Summer Math Learning Packet
Students entering Algebra-8

The daily activities in this summer math packet will review math concepts and skills of the grade that has just been completed during the prior school year. Just a few minutes each day spent "thinking and talking math" will help reinforce the math that has been learned and begin to bridge the foundation for extending to the concepts that will be developed next year. 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 math practice in this summer packet addresses the Fairfield Public School Curriculum for Mathematics which incorporates the Common Core Standards addressing these 5 critical areas in the Pre-Algebra-7 course:

1) Developing understanding of and applying proportional relationships;
2) Drawing inferences about populations based on samples,
3) Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations;
4) Grasping the concept of a function and using functions to describe quantitative relationships;
5) Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem

The packet consists of 2 calendar pages, one for June/July and one for August, as well as directions for math games to be played at home. Literature, worksheets, APPs 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.

Educational and Fun APPS and Websites to Practice Math
Student Accountability

I spent at least 10 minutes a day, 4 to 5 times a week, practicing math. I completed at least 250 – 300 minutes of math practice over the course of the summer. I recorded my minutes on the tracking sheet. I returned the recording sheet to my 8th grade math teacher. I also showed my teacher my journal where I kept track of my mathematical thinking.

_____   _____
Student Signature   Date

Websites:	Great Math Books to Read:
Here are websites that you can access at the **Fairfield Public Library** if you do not have a computer at home**.** You can record your activity on the "Create Your Own Summer Math Calendar!" sheet provided. 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	Evil Genius by Catherine Jinks Forever Changes by Brendan Halpin Geek Abroad by Piper Banks All of the Above by Shelley Pearsall Hannah Divided by Adele Griffin A Higher Geometry by Sharelle Byars Moranville Guinness Book of Records by Time Inc Mathematicians are People Too by Luetta Reimer & Wilbert Reimer

APPS to Practice Math!

This is a great, fun way to get practice with math skills on a smartphone or iPad. Many of these Apps are free or inexpensive. There are lots of other apps out there, but these are some of our favorites.
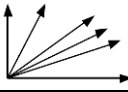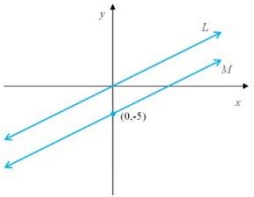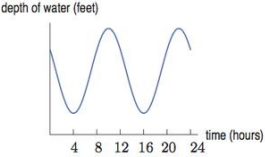
APPS	APPS
Nine Gaps	iCut Deluxe
Khan Academy	Math Doodles
Math Zombie	Flash to Pass
Math Bingo	Sumdog
Math Hunt	Sushi Monster,
Symmetry Shuffle	Slice It!
Kakooma	Ratio rumble
Deep sea duel	Chicken coop fractions
Pick a path	Zoom math
Lobster diver	Super 7
Math matrix	Pizza shop and slide 1000
Middle School Math HD	

Worksheets to Practice Math

http://www.commoncoresheets.com/
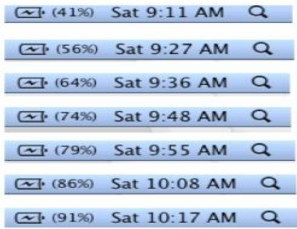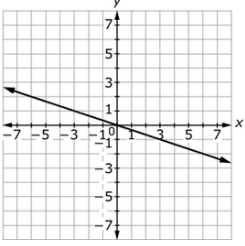
Algebra-8 Summer Work Calendar
June/July

