



EDUCARE

Science is Wonder

by Mike Huber

The best way to teach science to preschoolers is to inspire them to wonder. Let them be scientists. Let them explore.

What's in the Box?

In my book, *All in One Day*, the teacher, Walter, hands each child a box that is taped shut. There is something inside and each box has a small hole. The children need a little encouragement to try to figure out what is inside. They immediately find some clues. They can hear that it sounds like metal. They can see the size of the box and infer that the object is smaller than the box. I imagine that some children would stick their fingers in the hole in the box and try to feel the object. Some would look inside although it turns out to be too dark to see anything.

At this point the children are using listening skills, as well as differentiating materials (metal, plastic, etc.). They are problem solving. What they are, in essence, are researchers. They have a question to be answered and they will come up with several hypotheses. They will test those hypotheses, and they and their "colleagues" will narrow down the possibilities.

Sooner or later, one of the researchers is going to think of tools that will help the investigation. I imagine someone will get a pair of scissors and try to cut the box. In the book, one of the researchers decides that a flashlight would help. As it turns out, Walter had flashlights ready, anticipating that someone would come up with the idea.

Science from a Box

Too often in Early Childhood programs,

science comes out of a box. Each year children watch caterpillars in a butterfly tent make chrysalises and come out as butterflies. The activity is good, and it is quite dramatic. Most children see butterflies and are fascinated by them. Many children over the age of four could probably tell you that butterflies were once caterpillars. Certainly teachers can still have children ask questions and make predictions. Most children have read books about butterflies and know the basic story line, but a good teacher will help them focus on the details that can only be discovered by observation.

What's missing from the butterfly activity is the power of the ordinary. Let's face it, all insects have a larval stage and metamorphose into an adult. It would be just as easy for a class to watch mealworms change into darkling beetles, but it doesn't happen as often.

Science is mostly about the things we see every day but don't notice. Most of us probably couldn't explain why the sky is blue or what part of the branch leaves grow on and what parts they don't. And it's OK that we don't have the answers. What we need to do is help children ask those questions about the everyday things, and then help them figure out how to answer their questions. Science is about wonder.

Breaking Out of the Box

A teacher (or other adult) can help foster this sense of wonder by offering time and tools.

Children need to be in nature for long unstructured periods of time where

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**September
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2015**

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EDUCARE

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Heat Safety (continued)

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they naturally will make discoveries. It often starts with collecting small objects: stones, nuts, leaves, dandelions. As children collect, they notice similarities and differences.

An adult (or older child) can help the child reflect on what they have discovered. The adult can ask open-ended questions, taking the time to hear the child's answers rather than providing the answers. "Tell me about these." "How could I find some?"

The adult can also introduce "wonder" questions. "I wonder if..." "I wonder what would happen if you..."

Seeing What They Can't See

If children are going to be scientists, they also need tools. Tools can help children see things that they can't see otherwise. Magnifying glasses are often provided, but I have found that they don't provide much that a child can't already see by looking closer. On the other hand, a portable stereo microscope is fairly inexpensive and can be brought outside. Unlike compound microscopes, which require some specimens be mounted on slides, stereo microscopes allow the specimen to be simply placed under the lens. Worms and insects can crawl under. Pinecones, leaves, or any object under four inches in width can fit and the lenses can be focused on different parts of the object. Children can often see patterns on wings and leaves invisible to the naked eye. For younger children who may have a hard time looking into the microscope, you can hold a camera to one of the eyepieces and children can look at the camera's screen.

In my preschool classroom, one girl watched a worm move across the base of the microscope. She noticed the setae on the worm helped it move. After watching it, she held the worm and felt it tickle her hand. She realized she was feeling the setae. She had felt this before, but looking in the microscope helped her notice it.

Another way for them to "see what they can't see" is to open up the object. Hammers, knives, and saws can be used by children over three with adult supervision. Hammers can be used to crack nuts and other hard objects. Pumpkin carving knives can be used to open many firm vegetables. Depending on the size of the group and the abilities of the children, other knives could be used as well. An adult should hold the object unless it is big enough to stay still on its own. Saws can be used to open many other things. You need to clamp the object down so the children don't have to hold the object while sawing. In general, preschoolers only pay attention to one thing at a time so they shouldn't have to worry about steadying the object while cutting it.

Several years ago I asked my class how a marker works. There were several theories, some more realistic than others. Then I clamped the marker to a workbench, and helped the children saw the marker open. Even the kids who had predicted accurately were amazed to see the color-filled cylinder. I have done the same with golf balls, soccer balls and a guitar (all broken).

Many appliances or machines can be opened with screwdrivers. An adult should open it first to assess any risk of injury from sharp corners or moving parts. Adults may also find that there is very little for young children to see to understand how the machine works. While children can't open up every appliance on a whim, they may look closer at machines they may have otherwise looked right past.

Giving children time and tools to explore the world around them allows them to be scientists. They are not just opening a door to a new world. They are opening themselves up to wonder.

After all, science is wonder.

