



Math is for Everyone! Math is Everywhere!

According to the Erikson Institute Early Math Collaborative, research has shown that early math competence is one of the best predictors of school success across the curriculum. You play an important role in helping your child gain this competence –by *mathematizing the world around* him. In other words, by helping your child engage with the math that is all around him.

Mathematizing means seeing math in daily life and using “math talk” to describe and explore situations. When math words are connected to real and interesting things, they become more meaningful and easier to learn. You can do this by:

- ♥ Providing playful math activities that engage multiple senses (vision, hearing, touch and movement).
- ♥ Using story books to introduce the language or vocabulary of math as well as make math approachable and engaging for children.

The Erikson Math Collaborative identified “9 Big Ideas” or math concepts that lay the foundation for lifelong math learning and thinking. Two of these skills are shapes and spatial relationships (the relationship between people, objects and places). Helping young children learn about these ideas is foundational to children’s understanding of the physical world and is a critical area in mathematics for young children. Children explore and gain awareness of shapes and spatial relationships in their environment from birth. Before young children have the language to name or describe the different shapes or where something is located in relation to them, they are developing an intuitive understanding about



shapes and spatial relationships, e.g. the round ball is rolling away from me.

In this newsletter, we will discuss activities that promote the learning of shapes and spatial relationships at each age level – infants, toddlers and preschoolers. We will offer tips on making math part of daily routines, activities and interactions, emphasizing that math is for everyone!

This newsletter includes:

- ♥ **Age-specific information and suggestions** about activities to do with your infant, toddler, or preschooler,
- ♥ **Featured activities** for each age group,
- ♥ **How This Helps:** a summary of your child’s development by doing these activities together,
- ♥ **Resources:** for more information about this topic, and
- ♥ **Suggested Books:** a list of books to read with your child.

Infants

Infants begin to learn about shapes by holding, looking and mouthing objects. They learn about space as they repeat a body movement or gesture to make something happen. They are learning new ways to play and interact with objects and people. You can support an infant's learning about shapes and spatial relationships by:

- ♥ **Providing different shaped objects** that are safe for the infant to grasp, explore and mouth, e.g., a teething ring, soft blocks, textured balls, etc.
- ♥ **Creating opportunities** for the infant to play and move in different positions to manipulate objects. For example, lying on his back and reaching for a toy above, sitting on your lap and playing with a toy in front of him.



- ♥ **Using mirror talk to describe** what he is doing. For example saying, "You have a round teething ring. You see the ball in front of you. You got it!"

Activity for Infants: *My First Shape Container*

What You Need:

A large, empty container with a plastic lid, e.g. a coffee container

Round objects at least 3 cm in diameter and 6 cm in length so they can't be swallowed or lodged in a child's windpipe (e.g. baby sensory balls, round teething ring)

Scissors (for adult use only)

What to Do:

1. Cut a large hole in the plastic lid of the container. The opening should be large enough for the variety of round objects to easily fit through. Make sure there are no sharp edges.
2. Sit with your child and position the large container in front of both of you.
3. Let your child explore the different round objects then show him how he can put the objects in the round opening of the large container's lid.
4. Describe what your child is doing. For example say, "You have the round ball. You're putting it in."

It's okay if your child is more interested in dumping out the round objects, mouthing or tossing them. As he actively manipulates them, he is learning about each shape's properties.

(See page 5 for information on how doing these kinds of activities with your child helps his development and school readiness.)



Toddlers

Toddlers form their understanding about shapes by actively manipulating and playing with them. They experiment with putting objects together. For example, nesting cups together or placing a round or square piece in a shape board. Toddlers are beginning to identify shapes by their name, such as circle, square and triangle. They are further developing their understanding of spatial relationships as they use their whole bodies to explore and move through their environments. You can help a toddler learn about shapes and spatial relationships by:



♥ **Reading picture books about shapes.** While reading, take turns pointing out the various shapes you see in the pictures. After reading, go on a shape hunt and have your child find similar shapes in your home or around the neighborhood. You can take photos of the shapes, print them and make your child his own shape book.

♥ **Creating obstacle courses.** For example, use sofa pillows for your child to climb over, an empty appliance box for him to crawl through, and a chair for him to walk around. Then making up a playful chant to describe your child's movements to him, e.g. "You're climbing over the mountain, crawling through the tunnel, and going around the tree. Hurray, you've found me!"

Activity for Toddlers: *Where's Teddy*

What You Need:

A cardboard box (save one of your shipping boxes)

A stuffed teddy bear or any stuffed animal that can fit in the box

What to Do:

1. Place "Teddy" in different locations in relation to the cardboard box, e.g. in, on, under, next to.
2. Ask your child, "Where's Teddy?"
3. You can prompt your child by saying "Hmm, is Teddy in the box? Let's look. Is he under the box? I see Teddy. He's hiding under the box."
4. Let your child have a turn placing Teddy and asking you "Where's Teddy?"



Placing Teddy in different locations and using positional words teaches your child spatial language

(See page 5 for information on how doing these kinds of activities with your child helps his development and school readiness.)

Preschoolers

Preschoolers' knowledge and language about shapes expands as they become increasingly aware of the similarities and differences between shapes and as they use shapes to create and construct. They are able to recognize and name many common shapes, as well as understand the attributes of shapes. For example, saying "It has four same-kind sides and four corners, so it's a square."

