

**Strategies that Support Children in the Area of Science**

**Scientific Inquiry and Application**

* Model curiosity, inquiry, and investigation for children. Smile, laugh, and show delight in being with children.
* Plan and organize time for dressing children in outerwear. Dressing offers young children a rich language, social-emotional, and self-care learning experience.
* Provide regular outdoor opportunities for infants and toddlers to freely crawl, toddle, walk, climb, and run.
* Enliven children’s senses to encourage them to react and move. For example, place one or two colorful toys within an infant’s reach during tummy time or invite toddlers to taste different varieties of apples. Being outside presents a new world full of sights, sounds, smells, and tactile experiences.
* Provide a variety of tools for scientific observation and experimentation, such as magnifying glasses; scales and other measuring tools; collection boxes.
* Teach children observation skills. Encourage them to go beyond just “looking.” Have children describe, draw, discuss with others, redraw and describe again to refine observation skills, build vocabulary, and develop understanding of concepts.
* Give children journals, clipboards, and writing tools to engage them in recording observations, gathering data, and communicating their findings to others.
* Listen to children and ask about what they are seeing and doing. When children talk with interested adults about what they see, hear, and think, they do more noticing, wondering, and reflecting. They make connections, think about causes, choose words to express what they mean and learn new, often rare words. Incorporate science concepts and skills as children play with blocks, water, sand, playdough and other materials, and as they engage in dramatic play, cooking, art, music and movement, stories, and outdoor experiences.
* Build on and extend children’s interests in the physical world and living things by using information books, field trips, visitors, and other ways of opening up the classroom to science.
* Engage children in formulating questions, such as “What do you want to know?”; designing experiments, such as “How can we find out?”; and making predictions, such as “What do you think will happen if…?” Children attend more closely to what they see, hear, smell, and feel when they have put forth their own prediction or question. When they have considered how to go about investigating something, they are also more likely to think about what their observations mean.

**Knowledge of Science Concepts**

* Model an attitude of openness and flexibility to asking questions, not needing to have all the answers.
* Follow children's leads and change plans entirely to take advantage of unexpected discoveries.
* Focus on teaching scientific knowledge that is familiar and meaningful to children, such as concepts of temperature based on their own experiences with weather. Although children are more capable of abstract learning than previously thought, it is usually easier to begin with more concrete, accessible experiences that can be seen, touched, tasted, or heard. Facilitate young children's exploration of natural elements such as nonhazardous plants, animals, and bugs/insects; dirt and mud; rain and snow; water; shells and stones.
* Provide regular outdoor opportunities for infants and toddlers to learn about nature and begin to develop a connection with and an appreciation for the natural world.
* Involve parents in sharing science-related experiences from home.
* Read information books or explore the Internet to learn more about a given topic of study.
* Plan in-depth projects or topics of study related to science knowledge that build on and expand children’s interests.
* Engage children in coherent, organized studies of animals, plants, and the environment.
* Spend sufficient time on topics for children to follow their interests. For instance, in a class study of local animals, small groups of children or individuals may study one animal in-depth and report their findings to the others in the group.
* Focus children’s attention during a scientific study on relevant and interesting phenomena. Describe what is happening and point out details. Invite their questions and observations.
* Emphasize phenomena that can be observed and experimented with directly because the children’s interest and learning will be high. When children express interest in remote or invisible things and events, such as those in outer space or long ago, we need to find ways to support their interests while keeping a focus on more accessible topics and concepts.
* Encourage children to reflect on their experiences and share their ideas with others (EDC 2001). Young children’s direct experience with materials is important to their science learning, but it is not enough. Reflecting on what they have experienced, representing observations and ideas, and communicating with others are also crucial.
* Emphasize questions that can be explored. For example, ask what will happen if the child squeezes an object or challenge several children to blow on a spool to move it across a table. From infancy, children learn about the physical world by acting on objects. They often explore effects without knowing how they achieved the results. Getting children involved in focused explorations and asking about what they did and what happened helps them think about cause and effect.
* Give children a variety of ways to document and represent their work, which is powerful in promoting their insight and understanding (EDC 2001). Ongoing discussion between teachers and children, informally and in planned groups, gives children the chance to hear others’ thinking and perspectives and to develop skills in communication.