Name: _____

Grade: _____

Math Quest

Grades 6-8

SUMMER CHALLENGE

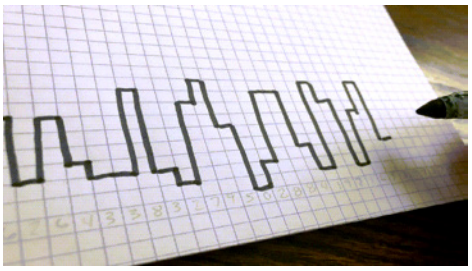
Complete these activities and return this signed document to your school for a chance to win a prize! You must complete at least 8 out of the 10 activities to be eligible to win.

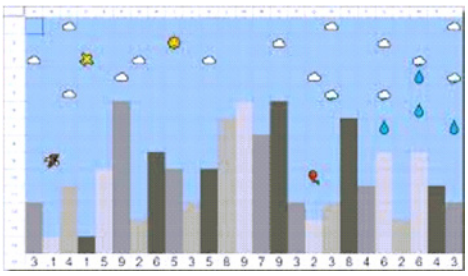
GET CREATIVE

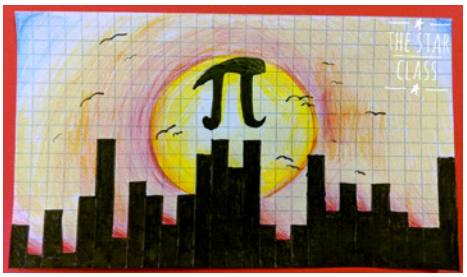
☐ **Pi City Skyline**

Use the digits of Pi to create a cityscape, or skyline.

- What is Pi? How many digits are in Pi?
  - Do some research to find out.
  - Ask friends and family members what they know about Pi (the one related to circles...not the one you eat).
  - Write down the first 40 digits of Pi.
- Use a sheet of graph paper to graph the digits of Pi like a bar graph.
  - This can be done on graph paper or on the computer using a program like Google Sheets or Microsoft Excel.
  - On the horizontal axis, each line will represent one digit of Pi. The value of that digit will be represented by the height of the bar.
  - Once you've graphed all of the digits that will fit on your paper, decorate your cityscape as desired using any art supplies you have available. See the examples shown for some inspiration.
- Show off your art to a friend or family member and tell them all about your Pi research.



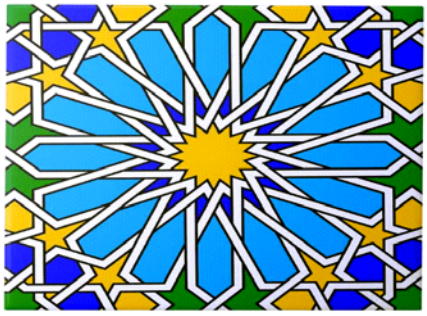




☐ **Paper Tiles**

Create paper tiles with a symmetric, geometric design like those often seen in Spanish and Islamic architecture

- Research symmetric, geometric patterns for some inspiration. An image has been included as well.
- Use a square piece of paper or THIS TEMPLATE (https://tinyurl.com/MathQuest6-8) for your paper tile. If you don't have a printer, follow the link to see an example of some shapes you may want to create a stencil for to help you with your design.
- Decorate your square paper tile with a geometric pattern using any art supplies you have available.
- Show a friend or family member your art. Describe the process you used to create a symmetric design, the shapes you used to create your tile, and any lines of symmetry your design has.
- Make more tiles and try out different designs and colors. Invite your family members or friends to make one too



Seminole County Public Schools

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Math Quest

Grades 6-8

MATH IN ACTION

The Best Deal

Which store has the cheapest prices?

- Use the grocery store ads that come in the mail or the internet to find the cost for each of the items on the grocery list shown for two (2) different stores.
- Calculate the total cost to buy all of the items on the list for each store. Sales tax does not need to be calculated.
  - Which store is cheaper? How much cheaper?

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- If your family were to shop at BOTH stores and bought each item from the store where it is cheaper, what is the least amount of money your family would need to buy all of the items on the list? How much money could be saved by going to two stores?
- Did you do the Grades 6-8 Math Quest last summer? If so: Do you still know how much the groceries cost last year? How do the costs compare?
- Have a family member check your work. Explain to them which store is cheaper if you only go to one store and how much money could be saved by going to two stores.

Item	Amount	Store A Price	Store B Price	Item	Amount	Store A Price	Store B Price
Bananas	1.5 pounds			Bread	2 loaves		
Pre-mixed salad	2 bags			Ice cream	1 container		
Frozen pizza	1 pizza			Tuna Fish	4 cans		
Milk	1 gallon			Laundry Detergent	2 containers		
Spaghetti Sauce	3 jars			Toilet Paper	12 rolls		
Spaghetti Noodles	3 boxes			Shampoo	1 bottle		
Ground Beef	3.5 pounds			Cookies	2 packages		
Juice	1 container			Chips	3 bags		

%

Cookie Dilemma

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You want to make cookies...but your only measuring spoon is 1 tablespoon.

