

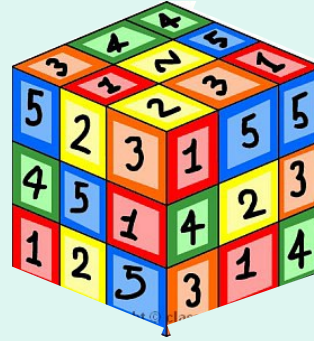
Celebrating
BABIES AND TOTS
2010



Early Math for Infants and Toddlers

VIRGINIA
INFANT & TODDLER SPECIALIST
NETWORK
"Achieving Excellence in Early Care"

Shape and Space



Matter and Motion

Numbers

Patterns, Reasoning and Operations

Change, Limits, Functions, Continuity

Relationships and Navigation

Measurement



Session Objectives

- Identify early math concepts and explain how infants and toddlers acquire those concepts
- Describe indicators of early math concepts for infants and toddlers
- Describe strategies for infusing early math concepts into daily routines, activities, and play for infants and toddlers

The development of mathematical thinking skills begins at birth.



It occurs in a very natural way through play, routines, and loving interactions with adults.

Babies explore the world using their senses. They look, touch, hear, smell, and taste everything!



Infants and toddlers are curious and want to know everything about their environment.



Mathematics is a way of describing the world – a way of thinking, knowing, and problem-solving that is accessible to all children regardless of their prior knowledge and experiences.

Learning About Mathematical Concepts

- Numbers and Operations
- Measurement
- Pattern and Relationships
- Shapes
- Spatial Sense
- Data Collection and Analysis
- Time and Sequence





Numbers and Operations

Building understanding of the concept of numbers, quantity, ways of representing numbers, one-to-one correspondence, and counting.



Numbers and Operations



Birth to 18 months

Indicators

- Begin to build understanding of more.
- Use number words in songs and finger plays with little or no understanding.

Strategies

- During meals, asking child, “Would you like more?”
- Play games, sing songs, and read books that use numbers and counting.





Numbers and Operations



18 months to 36 months

Indicators

- Build some understanding of quantity.
- Demonstrate growing understanding of one-to-one matching.

Strategies

- Signify “all done”/“gone”.
- Create an environment that contains a variety of objects with one-to-one relationships (i.e., containers w/ lids, markers w/ tops, cars and garages).





Measurement

Determining the size, volume, quantity, and other measurable qualities and using the appropriate tools to do so.

Measurement

Birth to 18 months



Indicators

- Explore objects in their environment.
- Show some awareness of the relative size of objects.

Strategies

- Provide an environment rich in child-appropriate learning materials and math manipulatives of various sizes and shapes.
- Provide toys that have incremental sizes (e.g. nesting cups, stackable rings).

Measurement

18 months to 36 months



Indicators

- Connect mathematical language to measurement concepts.
- Explore the concept of volume.
- Show some understanding of the concept of measurement.

Strategies

- Model vocabulary when talking about attributes and characteristics of objects in the environment.
- Provide sand and water play, giving child opportunities to pour, fill, scoop, weigh, and dump to develop and understanding of volume, under adult supervision.
- Use comparison words when playing with big and little toys.

Patterns and Relationships

Recognizing and/or creating planned or random repetitions of events, colors, lines, values, textures, and sound, including pitch, timbre, volume, and other qualities.



Patterns and Relationships

Birth to 18 months

Indicators



- Engage in sustained gazing or tracking of object with eyes.
- Demonstrate object permanence (i.e., realizes that people or things exist even when out of view).
- React to mental images of objects or events.

Strategies

- Provide a stimulating environment.
- Play peek-a-boo.
- Use descriptive language in everyday conversation, to support creation of mental images of objects or events.

Patterns and Relationships

18 months to 36 months



Indicators

- Show interest in patterns.
- Explore similarities and differences of objects (e.g., color, size, shape, and texture).
- Understand the relationship between objects, solving simple jigsaw puzzles and matching similar shapes.

Strategies

- Engage in matching everyday materials.
- Provide opportunities to notice patterns in nature (e.g., types of leaves).
- Provide toys that require problem solving.

Shapes



Recognizing, naming, and comparing and contrasting objects based on their geometric appearance.





Shapes



Birth to 18 months

Indicators

- Explore geometric shapes using their hands, eyes, and mind.
- Play with shape toys, though often will not match correctly.



Strategies

- Provide safe play and art materials that have different shapes (e.g., circles, squares, triangles).
- Engage child with toys or games that involve matching shapes.



Shapes



18 months to 36 months

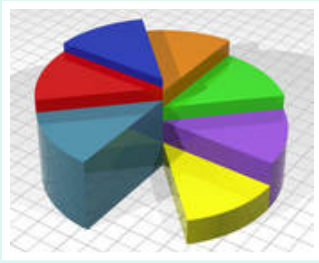
Indicators

- Identify simple objects by their shape.

Strategies

- Use ***shape*** words in daily life (e.g., “Let’s cut the cornbread into squares” and then later, “I like triangles too! How would I make cornbread triangles?”)





