Helping Your Child Learn Science

Why is the sky blue?
Why do things fall to the ground?
How do seeds grow?
Where do mountains come from?

Curiosity is natural to children, but they need help understanding how to make sense of what they see and to relate their observations to their existing ideas. In search of answers, we use science to both enlighten and delight. Being “scientific” involves being curious, observing, asking how things happen and learning how to find the answers. As a parent, you don’t have to be a scientist or have a college degree to help your child learn science. What’s far more important than being able to give a technical explanation of how a telescope works is your willingness to nurture your child’s natural curiosity by taking the time to observe and learn together. Science "happens" all around us every day. Without expensive chemistry sets, equipment or kits, a child can be introduced easily to the natural world and encouraged to observe what goes on in that world. When you least expect it, a moment for learning will occur: A bit of ice cream drops on the sidewalk and ants appear; some cups float and some sink when you’re washing dishes; static electricity makes your hair stand on end when you put on a sweater. In everyday interactions with your child, you can do many things to help her learn science.

Here are a few ideas:

★ See how long it takes for a dandelion or a rose to burst into full bloom
★ Watch the moon as it appears to change shape over the course of a month and record the changes
★ Solve the problem of a drooping plant
★ Bake a cake
★ Figure out how the spin cycle of the washing machine gets the water out of the clothes
★ Look for constellations in the night sky

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The Building Blocks of Language in Early Childhood, Part 3: The Value of an Interactive Environment

by Joy Simpson

Many parents create a wonderful training ground for language in the early years. They do this more or less naturally. When baby says "da-da," parents echo the cute sounds, cooing "da-da" back. This encourages baby to keep babbling. When baby reaches or points, mommy responds by giving him what he wants. The child’s actions have a concrete effect. Daddy and baby play Peek-a-Boo over and over, establishing a routine for interaction that enriches them both. When baby says "ba-ba," mommy says, "Here’s your bottle." This modeling of adult words in context gives sound a meaning -- and baby a reward. Many researchers believe rich layers of experience are instrumental in propelling a child’s growth.

Now, here's the rub. A child with developmental delays may not do the things that parents typically respond to. They may not show they are ready to communicate, and so the dance between parent and child is delayed and awkward. "This is not the fault of the parent. It is just another aspect to disability that must be overcome," says Steven

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For Steve Warren, director of the Schiefelbusch Institute for Lifespan Studies and a BNCD Investigator, babbling is exciting work. Parenting magazine recently quoted Warren in an article describing how families often adopt a word their children make up when they are developing speech skills.

"That's what babbling is about early on," he says. "It's your baby trying to make the sounds she's hearing. And that's why she mispronounces words later on" (Rosenberg, 2006).

Showing that you understand your child without focusing on her mistake can help her to communicate better, suggests Warren in Parenting:

If you're at the zoo and your child points and yells "Bar!" "you could respond: 'Yes, that's a very big bear,'" Warren says, "expanding the conversation, repeating the word correctly, and making sure your child knows you read her loud and clear" (Rosenberg, 2006).

Warren and Marc Fey, professor of speech-language-hearing, along with Paul Yoder from Vanderbilt University, recently received a $3.7 million, five-year grant from the National Institute on Deafness and Other Communication Disorders. The grant will allow the researchers to continue communication intervention to improve nonverbal and verbal communication skills for children with language delays.

1. Systems, Order & Organization

The natural world is so large and complicated that scientists break it down into smaller parts in order to study it in depth. These smaller units are called systems. Scientists look for patterns through which they can classify - or organize - things into systems. For instance, animals that have fur or hair are classified as mammals. When you encourage your child to gather and organize objects according to their size or color - for example, leaves or insects - you are helping prepare her to think in terms of systems.

2. Evidence, Models & Explanations

Scientists test the explanations they come up with, and the results of their tests are evidence on which to base their explanations. Sometimes they call their explanations "models" or "hypotheses." Children can test their theories about the world too: Is it the baking soda that makes my pancakes thick? Can I make thicker pancakes with more soda?

