Learning to Grow

MAKING A DIFFERENCE TOGETHER

Learning STEM through Water Activities

STEM education, a term initiated by the National Science Foundation, is an educational approach which focuses on one or more of the four disciplines of science, technology, engineering, and math. According to the National Association for the Education of Young Children, research has shown that giving children exposure to quality, hands-on STEM learning opportunities is a key predictor of children's school success.

For young children, STEM learning occurs through offering many opportunities for them to use their minds and hands to play, explore, and learn. You can add to this learning by asking "Why do you think…" questions and by asking the "5 W" questions (who, what, where, when, why). Here are examples of what STEM learning looks like for young children:

- **S**cience involves observing, experimenting, asking questions, wondering how things work, making predictions, and sharing findings.
- **T**echnology encourages invention and trying different tools to make things work. Tools may include crayons, scissors, magnifying glass, rulers, and for older children electronics.
- **E**ngineering involves identifying a problem and then thinking about different solutions to test. This may include building ramps, stacking cups, and creating structures with blocks.
- **M**ath includes counting, sorting, comparing and working with different shapes and patterns.

We encourage you to introduce STEM learning by starting with items that are familiar to your child and then add onto their learning. This newsletter will highlight STEM learning through water activities -- something familiar and accessible for infants, toddlers and preschoolers.

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

Children's first learning experiences with water usually include all kinds of pouring. These simple water play experiences are ones that your child may want to do repeatedly. This type of activity helps develop his fine motor skills, which leads to more precise or complex activities with other tools.

Here are ideas for how to use water activities and materials with your infant:

- ❤ Embed learning during routines throughout the day. For example, during bath time, encourage the child to pour and fill, experiment with cause and effect (what happens to the water when I splash my hands in the tub), and explore the properties of objects such as sinking and floating.
- ❤ Choose materials that are small enough to grasp, safe, unbreakable, and sturdy, such as measuring cups and small containers (e.g., margarine tubs, yogurt cups).

- ❤ Ask open-ended questions or "I wonder" statements such as "I wonder what will happen if we use the washcloth to clean the boat." "What happens if we put the red boat on the water?" Even if he doesn't respond, narrating the process and talking about what you are doing helps him learn.

Activity for Infants: *Scooping Water*

What You Need:

Container of water
Shallow pan
Plastic or paper cup
Measuring spoons

What to Do:

1. Place an empty cup on top of the shallow pan.
2. Use a measuring spoon to scoop water into the cup. You can place your hand over the child's hand and scoop the water together.
3. It's fine if your child just enjoys splashing the water with the spoon or his hand. Use this opportunity to talk about what he is doing and encourage this sensory activity.
4. As your child gets older, you can incorporate tools such as funnels and activities such as counting how many spoonfuls of water it takes to fill the cup

Safety Alert: Supervise your child closely. Babies can drown in just a few inches of water, so never take your eyes off him when playing with water.

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

Toddlers

You can encourage STEM learning by encouraging your toddler to be curious and ask questions. Sensory activities are important to include because toddlers use their senses to try and understand the world around them.

Here are ideas for how to use water activities and materials with your toddler:

- ❤ Introduce new materials such as eye droppers or pipettes, spray bottles, sponges, food coloring, and paint brushes. Use these with activities such as water painting and color mixing.
- ❤ Encourage your child to use his five senses to describe what he sees and observes. Ask questions such as, "How does it feel? What does it look like? What do you hear?"

Activity for Toddlers: *What is the Shape of Water?*

Adapted from "Investigating Water" by the Center for Informal Science Education

What You Need:

Container of water
Clean, empty plastic containers of different sizes and shapes (e.g., yogurt cup, tofu container, soap dispenser, honey bear bottle)
Shallow pan
*Optional: food coloring

What to Do:

1. Ask your child to fill the containers with water. If using food coloring, add a drop to help the child see the formation of the water. Encourage him to describe the shape that the water takes using words such as round, circle, and square.
2. Explain that you are going to explore what happens to the shape of water when it is poured onto something flat. Carefully empty one of the containers into a shallow pan. Draw his attention to the way the water spreads when poured onto a flat surface. You can ask, "Is the water the same shape as before? What was its shape before? What is its shape now?"
3. Explain that water has no real shape, but rather takes the shape of whatever it is in. Have your child pour the water back into the container. Talk about how the water now has the shape it did before.
4. Repeat the activity using other containers of various shapes and sizes. Discuss and describe the shape water takes in these containers

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

Preschoolers

To create a STEM activity for preschoolers, begin with a question, problem or situation. STEM is all about problem solving through the use of science, technology, engineering, and math.

