Introduction

One of the most intrinsic concepts for young children is numbers and counting. From the time they begin to talk, children attach meaning to numbers and sets of objects. While preschoolers and kindergarten children are too young to do traditional math (and worksheets are completely inappropriate for preschoolers), there are many activities for young children that will enhance their understanding of math concepts. Giving children the opportunity to manipulate objects, practice problem-solving skills, and communicate about their experiences will foster their mathematical thinking.

It is easy to create a classroom environment where children can learn about various math concepts. You will not need any special training, just a basic understanding of what to expect (see page 6 for some general developmental guidelines). Beginning math concepts should not be viewed as challenging for young learners. Instead, offer tasks that are fun and presented in a developmentally appropriate way. Here are some strategies to consider as you incorporate math topics into your curriculum:

- Plan a variety of open-ended activities that involve individual, small group, and large group learning.
- Immerse your class in rich opportunities to investigate math concepts (see "Creating a Math Environment" on page 7).
- Recognize that there will be many different levels of understanding. It is important to guide children along a continuum of skill development by offering diverse experiences to foster mathematical thinking.
- Encourage "math talk" in your classroom for vocabulary development. Examples might include the following: "This bucket is *larger.*" "Who has the *most*?" or "What number comes after four?"

In this handy resource book, you will find:

- Ideas for creating a math environment that include suggested read-aloud picture-book titles, finger plays and action rhymes, math center ideas, little book creations, and fun activities for transition times.
- Take-home letters for activities children can do with parents to encourage math learning at home.
- Ideas for math-box games, file-folder activities, and large-group experiences that also provide opportunities for tons of hands-on learning.

Educators can use *Math Experiences for Young Learners* to help children acquire basic and appropriate mathematical knowledge:

- number concepts (counting, one-to-one correspondence, learning the meaning of numerals 1–5, 1–10, or 1–20)
- geometric shapes
- order of objects/events (*first*, *second*, *third*, or *first*, *middle*, *last*)
- relative position of objects (*above*, *below*, *beside*, *under*, *in front of*, etc.)
- matching, extending, and creating patterns
- sorting and classifying objects
- problem solving
- measuring and estimating

Each large-group lesson also provides suggestions for extending the activity, a list of materials needed, a list of skills that are used and learned while engaged in the activity, and a suggestion for integrating the featured math concept in another curriculum area.

With the information and activity suggestions offered in this book, you can be confident that you are helping children acquire a solid foundation for future math learning.

Concept Reference for Easy Planning

After assessing children's knowledge of math concepts, use the following information to identify activities for introducing and reinforcing specific math skills.

Numbers and Counting

Concepts and Skills: numerals, number permanence, number words, one-to-one correspondence, ordinal numbers, awareness that numbers have multiple uses, comparing quantities, counting in correct sequence, labeling collections with numerals

School-to-Home Link
- Number Hunt (page 15)
- Look 'n' Count (pages 16–17)

Math Box Activities
- Sandpaper Numerals (page 18)
- Egg Carton Sort (page 18)
- Number Bracelets (page 19)
- Number Wheel (page 19)
- Number Cups (page 21)
- Marshmallow Toss (page 21)
- Counting Bugs (page 22)

File Folder Game
- Catching Bugs (pages 35–38)

Large Group Activities
- Shark Attack (page 45)
- Take Me Out to the Ball Game (page 49)
- Find Me First (page 50)
- Five Is Still Five (page 54)
- Snack Time Math (page 55)

Card Games
- Match Up Numbers (page 57)
- Go Fish for Numbers (page 57)

Geometry and Spatial Relationships

Concepts and Skills: match and name two-dimensional shapes, use shapes to make pictures, recognize geometric shapes in environment, use spatial words to place objects (directionality and position)

Math Box Activities
- Shape Sort (page 19)
- Shoestring Shapes (page 22)

File Folder Game
- Shape Factory (pages 39–43)

Large Group Activities
- Shape Stretch (pages 47 and 48)
- Boxes, Boxes, Boxes (page 51)

Patterning

Concepts and Skills: copy and extend patterns, create original patterns

Math Box Activity
- Candy Patterns (page 20)

File Folder Game
- Bug Patterns (pages 24–26)

Large Group Activities
- Sticks 'n' Stuff (page 44)

Sort and Classify

Concepts and Skills: recognize and group objects by one attribute

Math Box Activities
- Egg Carton Sort (page 18)
- Shape Sort (page 19)
- Little and Big Things (page 20)

File Folder Games
- Home Sweet Home (pages 27–31)
- Big or Little? (pages 32–34)

Large Group Activities
- Sticks 'n' Stuff (page 44)

Measurement

Concepts and Skills: nonstandard measurement, length, weight, comparing and ordering by size

Math Box Activities
Fill 'n' Line Up Bottles (page 20)
Simple Scale Measuring (page 21)
Junk Drawer Measuring (page 22)

Large Group Activity
How Many Steps? (pages 52 and 53)
Match My Size (page 56)

Concept Development Stages

When talking about math concepts with young children, it is important to remember that there is a wide range of abilities among children, which are influenced greatly by their experiences. For example, very young children will believe that the number of objects in a set can change if they are arranged differently, or that one elephant is more than five mice because it is larger. Knowing what you can expect when assessing prior knowledge will produce a more enjoyable time for everyone involved.

In general, children learn about numbers in an organized pattern of growth. First, they learn the names of some of the numbers. Next, they learn to count up to 10 or higher, in order. At this stage, children also begin to attach meaning to the numbers by pointing to objects (one-to-one correspondence) while counting, discovering that the last number said in the series refers to the size of a particular set of objects. At the same time, an awareness of numerals is starting to blossom. Finally, children begin to acquire a sense about numbers (numeracy) by comparing sets, using specific math vocabulary, such as *how many*, *which set is more*, and *which set is less*. This process requires being able to think logically and anticipate cause and effect. Therefore, while very young children are grasping simpler concepts such as sorting objects by color, older children are ready for estimating whether the space in their towers needs a large block or a small one. In the box below are some general guidelines for math development.

Three-Year-Olds

- Have little or no logical thinking
- Do not understand cause and effect
- Are developing small motor skills (may have difficulty picking up or putting small objects together)
- Make marks on paper but do not make recognizable numbers and shapes
- Understand simple ordinal concepts such as "first" and "last"
- Begin to recognize numerals but cannot write them
- Can recognize sets of objects up to three

Four-Year-Olds

- Begin to associate number concepts, vocabulary, and written numerals in meaningful ways
- Begin to develop an understanding of concepts of time: "yesterday," "today," or "tomorrow"
- Describe basic features of simple two-dimensional geometric shapes
- Can copy simple shapes and draw circles and squares without an example
- Can say number words and count and find groups of objects up to 10
- Understand counting and use one-to-one correspondence when counting objects
- Understand seriation such as big, bigger, biggest
- Understand that quantity does not change when sets of objects are rearranged (e.g., If you have five objects, there will always be five objects regardless of how they are positioned.)

Five-Year-Olds

- Easily count 10 or more objects; matches a set of objects with written numeral (up to 10)
- Begin to recognize patterns with numbers (e.g., When you add one to a number, it is always the next number.)
- Can make pictures with shapes
- Copy simple shape patterns
- Can make comparisons of objects based on two attributes
- Continue to build an understanding of time