

# **The Value of Science Education in Pre-K through Elementary School**

## VAST Position Statement

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### **Introduction:**

Because of the vital importance of a scientifically literate citizenry in an increasingly science- and technology-based world, and because much research highlights the importance of early experiences in science and the ability of young children to learn scientific concepts, the Virginia Association of Science Teachers (VAST) strongly advocates and supports a pre-K through elementary school science program in which all students experience daily instruction in science at every grade level utilizing inquiry based methods.

Opportunities for pre-K through elementary school children to experience meaningful and thoughtfully planned science instruction are fundamental to the learning of all students at this level. In a schoolwide culture which values reasoning, critical thinking skills and understanding, the process of scientific inquiry needs to permeate a well-designed science program where students learn to question, describe, test, explain, and communicate. In a robust elementary school science program the instructors are teachers, facilitators and life-long learners with strong content knowledge and training in science instruction. A strong elementary school science program also encourages children's natural tendencies to explore and learn, and develops language and mathematical skills through observations, manipulation and communication of data and discoveries during lessons where various subject areas are integrated. As students are encouraged to assume responsibility for their own learning, inquiry science is an essential vehicle for acquiring these skills. A robust elementary school science program also must exist in an appropriate physical setting and in a trusting and supportive atmosphere. The physical setting for teaching science must be safe, adequate, and appropriate; the science program needs proactive administrative support, time for doing science, and an emphasis upon significant and continual professional development for teachers.

### **Declarations:**

Pre-K through elementary school science education is shown to be valued when:

1. Conditions and school culture are conducive to science learning, and include
  - a. Time for an inquiry science program provided for every student on a daily basis;
  - b. Settings for science instruction both inside and outside of the classroom that are safe and adequate;

- c. Language and mathematical skills that are learned and applied in science;
  - d. Integration of other subject areas (history, art, music, language arts, and mathematics) with science and science with them;
  - e. A science contact person or specialist in every pre-K through elementary school in order to serve as resource and mentor;
  - f. Consistent administrative and community support, including financial support, for the above conditions.
2. Instruction emphasizes inquiry science skills such as
    - a. Tactile experiences in which all students discover scientific concepts and develop basic process skills;
    - b. Identification of assumptions;
    - c. Logical explanations based on natural causes;
    - d. Critical alternative ideas;
    - e. Construction of new mental frameworks.
3. All students are encouraged to
    - a. Take responsibility for their own learning;
    - b. Play a role in decision making;
    - c. Be aware of personal knowledge;
    - d. Practice reflective thinking;
    - e. Collaborate and communicate within groups and to the class.
4. Teachers are engaged in research-based learning and instructional techniques where
    - a. Strong content and strategies for teaching are addressed in both pre-service and in-service training;
    - b. Professional development is expected, supported, and continual;
    - c. Student activities are developmentally appropriate;
    - d. Student preconceptions are consciously addressed.
5. Assessments are
    - a. Multifaceted;
    - b. Consistent with the goals of the science program;

- c. Aligned with standards;
- d. Research-based;
- e. Providing feedback which is acted upon by teachers.

**Resources:**

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2. National Research Council. (1996). *National Science Education Standards*. Washington, DC: National Academy Press.
3. National Research Council. (1999). *Inquiry and the National Science Education Standards: A Guide for Teaching and Learning*. Washington, DC: National Academy Press.
4. National Research Council. (2007). *Taking Science to School: Learning and Teaching Science in Grades K-8*. Committee on Science Learning, Kindergarten through Eighth Grade. Richard A. Duschl, Heidi A. Schweingruber, and Andrew W. Shouse, Editors. Board on Science Education, Center for Education. Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
5. National Science Foundation. *Inquiry: Thoughts, Views, and Strategies for the K-5 Classroom*. (NSF 99-148). *Foundations* monograph, Division of Elementary, Secondary, and Informal Education.
6. National Science Teachers Association. (2002). *Position Statement: Elementary School Science*. Available at NSTA website: [www.nsta.org](http://www.nsta.org)
7. U.S. Department of Education. (2002). *Teaching Our Youngest, A Guide for Preschool Teachers and Child-Care and Family Providers*. U.S. Department of Education and Department of Health and Human Services.
8. Virginia Department of Education. (2007). *Virginia's Foundation Blocks for Early Learning: Comprehensive Standards for Four-Year-Olds*, pp. 24-31. Office of Elementary Instructional Services, Early Childhood – Head Start Task Force.