3. Change, Constancy & Measurement

The natural world changes continually. Some objects change rapidly and some at a rate too slow for us to observe. You can encourage your child to look for changes by asking him to observe and talk about:

- What happens to breakfast cereal when we pour milk on it?
- What happens over time when a plant isn’t watered or exposed to sunlight?
- What changes can be reversed? Once water is turned into ice cubes, can it be turned back into water? Yes. But if an apple is cut into slices, can the slices be changed back into the whole apple?

Children can observe change more carefully through measurement. Keeping a growth chart or making a graph of the temperature each day will give your child practice looking for differences and measuring them.

4. Evolution & Equilibrium

It’s hard for children to understand evolution (how things change over time) and equilibrium (how things attain a steady and balanced state of being). During these early years, you can, however, talk about how things change over time and point them out to your child. For instance, show your child a series of photos of himself from birth to the present and talk about the many ways he’s changed. And, you can talk about balance and the work it often takes to achieve it: Learning to ride a bicycle or walk with a book on his head are good examples.

5. Form & Function

One of the simplest themes in science is all around: The shape of a natural thing is almost always related to its function. Begin with man-made objects. Can your child guess the use of a thimble, a cork-screw, an egg beater? When you are looking at animals, ask him questions such as: "What might those plates do on the stegosaurus's back?" "What sort of habitat would a web-footed platypus like?" His best guess will almost always be correct.

As a parent, you can help your child want to learn in a way no one else can. Look on the back of this and future BNCD newsletters for science projects you and your child can do together!
About this Newsletter

The BNCD newsletter is designed to keep you informed about the ongoing research projects that are being conducted by BNCD researchers at the University of Kansas. Participants who have been part of recent research projects done by BNCD researchers, parents who have expressed interest in participating in future research, and individuals from organizations such as schools and daycare centers that have an interest in BNCD studies will receive this newsletter from time to time to keep them up-to-date about the research activities at the BNCD. If you do not wish to receive future newsletters, please call or e-mail the BNCD to have your name removed from our list. Research at the BNCD is supported in part by grant number 5 P30 DC05803 from the National Institutes of Health (NIH) at the University of Kansas.

Take a Science Walk!

What You Need
★ A magnifying glass
★ Science journal (any small notebook will do)

What to Do
Take a walk outside with your child. Invite her to bring along her science journal and show her how to use a magnifying glass. As you walk, stop and ask her to use the lens to examine things such as: Dirt, leaves (from the same tree, one on the ground and one on the tree), flowers, bugs, a mud puddle, a rock
★ Ask her to talk about what she sees. Ask, for example: What’s on each side of this leaf? How is this leaf on the ground different from the one on the tree? Are all the petals on this flower the same size and color? How many colors can you see in this mud puddle?
★ Other questions to ask: Is it smooth or rough? Hard or soft? Dry or wet? Is it alive? How do you know? Give your child two different rocks or flowers and ask her to tell you how they are alike and different.
★ Make sure she records what she sees and thinks in her science journal. Drawing pictures is a good way to record observations. Encourage her to share her journal with others!

Float or Sink?

Learning to make and test predictions is a good first step toward making and testing hypotheses.

What You Need
★ 2 pieces of aluminum foil
★ 1 piece of modeling clay
★ Sink filled with water

What to Do
★ Give your child a piece of foil and tell him to squeeze it tightly into a solid ball then drop it in the water. Does it float or sink?
★ Give him another piece of foil. Help him to shape it into a little boat, then have him carefully place it on top of the water. Does the foil float now?
★ Have your child predict whether other items will float or sink - wooden blocks, plastic caps, leaves, coins, and rocks - and then find out!

You Can Explain
The clay and foil balls sink because they are squeezed into small shapes and only a small amount of water is trying to hold up the weight. When the clay or foil is spread out, it floats because the weight is supported by a lot more water.