End of June/First Week of July	**Day 1** The cost to hire a plumber is $45 per hour plus an initial fee of $65. How long did the plumber work for a total charge of $290?	**Day 2** A right triangle has sides of $\sqrt{10}$ and $\sqrt{6}$. What is the shortest and longest possible length of the third side?	**Day 3** Create an equation that has a variable on each side and has a solution of $x = -3$.	**Day 4** Go to website: http://nrich.maths.org/public/leg.php?code=71&cl=3&cldcmpid=5864 and use reasoning and proof to solve the problems.	**Day 5** How many pairs of adjacent angles occur in this configuration of 6 rays? Explain your results.
Week 2	**Day 6** Lines *L* and *M* have the same slope. The equation of line *L* is $4y = x$. Line *M* passes through the point $(0,-5)$. What is the equation of line *M*?	**Day 7** The point in the *x-y* plane with coordinates $(1000, 2014)$ is reflected across the line $y = 2000$. What are the coordinates of the reflected point?	**Day 8** The figure below gives the depth of the water at Montauk Point, New York, for a day in November. How many high tides took place on this day? How many low tides took place on this day? How much time elapsed in between high tides?	**Day 9** Try a new activity at **http://www.coolmath4kids.com/** Challenge yourself. What did you chose to do?	**Day 10** Solve the equations: a) $-3x + 12 = 5x - 10$ b) $4(x + 2) = 3x - 4$ c) $5x + 2(x + 6) = -9$
Week 3	**Day 11** Look up a math topic and read about the history. Who discovered it? How was it used? Ex. pi, gallons, metric…	**Day 12** Is the quadrilateral with vertices $(-6,2)$, $(-3,6)$, $(9,-3)$, $(6,-7)$ a rectangle? Explain.	**Day 13** Ask at least 15 people you know (friends, parents, siblings) to determine if they play a sport (yes/no) or do they play an instrument (yes/no). Create a graph that would help visualize the association, if any, between playing a sport and playing a musical instrument.	**Day 14** Visit the website http://nlvm.usu.edu/en/nav/vlibrary.html . Challenge yourself with fun activities! List them.	**Day 15** Determine two values of *a* such that it creates one solution and no solution respectively. $y = 3x - 5$ $y = ax + 3$
Week 4	**Day 16** A penny is about $\frac{1}{16}$ of an inch thick. Research the internet to determine how many pennies were minted in 2013 and determine how tall a stack would be in feet and inches.	**Day 17** Go to http://nrich.maths.org/public/leg.php?code=218&cl=3&cldcmpid=5864 website, and play a probability game.	**Day 18** Determine the missing values in the table if the input values can be any English word and output values are letters from the English alphabet.	**Day 19** Choosing from the lengths below to make a triangle, which lengths would create a right triangle? 5cm, 6cm, 8 cm, 10 cm, 12 cm, 13 cm	**Day 20** Create two number sentences where the solution is -3 in which: a) Both numbers are integers b) Both numbers are fractions
Week 5	**Day 21** If a six-pack of soda cost $2.25, how much will it cost to buy 10 sodas?	**Day 22** Add & Subtract: $2\frac{1}{3} + \left(-3\frac{4}{5}\right) =$ $2\frac{1}{3} - \left(-3\frac{4}{5}\right) =$	**Day 23** Evaluate x = -2 if $y = 3x^2 - 5x + 2$	**Day 24** Choose a favorite professional athlete and research his/her annual salary. How much does s/he earn in a month? A day?	**Day 25** Choose a geometry activity at **Math Illuminations** http://illuminations.nctm.org/activitysearch.aspx **Record what you did.**

Algebra-8 Summer Learning Packet

Algebra-8 Summer Work Calendar
August

Week 6	Day 26 Using a receipt, find the mean, median, and mode of the prices of the items on the receipt from a store (grocery, clothing …)	Day 27 Solve: $3w + 50 = 20 + 5w$ Can you write a real world problem that this equation represents?	Day 28 The pictures below show screenshots of the battery charge indicator after it was plugged into the computer at 9:11 a.m. What are the two variables in this situation? When will the battery be charged? (41%) Sat 9:11 AM (56%) Sat 9:27 AM (64%) Sat 9:36 AM (74%) Sat 9:48 AM (79%) Sat 9:55 AM (86%) Sat 10:08 AM (91%) Sat 10:17 AM	Day 29 Visit the website: http://nrich.maths.org/secondary-lower and play a game with positive and negative integers.	Day 30 Play a strategy game. Ex. Monopoly, Parcheesi, Mancala, Connect Four … What strategy did you use?	
Week 7	Day 31 Look up a famous math person and read about him/her. What did s/he discovered? How was it used? Ex. Fibonacci, Pythagoras …	Day 32 Play **Sudoku** from the newspaper How did logic help you to solve the puzzle?	Day 33 Visit the website Figure This and look for a real life math challenge. http://www.figurethis.org/index.html	Day 34 Determine a value of x such that $y = 17$ for $y = -3x + 2$	Day 35 Write a system of equations that has a solution of (-2, -4).	
Week 8	Day 36 visit the website: http://nrich.maths.org/5864 and play *Connect Three* with positive & negative integers.	Day 37 Calculate: $\left(-1\frac{7}{8}\right)\left(2\frac{2}{5}\right) =$ $\left(-1\frac{7}{8}\right) \div \left(2\frac{2}{5}\right) =$	Day 38 Tim claims that the difference between positive and negative number is always negative or zero. Write a situation that supports Tim's claim and another that disproves him.	Day 39 A segment with endpoints of (2,4) and (-3,-1) is translated <x – 3, y + 2>. What are the new points of the segment?	Day 40 A sphere and cone have the same volume. Each figure has a radius of 3 inches. What is the height of the cone?	
Week 9	Day 41 In the following equation, a and b are both integers, find their value: $a(3x – 8) = -18x + 2b$	Day 42 John and Kim wrote down two different functions that have the same rate of change. John's function is represented by the table to the right. 	x	y
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-1	-5
1	-1
3	3 | Create a graph of Kim's function.	Day 43 Write an equation of the line in slope intercept from the graph on the right.	Day 44 Place the numbers –2, -1, 0, 1, 2 in the circles in the diagram so the sum of the numbers in each direction is the same.	Day 45 **YOU DID IT!** Please bring your journal to your eighth grade teacher on the first day of school!	

