

# Making Math Meaningful

presented for the summer conference - August, 2009 by Josie Field  
\*ideas for everyday math in preschool\*

- The Five Math Strands
  - Numbers and Operation
  - Geometry and Spatial Sense
  - Measurement
  - Patterns, Function, Algebra
  - Data Analysis

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[josiefield@sbcglobal.net](mailto:josiefield@sbcglobal.net)

## Number and Operation

Building Counting and Number Knowledge

- As we do math activities with children we help them to think quantitatively
- Children need multiple hands on opportunities to learn that things can be counted and measured
- Children are interested in quantity and have some understanding of more or less
- We can help by counting, comparing, ordering, adding and taking away.

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## Children Learn Enumeration

- They learn that a set of things can be represented numerically (Child counts six dogs and when teacher asks how many are in the set child responds "six".)
- They can recognize how many items are in a small group instantly (up to three items without counting by 4 years)
- They can count in order to ten
- They can understand saying a number with an object (one to one correspondence – example one peg to one peg board opening)
- They need to learn that the last number counted is the number in the group (cardinality).

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## Arithmetic Strategies

- Children can practice solving simple addition, subtraction, and division problems (show 2 items and 2 more join the group so now how many?)
- Children can solve problems using small sets of 1 -3 visible or hidden objects (show three bears going into a cave and one more goes in so now how many?)
- Children can practice one to one correspondence and problem solving a (such as one egg to one egg carton, one marker top for each marker, one fork on one napkin).
- \*Samples

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## Geometry and Spatial Reasoning

- For young children geometry means using shapes to look at attributes and discuss their characteristics. Teachers can help by noticing and discussing everything in the classroom and outdoors and its shape. Children need to know the distinguishing characteristics of various shapes such as sides, corners, angles.
- Spatial reasoning includes using position words (above, below) and relationships between objects (both have line and corners).
- \*Samples

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## Measurement

- During early childhood children start to understand measurement through their experiences with objects.
  - They learn that objects have attributes like length, weight, capacity (volume), temperature, texture.
  - Teachers provide measurement experiences and tools so that children can compare and order these items.
  - Children then acquire and use measurement language such as longer, shorter, heavier, lighter.
  - Both standard (ruler, tape measure) and non standard (blocks, a foot, a book) measurement tools can be used.

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## Ideas

- Measure any toy or furniture in room
- Measure items in nature, compare and contrast findings
- Use blocks, hands, feet, yarn or string pieces, lego pieces to measure
- Line up by tall to short, weigh children at intervals during the year and discuss
- Discuss, collect and post measurements
- Use balance scales to compare heavier and lighter items that might be a similar size but different weight

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## Algebraic Reasoning and Patterns

- This skill area develops slowly for children at this age. Learning about patterns and how to create them helps build early algebraic reasoning foundation.
- When we teach patterns it is critical to teach "units" in a pattern and always to give at least two full "units" before we ask children what the pattern is or to extend the pattern. ("a blue and green, and another blue and green, and another blue and green to reinforce the concepts of unit)

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# Ideas

- Sort anything you can find by a characteristic (rough-smooth, shiny-dull, hard-soft). These might be rocks, shells, lemons, apples, pennies, buttons, pieces of fabric.
- Classify items in any way you can (living-non living, large-small, sweet- sour). Ask children why something would not fit in a group.
- Organize or order from large to small, thin to wide, long to short, dark to light. Blocks, colored paper, pipe cleaners are great.
- Graph favorite foods, animals, vehicles in various ways.
- Ask children to predict outcomes, record the predictions, then compare results (Have them guess how many steps to get outdoors, how long before a seed will germinate, how many days it will rain)
- Use math concepts **in large and small group, during transitions, at mealtime, when talking with the children in centers, for parent connections at home, all day in all centers.**

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