Learning to Grow

MAKING A DIFFERENCE TOGETHER

UNIVERSITY OF HAWAI'I ❤ WINDWARD COMMUNITY COLLEGE

Scientific Thinking: Building On Your Child's Natural Curiosity

Science is a way of thinking and learning about our world through observation and experimentation. The scientific process includes observing, describing, questioning, investigating, explaining, predicting, and forming conclusions. Children are natural scientists. When they poke, pull, pound, roll, drop, taste, shake, touch, or carry an object, they are gaining information about it. They are learning about its texture, weight, size, volume, shape, color, odor, taste.

You play an important role in your child's scientific thinking. By being attentive and responsive to her explorations, discoveries and questions, you will help her learn things she would not learn by herself. You will help her stretch her thinking to the next level; helping to build and lay the foundation for lifelong learning.

Here are a few things you can do to build on your child's natural curiosity:

- **Everyday routines can be a teachable moment:** Be intentional in your everyday routines (eating, bathing, meal preparation, riding in a car, etc.) to point out opportunities for your child to observe, engage, and predict how things work in the world around her.
- **Plan and provide opportunities for discovery:** Provide unstructured time and a variety of interesting materials and settings that encourage discovery and exploration.
- **Engage with your child in her discoveries:** Ask questions, respond to her questions, use rich vocabulary, and make comments that will lead her to further discovery and thinking.

In this newsletter, we will offer tips and suggest activities to promote your child's scientific thinking at each age level – 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

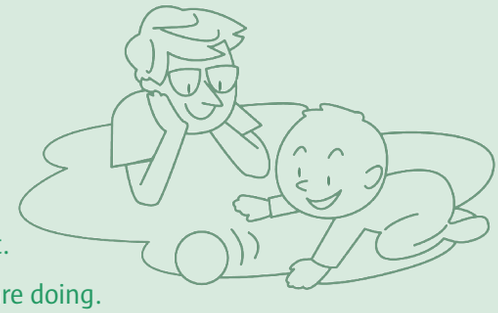
Infants are constantly investigating, experimenting and gathering knowledge about the world around them through their eyes, ears, nose, skin, fingers, and mouth. When your child puts an object into her mouth, she is determining its shape, texture and whether it tastes good! As she becomes more mobile, she will scoot or crawl to new objects that are interesting to her. Each new exploration and discovery adds to her knowledge and understanding about her world.

Here are ideas for building on your infant's natural curiosity:

- ❤ Point out objects that move in the wind, watch a ball roll and bounce, and describe the feeling of water on her hands.
- ❤ Provide safe, nontoxic sensory objects that she can explore; offer a variety of things that are soft, hard, smooth, rough, bumpy or sticky. For example, allow her to touch and feel non-poisonous leaves, sticks, rocks, sand, etc.
- ❤ Name/identify the objects in your child's world – what she sees, hears, tastes, smells and feels. Use rich vocabulary when describing objects (e.g., "Look at this shiny ball!").

Activity for Infants: *Let's Play Ball*

Adapted from *Baby Steps to STEM* by Jean G. Barbre



What You Need:

Soft or rubber balls of various sizes

What to Do:

1. When your child is able to sit up on her own, sit on the floor with her. Have your feet touching or almost touching her feet.
2. With two hands, roll the ball toward her. Describe what you are doing. For example, "I push the ball and it rolls to you!"
3. Next, have your child roll the ball toward you.
4. Use different-sized balls for added learning opportunities.
5. Use vocabulary words like: large, small, roll, bump, fast, slow, spin, twirl, pass, back and forth, around, between, behind.
6. For variation: Alternate between rolling and bouncing the ball or experiment with rolling other objects such as small cars or trucks.

⚠ **Safety Alert!** Be sure balls and other objects are large enough that the child cannot swallow or choke on it.

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

Toddlers

During the toddler years, children are developing more advanced thinking and reasoning skills. You will see this in your toddler's growing interest and ability to use words and manipulate objects. She may be asking questions about things she sees and how they work. Asking "Why?" is typical of children this age and evidence that your child is thinking. Responding positively to her seemingly endless questions will encourage her scientific thinking.

Here are ideas for building on your toddler's natural curiosity:

- ❤ Point her shadow out to her, encourage her to look at herself in the mirror to see her reflection, and have her discover what things float and sink in water.

- ❤ Ask questions such as *"What will happen if…?"* questions, such as when she's playing outside with cups and a jug of water.
- ❤ Respond to her *"Why?"* questions with, "Good question. Let's find out." Then find the answers together.