Algebra-8 Summer Learning Packet

Date	Website (Give Name)	Activity	Content Focus	Book Name (Give Name)	Minutes Worked	Parent Initial
7/2/14	nrich.maths.org	Coin Tossing Game	Experimental Probability	----	15 minutes	PLR

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Date	Website (Give Name)	Activity	Content Focus	Book Name (Give Name)	Minutes Worked	Parent Initial
8/5/14	nrich.maths.org	Flippin' Discs	Experimental Probability	----	15 minutes	PLR

Algebra-8 Summer Learning Packet

Algebra-8 Answer Key
Answers will vary for many of the activities depending on the choices students make. Here are the answers for activities with specific solutions.

Day 1
Let x = number of hours worked
$$45x + 65 = 290$$
$$45x = 225$$
$$x = 5 \text{ hours}$$

Day 2
Longest possible length: 4
Shortest possible length: 2

Day 3
Answers will vary (Possible answer: $3x - 4 = 9x - 22$)

Day 4
Notice that adjacent angles are not all composed from adjacent rays. But a pair of adjacent angles is determined by three rays and each collection of three rays determines a different pair of adjacent angles. Thus, each small angle has four adjacent angles. In all, there are 20 adjacent angels.

Day 6
$y = \frac{1}{4}x - 5$

Day 7
(1000, 1986)

Day 8
High Tides: 2
Low Tides: 2
Time between high tides: 12-hours

Day 10

    a) $x = -\frac{5}{2} = 2.5$
    b) $x = -12$
    c) $x = -3$

Day 15
One solution: a = any number other than 3
No solution: a = 3

Day 18
Answers will vary for most of the table. The output must equal the last letter of the input in the table.

Day 19
6 cm, 8 cm, 10 cm
OR
5 cm, 12 cm, 13 cm

Day 20
    a) Answers will vary
        Possible Answer: 5 + (-8) = -3
    b) Answers will vary
        Possible Answer: $2\frac{3}{4} - 5\frac{3}{4}$

Day 21
$$\frac{Number\ of\ sodas}{Cost} = \frac{6}{\$2.25} = \frac{10}{x}$$
$x = \$3.75$

Day 22
2 + (-3) = -1
(-2) + (-3) = -5
(-2) + 3 = -1

Day 23
$y = 3(-2)^2 - 5(-2) + 2 = 24$

Day 27
$w = 15$
Possible problem: (Answers will vary)
Sally starts with $50 and deposits $3 per day. Harry starts with $20 and adds $5 per day. After how many days will they have the same amount of money?

Day 28
The two variables are time, t and battery charge, b. There are several ways we can choose the units. A reasonable choice is "time in minutes since the laptop was plugged in" and "battery charge in percentage of full, %". The approximate function of the variables can be defined as $b = 0.76t + 43$. We can also use the equation to solve $0.76t + 43 = 100$ for t to obtain $t = 75$ minutes.

Day 34
$17 = -3x + 2$
$x = -5$

Day 35
Answers will vary. Possible equations:
$2x - 3y = 8$
$5x + y = -14$

Day 37

$\qquad$ a) $-\frac{9}{2} = 4\frac{1}{2}$

$\qquad$ b) $-\frac{25}{32}$

Day 38

Answers will vary

$\qquad$ Supports Tim's claim:

$\qquad$ -2 – (+3) = -5

$\qquad$ Disproves Tim's claim

$\qquad$ +3 – (-2) = +5

Day 39

New endpoints are (5, 2) and (-6, 3)

Day40

The height of the cone is 12 inches.
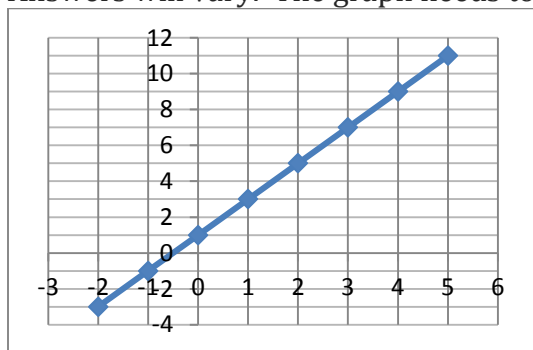
Day 41

a = -6

b = 24

Day 42

Answers will vary. The graph needs to have a slope of 2. Sample graph below.

Day 43

$y = -\frac{1}{3}x$

Day 44

Possible answer:

-2	0	2
	1	
	-1	