Activity

Small Group

1. What are two ideas you can share with families for teaching meaningful counting to their toddler?
2. What are three ideas for practicing measuring with toddlers?
3. What is one activity you could do to embed patterns and sequencing within daily routines?
4. What are some ideas for exposing infants who are mobile to shapes?

10 minutes





Spatial Sense

Acquiring an understanding of the physical relationship (i.e., direction and position) between self and objects, or between two or more objects, in one's environment.

Spatial Sense

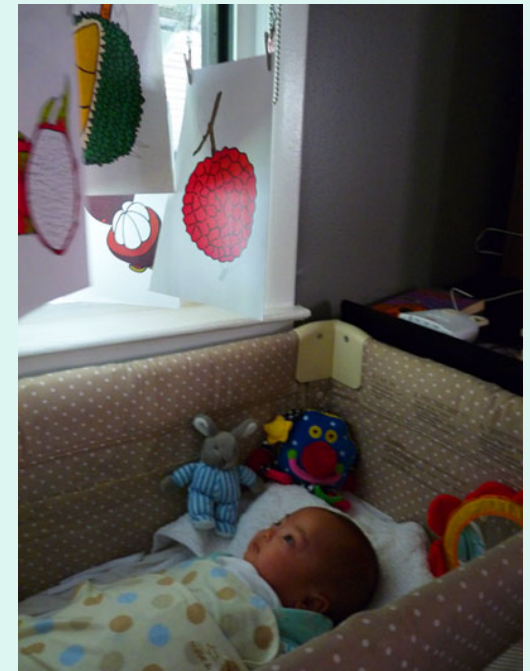
Birth to 18 months

Indicators

- Pay attention to what is happening in the environment.
- Demonstrate use of body and materials in space.

Strategies

- Place a stimulating mobile that plays music over the crib for infants under 5 months of age that are unable to push up on knees.
- Take baby/toddler to places where he/she can observe and explore the environment.



Spatial Sense

18 months to 36 months



Indicators

- Become aware of own body and personal space during active exploration of physical environment.
- Explore the size, shape, and spatial arrangement of real objects.

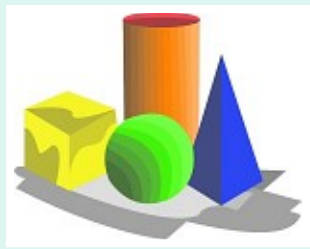
Strategies

- Encourage child to explore spatial relationships through activities and opportunities to move within his/her environments.
- Provide child with various materials with which to build and explore.

Data Collection and Analysis

The gathering, organizing, and analyzing of information, enabling one to make sense of phenomena in the environment.





Data Collection and Analysis

Birth to 18 months

Indicators

- Pay attention to what is happening in the environment.
- Gather information through the senses (e.g., mouthing, grasping, reaching).
- Observe persons or objects in the environment for a period of time.

Strategies

- Provide time daily for child to move freely on the floor safely.
- Follow child's lead while exploring the environment.
- Demonstrate and explain how things can be manipulated to make them different and/or more useful.
- Show child self in mirror.

Data Collection and Analysis

18 months to 36 months

Indicators

- Begin to explore physical properties of objects and to identify their use.
- Recognize objects as the same and different.

Strategies

- Provide opportunities for safe observation and exploration.
- Provide opportunities for the child to create and share collections based on his/her interest.



Data Collection and Analysis



Time and Sequence



Developing an understanding of the concept of time (especially as it relates to daily routines) and the sequencing of objects and events.

Time and Sequence

Birth to 18 months



Indicators

- Develop an understanding of the concept of time as it relates to everyday life (e.g., meals, bath, sleeping).
- Demonstrate some understanding of when things happen in relation to routines.
- Recall information about the immediate past.

Strategies

- Maintain a daily routine.
- Explain your daily routine as you perform the activities (e.g., “It’s time to go outside now”).
- Demonstrate, explain, and give child routines, talk about what happens before and after.

Time and Sequence

18 months to 36 months



Indicators

- Show increased knowledge and memory for details and routines.
- Anticipate, remember, and describe daily sequences of events.

Strategies

- Discuss the daily schedule with the child and asking questions such as, “What do we do after lunch?”
- Help the child recognize and describe sequences in daily routines (e.g., we read a book before naptime).

Activity

Large Group

1. What are some examples of materials that would support the learning of spatial sense for infants and toddlers?
2. What are three ideas for demonstrating how to classify objects with toddlers?
3. What are some ideas for infusing time and sequence concepts into an infant's day?



10 minutes



Application to Practice



- Activity Cards
- Books
- Back Home Plan

Web Resources



- www.pbs.org
- http://oldweb.madison.k12.wi.us/tnl/lilm/early_math/early_math.html
- <http://eclkc.ohs.acf.hhs.gov/hslc/ecdh/eecd/Domains%20of%20Child%20Development/Mathematics>

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THANK YOU

www.va-itsnetwork.org



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