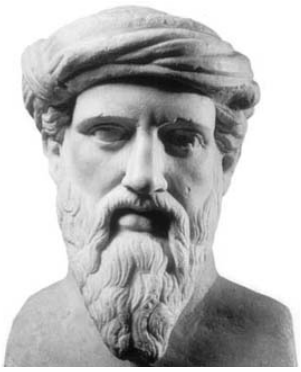
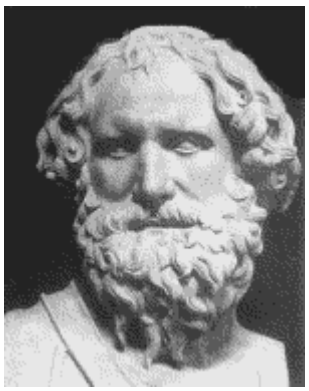


Pythagoras



Archimedes

Euclid

A MATHEMATICS Winter Number Land

Grade 2

Winter 2011-2012

Miami-Dade County Public Schools
Curriculum & Instruction

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Welcome to a Mathematics Winter Number Land

The realm of mathematics contains some of the greatest ideas of humankind. *A Mathematics Winter Number Land* activities included in this packet are a mathematical excursion designed to be read, fun to do, and fun to think and talk about. These activities will guide you in applying the concepts you have studied. Additionally, each activity addresses the Next Generation Sunshine State Standards for Mathematics Benchmarks. Each benchmark is listed at the end of the activity.

The journey to true mathematics understanding can be difficult and challenging but be patient and stay the course. Mathematics involves big ideas. As we make these ideas our own, they will empower us with strength, techniques, and the confidence to accomplish wonderful things. Enjoy working each activity.

Tip for Walking in a *Mathematics Winter Number Land*: the only rule is – HAVE FUN!

If you are in need of additional information about the Elementary Mathematics, *A Mathematics Winter Number Land*, Winter Break Activity Packet, please contact the Division of Mathematics, Science, and Advanced Academic Programs, at 305-995-1934.

Who Were They?

Pythagoras was a Greek mathematical genius and often described as the first pure mathematician. He invented the Pythagorean theorem which states that: "In any right triangle, the area of the square whose side is the hypotenuse (the side of a right triangle opposite the right angle) is equal to the sum of areas of the squares whose sides are the two legs (i.e. the two sides other than the hypotenuse)."

Euclid, the Greek mathematician, was known as the "Father of Geometry". He taught at the university in Alexandria, Egypt. While at the university, he compiled his famous 13 volume treatise called *Elements* that is still the basis of the geometry taught in schools to this day. He used axioms (accepted mathematical truths) to develop a deductive system of proof, which he wrote in his textbook *Elements*. Euclid's first three postulates, with which he begins his *Elements*, are familiar to anyone who has taken geometry: 1) it is possible to draw a straight line between any two points; 2) it is possible to produce a finite straight line continuously in a straight line; and 3) a circle may be described with any center and radius.

Euclid also proved that it is impossible to find the "largest prime number," because if you take the largest known prime number, add 1 to the product of all the primes up to and including it; you will get another prime number. Euclid's proof for this theorem is generally accepted as one of the "classic" proofs because of its conciseness and clarity. Millions of prime numbers are known to exist, and more are being added by mathematicians and computer scientists. Mathematicians since Euclid have attempted without success to find a pattern to the sequence of prime numbers.

Archimedes is one of the great scientists of antiquity also known for his mathematical work. It is believed he studied under followers of Euclid. He proved that an object plunged into liquid becomes lighter by an amount equal to the weight of liquid it displaces. Popular tradition has it that Archimedes made the discovery when he stepped into the bathtub, then celebrated by running through the streets shouting "Eureka!" ("I have found it!"). He also worked out the principle of levers, developed a method for expressing large numbers, discovered ways to determine the areas and volumes of solids, and calculated an approximation of pi (π).

Let's Travel with Numbers

Adapted from Ed.gov

Description:
In second grade, children develop and understanding of the numeration system and place-value concepts. In this activity, license plates are used to help children develop their knowledge of numbers.

Materials: License plates (passenger views license plates while riding in car), paper, crayons or markers

Directions: The goal is to chart each activity in a detailed schedule.

1. Point out the license plate of a car in front of you and ask your child to study it closely. Then, ask him/her to use the individual numbers on the plate to make the largest three-digit number possible and write it down. For example, if the plate number is 254-116, the largest three-digit number that can be made is 654. Have him read aloud his number. Carefully check his answer. If his number is correct, he wins the round. You can change the game by asking all people in the car to do the same; the person with the largest number wins the round.
2. You can do the same game but this time making the smallest three-digit number.
3. If you choose to simplify the activity, have them find the largest single or double digit, or even to recognize individual numbers or add all the numbers on the license plate. Know that the number of letters and numbers vary from car to car so be ready to modify your explorations.

For fun, point out license plates on which numbers are part of a message: ALL 4 1; IML8 (I'm late). Give your child an opportunity to design their own license plate. Hang a copy up in a central place (on the refrigerator). You have a new driver in the house!

