

**E**ARLY **L**EARNING

# MATH *at* HOME



**H**ELPING YOUR  
CHILDREN  
LEARN AND ENJOY  
MATHEMATICS



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Date: April 15, 2016

Session: #396



# Agenda



- Welcome & Introductions
- History of *Early Learning: Math at Home*
- *Growth Mindset*
- Playing and Doing Math
- Talking Math
- Math Stories
- Math Family Nights with Centers
- Closing

# Introductions

Please share with the people near you:

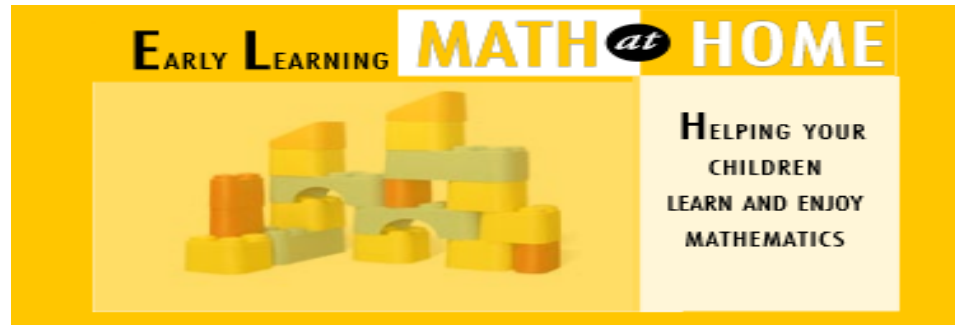
- Your name
- Name & age of an “early learner”
- One thing you do to encourage math learning and problem solving



Photo by Paul Giganti, Jr.

# Clap Like Me!

- Clap a pattern
  - For example: clap, clap, tap; clap, clap, tap, ...
- Then say, “Clap like me.”
- Your child will attempt to copy your clapping pattern
- Repeat your pattern several times
- Let your child make up clapping patterns for you to copy.



- Developed by the California Mathematics Council (CMC)
- Funding for preparation and distribution was provided by a generous grant from the Heising-Simons Foundation
- Author: Paul Giganti, CMC Chair of Special Projects
- Editor: Janet Trentacosta, editor of the CMC journal, the ComMuniCator
- Artistic Design: Sonoma County Office of Education

# Math is More Than Arithmetic

- Read box on p. 19
- Highlight some “first experiences” that will build a strong foundation for children 0 – 5 years old?
- Tell someone near you one of these important concepts:
  - Shape
  - Size
  - Location
  - Pattern
  - How Many?



# Growth Mindset

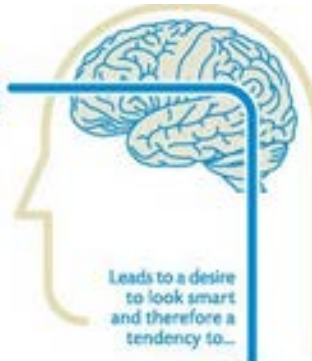
## Early Learning and a Growth Mindset

- Talk about it
- Praise the Process
- The Brain Can Learn
- Help Them Change Their Dialogue
- Encourage Mistakes (Say What?)

[www.youcubed.org](http://www.youcubed.org) Jo Boaler, Stanford Univ.

## Fixed Mind-set

Intelligence is static



Leads to a desire to look smart and therefore a tendency to...

### CHALLENGES

...avoid challenges



### OBSTACLES

...give up easily



### EFFORT

...see effort as fruitless or worse



### CRITICISM

...ignore useful negative feedback



### SUCCESS OF OTHERS

...feel threatened by the success of others

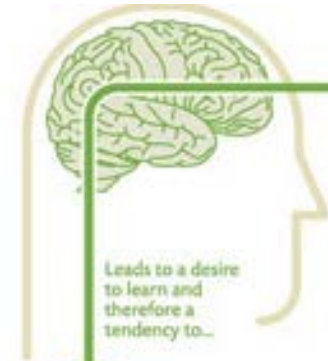


As a result, they may plateau early and achieve less than their full potential.

