

Inquiry in Action

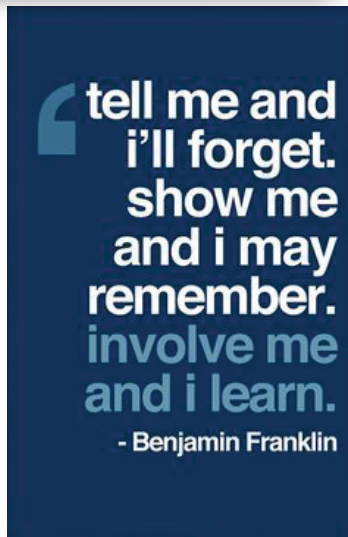
by Rui Dionisio, Superintendent of Schools

Focus. Explore. Reflect. Apply. Repeat.



The Verona Public Schools district is dedicated to cultivating learning environments that nurture the curiosity that exists naturally in children. It was clear from teacher feedback that last year's inquiry-based science pilot program fostered a high level of student engagement. The new science program, developed with support from the Smithsonian Institute and National Academies of Science, is being implemented this year in our elementary and middle schools with the goal of increasing student engagement and improving student knowledge of scientific processes.

The Next Generation Science Standards (NGSS) defines scientific inquiry as "the formulation of a question that can be answered through investigation, while engineering design involves the formulation of a problem that can be solved through design." Research has shown that an inquiry-based teaching approach fosters deeper critical thinking. Our new science program provides a commitment to active, hands-on learning in grades 1-8 focused on research-based standards that highlight what students should be able to do to at each grade level. Implementing inquiry-based science is one approach to address the needs of all learners, personalize instruction for students by addressing the preconceptions that they bring with them to the classroom, and develop critical thinking in order to raise student engagement and achievement in science.



As educators, we have a responsibility to help students develop a deep understanding of science concepts, knowledge, skills, and attitudes in order to grow up into responsible global citizens. Our schools must prepare students to compete in the future by focusing on critical thinking and problem solving which will prepare students for careers that do not yet exist today.

Curriculum should be designed to support student learning to develop scientific and technological literacy for an educated society as essential preparation for all careers in the modern workforce. Curriculum developed with fewer



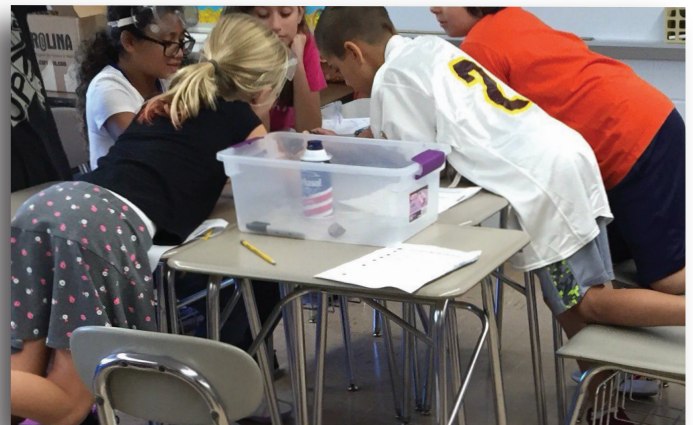
"Education is not the learning of facts, but the training of the mind to think." -Albert Einstein

"Too often we give children answers to remember rather than problems to solve." - Roger Lewin

topics in mind, where the teacher can devote time and energy on cultivating a greater depth of understanding, supports meaningful discussions centered around big ideas. If the curriculum has been designed with rich, engaging tasks, appropriate instructional decisions can be made to assist all students in attaining significant cognitive growth" (NRC, 1999).

Howard Gardner's theory of multiple intelligences outlines how people learn through different modalities such as auditory, visual, and kinesthetic. He believed that students should think independently and develop their own understanding of concepts as opposed to utilizing rote memorization and acceptance of others' ideas (Gardner, 1991). Inquiry-based instruction represents an evolution away from traditional lecture-based instructional methods of teaching science with a focus on process over memorization of a body of facts (Dewey, 1910). Many students simply memorize facts without truly grasping the idea but would better understand a concept if they were awarded opportunities to conduct hands-on experiments and engage firsthand with the scientific phenomena. That is exactly what our new science program seeks to accomplish.

The research from the National Research Council and AAAS Project 2061 is compelling, that conveying scientific processes in a coherent manner within and across all grade levels, provides teaching and learning opportunities in a continuous, interconnected, and cumulative manner with the greatest potential for maximizing student learning. The Verona Public Schools is committed to the success of all students by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth. We look forward to our progress from the collective efforts of our faculty and support of the Verona community for years to come as we enhance science as we know it.



References

Dewey, J. (1910). Science as subject matter and as method. *Science*, 31(787) 121-127.

Gardner, H. (1991) *The unschooled mind: how children think and how schools should teach.* New York: Basic Books Inc.

National Research Council. *Designing Mathematics or Science Curriculum Programs: A Guide for Using Mathematics and Science Education Standards.* Washington, DC: The National Academies Press, 1999.

