Early Education for All

A campaign of Strategies for Children

Math and Science in Early Learning

Early learning experiences influence children's math and science aptitude.

- The foundations for learning math and science are inquiry and exploration, which are also the hallmarks of learning during early childhood.[1]
- Recent neuroscience findings confirm the important link between early experience and subsequent achievement in math, science and technology.[2]
- Young children have been called "natural scientists," curious and inquisitive from birth to explore their surroundings and discover why things happen as they do.

Early Learning Lays the Foundation for K-12 Success.

K-12 science standards require students to use scientific reasoning and critical thinking to develop their understanding of science and technology.

K-12 math standards focus on mathematical competence through problem solving, making connections and using representations.

The Massachusetts *Guidelines for Preschool Curriculum Experiences* align with the K-12 math and science frameworks in order to introduce 3- and 4-year-olds to the skills that will help prepare them to better understand and enjoy math and science later in school and life.

Source: Massachusetts Department of Education, Guidelines for Preschool Learning Experiences, *2003. Available at: http://www.doe.mass.edu/els/standards/ple_guidelines.pdf*

Quality early childhood education builds children's math and science skills.

- Preschool provides children a structure in which to build upon their natural inclination to explore and inquire.
- Early childhood settings offer hands-on opportunities to collect and organize data to answer a question.[3]
- Children learn about science through play, such as blowing soap bubbles at the water table, adding a block that causes a structure to collapse, or refracting light through a prism.[4]
- Children learn to solve math problems as they design and test solutions through the construction of block towers, piecing together puzzles and even dividing up a snack among friends.
- Science in early childhood settings offers a means for children to develop many important skills: large- and small- muscle control, language, early math concepts and problem solving.[5]

Quality early childhood education helps prepare children to succeed.

- Learning about math and science concepts in early childhood provides children with opportunities to begin make sense of phenomena in the everyday world—such as why water evaporates and how electricity works—that they will revisit throughout their K-12 years.[6]
- Math and science concepts elaborate on young children's natural curiosity by giving them tools to ask questions, make predictions and investigate problems—processes they will use both in school and in life.[7]
- Math and science skills—such as reasoning, thinking creatively and problem solving—are becoming increasingly important in the workplace.[8]

---

[1] Massachusetts Department of Education, *Guidelines for Preschool Learning Experiences,* 2003. Available at: http://www.doe.mass.edu/els/standards/ple_guidelines.pdf

[2] Bowman, B. "A Context for Learning: Policy Implications for Math, Science, and Technology in Early Childhood Education." *Dialogue on Early Childhood Science, Mathematics and Technology Education*, American Association for the Advancement of Science or the National Science Foundation, February 1998.

[3] K. K. Lind. "First Experiences in Science, Mathematics and Technology –Science in Early Childhood: Developing and Acquiring Fundamental Concepts and Skills." *Dialogue on Early Childhood Science, Mathematics and Technology Education*, American Association for the Advancement of Science or the National Science Foundation, February 1998.

[4] Chalufour, I & Worth, K. (2004) "Building structures with young children." *The Young Scientist Series.* St. Paul, Minnesota: Red Leaf Press.

[5] Rillero, Peter. "Doing Science With Your Children" ERIC Clearinghouse for Science, Mathematics, and Environmental Education, Columbus, Ohio. June 1994

[6] Chalufour, I & Worth, K. (2004) "Building structures with young children." *The Young Scientist Series.* St. Paul, Minnesota: Red Leaf Press.

[7] Ibid.

[8] National Science Educational Standards: An Overview. Available at: http://www.nap.edu/readingroom/books/nses/html/overview.html

[Updated December, 2005]

400 Atlantic Avenue
Boston, Massachusetts 02110

www.strategiesforchildren.org
www.earlyeducationforall.org

phone: 617.330.7380
fax: 617.330.7381