Next Generation Sunshine State Standards: Grade 2, Big Idea/Supporting Idea & Benchmarks
BIG IDEA 1: Develop an understanding of base-ten numerations system and place-value concepts.

- **MA.2.A.1.1:** Identify relationships between the digits and their place values through the thousands, including counting by tens and hundreds.
- **MA.2.A.1.2:** Identify and name numbers through thousands in terms of place value and apply this knowledge to expanded notation.
- **MA.2.A.1.3:** Compare and order multi-digit numbers through the thousands.

Math Card Games!

Adapted from Education.com

Description:
Using popular card games, your child can enjoy working out the math.

Slap It! An Odds and Evens Card Game:
This game uses cards to reinforce concepts of odd and even. The game is based on the popular card game, Slapjack.

Materials: A deck of cards
2-8 players

Directions:
The object of the game is to win as many cards as possible, by being the first to slap each odd number as it is played in the center.

1. Deal the cards face down to each player until all the cards have been passed out.
2. Beginning with the dealer, each player lifts the top card off of his pile and places it face up in the center.
3. When the card put down is odd, the first player to slap his hand down on it takes it, as well as all the cards beneath it. The player winning these cards turns them face down, places them under his pile of cards, and shuffles his new pile of cards. The next person plays his/her card.
4. If more than one player slaps a card, the one whose hand is directly on top of it wins the pile. If a player slaps at any card in the center that is not odd, he must give one card, face down, to the player of that card. When a player runs out of cards, he stays in the game until the next odd card is turned. He can slap at that card in an effort to get a new pile. If he fails to win that next pile, he is out of the game.
5. The game continues until one player has won all the cards- the WINNER! ☺

Popular card games that can be used to reinforce mathematics concepts:
(Family card game rules: http://www.webterrace.com/family/games.htm)

- ***War:*** *Skills developed- counting and the card values.*
- ***Go Fish:*** Skills developed- matching and pairing.
- ***Old Maid:*** Skills developed- matching, pairing, and recognizing numbers.
- ***Concentration:*** Skills developed- matching and pairing.

Next Generation Sunshine State Standards: Grade 2, Big Idea/Supporting Idea & Benchmarks
Supporting Idea 4: Algebra

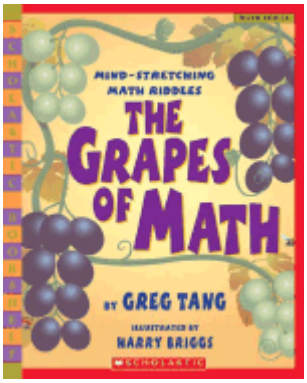
- **MA.2.A.4.2**: Classify numbers as odd or even and explain why.

My Math Literature Connection

This activity has literature connections to enhance literacy and mathematics skills. The local public library is a good resource to find the recommended books.

Description:
You will have volumes of mathematics fun as you explore subtracting and fractions in the stories, respectively.

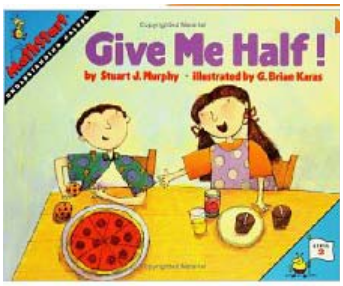
The Grapes of Math by Greg Tang



The book's encourages creative ways to use patterns and combinations of numbers to solve math puzzles.
Things to do-

- Try to answer the math problems while reading the story. Let's see who answers right!

Give Me Half by Stuart J. Murphy



The story is about two bickering siblings who end up deciding that if they each clean up half of the mess they made, they will be finished with the chore a lot sooner.
Things to do-

- Explore the concept of fractions with your child in the kitchen (for example, as you use a recipe, divide portions at dinner).

Next Generation Sunshine State Standards: Grade 2, Big Idea/Supporting Idea & Benchmarks
Supporting Idea 4: Algebra

- **MA.2.G.4.1**: Extend number patterns to build a foundation for understanding multiples and factors – for example, skip counting by 2's, 5's, 10's.

Supporting Idea 5: Geometry and Measurement

- **MA.2.G.5.1**: Use geometric models to demonstrate the relationships between wholes and their parts as a foundation to fractions.

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Title VII of the Civil Rights Act of 1964, as amended - prohibits discrimination in employment on the basis of race, color, religion, gender, or national origin.

Title IX of the Educational Amendments of 1972 - prohibits discrimination on the basis of gender.

Age Discrimination in Employment Act of 1967 (ADEA), as amended - prohibits discrimination on the basis of age with respect to individuals who are at least 40.

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Florida Civil Rights Act of 1992 - secures for all individuals within the state freedom from discrimination because of race, color, religion, sex, national origin, age, handicap, or marital status.

Veterans are provided re-employment rights in accordance with P.L. 93-508 (Federal Law) and Section 295.07 (Florida Statutes), which stipulates categorical preferences for employment.

Revised 9/2008