

MATH AND PLAY: AGE BY AGE

Birth to 2 years: **Sensorimotor play.** Early sensorimotor play may appear to be only distantly related to mathematics. However, there are many sensorimotor activities that can provide foundations for, or direct experiences with, mathematical ideas.

WHAT YOU CAN DO: Emphasize patterns. In the Chinese game “open-close,” the teacher repeatedly makes and forms the baby’s hand into a fist as she says “closed” and opens it for “open.” With toddlers, imitating what children do when they play with blocks, sand, or water, and then adding subtle variations, invites pre-mathematical explorations.

Introduce rhythmic patterns. Very young children love to jump up and down, march, or chant, often in patterns. Such activities build action sequences that are one basis for the pervasive mathematical concept of patterns. Older preschoolers can chant “up” (as they jump); “down!” (as they crouch low); “up, down; up, down,” creating a pattern. Music can help deepen these patterns.

15 months: **Symbolic or pretend play emerges.** Symbolic play is important for later development of mathematical skills.

WHAT YOU CAN DO: Invite children to set the table in the dramatic-play area, introducing one-to-one correspondence, counting, and sorting. A 2-year-old may set a table with toy plates, silverware, and plastic food, copying what he has lived. A 3-year-old may use a flat piece of wood for a plate and cylinder block for a glass. A 4- or 5-year-old may imagine the dishes and play roles of family members with interactions and plots.

2 to 3 years: **Parallel play emerges.** Children play side by side, aware of and observing each other. While they may not seem to some adults to be “playing together,” they usually want to be playing near each other.

WHAT YOU CAN DO: With toddlers, imitate what children do when they play with blocks, sand, or water, and then carefully add subtle variations. This invites pre-mathematical explorations.

3 to 5 years: **Group play emerges.**

WHAT YOU CAN DO: Involve children in large group activities, such as Simon Says and other verbal games. Games such as “I Spy” or “I’m Thinking of a Number” sharpen older children’s knowledge of attributes and logical reasoning.

4 to 7 years: **Children participate in game playing.** Younger children play in an improvisational way, with a vague idea of rules. For older children, rules are decided beforehand and alterations must be agreed upon. Such games are a fertile ground for the growth of mathematical reasoning, especially strategic reasoning, autonomy, or independence.

WHAT YOU CAN DO: Introduce games with number cards to provide experiences with counting and comparison. Card games, such as Compare (“War”), Odd Card (“Old Maid”), and Go Fish, can be used or adapted for learning mathematics and reasoning.