



## Best Practices

Young children show an early use of math when they count their fingers and toes, show and tell how old they are, compare who has more or less juice, or figure out who is taller and tallest. Early math experiences like these are the foundation for understanding more complex mathematical ideas and concepts, and are integral in helping children understand, explain, and describe their world. Early childhood educators can help strengthen this beginning foundation by integrating math into daily activities, regularly using the language of math, and observing and assessing children's understanding of math concepts and skills.

### Integrate Math into Daily Activities

The early childhood center offers a wealth of opportunities each day for children to think mathematically during daily calendar activities, snack time, read alouds, outdoor play, in learning centers, and so on. Educators can use these experiences, whether formal or informal, planned or organic, to prepare a child for deeper mathematical learning.

- **Use routine play experiences** to encourage children to use their mathematical vocabulary. For example, incorporate words such as *more*, *less*, *bigger*, *shorter*, and *counting* into conversation during art projects, block play, snack time, and physical play.
- **Utilize learning centers** to provide opportunities for children to connect prior knowledge to newly-learned concepts and vocabulary. For example, the Pretend and Play Center might include play money, a scale for weighing, or a yardstick for measuring. In the Block Center, children can group similar shapes together. While painting or drawing in the Art Center, children can trace and identify shapes or identify structures as bigger, smaller, longer, or shorter. In the Library Center, children can browse number and counting books.
- **Provide a range of materials** that support mathematical learning, such as number cards for number recognition, connecting cubes for counting, or nonstandard measuring tools. Scales can help children weigh and compare. Number puzzles and giant hopscotch games are also fun learning tools.

### Why is it important to teach math concepts or ideas in a variety of settings?

- Most children need to practice and reinforce a skill or concept over time, in different formats, and in several contexts to help them thoroughly understand the concept.

### How can educators utilize everyday activities to encourage children's use of math?

- In addition to providing specific instruction, embed math learning in nearly all activities of the day. For example, children might count, sort, compare, measure, sing counting songs, and participate in counting games and puzzles to practice skills.
- Use daily routines (such as outdoor games or exercise, lining up, waiting a turn, gathering in a circle, and tidying up) to teach and use basic mathematical language and concepts such as *first*, *next*, *last*, *bigger*, *smaller*, *more*, *less*, *fewer*, and *how many in all*.
- Look for opportunities during typical classroom experiences. For example, children could count the number of days in a week or the months in a year, the number of children in a circle, or the number of children wearing red sneakers. They could determine who is first or last in line and who has more letters in his or her name. Children could also draw shapes in chalk on outside play areas to help with geometric recognition.

### How can educators design learning centers to promote children's use of mathematical concepts and vocabulary?

- Design learning centers to support the natural exploration of mathematical concepts and vocabulary. Here children can explore by themselves and/or with the support and guidance of an educator. For example,
  - In the Science and Math Center, offer connecting cubes, counters, number lines, hundreds charts, and other manipulatives to help children discover patterns and compare shapes, sizes, length, height, and width.
  - Playing in the Block Center gives children the opportunity to explore, identify, and understand physical relationships and balance, and supports learning about measuring and comparing (e.g., *longer*, *shorter*, *wider*).
  - As children draw or paint in the Art Center, they work with shapes, colors, patterns, textures, size, and shape.
  - The Pretend and Play Center can become a restaurant, store, or a bakery, where play money is exchanged, plates are counted, and snacks are shared evenly. Environmental print on signs announcing prices, times, and "specials" of the day (*buy 2 apples here*) provide additional math and reading opportunities.
  - Reading counting and other number books is a great way for children to learn math vocabulary and concepts.
  - At the Sensory Table Center, children can measure and compare amounts of water or sand, fill and empty different-sized containers, and estimate how many cups or teaspoons will fill a container.

## Use the Language of Math

To help children develop mathematical ideas and be able to express them naturally, educators can “flood the environment” with mathematical talk and concepts, and encourage children to use math talk, too.