All this can cause a deterioration in the quality of the work.

## Growth Mind-set

Intelligence can be developed



Leads to a desire to learn and therefore a tendency to...

...embrace challenges



...persist in the face of setbacks



...see effort as the path to mastery



...learn from criticism



...find lessons and inspiration in the success of others



As a result, they reach ever-higher levels of achievement.

All this can cause a constant stream of new skills.



# Playing and Doing Math

- Examine a collection of objects with your group.
- Talk about how you could use the objects to teach early math concepts
- Share a few of your ideas with the whole group.



## COUNTING LOTS OF THINGS

Anything can be counted! Make a game of finding all sorts of things to count—inside and outside! With the earliest counting, it's best to find objects that are mostly the same, such as spoons—even if all the spoons aren't exactly the same. By sometimes counting big things and then sometimes counting little things, children will learn that five spoons is quite different from five elephants, but that both have “fiveness” in common.

Try counting these things:

- Stairs as you go up or down.
- The glasses of orange juice in an orange juice carton (you can always pour it back).
- How many times you can hop on one foot (how many on the other foot?).
- Eggs in the carton.
- Shoes, then pairs of shoes.
- Spoons, knives, and forks—separately or together as “utensils.”
- The petals on different flowers.
- Blue cars on the freeway.
- The pennies you save.

Encourage your children to look all around and come up with many different things to count!

# Talk Math

- Read the box on p. 13  
“Counting Lots of Things”
- Use everyday opportunities to discuss location, direction, distance, time, money, quantity, shapes and their relationships.

# Let's Watch

- An interactive counting situation with Jameson (2 ½ years old).



Photo by Rachel Davis

# Types of Counting

- **Rote counting**

Numbers are recited verbally in sequence without referring to objects

**vs.**

- **Rational counting**

Objects or events are matched with a number name

- “It is through rational counting and matching number names and objects one-to-one that children start to understand the concept of quantity.”

*(p. 2 Math Matters)*

## MATH & CHILDREN'S LITERATURE

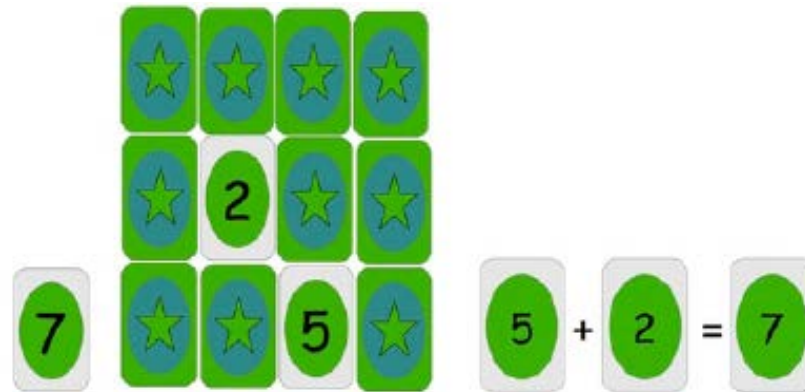
*Anno's Counting Book*, by Mitsumasa Anno  
*Bear in a Square*, by Stella Blackstone (also in Spanish)  
*The Button Box*, by Margarete S. Reid  
*Caps for Sale*, by Esphyr Slobodkina  
*Changes, Changes*, by Pat Hutchins  
*Color Zoo*, by Lois Ehlert  
*Each Orange Had Eight Slices*, by Paul Giganti  
*Fish Eyes*, by Lois Ehlert  
*Gray Rabbit's Odd One Out*, by Alan Baker  
*How Many Feet in the Bed?* by Diane Hamm  
*How Many Snails?* by Paul Giganti  
*Is It Larger? Is It Smaller?* by Tana Hoban  
*The Line Up Book*, Marisabina Russo  
*Math in the Bath*, by Sara Atherlay  
*More Than One*, Miriam Schlein  
*One Hungry Monster*, by Lynn Munsinger  
*One Watermelon Seed*, Celia Barker Lottridge  
*Over in the Meadow*, Ezra Jack Keats  
*A Pig Is Big*, Douglas Florian  
*Rooster's Off to See the World*, by Eric Carle  
*Rosie's Walk*, by Pat Hutchins (also in Spanish)  
*Round Is a Mooncake*, by Roseanne Thong  
*Round Trip*, by Ann Jonas

