IT'S MORE THAN COUNTING TO 10!

FOSTERING CHILDREN'S FOUNDATIONAL KNOWLEDGE OF MATHEMATICS IN PRESCHOOL

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ROAD MAP

1. Why does math matter?
2. Making a place for math throughout the day
3. Finding the FUN: Using hands-on materials to teach math concepts

WHY DOES MATH MATTER?

- Early childhood math knowledge and skills predict *both* later math *and* reading achievement (literacy skills only predicted reading)
- Math skills are related to children's Executive Functioning skills (attention, working memory, inhibitory control)
- In our work with the Nashville ELC classrooms, children who participated more often in math activities had stronger math gains. *This difference is even more pronounced for children who entered pre-k with weaker initial skills.*
  - Math activities are "sequential" in nature – a series of steps; require children to plan
  - Math activities can also encourage associative and cooperative learning among children – requiring them to work together to accomplish a task

CLASSROOM MATH PRACTICES?

- *What kinds of math concepts do you focus on with children in your age group?*
- *How do you currently incorporate math content during the day?*
- *Are there some math skills that you are more comfortable teaching than others?*

MAKING TIME FOR MATH

- Everyday Math Activities (Calendar, lining up, tallying)
- Spontaneous Comments and Conversations during Free Play
- Meal-time conversations
- Whole Group Lessons to model skills or introduce materials; asking children to share their work
- Small Group Lessons to teach specific concepts

OPPORTUNITIES FOR MATH

- Keeping your eyes open and your ears on
- Providing math materials and encouraging play in a *math way*
- Talking with a child one-on-one
- Discovering what a child doesn't know

EARLY MATH SKILLS

Understanding Number

- Counting & How Many
- Mental Number line

Understanding Geometric Properties & Spatial Relationships

- Recognizing and Identifying shapes
- Composing shapes
- Building with shapes

Building Blocks for early childhood mathematics (Sarama & Clements, 2004)

IMPORTANCE OF "HANDS-ON" MATH

Playing with manipulatives and talking about math provide *experience* and *insight* for both the teacher and the child.

For children, they are toys that provide concrete opportunities for thinking out loud about math.

For teachers, math manipulatives are tools to help foster and clarify a children's math understanding.

FOSTERING CHILDREN'S CONCEPT OF "NUMBER"

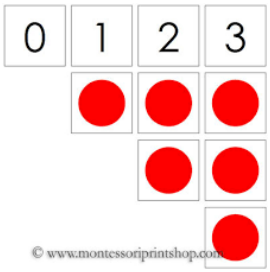
- Counting & How Many
- Mental Number Line

COUNTING & HOW MANY . . .

It's more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10!

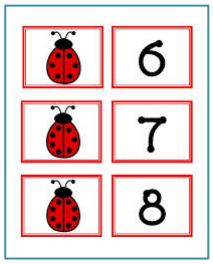
Children need experiences to help them link numerals with quantities. Manipulatives are the concrete tools that help children make that link. They can also foster children's understanding of more complex concepts in more accessible ways.

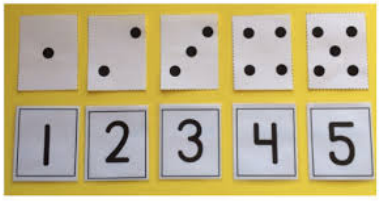
COUNTERS



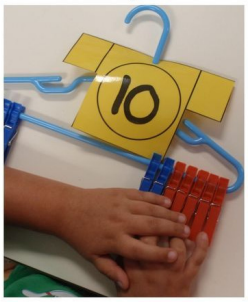
- ✓ Counting practice
- ✓ 1-to-1 correspondence
- ✓ Cardinality

NUMERAL CARDS



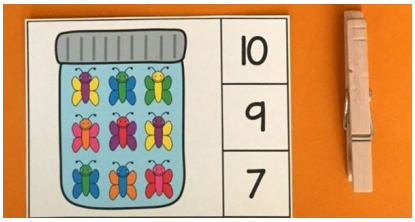


- ✓ Connecting numerals to quantities
- ✓ Composing number



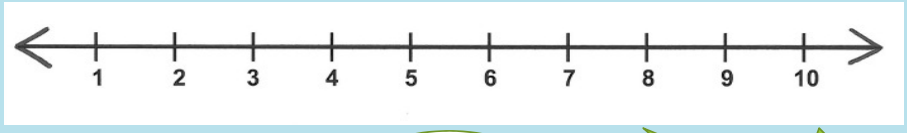
OTHER FUN IDEAS: PLAY-DOH MATS

OTHER FUN IDEAS: FOLDER ACTIVITIES



MENTAL NUMBER LINE

What number comes right before 10?



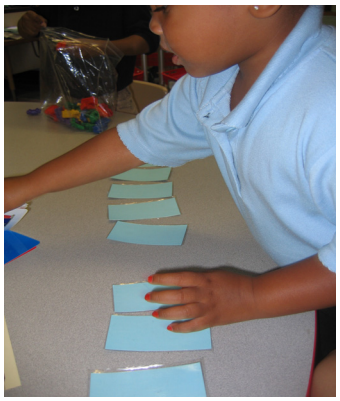
What number is 2 numbers AFTER three?

Children need to develop number line flexibility -- to move up and down the sequence when asked.

