Intentional Mathematics:
Targeting Preschool Numeracy and Math TASN/KITS Webinar 2013

Big Ideas for Preschool Math

Carla Heintz, USD 259 Teaching Specialist

Numbers and Operations*

A. **Number Core** (naming, representing and counting)

- **Cardinality**- count and tell how many
    a. Practice counting items as a group
    b. Emphasize that the number the child ended on, is the total amount in the whole group. (ie. after counting 7 bears, say, "WOW great counting we have 7 bears in this group!")
- **Knowing the number word list** – rote counting
    a. Include zero
    b. Count, count and count some more, any time you can count do it, while waiting in line, any transition time
    c. As a math time activity have students count and hop, clap, stomp, or move to help solidify the count sequence in their mind.
- **One to one correspondence**- Count objects, touching or moving each one as you count.
- **Written number symbols-** Practice writing the numeral and learning the name, use paper, dry erase board, in the air with whole body movements on a friends back or on their own palm with a finger, making the number on the floor with your body or with the help of a partner.

Putting all the Skills together:

Say a number and show the numeral and:

- Show multiple representations of each numeral- number of blocks, number on a clock, die/domino pattern, that many fingers.
- Count to that number, move that many times (jump, hop, stomp, clap, etc.)
- Build a tower of that many. For numbers greater than 3 support their understanding of numbers within numbers by using 2 different colored blocks or connecting cubes and ask them how many ways

they can put their blocks together to make that number (i.e. for the number 6, they could use 4 red blocks, and 2 blue blocks; or 3 red blocks and 3 blue blocks; or 1 red block and 5 blue blocks; or 0 red blocks and 6 blue blocks) to show numbers within numbers. (This also supports the relations core and an understanding of quantity)

- Make it relevant by teaching it in context of other domains- color by number, sequencing steps to complete an art project, dramatic play- pizza shop, instead of focusing just on making the pizza, focus on how many pepperoni go on the pizza.
- Play games involving numbers like “Hi Ho Cherry O!”,” Go Fish”, and others
- Do cooking with the class that involves using a recipe and counting out measurements

B. **Relations Core** -connections to and comparisons with other numbers.

- Look for multiple opportunities to build connections to number words and quantity terms- (5 is more than 3, 7 is less than 10, etc.).

- Use 2 hula hoops and divide children between them and ask which hula hoop is more or less, and have them tell you how they know. Try again with different sized groups of children.

- Practice subitizing- using dots on a page or simple manipulatives such as lacer links or inch cubes on a table. Quickly show children the different arrangements of items from 1-5 and ask them how many they saw.

    a. Always start with linear patterns, followed by the “domino” or “dice” configurations leaving random scatters to the end as they are the most difficult.

    b. Use similar shapes on a contrasting background. Stay away from cute pictures and busy backgrounds that might take away from the child being able to see the set.

- Have benchmark collections of objects such as 3, 10, 20 50 and 100 to give children a sense of number size and use them for comparisons when making estimations or talking about if an amount is a large amount like 100, or a small amount like 10.

- **Number Conservation**- Count 2 equal groups of the same item in multiple configurations to show that regardless of how they are arranged there is always the same number. Count 2 equal groups of different size or shaped items multiple times to show that even though one group of items may be larger than the other, there is still the same amount of items,

C. **Operations Core** -addition, subtraction and estimation

- Encourage children to use multiple strategies and talk about how they came up with their answer.
- Use concrete objects and fingers
- Present problem in story form and act them out as a group.
    a. Change-Plus/ Change-Minus
        - Start with an initial amount and add some quantity or take from that amount (change). Resulting in a final amount (e.g. Change Plus- One caterpillar was on the leaf, two more caterpillars crawled on the leaf, how many caterpillars are on the leaf now?, Change Minus- 5 Little Monkeys)

    b. Put-together/Take- Apart
        - Two initial quantities are "put together" to make a third quantity. One quantity is "taken apart" to make 2 quantities. (e.g. Put-together-Bethany has two orange m&ms and three blue m&ms, how many m&ms does she have in all? Take-Apart- Mom bought 4 balloons, one balloon is red, the others are all yellow, how many yellow balloons are there?)
- The final amount is focus of the question and it is more about how they got there, than the answer they came up with.

Geometry*

- **Identify Shapes**-provide a variety of shapes, and a variety of examples of each shape. (different sizes and typical and atypical examples) Encourage descriptive language when talking about each shape and their attributes.

    a. Use a feely box and have children reach inside and describe the shape they are feeling, discuss how shapes are the same and different, form shape with their bodies.
    b. Sort and discuss why certain shapes do or don't fit in each category.
    c. Go on a shape hunt, give each child a shape and have them match that shape to a real-world object.
    d. Create shapes using straws, craft sticks, pipe cleaners, or Wikki Stix, build 3-D shapes with toothpicks and marshmallows,

- **Transformations and Symmetry** use unit blocks, puzzles, and tangrams intentionally and strategically.

    a. Use tangrams to cover pictures.
    b. Create a picture using tangrams and have students copy it.

- **Spatial Reasoning** use spatial vocabulary when giving directions.

    a. Talk about landmarks as you travel from place to place.
    b. Have students reconstruct locations they are familiar with using blocks.
    c. Draw maps of familiar locations such as the classroom their home, or a zoo or town they created in dramatic play or the block center.
    d. Use maps to locate hidden "treasure" in the classroom or on the playground.
    e. Set up an obstacle course using spatial vocabulary to help them navigate through it.

Measurement* Use specific measurement terms- more, less, same, different, longer, shorter, heavier, lighter.

- Provide experiences comparing lengths, mass and volumes of objects. Use measurement for real life application.

- Be specific in the use of counting terms vs. measurement, always need to clarify units when measuring.

- Line up by height.
- Cut a length of ribbon the length of the child's arm and have them hunt for things that are the same length, longer and shorter than their ribbon.
- Have children compare how much sand or water 6 containers will hold, have them show you which holds the most and how they know.
- Ask children to show you which of 2 containers holds more/less when they use a third container to fill both, discuss how they know.

***Numbers and Operations, Geometry and Measurement are the priorities in early childhood.**

Data Analysis- question of the day, and determine which answer was the most/least popular, graph a sorting activity

Algebra- Patterning- Identifying the rule of the pattern helps bring order to a situation and helps math make sense.

- Create patterns with children (using gender, hair color, clothing items, etc.) and have the children determine what your pattern is.
- Do movement patterns such as jump, hop, jump hop, or snap, snap, clap, snap, snap, clap. Make pattern with blocks.
- Go on a pattern walk and look for patterns they see.
- Point out patterns within our numbering system.
- Find patterns in literature