

The 5 Es – A method of inquiry based science instruction

Engage – Explore – Explain – Elaborate – Evaluate

These descriptions based on the BSCS curriculum. This approach is part of the pedagogical method called constructivism, a term that has the student as an active learner who “constructs” meaning out of his or her experiences, rather than passively absorbing information. The student redefines, reorganizes, elaborates, and changes initial understandings through interactions. One way to approach this method is with 5 words that start with the letter E: Engage, Explore, Explain, Elaborate and Evaluate.

Engage – These lessons mentally engage the students with an event or question. Engage activities help students reflect on what they know and can do.

Explore – Students work with one another to explore ideas through activities. This exploration provides a common experience for all learners. Under the guidance of the teacher, students begin to clarify their understanding of major concepts and skills.

Explain – Students construct explanations of the concepts and processes about which they are learning. Teachers probe students’ understanding to help them gain clarity and develop skills.

Elaborate – These activities challenge students to apply what they have learned and to build on the students’ understanding of concepts in ways that extend their knowledge and skills.

Evaluate – Students synthesize their learning across the instructional model and assess their own knowledge, skills and abilities. These activities also allow teachers to evaluate students’ progress.

What the Teacher Does

ENGAGE

What the teacher does	
that is consistent with the BSCS 5Es	that is inconsistent with the BSCS 5Es
<ul style="list-style-type: none">• Creates interest• Generates curiosity• Raises questions• Elicits responses that uncover what the students know or think about the concept/topic	<ul style="list-style-type: none">• Explains concepts• Provides definitions and answers• States conclusions• Provides closure• Lectures

What the Teacher Does

EXPLORE

What the teacher does	
that is consistent with the BSCS 5Es	that is inconsistent with the BSCS 5Es
<ul style="list-style-type: none">• Encourages the students to work together without direct instruction from the teacher• Observes and listens to the students as they interact• Asks probing questions to redirect the students’ investigations when necessary• Provides time for the students to puzzle through problems• Acts as a consultant for the students	<ul style="list-style-type: none">• Provides answers• Tells or explains how to work through the problem• Provides closure• Tells the students that they are wrong• Gives information or facts that solve the problem• Leads the students step-by-step to a solution

What the Teacher Does

EXPLAIN

What the teacher does	
that is consistent with the BSCS 5Es	that is inconsistent with the BSCS 5Es
<ul style="list-style-type: none">• Encourages the students to explain concepts and definitions in their own words• Asks for justification (evidence) and clarification from the students• Formally provides definitions, explanations, and new labels• Uses students' previous experiences as the basis	<ul style="list-style-type: none">• Accepts explanations that have no justification• Neglects to solicit the students' explanations• Introduces unrelated concepts or skills

What the Teacher Does

ELABORATE

What the teacher does	
that is consistent with the BSCS 5Es	that is inconsistent with the BSCS 5Es
<ul style="list-style-type: none">• Expects the students to use formal labels, definitions, and explanations provided previously• Encourages the students to apply or extend the concepts and skills in new situations• Reminds the students of alternative explanations• Refers the students to existing data and evidence and asks: What do you already know? What do you think? (strategies from explore apply here also)	<ul style="list-style-type: none">• Provides definitive answers• Tells the students that they are wrong• Lectures most of the time• Leads the students step-by-step to a solution• Explains how to work through the problem

What the Teacher Does

EVALUATE

What the teacher does	
that is consistent with the BSCS 5Es	that is inconsistent with the BSCS 5Es
<ul style="list-style-type: none">• Observes students as they apply new concepts and skills• Assesses students' knowledge and/or skills• Looks for evidence that the students have changed their thinking or behaviors• Allows the students to assess their own learning and group-processing skills• Asks open-ended questions such as, Why do you think ...? What evidence do you have? What do you know about x? How would you explain x?	<ul style="list-style-type: none">• Tests vocabulary words, terms, and isolated facts• Introduces new ideas or concepts• Creates ambiguity• Promotes open-ended discussion unrelated to the concept or skill