# Math Stories

- Support literacy and numeracy
- Read early number books featuring counting, number sense or geometry

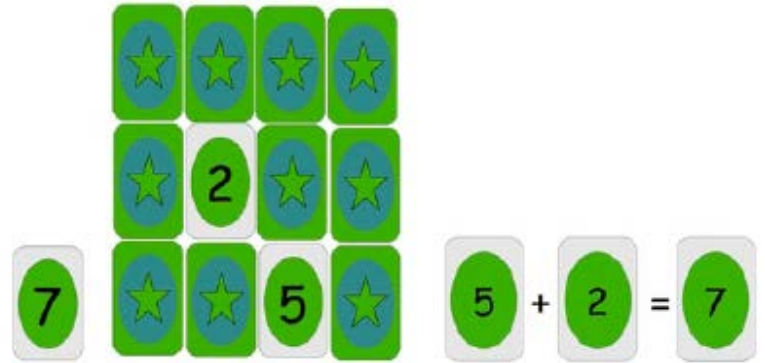
# Family Connection

- NCTM Common Core Tools: “Common Core Math - A Grade-by-Grade View for Parents” – Bevens & Sinha
  - Grade 1 Kiri’s Mathematics Matching Game  
<http://www.illustrativemathematics.org/illustrations/991>



# Kiri's Mathematics Matching Game

- Group: 2-4 players
- Materials: Number cards 0-9  
(four of each)
- Directions:



- An array of 12-20 cards are dealt face down and one target card is placed face up
- Players take turns flipping over two cards, one at a time
- If the sum or difference of the values on the two cards equal the target card, the player states the number sentence that tells the relationship.
- If they are correct, they take the three cards and the dealer replaces the missing cards, so that the array remains full.
- If the player cannot combine the flipped cards to make the target value, they replace the cards face down and it is the next player's turn.

# Math Family Nights

- Play the game or do the activity at each center
- How will these tasks help build number sense for primary students?
  - Matching Dot Cards
  - Go Forward, Go Back
  - Star Cover
  - Part-Part-Whole
  - How Many Are Hiding?
  - Making 5



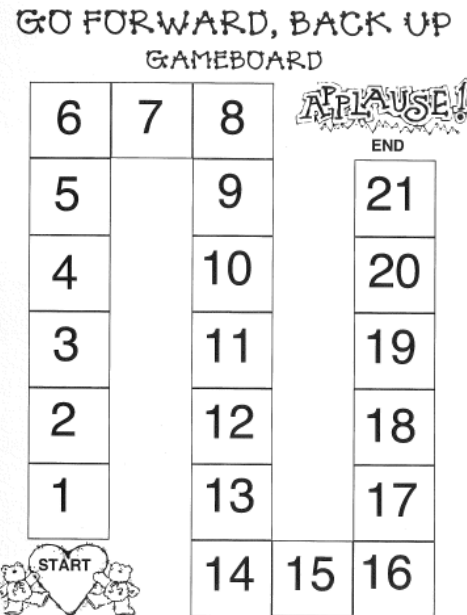
# Go Forward, Go Back

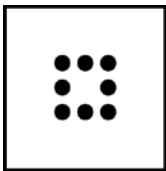
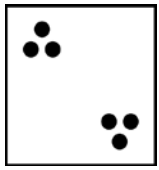
- Place markers on “Start”
- Roll both the action cube and number cube. For + go forward the number of spaces, for – go back.
- Winner is the **last** player to get to the end or beyond

GO FORWARD, BACK UP  
GAMEBOARD

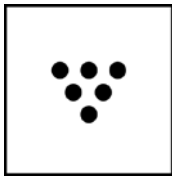
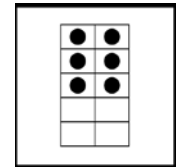
6	7	8	APPLAUSE!
5		9	END
4		10	21
3		11	20
2		12	19
1		13	18
		14	17
		15	16

