

Table 4.1 The BSCS 5Es Teacher

	What the teacher does	
	<i>CONSISTENT</i> with the BSCS 5E model	<i>INCONSISTENT</i> with the BSCS 5E model
engage	<ul style="list-style-type: none"> ● Generates interest and curiosity ● Raises questions ● Assesses current knowledge, including misconceptions 	<ul style="list-style-type: none"> ● Explains concepts ● Provides definitions and conclusions ● Lectures
explore	<ul style="list-style-type: none"> ● Provides time for students to work together ● Observes and listens to students as they interact ● Asks probing questions to redirect students' investigations when necessary 	<ul style="list-style-type: none"> ● Explains how to work through the problem or provides answers ● Tells students they are wrong ● Gives information or facts that solve the problem
explain	<ul style="list-style-type: none"> ● Asks for evidence and clarification from student ● Uses students' previous experiences as a basis for explaining concepts ● Encourages students to explain concepts and definitions in their own words, then provides scientific explanations and vocabulary 	<ul style="list-style-type: none"> ● Does not solicit the students' explanations ● Accepts explanations that have no justification ● Introduces unrelated concepts or skills
elaborate	<ul style="list-style-type: none"> ● Expects students to apply scientific concepts, skills, and vocabulary to new situations ● Reminds students of alternative explanations ● Refers students to alternative explanations 	<ul style="list-style-type: none"> ● Provides definite answers ● Leads students to step-by-step solutions to new problems ● Lectures
evaluate	<ul style="list-style-type: none"> ● Observes and assesses students as they apply new concepts and skills ● Allows students to assess their own learning and group process skills ● Asks open-ended questions 	<ul style="list-style-type: none"> ● Tests vocabulary words and isolated facts ● Introduces new ideas or concepts ● Promotes open-ended discussion unrelated to the concept

Adapted from *Achieving Scientific Literacy: From Purposes to Practices* (Bybee 1997).

Table 4.2 The BSCS 5Es Student

	What the student does	
	<i>CONSISTENT</i> with the BSCS 5E model	<i>INCONSISTENT</i> with the BSCS 5E model
engage	<ul style="list-style-type: none"> Asks questions such as, “Why did this happen? What do I already know about this? What can I find out about this?” Shows interest in the topic 	<ul style="list-style-type: none"> Asks for the “right” answer Offers the “right” answer Insists on answers and explanations
explore	<ul style="list-style-type: none"> Thinks creatively, but within the limits of the activity Tests predictions and hypotheses Records observations and ideas 	<ul style="list-style-type: none"> Passively allows others to do the thinking and exploring “Plays around” indiscriminately with no goal in mind Stops with one solution
explain	<ul style="list-style-type: none"> Explains possible solutions to others Listens critically to explanations of other students and the teacher Uses recorded observations in explanations 	<ul style="list-style-type: none"> Proposes explanations from “thin air” with no relationship to previous experiences Brings up irrelevant experiences and examples Accepts explanations without justification
elaborate	<ul style="list-style-type: none"> Applies new labels, definitions, explanations, and skills in new but similar situations Uses previous information to ask questions, propose solutions, make decisions, design experiments Records observations and explanations 	<ul style="list-style-type: none"> “Plays around” with no goal in mind Ignores previous information or evidence Neglects to record data
evaluate	<ul style="list-style-type: none"> Demonstrates an understanding of the concept or skill Answers open-ended questions by using observations, evidence, and previously accepted explanations Evaluates his/her own progress and knowledge 	<ul style="list-style-type: none"> Draws conclusions, not using evidence or previously accepted explanations Offers only yes-or-no answers and memorized definitions or explanations Fails to express satisfactory explanations in his/her own words

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