BMS Mathematics

Supplemental opportunities in the world of Mathematics!

These activities are intended for middle school aged students but can be adjusted for the whole family! Be creative, have fun, and enjoy!

"Mathing" Around:

Cut It In Half or Double It: Using a recipe, bake a sweet treat or help prepare a meal! Use your knowledge about fractions!

Graphing: Tally mark how many times you, or your whole family, washes their hands each day. At the end of the week, make a graph to display your data. (Bar graph, pie chart, etc.)

Online Games/Apps/Resources:

- www.mathplayground.com
- www.purplemath.com
- www.mathisfun.com

Get Some Fresh Air!

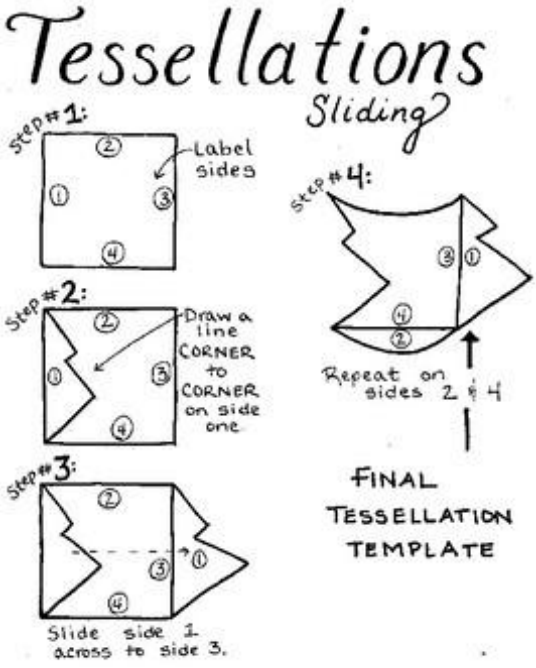
Nature Walk: Go on a scavenger hunt looking for shapes and patterns in nature. These can be any shapes (2-D/3-D), patterns, or types of symmetry. Document your findings with a sketchbook, pictures, or other creative ways. Make a poster, slideshow, book, brochure, etc.
*Challenge: Categorize your findings by attributes of your choice! (size, color, shape, pattern, type of symmetry, etc.)

Artist's Corner:

Tessellations: A surface covered with a repeated pattern of flat shapes so that there are no overlaps or gaps; sometimes called Tiling.

Materials Needed: Scissors, tape, pencil, plain white paper, 3x3 (or larger) square paper, colored pencils (or markers, crayons, etc.)

Make a template of your choice using the small square. (See the diagram on the right.) Use that to create a pattern on your plain white paper. Create animals, color patterns, etc. Add color and/or shading. Be creative!



Office Hours:

(Quicker responses during these times.)

Mrs. Clark
Mon-Tues 12pm-2pm; Thurs-Fri 10am-12pm
Email: karlac@banks.k12.or.us

Mrs. Thomas
Mon 12pm-2pm; Tues/Thurs/Fri: 9am-11am
Email: ashleyt@banks.k12.or.us

Problem of the Day:

On the following two pages, you will find a variety of problems to solve. These problems are designed to be solved in different ways, and some may have more than one answer. Involve the whole family and challenge yourself to solve all of them, or just a few! Answers will be available in the next newsletter.

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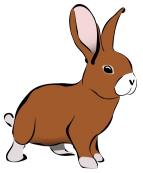
Problem of the Day

Sources: https://www.youcubed.org/tasks/ **and** https://www.insidemathematics.org/problems-of-the-month

Problem 1:

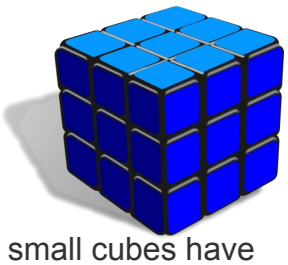
Consider a collection of pennies with the following constraints:
When the pennies are put in groups of 2 there is one penny left over. When they are put in groups of three, five and six there is also one penny left over. But when they are put in groups of seven
there are no pennies left over. How many pennies could there be?

Problem 2:



Leo the Rabbit is climbing up a flight of 10 steps. Leo can only hop up 1 or 2 steps each time he hops. He never hops down, only up. How many different ways can Leo hop up the flight of 10 steps? Provide evidence to justify your thinking.

Problem 3:



Imagine that we paint a 3 x 3 x 3 cube blue on every side.

1. How many of the small cubes have 3 blue faces?
2. How many have 2 blue faces?
3. How many have 1 blue face?
4. How many have not been painted at all?

Now answer the same questions about a 4x4x4 cube and then a 5x5x5 cube.
Can you come up with a general rule to find these answers for any sized cube?

Problem 4:

Rob and Jennie were making necklaces to sell at the school fair. They decided to make them very mathematical. Each necklace must have eight beads: four of one color and four of another. Each necklace must be symmetrical.
(example: YGYGGYGY with yellow & green)
How many different necklaces could they make?
What if they had 9 beads (five of one color and four of another)?
What if they had 10 beads (five of each color)?
How could someone determine the answer to this question given any number of beads?

