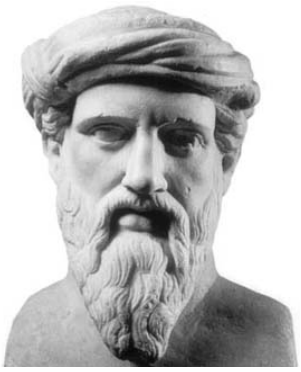
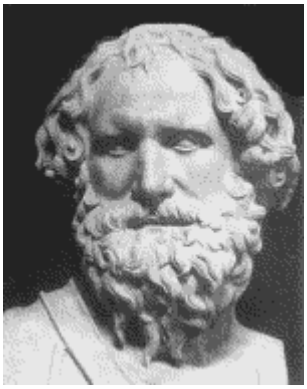


Pythagoras



Archimedes

Euclid

A MATHEMATICS Winter Number Land

Grade 1

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).

Popsicle Math

Adapted from Education.com

Description:
This activity helps children practice their addition and subtraction "math facts".

Materials: 23 Popsicle sticks (or use index cards or hard stock paper to make 23 "sticks"), kitchen timer (or any means to time), crayons or markers, construction paper, scissors, 2 Ziploc bags

Directions:

1. Label the sticks. Have your child hold each stick vertically and label it with one number; make numbers 1 through 20. Use the remaining three sticks to write a plus, minus, and equals sign (+, -, =) using crayons or markers.
2. Work on building an equation. Start with addition. Help your child make problems by using the popsicle sticks and having her hold up the answers. For example, 1+1=2, 1+2=3, 1+3=4, etc.
3. Using the same popsicle sticks already labeled, you can have your child practice making subtraction facts and holding up the answers.
4. Include situations that add a two-digit and a one-digit number, and subtract a two-digit and a one-digit number.
5. Finally, ask your child to make a "popsicle addition" or "popsicle subtraction" fence, using three numbers, the plus or minus, and the equal sign:

6. Make sure to include fences that add a two-digit and a one-digit number, and subtract a two-digit and a one-digit number.
7. Now challenge your child to complete your fence. Place two numbers, the plus or minus and equal sign, leaving one number out. Ask him to put the missing piece (number) of the fence. He may also want to challenge you and check your answer!

Other activities you can do:

- Pump up the level of difficulty. Time your child to see if he can answer each problem correctly in three seconds or less.
- Extend the activity by having your child make flashcards using construction paper, scissors, and crayons or markers. Ask your child to write one number per card, and make separate cards for plus, minus, and equals signs. Then, he can make addition and subtraction problems using the cards and holding up the answers the same way he did with the popsicle sticks.

You can save both the popsicle sticks and the flashcards in ziploc bags to revisit at a later day. Make practicing addition and subtraction fun!

See next page for Common Core Standards for Mathematics, Grade 1, addressed by this activity.

Popsicle Math

This activity touches upon some content of the following standards:

Common Core State Standards: Grade 1; Domain, Cluster & Standards

Domain: Operations and Algebraic Thinking (**1.OA**)

Represent and solve problems involving addition and subtraction.

1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (**1.OA.1**)

Understand and apply properties of operations and the relationship between addition and subtraction.

4. Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. (**1.OA.4**)

Add and subtract within 20.

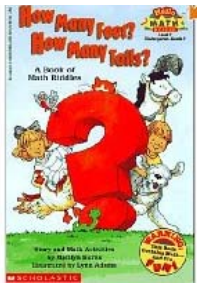
5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2). (**1.OA.5**)
6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). (**1.OA 6**)

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 counting and subtraction in the stories, respectively.

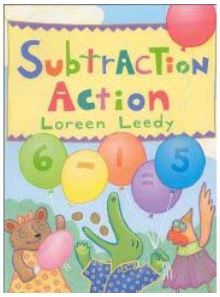
How Many Feet? How Many Tails? A Book of Math Riddles by Marilyn Burns



This book provides the opportunity for children to work with basic counting skills within the thin fictional framework of a walk with Grandpa. A page will contain clues and a question asking a child to guess the identity of an animal. When the child turns the page, he/she will see the answer and an opportunity to count tails and feet in the colorful pictures.
Things to do-

- Try to guess the answers to the riddle and count together. Let's see who guesses right!

Subtraction Action by Loreen Leedy



The book's seven short chapters center around the school fair. A scholarly hippo leads her class on an adventure in numbers. Your child will learn the definition of difference, writing a subtraction equation, regrouping, and three-digit equations. Other brief episodes involve calculations as well. A math problem is presented in every episode with the answers given on the back page.
Things to do-

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

See next page for Common Core Standards for Mathematics, Grade 1, addressed by this activity.

My Math Literature Connection

This activity touches upon some content of the following standards:

Common Core State Standards: Grade 1; Domain, Cluster & Standards

Domain: Operations and Algebraic Thinking (**1.OA**)

Represent and solve problems involving addition and subtraction.

1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (**1.OA.1**)

Understand and apply properties of operations and the relationship between addition and subtraction.

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Math Card Games!

Adapted from EducationWorld.com and Everyday Mathematics

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

Addition Battle:
This game uses cards to reinforce addition skills. The game is based on the popular card game, War.

Materials: A deck of cards
2-8 players

Directions:
1. A player shuffles the cards and places the deck number-side down on the table.
2. Each player turns over two cards and calls out their sum. The player with the highest sum wins the round and takes all the cards.
3. In the case of two or more players with the same "highest sum", each player turns over two more cards and calls out their sum. The player with the highest sum then takes all the cards from both plays.
4. Play ends when not enough cards are left for each player to have another turn. The player with the most cards wins.

Option: Toss a penny to determine whether the player with the most or the fewest cards wins.

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.

See next page for Common Core Standards for Mathematics, Grade 1, addressed by this activity.

Math Card Games!

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ANTI-DISCRIMINATION POLICY

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The School Board of Miami-Dade County, Florida adheres to a policy of nondiscrimination in employment and educational programs/activities and strives affirmatively to provide equal opportunity for all as required by law:

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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.

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The Pregnancy Discrimination Act of 1978 - prohibits discrimination in employment on the basis of pregnancy, childbirth, or related medical conditions.

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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.

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Revised 9/2008