- Find your favorite cookie recipe and write it down. This could be a favorite family recipe or one that you find on the internet and want to try.
- Rewrite the recipe with all units as tablespoons. For example, a recipe that requires 1 cup of sugar would need about 16 tablespoons of sugar. A table of conversions has been provided for you.
- Since you only have 1 tablespoon, you may need to make more than one batch of cookies. How many batches of cookies will you need to make in order to use only whole numbers of tablespoons? Write the recipe for this many batches using only tablespoons as units.
- Show a family member your recipe and explain your dilemma.
- Safety Warning: DO NOT bake any cookies without prior permission and supervision from an adult.

PLAY GAMES

☐ **BINGO, but with Math**

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- Supplies: paper, something to write with, and two standard dice
- Prepare your BINGO card:
  - Create a BINGO style table on your paper. It should have 5 rows and 5 columns.
  - Choose numbers from 0 to 100 to fill in the spaces on your BINGO card. You cannot repeat any numbers on your card.
- Number of players: 1 or more
  - If you play with friend(s) or family member(s) each player will need their own card.
  - To play by yourself, you could make more than one card and see which one wins. This will let you get in a few practice rounds and determine the best numbers to fill in your spaces.
- Play:
  - Each player takes a turn rolling the dice.
  - Each time the dice are rolled, find the product of the two numbers showing on the top side of the dice.
  - Mark off each number on your card that is a **factor or multiple** of the product from the dice.
- Winner:
  - Just like in any BINGO game, you can choose the winning pattern before the game. Some winning patterns are:
    - 5 in a row, column, or diagonal
    - 4 corners
    - Full card
- Reflect:
  - What are the best numbers to include on your board? Why?
  - What are the worst numbers to include on your board? Why?

☐ **Design Your Own Puzzle**

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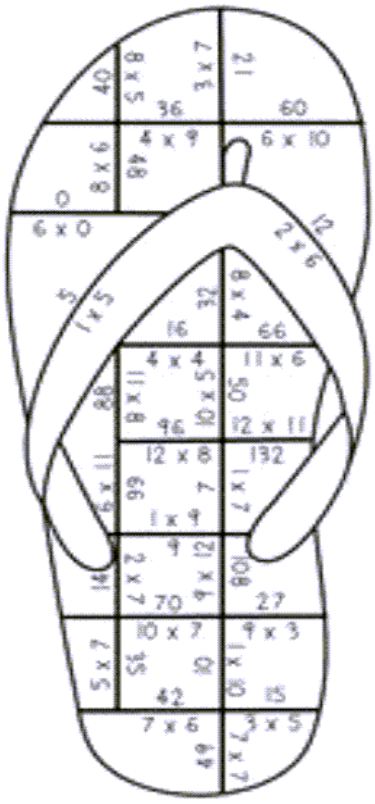
- Your goal is to create your own puzzle to practice math facts. A flip flop multiplication puzzle is shown as an example.
- Start by drawing a picture, like the flip flop, or finding an outline to print online.
- Draw lines on your picture to show where you will cut. Do not cut the individual puzzle pieces out until you write in the math problems.
- Write a numerical expression on the edge of one piece with the value of the expression on the other side of the edge.
  - You can use any operations (add, subtract, multiply, divide) or even exponents or absolute value to make your expressions.
  - As an example, take a look at the top of the flip flop. You will see 37 on one edge of piece, with 21 on the other side. When building the puzzle, that is how you will know the puzzle pieces go together!
  - Try not to repeat any values! For example, you may not want to use 43 and 26 as expressions because they both have a value of 12.
- Once all of the expressions and values are written, cut your puzzle along the lines.
- Mix up the pieces and build your puzzle! Remember, to build the puzzle, you will need to match expressions with their value.



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Math Quest

Grades 6-8

REASONING WITH MATHEMATICS

Equivalent Ratios

- Using the digits 0 to 9 at most one time each, place a digit in each box to make two equivalent ratios where one of the ratios is a unit rate.

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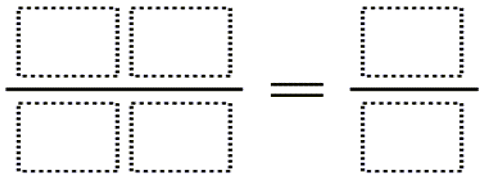
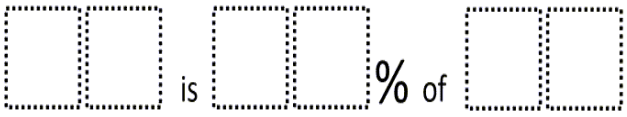


- How many different sets of equivalent expressions can you make?

Percent of a Number

- Using the digits 0 to 9 at most one time each, fill in the boxes to make two true statements without rounding. You may reuse all of the digits for your second statement.



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- If you've created two statements already, try to make more!

Data Set

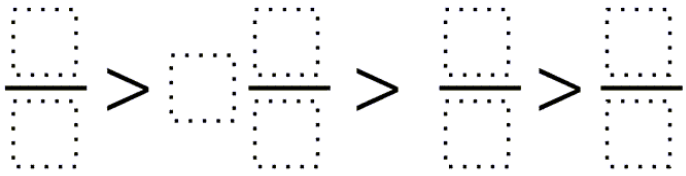
- Using the digits 1 to 9, find a six number data set that has a Mode of 1, Median of 2, and Mean of 3. Digits can be repeated.

9

- How many different ways can you make a data set that meets these criteria?

Ordering Fractions

- Using the digits 1 to 9 at most one time each, place a digit in each box to make a true statement. Try to find solutions where the fractions are in their lowest terms.



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- After you've found a solution, try to find another one! There are many.