WHAT WE KNOW ABOUT CHILDREN'S SCIENCE LEARNING

Children are exploring their world every day. Young children learn science best when they are doing hands-on investigations with others. Adults can provide scaffolding to help children articulate their questions and thinking, pursue inquiry, and make sense of their discoveries.

Why should young children learn about science?

Science learning in early childhood can improve children's school readiness. Science skills and knowledge also prepare children to be citizens of an increasingly complex world and pave the way for future job opportunities.

Developmentally appropriate science learning for young children:

- Supports language and literacy development.
- Provides the roots of an emerging ability to think about and understand complex relationships.
- Offers opportunities to use logical thinking to solve problems.
- Helps children develop creativity, flexibility, and persistence.
- Encourages curiosity.
- Gives children experiences working with others.
- Engages all children and fosters a motivation to learn.
- Supports the development of self-regulation.
- Helps address achievement gaps between low-income and other children in lifelong science performance.
- Has the potential to engage families.

What should young children learn about science?

The Head Start Child Development and Early Learning Framework identifies goals for young children's science learning that include observing, predicting, and explaining.

Early learning standards in the area of science vary from state to state, but they all include the science skills: observe, question, predict, experiment, and discuss. Common topics include: living vs. non-living things; plants, animals, and life cycles; motion; states of matter; the human body; weather and seasons; day and night; water, rocks, and soil; sun, moon, stars, and clouds; use of tools; and the impact of humans on the environment.

Fundamental skills for young children are learning and practicing the steps of scientific inquiry. Adult guidance can help children gain more understanding from their investigations. Teachers can provide modeling and scaffolding so children can learn new science concepts, vocabulary, and skills. They can give children time to think and express ideas. As children develop their inquiry skills, teachers can support children in taking steps toward open inquiry, where children ask questions and pursue their own investigations.

Effective practices for working with young children also apply to science learning. These include following children's interests, engaging in conversations, teaching vocabulary, reading and discussing books on science topics, and involving families. Dual language learners should also have opportunities to demonstrate science skills and knowledge in any language, including their home language.

Early childhood teachers can model curiosity in exploring the world. Teachers can investigate and seek answers with children. Teachers may need to do research on science topics to guide children to accurate conclusions. In addition to planned science activities, early childhood teachers have opportunities throughout the day to help children engage in scientific inquiry.

Other recommendations to support young children's investigations include:

- Open-ended materials for exploration
- Opportunities for children to work together and compare thoughts
- Opportunities to document and discuss findings
- A coherent science program over an extended period of time
- Chances to explore concepts in depth
- Scaffolding that links new knowledge to concepts children already know
- Integration with other subjects, particularly math and language
- A positive social and emotional environment
- A dynamic science area
- Diagrams that show cause and effect relationships
- Images—when time and location prevent children from watching events unfold in nature
- Practice with science tools

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