Activity for Toddlers: *Ooh La La Oobleck (aka "Goop")*

Adapted from *Baby Steps to STEM* by Jean G. Barbre

What You Need:

- Plastic tablecloth
- Two parts cornstarch
- One part water
- Large mixing bowl, foil pan, or plastic tub
- Measuring cup
- Pitcher
- Painting aprons or old t-shirts
- Bucket of water and towels for cleanup

What to Do:

1. This activity can be a bit messy, so be sure to cover the table with a plastic tablecloth.
2. Have your child help pour the water into the bowl, then add the cornstarch.
3. Have her mix the ingredients together with her hands or a spoon until it reaches a gooey consistency.
4. Encourage her to grab a handful of Oobleck and squeeze it.
5. Ask her questions such as, "What will happen if you roll it into a ball?" or "What will happen when you let go?"
6. Talk to her about what it feels like and what is happening. Use words such as: liquid, solid, mix, gooey, squeeze, ooze, slippery.

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

Preschoolers

As children enter the preschool years, their curiosity and inquisitiveness increases. As they interact with the world around them, they develop their own theories. You may see your child using reasoning and inquiry skills to explain what she sees, make guesses, and invent reasons to explain "why." She will develop scientific understanding best when given multiple opportunities to explore. Talk to her about what just happened and what you saw together. Ask her open-ended questions to help stimulate her thinking and problem-solving skills, and extend learning.

Here are ideas for building on your preschooler's natural curiosity:

- ❤ Help her notice similarities and differences, look for patterns in her environment, and describe her observations.
- ❤ When you notice your child is interested in something encourage her to write, draw or take photographs of what she has observed.
- ❤ Ask her open-ended questions to prompt further thinking and exploration. Here are questions to ask: What do you see happening? How are they alike, different? How does it feel? How did you know that? Can you think of a new way to do it? What might happen if we try this? What do you think caused it to change?

Activity for Preschoolers: *How Does Your Garden Grow?*

What You Need:

Bird seed or dried lima beans
Soil
Clear plastic cup with a small hole in the bottom
Ruler
Calendar

What to Do:

1. Explain to your child that many plants grow from seeds. Together, plant some seeds against the side of a plastic cup filled with soil.
2. Have your child mark the day you planted the seeds on a calendar.
3. Have your child water the seeds every day and make sure they have lots of sunlight.
4. As the seeds start to sprout, show her how to measure the tallest sprout with a ruler. Write the measurement notes on the calendar. Each day, record how tall the sprout is.
5. Talk with her about the changes in the size and length of the various sprouts. Ask her to describe how the plants are changing. Count the number of leaves that develop on each sprout as it grows bigger.

(See page 5 for information on how doing these kinds of activities with your child helps her 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, e.g., fingers, hands and toes
- ❤ Use and strengthen large muscles, e.g., arms and legs

Social and Emotional Development

- ❤ Learn to interact with others
- ❤ Shows eagerness and curiosity as a learner

Language and Literacy Development

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

Cognitive Development

- ❤ Develop her curiosity about how things work
- ❤ Makes meaning from explorations, and generates ideas and solutions

Kids in the Kitchen

Cooking teaches valuable lessons such as math and science concepts, fine motor skills, and language development. As you make this recipe with your child, ask questions throughout the process to encourage her thinking skills. Talk about kitchen safety. Show her how to handle items safely and allow her to do as much as she is capable of. Most of all, have fun!

Sleepover Oatmeal

Ingredients:

- 1 cup rolled oats
- 1 cup milk
- ½ tsp. cinnamon
- 1 Tbsp. chopped nuts
- 3 Mason jars
- 1 tsp. vanilla extract
- 2 Tbsp. dark chocolate
- Your child's favorite fruits such as: bananas, blueberries, strawberries

Directions:

1. Ask your child to help combine all the ingredients in a bowl and stir well.
2. Have her scoop the mixture into the mason jars.
3. Refrigerate overnight
4. Serve cold the next morning or warm in the microwave for 1 minute.

Resources

Baby Steps to STEM
Infant and Toddler Science, Technology Engineering and Math Activities, by Jean G. Barbre, EdD

NAEYC for Families: 10 Tips to Support Children's Science Learning
https://www.naeyc.org/our-work/families/support-science-learning

Investigating Rocks
https://www.youtube.com/watch?v=CupEMB5NIDo
The Center for Early Childhood Education at Eastern Connecticut State University is committed to sharing useful resources with those who work with and care for young children. The Center has developed a large archive of video footage of young children engaged in learning. These video clips, such as this one on helping children learn through the investigation of rocks, are available for free on YouTube.

Suggested Books
Discover these books and more at the **Hawaiʻi State Public Library** www.librarieshawaii.org.

Infants and Toddlers
Tip Tip Dig Dig by Emma Garcia
A book of different construction trucks that make different noises –from the crane that lifts, to the bulldozer that pushes. As the construction trucks work, they build a playground for children to enjoy.

Bear Sees Colors by Karma Wilson
Bear takes a journey to discover a variety of colors. Children will be able to see the plethora of colors that exist in the world.

Preschoolers
Things that Float and Things that Don't by David Adler and Anna Raff
A picture book that uses hands on activities to teach a variety of math and science concepts to young children. Learn about concepts like density and flotation.

Flashlight by Lizi Boyd
Go on an adventure as a child takes a flashlight and discovers all the things that are revealed in the darkness.

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