Problem 5:

In shops with lots of ice-cream flavors there are many different flavor combinations, even with only a 2-scoop cone. With 1 ice-cream flavor there is 1 kind of 2-scoop ice cream, but with 2 flavors there are 3 possible combinations (eg vanilla/vanilla, chocolate/chocolate, and vanilla/chocolate).

- How many kinds of 2-scoop cones are there with 5 flavors?
- How many kinds of 2-scoop cones are there with 10 flavors?
- *Challenge* What about “n” flavors?

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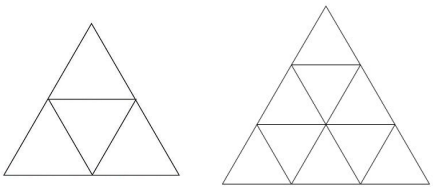
Problem of the Day

Problem 6:



How many equilateral triangles are there in the first figure?
How many are in the 2nd figure?
Draw the next two figures and find the number of triangles. What patterns do you see?

Problem 7:

Pick a 3-digit number that contains three different digits. Order the digits from highest to lowest to create the largest number. Next order the digits from lowest to highest to create the smallest number. Find the positive difference between the two numbers.
Example: 987 - 789

Do this with 3 more sets of 3-digit numbers.
What patterns did you find?
If you were to take another set of numbers, could you find the difference without completing the entire subtraction process?
What if you use one digit twice (ex: 998)?

Problem 8:

How many different towers can you make using one red, one blue, and one yellow block?
How many can you make if you have a green block as well?
What if you also have an orange block?
What patterns do you see?
How many towers can be made with different numbers of blocks?

Problem 9:

Some students are going out for a picnic lunch. The teachers bought drinks in packs for their classes.
Thirty-three students are in Mrs. Thomas's class. Mrs. Thomas bought 6-packs of juice for her class. She picks students to carry one 6-pack each.
Twenty-two students are in Mrs. Clark's class. Mrs Clark bought 4-packs of juice for her class. She picks students to carry one 4-pack each.
Which teacher had to pick more helpers?
Show how you found your answer.

Problem 10:

Polly works in a zoo and needs to build pens where animals can live and be safe. The walls of the pens are made out of cubes that are connected together. Polly has 40 cubes and wants to make the largest pen possible so that the animals can move around freely but not get loose. Build the largest area using all 40 cubes. Your walls must be

- fully enclosed, with no doors or windows so Polly's animals can't get out;
- have a height of one cube; and
- be joined cube face to cube face (no diagonals/leaning cubes).

Help Polly by making pens of several shapes and determine which pen provides the largest area for the animals. You might want to use graph paper to do this (it will make it easier to find each area).

Choose the largest pen and explain to Polly why it is the largest one that can be made.

BMS Mathematics

Math Games: Feel free to make your own variation of the games we provide.

Game: Spiral

Skill- Multiplication (or any operation)

Objective- The first one to travel from start to finish wins.

Materials-

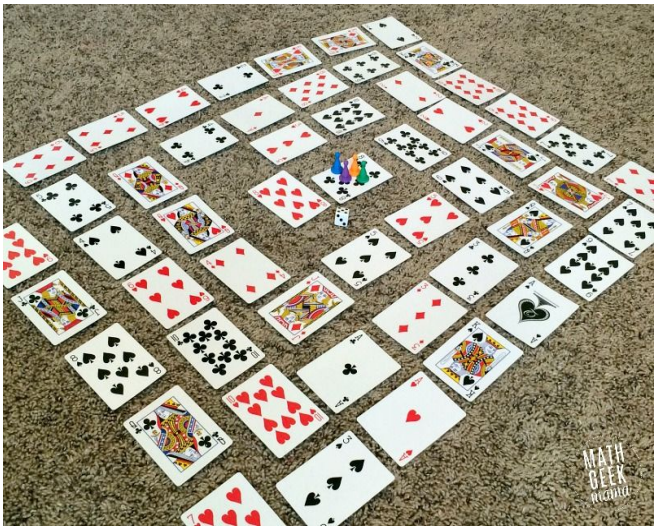
- Deck of playing cards (or number cards 1-13)
- Game pieces for each player (coins, beads, anything!)
- 1 or 2 dice
- (Ace = 1, Jack = 11, Queen = 12, King = 13)

How to Play-

1. Create a spiral using the complete deck of cards. (Picture shown) This will serve as your game board.
2. Each player places their game piece in the center of the spiral (start).
3. Player one rolls the die and moves that number of cards.
4. Multiply the number on the die with the value of the card landed on.
5. If solved correctly, stay there, otherwise go back to the previous position.
6. Players take turns rolling, moving and multiplying.
7. If a player lands on a card with another player on it, once they solve the problem, the first player gets bumped back to start. If they don't multiply it correctly, they go back to the previous position.
8. If a player lands on a "double" (the die and the card are the same number) they get to go again.
9. The first player to land exactly on the last card and solves it correctly, wins!

Other ways to play:

- Add, subtract, or divide
- Red cards can represent negative values, black cards can represent positive values.



Math Funny:

what is a math teacher's favorite kind of tree?

Geometry

If you have any good jokes, send them our way! We would be happy to feature you and your joke in our next newsletter! Must be math related. :)