

“Nurturing A Natural Scientist” Activities

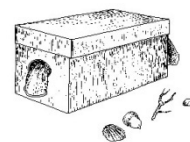
Infant/ Toddlers:

From an early age, infants use all of their senses – sight, taste, touch, hearing and smell – to gather information about the world around them. Their senses may be considered their first scientific “tools”. Babies put nearly everything in their mouths! As babies move into toddlerhood and they are able to move around, they begin to expand their investigation and “test” – getting into – things in their environment; for example, seeing what will happen if a cat’s tail is yanked. Caregivers should plan activities that enable little ones to experiment, and teachers should provide opportunities for children to ask questions, make observations, and gather and analyze information. Satisfying the natural inclination to question stimulates curiosity and can lead to an interest in science that lasts a lifetime!



Toddler Science Ideas:









- Have plastic bottles available for water play; some with or without lids; some empty, partially or completely filled. Experiment with making bubbles by “dunking” the bottles without lids and with sinking and floating. Make small holes in a bottle to make a “shower”.
- Use empty squeeze bottles (ketchup, mustard, lotion, etc) to move a variety of objects. What makes a feather or scraps of paper move easier than a block or toy car when the bottle is squeezed in front of it?
- Make a “Feely Box” by cutting a hole in a shoebox and placing items of differing textures (pieces of fabric or cloth, a feather, plastic, metal, wood, etc.) in it. Have children guess what it is they are feeling. Ask questions such as: “Is it soft?”, “Is it smooth?” or have *them* describe to *you* what it feels like.



Preschoolers:

Preschoolers are beginning to build concepts. Language, cognition and gross motor skills are continuing to develop. Cognitive development skills are continuing to develop in observation, counting, recording and organizing information. Teachers should provide objects with which children can sort and classify. For example, have children collect a number of items while on the playground or during a nature walk. Sort the collection by size, color or other attributes. Record and chart the attributes of the objects collected.

SAMPLE CHART
 “Things we found on our playground.”

Object	Color	Size
leaf 	green 	small
old shoe 	black 	big
rocks 	gray 	big and small
feather 	white 	small

Sink and float (density) experiments can also be charted in a similar method. Mathematical thinking and concepts are also developed when children are given opportunities to group, sort, classify and chart. Add language concepts by allowing children to “journal” their observations before, during and after an experiment.

Preschool Science Ideas:

- Make shadows using flashlights and record observations. What happens when you move an object closer to a wall? What happens if it is moved further away from the wall? Alter the angle of the light source to see how it affects the size of the shadows. Record the hypotheses and results!
- Study water transference by transferring water from one container to another in different ways. (Use cups, sponges, eye droppers, straws, etc.). Or gather different size plastic containers and bowls. Discuss the shape of the water in the containers so that children can learn that water has no shape or form.
- Gather objects that make different sounds. Ask children to cover their eyes and guess the objects.
- Cut cardboard boxes of varying lengths (cereal, pasta, etc) in half lengthwise and/or cut a Pringles chip-like container in half. Tape them on a wall at various angles. Have children roll balls down the paths to explore velocity/speed. Use other three-dimensional shapes (cone, cube, cylinder) to see if they will move as a ball (sphere) does.
- Conduct the “Celery Experiment”:
 - Place a stalk of celery in a glass of water. Add food coloring with an eye dropper. Wait and observe what happens. Ask questions such as: “What do you think will happen?”; “What happened?”; “Why do you think that happened?”
 - Record “before” guesses and “after” results.





School-agers:

Naturally, school-agers' approach to science is a bit more advanced. They are able to use more mathematical and scientific vocabulary to rationalize and reason as they learn from books, older siblings and even the internet. Teachers should plan more in-depth science experiences that allow investigations to occur over a longer period of time and consider using more scientific tools. Help children make concept connections as you guide them in their explorations and subsequent discoveries.

**The previous activities mentioned for preschoolers can be modified and expanded for school-agers.*

School Age Science Ideas:

- Fill a bottle with hot water (**adult supervision is a must**) and a bowl with cold water. Allow one minute to pass, and then empty out the bottle. Stretch a balloon over the mouth of the bottle and then place it in the bowl of cold water. Observe what happens to the balloon. Ask questions such as: "What happened?"; "Why do you think that happened?" (If done correctly, the balloon should be "pulled" inside the bottle and inflated a little). The warm water heats the bottle and when the water is poured out, the heated bottle then heats the air inside of it. The air inside the bottle cools and contracts when the bottle is placed in the cold water. That causes outside air to be drawn in which pulls the balloon into the bottle and inflates it inside.
- Select a few vegetables to plant. Explore parts of a plant (roots, seeds, stems, leaves, flowers)
- Examine fossils, rocks or minerals
 - Play a matching game – match concrete object (an actual mineral) to a photograph
 - Test hypotheses (guesses) [Example: "Which rock is heavier?", "How can you find out without lifting them?"]
- Explore properties of liquids, solids and gases
 - Fill a one balloon with air, another with water and yet another with plaster of Paris. Discuss.



All Age Groups:

Here is a specific science activity that can be done with children ages 2 and up. You may wish to modify the activity depending on the developmental level or age of your group of children.

"Let's Make Rain"

- **Trays/pans filled with ½ inch of cold water**
- **Cotton balls for each child in a small group**



1. Give each child a cotton ball to hold. Tell them to pretend that they are holding a cloud.
Ask: "How does the cloud feel?" (Light, heavy, warm, cold, dry, wet).
2. Show the children how to gently place their cotton ball "cloud" over the cold water so that a little of the cloud is touching at first.
Ask: "What is happening with the water?"; "How does the "cloud" feel *now*? (Light, heavy, warm, cold, dry, wet)
3. Have them slowly dip the entire "cloud" in the tray/pan of water so that it is dripping.
Ask: "What is happening with the water?"; "How does the "cloud" feel *now*? (Light, heavy, warm, cold, dry, wet)
4. Have the children pick up the "cloud" from the tray/pan.
Ask: "What is happening?"; "Why is the water dripping from the "cloud"? "Where is the water falling into?"

Explain that water that has evaporated has traveled up to the cloud and it is a lot colder up in the sky, so the vapor turns into water, and it is filling up the cloud. The cloud cannot hold all that water because it is heavy. Ask: "What do we call water that falls from the clouds?" Rain! Ask: "Where does rain go?" It goes into the ground, river, stream or ocean like the water dripped back in the pan!



Getting Parents Involved:

Share the science activities that are done in your classroom with parents. Invite them to participate and perhaps, include some of their ideas. Remind them that the main goal is to create an environment of inquiry so children are able to do more than just *give* answers, but to *seek* to find them. Suggest parents spend time outdoors with their child, either in the yard or at a nearby park to observe nature and the natural things in the environment. Encourage parents to "conduct" the same experiments and to ask the same open-ended questions you do with their child at home.

Here are a few:

"What do you think?"

"Why do you think that happened?"

"How do you think that happened?"

"What do you think will happen next?"

"Can you think of another way this could be done?"

"What does it look like/ how does it feel/taste/sound like?"

The Department of Education has a science booklet entitled "Helping Your Child Learn – Science" that provides simple science activities for children in preschool to fifth grade. You can view series titles by visiting www.ed.gov/parents/academic/help/hyc.html?src=rt. To view and download the Science booklet, visit www.ed.gov/parents/academic/help/science/science.pdf.