- **Beginning and ending the day routines** offer rich opportunities for math talk. For example,
  - lining up (*Let's count the number of boys and girls in line.*)
  - sorting classroom items (*How many red buttons did you find?*)
  - taking attendance (*We have more boys than girls today.*)
- **Calendar routines** give children daily experience in counting, number recognition, pattern recognition, and concepts of *before*, *after*, *more than*, *less than*, *first*, *next*, and *last*.
- **Outdoor or active play** promotes the use of various math words and math ideas, such as *circle*, *line*, *before*, *after*, *next*, *triangle*, *more*, *fewer*, *shorter*, *longer*, and *add*.
- **Snack time** offers many opportunities to introduce math language. Concepts of shape, size, quantity, position, length, and volume can be introduced when cutting a sandwich, pouring a cup of juice, holding a paper plate, or merely counting the children at the table.

## Why is it important to “flood the environment” with math language?

- Math language gives children a way to express their growing understanding of math concepts.
- Children need multiple opportunities to use mathematical language in a variety of activities.

## How can educators use math talk throughout the day?

- Use daily calendar routines to engage children in patterning, number recognition, and counting to 10.
- Take attendance by counting the number of children present and graphing the results. (*How many are boys? How many are girls? Do we have more boys? Fewer boys?*)
- Use Snack Time to count, sort, and classify. For example, count the crackers on the plate, determine equal shares, find the longest pretzel, or talk about the shape of a sandwich or plate.

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- Use concrete objects to model real world addition or subtraction. (*How many crackers do we have now? What will happen if we take one away?*)
- Use lining up to ask children to identify relative positions of objects in space. (*Who is first in line? Who is next? Who is last in line?*).
- Use the clock and a thermometer to teach mathematical vocabulary such as *numbers, temperature, time, higher, lower, before, and after*.
- Utilize learning centers. At the Block Center, for example, have children explore shape, lengths, weights, and volume using words such as *longer, shorter, heavier, lighter, higher, lower, more, fewer, big, bigger, and biggest*.
- Use classroom chores to teach concepts such as *same, different, high, low, inside, outside, on top of, and below*. The task of sorting, for example, requires a basic understanding of classes or kinds of objects. (*Put all the pencils in the case and all the crayons in the bucket.*)
- Use nonstandard measures such as lengths of yarn or Unifix cubes to determine distance, length, or height comparisons. (*How many cubes tall is your tower? What about measuring your tower now with string?*)

## Assess What Children Understand

To fully support children's math learning, educators should thoughtfully and continually observe and assess what skills children have or do not have, and what concepts they understand or misunderstand.

- **Watch and listen.** Notice what challenges children face and where children excel. Carefully observe performance, interactions with peers and adults, answers to questions, and the words children use to describe their world.
- **Customize instruction.** Use observations to build an intentional math curriculum for each child's needs. For example,
  - Use small group and one-on-one activities to target specific needs for specific children.
  - Challenge children who demonstrate advanced mathematical understandings by introducing more complex ideas and vocabulary.

## What is assessment and why is it important?

- Assessment is the processes of identifying how a child is doing in comparison to how he or she was doing before, and in comparison to what is expected at a child's developmental age.

## Best Practices (CONTINUED)

- Assessment is critical to understanding each child's unique strengths and needs.
- Assessment allows educators to support children's development and learning more effectively as it offers information about the challenges the child is facing and how to best support him/her.

### How can educators use informal assessment to identify children's strengths or needs in math?

- Make mental notes or keep a log to track children's math knowledge and plan the next activities or instructional goal.
- Use small group and one-on-one instruction to better assess children's strengths and needs, address unique learning needs, target a skill, and plan for next steps for learning.

### How can educators customize the math curriculum for every child's needs?

- Provide opportunities for small group or one-on-one activities.
- Seek an alternate way to teach a topic. If a child does not recognize shapes, try making the shapes in a different medium (such as shaving cream, paint, chalk, or yarn).

## Glossary

**assessment:** an accounting of what learners know using objective evidence. Informal assessment is ongoing as adults monitor young children's learning each day

**math concepts:** early ideas about numbers, counting, shapes, measurement, time, greater than, less than, money

**math language:** commonly used math vocabulary, such as *more, less, how many in all, fewer, add, take away, number, triangle, square, and circle*

**open-ended questions:** questions that require critical thinking, invite opinion or explanation, and result in more than a one-word answer

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