Preschoolers' understanding of spatial relationships broadens as they continue to explore, manipulate, fit together and construct with two-dimensional and three-dimensional shapes. Their sense of space also develops as they gain the motor coordination to move their bodies through space and learn spatial language (positional and directional words). You can support a preschooler's deepening understanding of shapes and spatial relationships by:

♡ **Turning an everyday task into a hands-on math lesson.** Your pantry items are usually 2-D or 3-D shapes in a variety of sizes,



for example cylinders (cans of soup) and rectangular prisms (boxes of cereal). Have your child help put away the pantry items by matching similar sized and shaped items. Use positional words to describe how your child makes the items fit on the shelf. For example, "You put one cylinder soup can on top of another can that's the same shape so it fits."

♡ **Singing and moving along to spatial concept songs or chants**, such as *We're Going on A Bear Hunt*. This movement chant gets spatial language (positional and directional words) into the *eyes, ears, hands and feet* of your child.

Activity for Preschoolers: *Tangram Puzzle Picture*

What You Need:

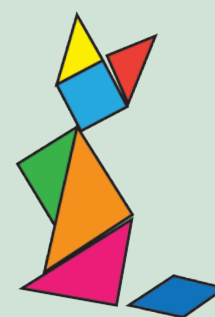
A rectangular piece of heavy weight paper, e.g. cardstock, manila file folder or an empty cereal box.

Scissors (with adult supervision and assistance).

What to Do:

1. Cut out shapes to make tangram pieces. You should have 7 pieces (2 small triangles, 1 medium triangle, 2 large triangles, 1 square and 1 parallelogram). You can use the pattern included in this packet.
2. Start with the Tangram Puzzle pieces together in a large square.
3. Show your child how he can separate the large square into seven different shaped pieces. Name each shaped piece.
4. Show your child how he can put the different shapes together to create a new shape or picture.
5. You can also create Tangram puzzle outlines for your child to match the pieces.

(See page 5 for information on how doing these kinds of activities with your child helps his development and school readiness.)



How This Helps

The activities suggested in this newsletter help promote many different aspects of development:

Physical Development

- ♥ Learn through his senses
- ♥ Develop control of large muscles

Social and Emotional Development

- ♥ Learn to cooperate with others
- ♥ Feel important and good about himself

Language and Literacy Development

- ♥ Build vocabulary skills
- ♥ Develop listening and understanding skills

Cognitive Development

- ♥ Develop and use categorization skills
- ♥ Develop understanding of spatial relationships



Kids in the Kitchen

Cooking teaches valuable lessons such as math (quantities, measurement), science (how matter changes), fine motor (stirring, pouring), and literacy (print awareness). As you make this recipe with your child, talk about kitchen safety. Show him how to handle items safely and allow him to do as much as he is capable of. Praise his efforts, and ask questions throughout the process to encourage his thinking skills. Most of all, have fun!

DIY Lunchables

Ingredients:

- Fruits, such as banana and melon
- Cheese slices
- Cold cuts, such as sliced turkey
- Whole grain crackers
- Vegetables, such as cherry tomatoes or small cucumbers
- Meal prep container with compartments and a lid



Directions:

1. Create different shapes using the various fruits and vegetables to create a “lunchable” snack or meal.
2. Using a plastic knife, provide the hand-over-hand guidance to assist your child (ages older toddler and above) with safely learning how to handle a knife. Help your child slice the fruit into different shapes.
 - Circles: banana, cucumbers, tomatoes
 - Cubes: melon
 - Triangles: cheese
3. Talk about the different shapes that he is creating.
4. Place the different food items in the various sections of the container. Your child can place the shapes in various parts of the containers, putting shapes together to make new shapes, or just putting his favorite foods together.

Resources

Discovering Shapes and Space in Preschool, NAEYC

<https://www.naeyc.org/resources/pubs/tyc/apr2014/discovering-shapes-and-space-preschool>

This article discusses how preschool teachers can create an environment in which children are eager to explore and learn about math by providing developmentally appropriate materials and opportunities about the topic as part of the daily routines, activities, and interactions in preschool.

High Five Mathematize: An Early Head Start and Head Start Math Resource Guide

https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/high-five-mathematize-guide_0.pdf

This PDF promotes teaching math concepts through children's play and everyday experiences. It provides home and classroom activities for those who work with children birth to five and their families.



Suggested Books

Discover these books and more at the **Hawai'i State Public Library** www.librarieshawaii.org.

Infants and Toddlers

Mouse Shapes: A very first book by Jim Arnosky

A mouse scrambles through an obstacle course, introducing the reader to simple shapes.

My Very First Book of Shapes By Eric Carle

Split pages help early learners find and match basic shapes to everyday objects.

Preschoolers

Grandfather Tang's Story – A Tale Told with Tangrams by Ann Tompert

Grandfather tells a story about shape-changing fox fairies who try to best each other until a hunter brings danger to both of them.

Rosie's Walk by Pat Hutchins

Although unaware that a fox is after her as she takes a walk around the farmyard, Rosie the hen still manages to lead him into one accident after another.



Learning to Grow is a project of the University of Hawai'i, Windward Community College, with funding from the Hawai'i Department of Human Services. Visit our website at www.learningtogrowhawaii.org or visit us on Facebook at www.facebook.com/learningtogrowhawaii