



HELPING YOUR
CHILDREN
LEARN AND ENJOY
MATHEMATICS

THE EARLIEST MATHEMATICS LEARNING: BIRTH TO AGE TWO

Babies learn mathematics too! Infants begin to develop an understanding of math and skills very early in the first year of life. It's not the sort of math that children learn in a classroom: instead they learn by exploring with their sight, touch, hearing, and taste. Math helps infants and toddlers deal with the new world around them and get what they want.

As a parent you can take an active role in this very early math learning if you first understand what sorts of information infants and toddlers learn when they grasp, taste, or listen to something new. Then you can help make these earliest math experiences more frequent and interesting.

GEOMETRY: THE FIRST MATHEMATICS WE LEARN

Soon after birth, the mathematics of geometry becomes very useful to infants as they begin to explore. Geometry lets infants and toddlers discover how shapes are arranged and fit together. We call these discoveries *spatial relationships*. This early knowledge is very important because it helps babies recognize things and people—the things they want and the things they don't want. For example, when babies hold, wave, and mouth a teething ring, they learn that it is round and smooth with no sharp corners, easy to hold, just so heavy, and great to suck on, but not as good as food when they are hungry.

WHAT WE KNOW ABOUT INFANTS, TODDLERS, AND MATHEMATICS

We know very little about how babies learn math because, until infants and toddlers can talk, they can't tell us what they know and understand. Here are a few things that have been observed about babies and mathematics.

- One of the first things babies recognize is their mother's face, and they can soon tell this important person from everybody else, something that's a great deal of work for a computer to do! Infants also learn to recognize their favorite toy or blanket from all others. Shape, size, texture, and taste are the mathematical variables that allow them to know that one thing is different from another. Babies also begin to recognize patterns at a few months of age.
- Infants and toddlers explore shapes and spatial relations by passing an object from hand to hand: is it sharp, hard, or heavy?; by tasting it: does it have taste and can you eat it?; by banging and even trying to break it: what's it made of, is there something inside? While parents may not like when toddlers do these things, they are similar to the steps scientists use when they investigate something new.
- Infants and toddlers often learn spatial relationships, such as location, direction, and distance, by using their bodies. They first develop spatial

sense when they reach for things, then when they move through their environment by rolling over and eventually crawling.

- Toddlers can often tell the difference between one, two, and three objects. They don't "count" objects, but they learn to recognize that "three-ness" is different from "two-ness." For this reason, most toddlers can't tell the difference between higher numbers of objects—for a long time it's one, two, three, or MORE.

WHAT PARENTS CAN DO TO ENHANCE INFANTS AND TODDLERS MATHEMATICS LEARNING

Children need to see, touch, and examine lots of things. They need to look at, hold, and explore the many characteristics of objects. What may appear to adults as play is actually active exploring and information gathering for an infant or toddler. They are always busy filling their minds with sights, sounds, and sensations that may prove useful later—just as when you eat a very bitter berry, you never make that mistake again! Your role as a parent is to make sure those sensory experiences are as varied, frequent, and SAFE as possible. Here are some things you can do to promote the earliest math learning.

- Make sure that even the youngest babies have lots of things to observe within their field of vision, such as brightly colored, high-contrast objects, moving mobiles overhead, a window with changing scenery, and pictures on the wall. Every so often change what babies can see when they look around so they can observe different things.
- Provide infants with simple toys they can explore, such as rings, rattles, and soft or stuffed toys with different textures. Don't forget things that make different sounds, such as rattles, shakers, and drums. Provide toddlers with a variety of objects—such as blocks, balls, and simple geometric shapes of different sizes, colors, and patterns—to explore, sort, and compare, but always be aware of objects that can be choking hazards.
- Frequently change the toys that babies and toddlers play with. Even babies get bored—change stimulates even the youngest minds. You don't have to buy new toys; just put some toys away for a while and take others back out.
- Provide toddlers with lots of different containers for play—large, small, round, square, tall, short—some that nest neatly and some with lids. Have a separate set they can fill and empty when they take a bath. Containers may not seem like toys to us but, in a toddler's hands, these "toys" can teach math concepts long before entering preschool.
- Sometimes the simplest toys are the best for learning. The more things toddlers can do with a toy, the more their imaginations are at work. Blocks of all different sorts and sizes (but not too small) are great examples of the simplest toys that teach MANY things to young children.



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