Spring Break!

Please work on one or more of these topics in class before spring break if your work on the Stomachion is finished. There is no POW homework assignment over spring break. Of course, if you and your family want to have fun with any of the problems over spring break, you're welcome to!

Part One. Spelling and Sound

"Spring" and "break" are interesting words. Spring has five consonants and only one vowel. We could say that's a ratio of five to one. But that's according to its spelling. If we consider the sounds, it's a ratio of four consonants to one vowel because "ng" in this word is a *digraph*, two letters that represent a single sound. Can you find English words with a higher ratio of consonants to vowels? Explain if you're counting letters or sounds.

"Break" is interesting for another reason. It's one of very few English words where "ea" has the sound of the letter "A." Can you find other words where "ea" makes that sound? What other sounds can "ea" represent? What other spellings can represent the sound of "A"?

Part Two. Meanings

"Spring" and "break" are also interesting because each word has many different possible meanings or *senses*. How many sentences can you write with each word showing different meanings for the words?

Part Three. The Counting Number Game

Here's a fun game to play with a friend or a family member. It involves the counting numbers, that infinite set of numbers that begins 1, 2, 3, 4, 5, 6... (They're also called natural numbers or positive integers.) You and your friend call out a counting number at the same time. Whoever has the smaller number wins a point. For example, if you say "one," and your opponent says "four," you win a point and your opponent gets nothing. But there's one more rule! If someone says a number one greater than the other person's number, they win two points and the other person gets nothing. For example, if you say "one," and your opponent says "two," your opponent wins two points and you get nothing. You can decide how many points win the game, maybe ten or twenty. What do you notice when you play? Can you come up with a strategy to help you win? Enjoy it!

Part Four. Mathematicians and Hats

Three mathematicians were given a test. They were shown three black hats and two white hats, and then they were asked to stand in a line, one behind the other, and close their eyes. One of the five hats was placed on each mathematician's head. When they opened their eyes, they could see the hats on the person or people in front of them, but not their own hat, or the two hats left over. They were asked to say if they knew for sure what color their hat was. The mathematician in the back said, "I don't know." Then the mathematician in the middle said, "I don't know." Then the mathematician in the front said, "I know what color hat I have on!" How did she know, and what color hat did she have on?

Part Five. Magic Squares

Here's a magic square with nine numbers:

2	7	6
9	5	1
4	3	8

Every row and column and both diagonals add up to the magic sum of 15. Can you figure out a way to discover the magic sum of an n x n magic square? Here's the beginning of a four by four magic square, with some numbers filled in. Can you complete it?

7	12	1	14
		8	11
	3		
9	6		4

Can you find other magic squares? Can you learn a method for creating them? Do you like Renaissance art? See if you can find out about Durer's magic square!

Part Six. The Square Root of Wonderful

There was once a play on Broadway called "The Square Root of Wonderful." I believe Martin Gardner invented this puzzle to go with it. If every letter in WONDERFUL stands for a digit (not using zero) and OODDF (using the same code) is the square root of wonderful, then what number *is* the square root of wonderful?!

Part Seven. Have fun!