

## **FAST Position Statement**

# **Best Practices for Science Education**

## **Introduction**

FAST recommends a strong commitment to science education in K-20 education. This can be achieved by recognizing the unique nature of science as a way of knowing; then developing curriculum, assessment, and instruction from this perspective. Science concepts are developed over time by disciplining our natural curiosity to the methodological observation of the natural world. The goal of a sound science education is to produce a student who can discover, comprehend, appreciate, and evaluate the natural world and the mechanisms that govern its behavior. Further, it is the philosophy of FAST that responsible citizens of our highly technological and scientific society recognize the potential and limitations of science.

Research shows that the United States of America does an admirable job of teaching science during the formative years of a child's education. According to the 2003 Trends in International Mathematics and Science Study, the US fourth graders ranked sixth among twenty-five nations, statistically outscored only by Singapore, Chinese Taipei, and Japan. During this time the learning environment is typically safe, enthusiastic, and nurturing to the innate spirit of inquiry. With the imposition of more cognitively complex and structured learning in the middle grades and beyond we see an alarming chasm forming between the scientifically knowledgeable and the larger population. Again, referring to the TIMSS study; American eighth graders ranked ninth out of forty-five countries, statistically outscored by Singapore, Chinese Taipei, Republic of Korea, Hong Kong SAR, Estonia, Japan, and Hungary. As this trend affects our work force, we experience a critical shortage of technically skilled workers into the future.

(Trends in International Mathematics and Science Study, 2003) The Organization for Economic Cooperation and Development commissioned the Programme for International Student Assessment which found that one quarter of fifteen-year old US students performed below basic proficiency on science competencies. (Organization for Economic Cooperation and Development, 2007)

FAST remains engaged in the legislative arena to educate and facilitate in the discussion of the looming crisis created by the lack of suitable candidates for technologically involved careers in the United States. FAST supports the efforts of those who combat the devaluation of science education. The burden rests on the teachers of America's children to refresh the teaching of science, to remediate a generation of students deprived of sufficient time and resources to pursue science education, and to prepare all future generations of scientifically literate and skilled citizens.

## **Declarations**

### **FAST recommends that the standards for science**

- contain clear and fair expectations by grade level for students

- Are organized in a sensible way, showing both logical grade progression and easy navigation for teachers, parents, and the public
- contain an appropriate amount of science *content*, and a mechanism to share that content
- have expectations outlined and specific that will equip students with the science skills they need for college and life
- are appropriately serious, without pseudo-scientific fads or politics

(Fordham Foundation 2005)

**FAST recommends that the teaching of science**

- respond to the individual student's interests, strengths, experiences, and needs
- focus on student understanding and use of scientific knowledge, ideas, and inquiry processes
- guide students in active and extended scientific inquiry
- provide opportunities for scientific discussion and debate among students
- support a classroom community with cooperation, shared responsibility, and respect

(National Science Education Standards, 1996)

- exist as a partner throughout the school to support the learning of science
- involve appropriate content and context to engage students

**FAST recommends that the curriculum for science**

- is anchored in high quality, measurable standards
- provides deep and contemplative study of science rather than a survey
- provide students the opportunity for extended scientific inquiry
- fosters higher cognitive skills
- is rigorous enough to challenge all learners
- is based on scientific principles
- is relevant to the students with respect to their local environment

**FAST recommends that the assessment for science**

- match the curriculum and the standards
- provide sufficient rigor to distinguish mastery and excellence
- tests the process of inquiry
- questions at the highest appropriate cognitive level

**FAST recommends that the funding for science**

- provide funding at the classroom level for laboratories, demonstrations, and long-term inquiry
- provide resources for high quality instructional materials and technology
- provide resources for no less than one hour every day of science instruction from K through 12