the unit rate as the slope (how steep or flat a line is)
- Solving and graphing one- and two-variable linear equations
- Understanding that a function is a rule that assigns to each value of x exactly one value of y , such as $y=2x$, a rule that would yield such ordered pairs as (-2,-4), (3,6), and (4,8)
- Comparing the properties of two functions represented in different ways (in a table, graph, equation, or description)
- Determining congruence (when shapes are of equal size and shape) and similarity (same shape but different sizes)
- Learning and applying the Pythagorean Theorem (an equation relating the lengths of the sides of a right triangle: $a^2 + b^2 = c^2$)
- Solving problems involving the volume of cylinders, cones, and spheres

*Adapted from *Parent Roadmaps* by Council for Great City Schools

Boston Public Schools Summer 2016

Some of these activities have been adapted from materials developed by Cambridge and Brookline Public Schools

Grade 8 Summer Math Ideas

DIRECTIONS: Do your best to complete as many of these summer math activities as you can! Record your work in your math journal every day. In September, share your Math Journal with your third grade teacher.

Each journal entry should

- Have the date of the entry
- Have a clear and complete answer
- Be neat and organized

Math Tools You'll Need:

- Notebook for math journal
- Pencil
- Crayons
- Regular deck of playing cards
- Coins
- Dice

Here is an example of a "Great" journal entry:

July 23rd

Today's number is 144.

$$12 \times 12 = 24 \times 6 = 48 \times 3$$

$$1440 \div 10 = 12 \div \overline{12}$$

$$143 + 1 = 121 + 23$$

Games to play: Checkers, Othello, Memory, Set, jigsaw puzzles, Parcheesi, Crazy Eights, Connect Four, Legos, etc.

July 2016 Entering Eighth Grade Mathematics Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
There are three choices of jellybeans: grape, cherry and orange. If the probability of getting a grape is $\frac{3}{10}$ and the probability of getting cherry is $\frac{1}{5}$, what is the probability of getting orange?	Twice a number (n) minus nine is ninety-five. Find the number (n).	Try a new activity at http://www.coolmath4kids.com/ Challenge yourself. What did you choose to do?	A menu has these options for sandwiches: 3 types of bread, 4 meat choices, 5 topping choices. How many possible sandwiches can be made? Can you create a different menu with the same outcome?	Go to website: http://nrich.maths.org/public/leg.php?code=71&cl=3&clcm pid=5864 and use reasoning and proof to solve the problems.	Solve: $45 \div (-9) = (-105) \div (-15) =$	
10	11	12	13	14	15	16
Look up a math topic and read about the history. Who discovered it? How was it used? Ex. pi, gallons, metric...	Joe has an 80:1 scaledrawing of the floor plan of his house. On the floor plan, the dimensions of his rectangular living room are $1\frac{7}{8}$ inches by $2\frac{1}{2}$ inches. What is the area of living room in square feet?	Write an expression for the sequence of operations. Add 3 to x, subtract the result from 1, then double what you have.	Visit the website http://nlvm.usu.edu/en/nav/vlibrary.html . Challenge yourself with fun activities! List them.	If the product of 6 integers is negative, at most how many of the integers can be negative?		
17	18	19	20	21	22	23
Games Unlimited buys video games for \$10. The store increases the price 300%. What is the price of the video game?	Games Unlimited buys video games for \$10. The store increases the price 300%. What is the price of the video game?	Using a grocery store receipt, figure what percentage of the bill was spent on vegetables, meat, drinks, junk food ...	Can a triangle have more than one obtuse angle? Will three sides of any length create a triangle?	Describe situations in which opposite quantities combine to make 0.		
24	25	26	27	28	29	30
The pages of a book are numbered consecutively from 1 to 275. How many times is the digit 8 used in numbering the pages?	Add: $2 + (-3) =$ $(-2) + (-3) =$ $(-2) + 3 =$	A circle has a circumference of 28π centimeters (cm). What is the area, in cm, of this circle? Show all work necessary to justify your response.	Mia's cell phone plan: \$15 a month plus free texts plus \$0.20 per minute of call time. Mia made 30 minutes of calls this month, and 110 texts. How much does she have to pay?	In the following equation, a and b are both integers, find their value: $a(3x - 8) = b - 18x$		

August 2016 Entering Eighth Grade Mathematics Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
31	1	2	3	4	5	6
Two adjacent angles are complementary. True or false?	Make a paper airplane and fly it several times. Find the mean, median, and mode of the distance your plane can fly	May 1st Jay's mom gives him 1 cent. Each day, she pays double the amount she paid the day before. How much money did Mike earn in total by May 15?	Choose a favorite professional athlete and research his/her annual salary. How much does s/he earn in a month? A day?	Choose an activity at Math Illuminations http://illuminations.nctm.org/activitysearch.aspx Record what you did.		
7	8	9	10	11	12	13
Using a receipt, find the mean, median, and mode of the prices of the items on the receipt from a store (grocery, clothing ...)	Solve: $3w + 2 = 20$ Can you write a real world problem that this equation represents?	Joe has a bag containing 8 red sweets, 9 yellow ones and 11 green. He takes out a sweet and eats it, then, he takes out a second sweet. What is the probability that both the sweets are red?	Visit the website: http://nrich.maths.org/secondarylower and play a game with positive & negative integers.	Play a strategy game. Ex. Monopoly, Parcheesi, Mancala, Connect Four ... What strategy did you use?		
14	15	16	17	18	19	20
Look up a famous math person and read about him/her. What did s/he discovered? How was it used? Ex. Fibonacci, Pythagoras ...	Play Sudoku from the newspaper How did logic help you to solve the puzzle?	Visit the website Figure this and look for a real life math challenge. http://www.figurethis.org/index.html	George's weekly pay rate is \$455 per week. He receives a 20% raise. What is his new weekly wage rate	$m\angle A = 13^\circ$ and $m\angle B = 77^\circ$. Are the angles complementary?		
21	22	23	24	25	26	27
visit the website: http://nrich.maths.org/5864 and play Connect Three with positive & negative integers..	Calculate: $7 \times 8 =$ $-7 \times 8 =$ $(-7) \times (-8) =$	Find the area of a circle if the diameter is 20 feet.	Dave buys 2 pineapples and some bananas. One pineapple is \$2.99. Bananas are \$0.67 per lb. He wants to spend less than \$10.00. Write an inequality that represents the number of pounds of bananas, b, he can buy.	Dan's salary is \$70 less than Sam's, whose weekly salary is \$50 more than Jen's. If Jen earns \$280 per week, how much money does Dan earn per week?		
28	29	30	31			
33.3% is the answer. What could the question possibly be? Challenge yourself to think of more questions.	Which is a better price? Why? a. 15oz. for \$1.79 b. 12 oz. for \$1.49	YOU DID IT! Please bring your journal to your eighth grade teacher on the first day of school!				