NUMBER CARDS

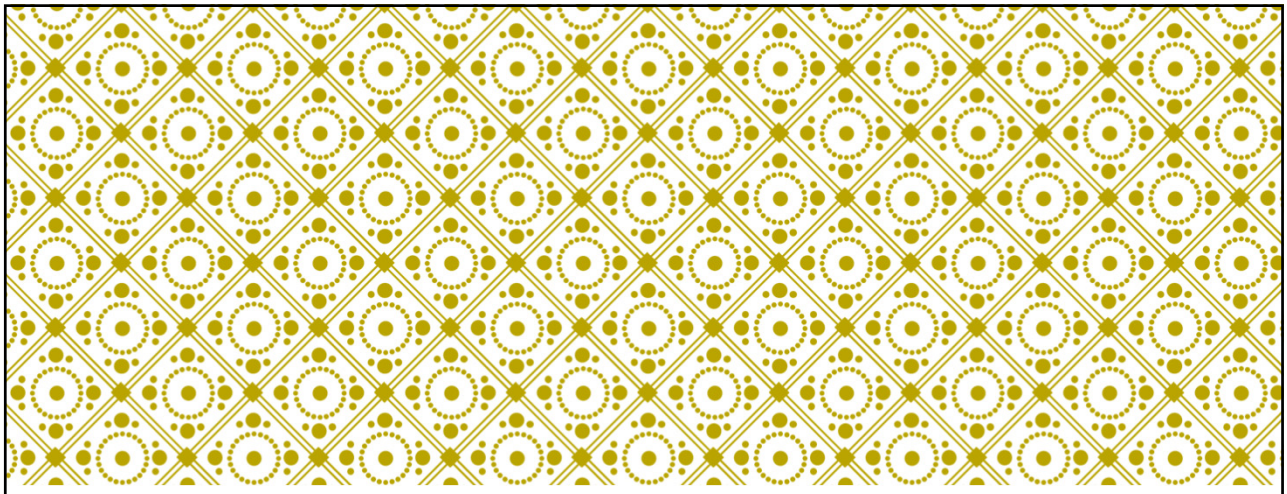
- ✓ Orders numbers 1-10
- ✓ "What number is before 5?"
- ✓ Close eyes, remove number, what's missing?

- ✓ Orders numbers 1-10
- ✓ Turns all cards over
- ✓ "Which number is this?"



ENCOURAGING CHILDREN'S ATTENTION TO NUMBER AND QUANTITY

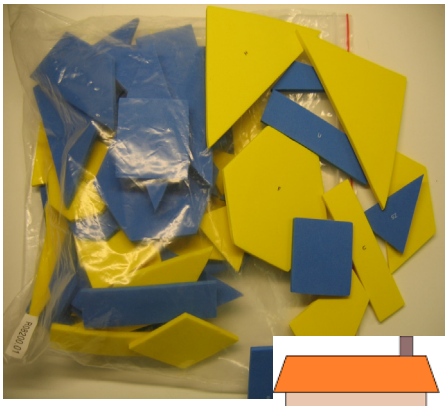
- Thinking out loud helps! Call children's attention to quantity in everyday interactions.
- Avoid questions answered with "yes" or "no".
  - *Instead*, ask questions like, "How did you do that?" "How do you know?" "What is another way to do that?" "What would happen if …?"
- Encourage interaction/discussion between children.
  - "Did anyone do it a different way?" "Do you agree? … Why? Why not?"
  - "Do you have the same number of blocks as she has?"
  - "Look how many cows he has in the pen! Who has the most?"

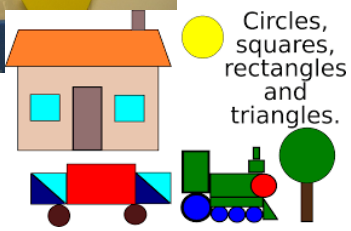


FOSTERING CHILDREN'S EARLY GEOMETRY CONCEPTS

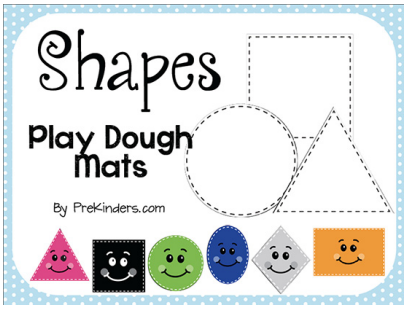
- Recognizing Shapes
- Composing Shapes
- Building with Shapes

RECOGNIZING SHAPES





COMPOSING SHAPES



BUILDING WITH SHAPES

ENCOURAGING CHILDREN'S ATTENTION TO GEOMETRY/SHAPES AND SPATIAL AWARENESS

- Point out shapes and geometric properties in the world around you (example: the shapes and sizes of items in your classroom)
- "Describe your shape. Can your friend guess your shape?"
- "Which of these shapes is not like the other?"
- "How did she make her triangle? Is it different from yours?"
- "Make a flower with these shapes … Can you make the flower with fewer shapes?"

REMEMBER …

In early childhood, play = learning!

You will foster children's mathematical thinking if you follow and encourage their natural curiosity about the world around them!

So …

Look for playful ways to incorporate math into your classroom – and don't forget the FUN!

ADDITIONAL RESOURCES

https://illuminations.nctm.org/Lessons-Activities.aspx

http://www.k-5mathteachingresources.com/

https://www.pinterest.com/tandekile/pre-k-cc-math-objectives/