Article featured in Community Playthings

Educare Support Group:

- **September 17** — **Emergency Preparedness:** 5:00-6:30 p.m. & 8:30-9:00 p.m. Educare Office, 200 W. First St., Suite 182, Farmington
- **October 15** — **Fire Safety:** 5:00-6:30 p.m. & 8:30-9:00 p.m. Educare Office, 200 W. First St., Suite 182, Farmington

Registration required at least 7 days prior.

These support groups are open to anyone and DO NOT include clock hours.

Call Educare at 573-431-3173 for details, or more information.

Awakening the Senses *(continued from our last newsletter)*

By Alice Sterling Honig, PhD



Sight

As a part of your morning greeting ritual, ask children to share what they noticed on the way to your program. Children are exceptionally observant but often

need help to find the language to describe what they have seen. Going outdoors with your class provides a variety of sights, colors, and visual experiences for children. Teachers are children's personal guides to awaken a sense of awe and rejoicing in the variety and richness of nature.

Identifying birds or flowers will help sharpen children's visual processing skills. Even if you don't live in an area teeming with nature, there are sure to be weeds growing abundantly. Or go on a bug hunt! Sometimes that will involve tramping through grass or looking under rocks. Sometimes children just want to

lie still on their tummies and watch little ants going about daily chores or watch a grasshopper jump. Walking through a garden, children can spy bees collecting pollen from different plants or observe butterflies delicately sipping nectar from a flower.

Conclusion

As children look for leaves and bugs, sniff flowers and fruits, and listen for birds or the patter of rain, they are enriching their sensory awareness and attunement to nature and the environment. The teacher acts as a guide to expand a child's sense of delight and provides vocabulary to describe what the children are experiencing. As a child's awareness of the world grows, his love of nature increases.

This article is adapted from Chapter 1 of *Experiencing Nature with Young Children. Awakening Delight, Curiosity, and a Sense of Stewardship*. Published by the National Association for the Education of Young Children. (You can order by calling 1-800-424-2460.)

To view the entire article, visit: www.communityplaythings.com/resources/articles/2015/awakening-the-senses

Sensory Activity Fun

Fall is a wonderful time for being outside, not too hot, not too cold. It is the perfect time for a sensory walk or hike. Help your children notice what they hear, smell, see and touch. Build vocabulary and language skills; the leaves are beautiful and vibrant, they are crunchy as we walk on them, perhaps you can smell burning leaves. Feel the air blow. Pretend to be leaves dancing in the wind. Give each child a bag to collect leaves and other special items from the ground.

Flip-a-Coin Hike: On your walk, flip a coin to choose direction. Heads go right, tails go left.



Center Pieces: Give each child his bag of items found on your fall walk. Give each child a handful of clay. The children can press the items into the clay and allow to dry to make a seasonal center piece. Some people use plaster of paris instead of clay.



Sponge Painting: *Supplies needed* — Brown paper cut into leaf shapes (Educare has a maple leaf die cut), orange, red and yellow paint, sponges. Have the children use the sponges to paint on the leaf shapes.

Have some real leaves nearby so the children can try to make similar color patterns. Allow the children to make as many leaves as they wish. Make a larger paper tree shape for the bulletin board or wall. Hang their fall leaves on the tree for a beautiful seasonal decoration.

Movement Scarves: Go outside on a breezy day with movement scarves (available to borrow from Educare) and blow around like the leaves. You can also do this activity indoors using a fan. Start with the fan on the low setting. Slowly begin to move around. Lift your head and move your arms gently. Turn the fan up to medium. Rise to your knees. Arms swirl around and around. Turn the fan up to high. Make your scarf dance all around the room. Slowly reduce the speed of the fan until everyone is lying still.



These fun activity ideas were contributed by Liz Bennet, Educare's new Assistant Child Care Trainer. Stop by to meet Liz sometime! She is full of ideas to engage the children in movement and fun!



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www.sfccp.com/educare

**September
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Promoting Quality Care
& Education of
Young Children

Training Opportunities

FOR STATEWIDE TRAINING OPPORTUNITIES, VISIT: www.moworkshopcalendar.org

*“Classroom Hacks: Unusual
Uses for Everyday Items”*

Thurs., Sept. 17, 2015

Time: 6:30-8:30 P.M.

*****FREE!***FREE!***FREE!*****

Presented by: Diane Miesner

Location: The Factory, 3rd Floor Meeting Room

PRE-REGISTRATION IS REQUIRED.

Register online at:
www.moworkshopcalendar.org
Call 573-431-3173 for more information.

*“Building Collaborative
Relationships with Families”*

Thurs., Oct. 15, 2015

Time: 6:30-8:30 P.M.

\$12 per person*

Scholarship available for first 15 registrants

**Presented by: Jessica Sims
from Child Care Aware of Missouri**

Location: The Factory, 3rd Floor Meeting Room

PRE-REGISTRATION IS REQUIRED.

Register online at:
www.moworkshopcalendar.org
Call 314-469-9805 for more information.

www.sfccp.com/educare