

Building a Student-Centered Lesson

Our lessons are built using a student-centered learning approach called the 5E Learning Cycle that emphasizes student exploration, engagement, and inquiry rather than teacher centered lectures and rote learning.

For this exercise, as we go through the lesson demo, jot down the things you See/Think/Wonder about each of the 5E's. Additionally, identify the Science & Engineering Practices applied.

Definition	SfS Lesson Example	Create Your Own
Engage		
<ul style="list-style-type: none"> ● Capture the interest of students through the introduction of a phenomenon, i.e. specific examples of familiar, observable events or personable experiences. ● Instructors ask guiding questions designed to be thought provoking and shift the focus from “learning about” to “figuring out”. ● This section of the lesson may include the use of teaching tools such as: Think/Pair/Share, Word Splash, Turn & Talk, See/Think/Wonder 		
Explore		
<ul style="list-style-type: none"> ● Students complete hands-on activities to develop a common set of experiences about a scientific concept or phenomenon. ● Used to help students arrive at the why. ● Incorporate 1+ NGSS’ eight Scientific and Engineering Practices (SEPs) 		
Explain		
<ul style="list-style-type: none"> ● Student-centered debrief to link the engage & explore, and to seal the understanding. ● Students can make further connections to phenomena discovered. ● Can be in the form of a student-led discussion, the presentation of findings, a drawing to explain to peers, etc. 		

Note, We often are unable to cover these last 2E's in a 45 minute class. However, you would want to incorporate them into a broader/longer curriculum, where possible.

Elaborate		
<ul style="list-style-type: none"> • Students further develop their understanding of the topic and/or skills learned • This can be used as an add-on to the main activity, asking students to think more deeply to explain phenomena, have them come up with questions they might have based on what they learned, etc. 		
Evaluate		
<ul style="list-style-type: none"> • Assesses student understanding and abilities • Can be thought of as the SfS quiz, formal in-class evaluation (e.g., classroom tests), or a formative assessment that is part of the activity, depending on the lesson. 		

Based on the 5E Instructional Model presented by Dr. Jim Barufaldi at the Eisenhower Science Collaborative Conference in Austin, Texas, July 2002.

Science and Engineering Practices - Incorporate these 8 practices into the 5E's

1. Asking Questions and Defining Problems
2. Constructing Explanations and Designing Solutions
3. Planning and Carrying Out Investigations
4. Analyzing and Interpreting Data
5. Using Mathematics and Computational Thinking
6. Engaging in Argument from Evidence
7. Obtaining, Evaluating, and Communicating Information
8. Developing and Using Models