Here are some ideas for activities and materials to use with your preschooler:

- ❤ Provide books to learn more about how things work. Start with a question such as "Does this sink or float?" and choose both fiction and non-fiction books that are age-appropriate, have pictures, and present new ideas for the child to consider. As you read the book together, ask questions and see what the child is interested in which can lead to further explorations.
- ❤ Encourage documentation of the child's observations by having him draw, paint, or record voices to describe what he is noticing

(for example, talking about the weather or charting the growth of the tomato plant). You can use a composition book, crayons, and other tools such as rulers or binoculars to help in the child's documentation process.

Activity for Preschoolers: *Walking Water*

Adapted from: https://taminglittlemonsters.com/walking-water-stem-activity-for-kids/

What You Need:

6 plastic containers
6 paper towels
Food coloring
Water

What to Do:

1. Set up all the containers in a circle.
2. Pour water into every alternate container about halfway up.
3. In the containers with water in them, add a few drops of food coloring – yellow in one, red in another container, and blue in the last container.
4. Fold a paper towel in half lengthwise and hang it between two of the containers so that one end of the paper towel is inside the container with the food coloring and the other end sits inside the empty container. Repeat this until you use all 6 paper towels, creating a "bridge" between each of the containers to connect the circle.
5. Ask your child to make a prediction for what will happen. Observe together as the colored water travels up the paper towels and create pools in the empty container. As the two colors drain into the same container, you'll see the colors mix. You can talk about topics such as colors mixing and water being absorbed into the paper towel.

(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

- ❤ Use and strengthen small muscles
- ❤ Develop eye-hand coordination

Social and Emotional Development

- ❤ Learn to interact with others
- ❤ Feel important and good about himself

Language and Literacy Development

- ❤ Build verbal skills, vocabulary, and use of descriptive language
- ❤ Learn to ask and answer questions

Cognitive Development

- ❤ Develop early math skills
- ❤ Develop his thinking and problem-solving skills

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!

Iced Herbal Tea

Adapted from: https://www.farmtokeiki.org/recipes/

Ingredients:

3 T fresh herbs (examples of herbs: blue butterfly pea flowers, mint leaves, oregano leaves, rosemary leave, thyme leaves)
1 cup purified water
Glass jar

Directions:

1. Have keiki pick and wash their favorite garden herbs.
2. Add the herbs to a jar of purified water.
3. Place the jar in the sun for 1-6 hours. Teas are safe and simple garden remedies. Choose one or more herbs to make tea for a garden tea party!

Resources

STEM as an Approach to Early Childhood Learning

https://www.youtube.com/watch?v=-r4DfID6H24
This short video is one of 10 videos produced as part of the Idaho STEM Action Center to explore and advance Early STEM Education. It shows what STEM learning looks like in an early childhood classroom.

Move and Learn Together for STEM

https://sesamestreetincommunities.org/training/move-learn-together-stem/
Questioning, exploring, investigating, and experimenting are all wonderful ways to learn more about STEM (Science, Technology, Engineering, and Math). In this webinar, you'll learn some unique ways to use everyday materials and activities to explore STEM concepts.

Suggested Books

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

Infants and Toddlers

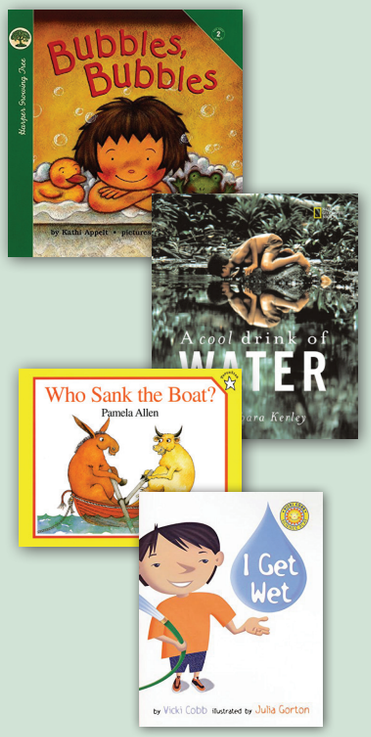
Bubbles, Bubbles *by Kathi Appelt*
Read along with the rhyming text of the book which show the fun a child can have in soapy, bubble-filled bath water.

A Cool Drink of Water *by Barbara Kerley*
Color photographs show people around the world gathering, drinking, and sharing water.

Preschoolers

Who Sank the Boat *by Pamela Allen*
Five friends decide to take a boat out in the bay. Watch the boat get fuller and fuller and make predictions about which animal will sink the boat.

I Get Wet *by Vicki Cobb*
This book encourages children to make discoveries. Follow along as a young boy asks questions and suggests easy experiments to demonstrate the properties of water.



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