Embedding math instruction in the preschool classroom

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OBJECTIVES

For this session participants will gain a better understanding of

1. How to plan for instructional opportunities using daily routines and schedules
2. How to use typical early childhood materials available to teach math-based concepts
3. Determine what strategies to use when teaching within the routines of the classroom, based on the needs and ability level of your students
Rationale-Math

- Early Math skills are the biggest predictor of children’s math achievement in later school years
- Sequential and cumulative in nature
- Strengthens problem-solving skills and higher level thinking

Taken from: http://www.pbs.org/wgbh/misunderstoodminds/mathbasics.html
Let’s take a look at...

- Environment
- Curriculum
- Schedule
- Activities
- Materials
- Evaluation
Environment

- Physical as well as social-emotional
- Availability, condition and variety of materials
- Number of children
- Number of adults
- Space for 1:1, small group, and large group activities
Curriculum

- What to teach
- When to teach
- Scope & Sequence

*Virginia’s Foundation Blocks for Early Learning: Comprehensive Standards for Four Year Olds (2012)*

Schedule

- Duration of activities
- Number of transitions
- Instructional time
- Teacher-directed
- Child-directed
- Zone defense (staffing)
- Static vs dynamic
- Flexibility
Schedule

- Arrival and Dismissal
- Circle or large group instruction
- Meal times
- Learning centers
- Small group activities
- Outdoor or gross motor play
- Music
- Story time
Activities

- Focus on helping children understand concepts
- Encourage children to use analysis and reasoning skills
- Help children apply concepts to their everyday world
- Help children to think about their own process of thinking
Math Materials

- Quantity, Quality, & Variety
  - Enough for everyone
  - Matching toys to encourage parallel play
  - At or slightly above skill level
  - Accessible, adapted
  - Rotate on regular schedule
  - Developmentally, functionally, culturally, and age-appropriate
Math Materials

Organization and storage
- Easily accessible
- Clearly visible
- Clearly labeled
- Tactile cues
Evaluation

*How will we know if it works?*

- Take data on child progress, methods, materials and outcome
- What do I need to change?
- Was it developmentally appropriate for this age group?
- Can I build on this activity for greater skill development?
Mathematical Concepts

- Number words in songs and fingerplays
- Building understanding of quantity
- Growing understanding of 1:1
- Rote counting (forward and backward)
- Associates number concepts in meaningful ways
- Advancing knowledge of numbers & counting
Mathematical Concepts

- Numbers have meaning
- Comparing numbers with vocabulary
- Counting in sequence
- Shows increased curiosity in numbers
- Solves problems with numbers
Virginia Standards for Mathematics

1. Number and Number Sense*
2. Computation
3. Measurement*
4. Geometry
5. Data Collection and Statistics
6. Patterns and Relationships
Number and Number Sense

- Children must have daily experiences involving counting, comparison and quantity.
- How can we make counting and quantity personally meaningful for young children?
- How can we challenge them beyond the calendar?
- Where can we incorporate these skills in all areas of our day?
Number sense (counting) pre-requisites

To count successfully, a learner must…

- Know the verbal sequence
- Demonstrate one – to – one correspondence
- Keep track
- Say the last number to answer “how many” (cardinality)
Routines & Activities for Number & Number Sense

● Arrival and Dismissal
  • Counting children, steps, ordinal concepts in a line

● Circle or large group time
  • Counting items related to opening activities

● Meal Times
  • One to one correspondence: handing out utensils, plates, napkins

● Music and movement
  • Count tapping or beats, count and compare two sets of instruments
Measurement

- Children must have daily experiences involving comparison and measurement.
- How can we make measurement personally meaningful for young children?
- How can we challenge them beyond just big and small?
- Where can we incorporate these skills in all areas of our day?
Measurement pre-requisites

To measure successfully, a learner must…

- Be able to count sequentially
- Identify numerals
- Differentiate between size comparisons
- Choose best tools for measurement based on size and scope
Routines and Activities for Measurement

- Arrival and Dismissal
  - Measure the length of the sidewalk using a rope

- Meal time
  - Compare the length and weight of food items, utensils, height of cup/milk, etc.

- Small group time
  - Compare length of objects using crayons vs pencils; using scales to compare the weight of objects

- Outdoor play
  - Use a thermometer to look at the temperature of outside vs in the classroom
Measurement
Explore Math Together

- Have variety of math materials/toys/activities
- *Math Around Us* books
- Materials available to make simple math games
- Brainstorm ideas on how you can use math in your classroom
### Measurement

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[Images of children playing with toys and a balance scale showing different items and their measurement on land, sky, and water.]
Additional Resources