THE 5E LESSON FRAMEWORK

A CYCLE OF LEARNING

The 5E lesson format is a process to deepen student understanding of a concept through activities that engage, explore, explain, extend/elaborate, and evaluate. The traditional roles of the teacher and the student are reversed in this model. In the 5E format, students take on much of the responsibility for learning as they construct knowledge through discovery. In traditional models, the teacher is responsible for dispensing information to be learned or retained by the students (Morgan & Ansberry, 2013). Developed by the Biological Sciences Curriculum Study (BSCS), the 5E model asks the learner, with their preconceived ideas of how the world works, to test those ideas against new concepts and information that may or may not support their original view.

> *In the 5E model, the teacher acts as a guide: raising questions, providing opportunities for exploration, asking for evidence to support student explanations, [. . .] correcting misconceptions, and coaching students as they apply new concepts. This model differs greatly from the traditional format of lecturing, leading students through a step-by-step sequence to a solution, providing definite answers, and testing isolated facts. (Morgan & Ansberry, 2013, p. 31)*

The 5E format provides a planned sequence of instruction that places the student at the center of their learning experience.

ENGAGE

THE LEARNING—ASSESSING PRIOR KNOWLEDGE

These activities mentally engage students with an event or question. Engagement activities capture students' interest and help them make connections with what they already know. The teacher provides an orientation to the lesson and assesses students' prior understanding of the concepts addressed in the lesson.

EXPLORE

THE CONCEPTS OR TOPIC

Students encounter hands-on experiences in which they explore the concepts further. They receive little explanation and few terms at this point because they are to define the problem or phenomenon in their own words. The purpose at this stage of the model is for students to acquire a common set of experiences from which they can help one another make sense of the concepts. Students must spend significant time during this stage talking about their experiences, both to articulate their own understanding and to understand the viewpoints of others.

EXPLAIN

THE CONCEPTS—DEFINING TERMS

After students have explored the concept, they summarize what they have observed or learned during the explore section, share their new knowledge with other students, and receive feedback. Only after students have substantive conversation and reach some common understanding does the curriculum and/or teacher provide the content explanation and terms for study. The teacher may present the concepts via lecture, demonstration, reading, or multimedia (video, computer-based, etc.). Students then use the terms to describe what they have experienced, and they begin to process how this explanation fits with what they already know.

EXTEND/ELABORATE

THE CONCEPTS

Students expand on their understanding of the concepts. They are given opportunities to apply the concepts in unique situations, or they are given related ideas to explore and explain using the information and experiences they have accumulated so far. Interaction between the students is essential during the extend stage. By discussing their ideas with others, students can construct a deeper understanding of the concepts. With this deeper understanding, students expand their knowledge from the specific context encountered in the explore section to a much broader perspective.

EVALUATE

STUDENTS' UNDERSTANDING OF CONCEPTS

The final stage of the model has a dual purpose. It is designed for the students to continue to elaborate on their understanding, evaluate what they know now, and cosider what they have yet to figure out. Students should be given the responsibility of reflecting on their learning, determining what they still need to learn, and demonstrating their understanding. While formative assessment of student understanding should take place throughout all phases of the instructional model, the evaluate state is also when the teacher determines the extent to which students have developed a meaningful understanding of the concepts.

REFERENCES

Abell, S.K. & Volkmann, M.J. (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 educational terms every science teacher should know.* Arlington, VA: NSTA Press.

Morgan, E., & Ansberry, K. (2013). *Even more picture perfect science lessons, K-5: Using Children's Books to Guide Inquiry.* Arlington, VA: NSTA Press.

5E LESSON FORMAT	What the teacher does...	What the student does...
ENGAGE	• Generates interest and curiosity • Raises questions for students to consider and encourages their responses • Assesses current knowledge and preconceptions	• Asks questions • Displays interest in the topic • Responds to ideas and questions from others
EXPLORE	• Uses strategies to structure active student engagement in a learning topic • Provides opportunities for students to learn and reflect collaboratively • Observes and listens as students interact • Asks probing questions • Encourages and facilitates participation for all students	• Participates actively in a set of learning experiences that relate to the topic • Actively gathers and synthesizes new information • Interacts with others during learning experiences • Shares ideas and suspends judgement • Records observations or generalizations
EXPLAIN	• Asks for evidence and clarification • Leads discussions to help students connect new learning to prior knowledge • Encourages students to offer ideas and explanations in their own words • Ensures students have a common understanding of the main topic or concept of the lesson • Provides definitions and academic vocabulary	• Participates in discussion in a positive, respectful way • Listens and then responds to the ideas of others using reasoned thinking • Uses evidence from previous activities to support explanations • Connects ideas from a learning activity to prior understanding
EXTEND/ ELABORATE	• Provides students with opportunities to apply knowledge to new situations • Guides students to consider alternative explanations • Challenges students to gain deeper understanding of a concept using a new or related situation • Encourages interactions with additional resources	• Applies new terms and definitions using appropriate academic vocabulary • Uses previous information and findings to ask questions, propose solutions, or make decisions • Pursues alternative explanations • Practices and refines skills in diverse or novel situations
EVALUATE	• Observes and assesses students as they apply new knowledge and skills • Asks open ended questions • Allows students to assess or reflect upon their own learning	• Demonstrates a deeper understanding of the concept or skill • Answers open ended questions by using evidence/knowledge gained • Evaluates their own progress