Elevate Science 5E Instructional Design

The 5E learning model is well researched and documented as a highly effective instructional design for the science classroom. Developed by Roger Bybee in 1987, the 5E model is based on the idea of constructivism. In a constructivist schema, students have preconceived ideas about how the world works. When they learn something new that matches how they think the world works, they easily grasp the concept. If it doesn't match, they can have hard time learning the new concept. The stages of the 5E learning model help students to adapt to a new way of thinking and expands their understanding of the how the world works.

Elevate Science uses this model because it flows seamlessly with the CA NGSS. Because NGSS is a student-centered set of standards based on performance, our curriculum mirrors the concept of students developing their own questions, solving problems, building design solutions – all constructivist activities designed to build knowledge based on students' unique experience – their personal science story.

The stages of the 5E learning model are below.

Engage

- Reflect on and relate to personal experience
- Develop curiosity and ask questions about a phenomenon, issue, problem, or trend
- Access prior knowledge of related core ideas and crosscutting concepts
- Pose and dissect real-world problems and challenges
- Make connections within and across content areas and to the real world

Explore

- Investigate phenomena, issues, problems, or trends
- Use methods, tools and perspectives of scientists and engineers
- Develop knowledge and skills

Explain and Elaborate

- Analyze informational text to increase scientific literacy
- Comprehend and explain core ideas and crosscutting concepts
- Interpret and evaluate scientific evidence
- Construct explanations and arguments using evidence
- Formulate design solutions
- Synthesize and make comparisons between different sources
- Collaborate with others in formulating ideas
- Draw conclusions and make decisions

Evaluate

- Demonstrate understanding
- Use digital media to communicate effectively
- Publish and defend your ideas or argument
- Take informed action
- Demonstrate understanding through authentic assessments and performance-based learning
- Transfer learning to new situations
- Test design solutions and redesign based on results and other's feedback

Research on the 5E Model

Abell, S. K., and M.J. Volkmann. 2006. Seamless assessment in science: A guide for elementary and middle school teachers. Chicago, IL: Heinemann and Arlington, VA: NSTA Press.

Bybee, R. W. 1997. Achieving scientific literacy: From purposes to practices. Portsmouth, NH: Heinemann.

Colburn, A. 2003. The lingo of learning: 88 education terms every science teacher should know. Arlington, VA: NSTA Press.