START





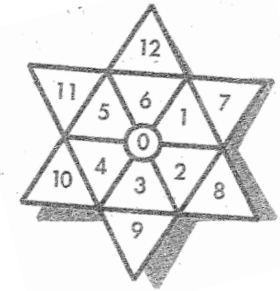
# Match the Dot Patterns



- 2-4 students and 72 dot cards (use numbers appropriate for students)
- Players lay cards out in a rectangular array (face-up)
- Player #1 chooses cards that show the same number of dots and counts the dots on each card.
- Player #2 counts the dots on Player #1's cards and agrees or disagrees that the total is the same on each card.
- Player #2 then chooses cards that show the same number of dots and counts the dots on each card.
- Player #1 counts the dots on Player #2's cards and agrees or disagrees that the total is the same on each card.
- Players alternate turns and stack the matching pairs together.
- If there are single cards left at the end of the game, players decide which stack they belong on.

**Alternative:** One student chooses a card and their partner needs to find another card with the same number of dots.

# Star Cover



- Materials: Game board, 2 dice, 20 markers for each player
- Players roll the dice; largest sum goes first.
- Players alternate turns:
  - Roll the dice. Add the numbers and cover the sum on the star
  - Next, subtract the smaller number from the larger number. Cover that answer with another chip
  - End the turn by putting a chip on the 20-square board to track the number of turns
  - If the number you want to cover already has one of your chips on it, leave it.
  - If the other players chip is on the space you want to cover, hand it back to the owner and place your chip.
  - Winner has the most chips on the star after 10 turns.

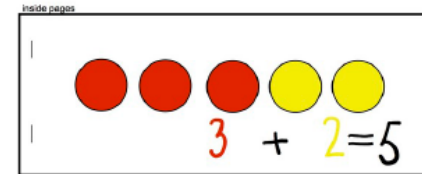
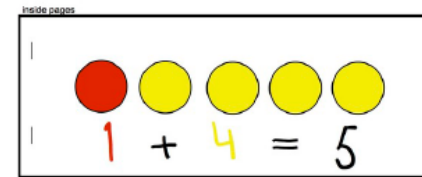
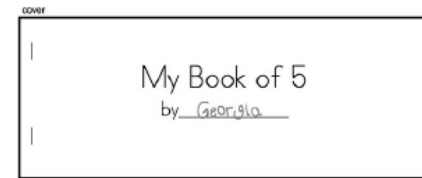
# How Many Are Hiding?



- Decide on the number of bears to play with. Have your child count out that many bears.
- Hide some under your hand or a cup. Ask your child, “How many are hiding?”
- After your child tells you how many are hiding under your hand, reveal the covered bears
- This is practice for procedural fluency with combinations of numbers

# Family Connection

- How are you sharing Common Core Math with families?
- Common Core Math: A Grade-by-Grade View for Parents – Bevans & Sinha
- My Book of Five
  - Students take 5 two-color counters; shake them in their cupped hands and drop them on their page.
  - They color the circles on the page to match the counters and then write a number sentence to represent the combination of 5.



# Book of Five



0	1	2	3	4	5
5	4	3	2	1	0
$0+5=5$	$1+4=5$	$2+3=5$	$3+2=5$	$4+1=5$	$5+0=5$

- ❑ Make the number relationships explicit; record the combinations in a table
- ❑ Ask the students:
  - What do you notice about the numbers in the table?
  - Why is it that as one number gets larger, the other number gets smaller?

# Closing

- Encourage a daily 10 mins. of math in a natural environment through everyday interactions
- Think of a way to talk math to your child tomorrow
- Tell your plan to someone near you
- Thank you for your active participation! Enjoy math with your child! [www.cmc-math.org](http://www.cmc-math.org)  
(free download)



Photo by Paul Giganti, Jr.

# CMC free resources



- [www.cmc-math.org](http://www.cmc-math.org)
  - For Families
    - Math at Home, Early Learning – scroll down for free download of agenda, Power Point and videos.
  - “Clap Like Me” Power Point posted on NCTM website



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TEACHERS OF MATHEMATICS