The Alphabet Soup of 21st Century Early Education

First it was SET then STEM now STEAM. These letters and acronyms are tossed around frequently, and if a program is progressive, its staff will be actively planning experiences that align with the STEM agenda. But what is STEM, and why should early care providers care? STEM—Science, Technology, Engineering, and Math—is an approach to learning that emphasizes these four content areas. Francis Eberle, executive director of the National Science Teachers Association, explains, “Because science is the one subject that encompasses everything in life and helps students be curious, ask questions, and make connections as to why the world exists as it does, it is the backdrop for understanding our world, and helps us to explain and appreciate it in new ways.” (2010)

Why are corporations like Chevron and USGA teaming up to generate interest in and resources for STEM learning? Answer: Tomorrow's Chevron engineers are today's children. 2010 statistics reflect 15 of the top 20 fastest growing occupations in the U.S. require math and science understanding, and this country's eighth grade students are lagging behind students in much of Europe and Asia in these subjects. (Eberle) Policy makers and educators believe that early and integrated education is the solution to this need. STEM learning does not just teach science and math in the traditional ways, but seeks to apply math and science concepts to interesting, real-life situations that are inquiry-based. This means that teachers start with something that the children are interested in or wondering about and develop or find the science and math in those investigations. They use technology to enhance the experience. But just as programs are jumping on the STEM bandwagon, the emphasis has been tweaked.

STEM has been the priority agenda for many grants, but in recent proposals, organizations have started to use a new word—STEAM. Educators are revisiting curriculum decisions and realizing that an even richer approach, a more holistic approach, is to layer the STEM learning with an inclusion of the arts. STEAM, sometimes defined as “science, technology, engineering, art, and music,” sometimes defined as “science, technology, engineering, the arts, and math,” is becoming the latest favored approach.

Consider this example of integrated exploration from a preschool room at Northampton Community College’s Children’s Center:

A preschool teacher visited New York City and talked about her experience with her preschoolers upon her return. Her sharing included showing the children photos of the city skyline and books with photos of skyscrapers. The children got excited about building their own version of a skyscraper (engineering, architecture). The teacher supported them by providing a variety of open-ended building and art materials, including an artist's rendition of a skyscraper in a Metropolitan Museum of Art calendar (art, design, observation). They talked about the importance of a solid foundation (geometry, physics). They tested and retested how to make the buildings using different blocks (science research, observations). A final building was painted colors similar to the calendar reference (art).

These teachers understand the thinking behind the STEM and STEAM philosophies. Engage children through something that is developmentally appropriate and interesting to them. Allow the children to explore and question and create. Facilitate the learning by providing hands-on experiences, supporting language, and offering opportunities to connect this exploration to other experiences in the children’s lives, building an expanding understanding of science, math, and art concepts.
Adults at Northampton Community College’s Children’s Center provide preschoolers with art references and open-ended building and art materials and support them as they explore skyscrapers and cityscapes using science, engineering, math, and art concepts.

Not only are educators now challenged to find the art in science and the science in art, but there is an additional acronym on the horizon, suggesting that even STEAM is not inclusive and integrated enough. What is the new term? Community outreach educators at Philadelphia’s Franklin Institute, a premier science museum, share that the acronym on the horizon for early childhood educators may be STREAM - Science, Technology, Reading (Literacy), Engineering, the Arts, and Math. In essence, everything.

Children learn holistically. They learn in integrated ways, and early learning staff members need to intentionally plan to NOT segregate learning into subject matter areas or categories but to embrace a child’s interest and allow the child to explore and investigate and dissect that interest tapping into knowledge in all the subject matter areas. This approach at an early age will foster inquisitive, creative, adventurous learners who will be ready to tackle the challenging subjects and research in high school and college and will in time be the leaders of the next generation, prepared because in their beginning years, an adult encouraged them to explore with their whole minds.

References:

- National Science Foundation, Division of Science Resources Statistics. 2007. Asia’s Rising Science and Technology Strength: Comparative Indicators for Asia, the European Union, and the United States. NSF 07-319. Arlington, VA.
- Northampton Community College Children’s Center Annual Art Show, June 2013, Bethlehem, PA