

Step 2: Inquiry Based Lesson Design

Stages of the 5E Instructional Model

The following tables list the stages of the 5E Instructional Model, defining relative instructor and student (consistent and inconsistent) instructional practices.

What the Teacher Does

5E Instructional Model Stages	Consistent with the 5E Instructional Model	Not Consistent with the 5E Instructional Model
Engagement	<ul style="list-style-type: none">• Piques students' curiosity and interest• Determines students' current understanding (prior knowledge) of a concept or idea• Invites students to express what they think• Invites students to raise their own questions	<ul style="list-style-type: none">• Introduces vocabulary• Provides definitions and answers• Provides closure• Discourages students' ideas and questions
Exploration	<ul style="list-style-type: none">• Encourages student-to-student interaction• Observes and listens to the students as they interact• Asks probing questions to redirect the students' investigation when necessary• Asks questions to help students make sense of their experiences• Provides time for students to puzzle through problems	<ul style="list-style-type: none">• Provides answers• Proceeds too rapidly for students to understand• Provides closure• Tells the students that they are wrong• Gives information and facts that solve the problem• Leads the students step-by-step to a solution
Explanation	<ul style="list-style-type: none">• Encourages students to use their common experiences and data to develop explanations• Asks questions that help students express understanding and explanations• Requests justification (evidence) for students' explanations	<ul style="list-style-type: none">• Neglects to solicit students' explanations• Ignores data and information students gathered from previous lessons• Dismisses students' ideas• Accepts explanations that are not supported by evidence

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	<ul style="list-style-type: none"> • Provides time for students to compare their ideas with others’ and perhaps revise their thinking • Introduces terminology and alternative explanations after students express their ideas 	<ul style="list-style-type: none"> • Introduces unrelated concepts or skills
Elaboration	<ul style="list-style-type: none"> • Focuses students’ attention on conceptual connections between new and past experiences • Encourages students to use what they have learned to explain a new event or idea • Reinforces students’ use of scientific terms and descriptions previously introduced • Asks questions that help students draw reasonable conclusions for evidence 	<ul style="list-style-type: none"> • Neglects to help students connect new and past experiences • Provides definitive answers • Tells the students that they are wrong • Leads students step-by-step to a solution
Evaluation	<ul style="list-style-type: none"> • Observes and records as students demonstrate their understanding of concepts and performance of skills • Provides time for students to compare their ideas with others’ and perhaps revise their thinking • Interviews students as a means of assessing their developing understanding • Encourages students to assess their own progress 	<ul style="list-style-type: none"> • Tests vocabulary words, terms, and isolated facts • Creates ambiguity • Promotes open-ended discussion unrelated to the concept of skill

From: BSCS, Bioinformatics and the Human Genome Project

What the Students Do

5E Instructional Model Stages	Consistent with the 5E Instructional Model	Not Consistent with the 5E Instructional Model
Engagement	<ul style="list-style-type: none"> • Become interested in and curious about the concept/topic • Express current understanding of a concept or idea • Raise questions such as, What do I already know about this? What do I want to know about this? 	<ul style="list-style-type: none"> • Ask for the “right” answer • Offer the “right” answer • Insist on answers or explanations • Seek closure
Exploration	<ul style="list-style-type: none"> • “Mess around” with materials and ideas • Conduct investigations in which they observe, describe, and record data • Try different ways to answer a question • Acquire a common set of experiences so they can compare results and ideas • Compare their ideas with others’ 	<ul style="list-style-type: none"> • Let others do the thinking and exploring • Work quietly with little or no interaction with others • Stop with one solution • Demand or seek closure
Explanation	<ul style="list-style-type: none"> • Explain concepts and ideas in their own words • Base their explanations on evidence acquired during previous investigations • Become involved in student-to-student conversations in which they debate their ideas • Record their ideas and current understanding • Reflect on and perhaps revise their ideas • Express their ideas about what scientists know and understand 	<ul style="list-style-type: none"> • Propose explanations from “thin air” with no relationship to previous experiences • Bring up irrelevant experiences and examples • Accept explanations without justification • Ignore or dismiss other plausible explanations • Propose explanations without evidence to support their ideas
Elaboration	<ul style="list-style-type: none"> • Make conceptual connections between new and past experiences • Use what they have learned to explain a new object, event, organism, or idea • Use scientific terms and descriptions 	<ul style="list-style-type: none"> • Ignore previous information or evidence • Draw conclusions from “thin air” • Use terminology appropriately and without understanding

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	<ul style="list-style-type: none">• Draw reasonable conclusions from evidence and data• Communicate their understanding to others	
Evaluation	<ul style="list-style-type: none">• Demonstrate what they understand about the concepts and how well they can implement a thinking skill• Compare their current thinking with that of others and perhaps revise their ideas• Assess their own progress by comparing their current understanding with their prior knowledge• Ask new questions that take them deeper in a concept or topic area	<ul style="list-style-type: none">• Disregard evidence or previously accepted explanations in drawing conclusions• Offer only yes-or-no or memorized answers• Fail to express satisfactory explanations in their own words• Introduce new, irrelevant topics

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