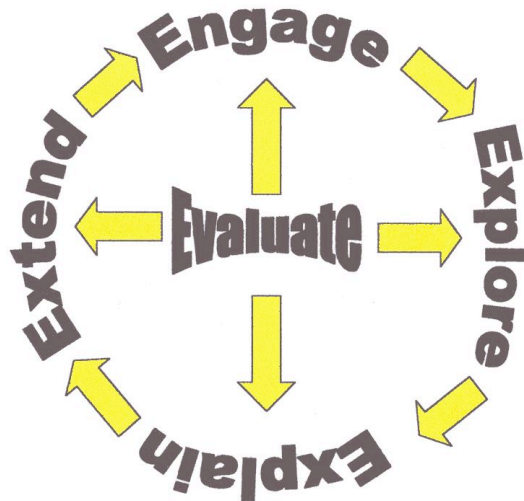


The Learning Cycle as a Tool for Planning Science Instruction

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The learning cycle is an established planning method in science education and consistent with contemporary theories about how individuals learn. It is easy to learn and useful in creating opportunities to learn science. You can think of the learning cycle model as having five parts, though these parts are not discrete or linear.



Engage: In most instances you will want to begin with **Engage**. In this stage you want to create interest and generate curiosity in the topic of study; raise questions and elicit responses from students that will give you an idea of what they already know. This is also a good opportunity for you to identify misconceptions in students' understanding. During this stage students should be asking questions (Why did this happen? How can I find out?) Examples of engaging activities include the use of children's literature and discrepant events.

Explore: During the **Explore** stage students should be given opportunities to work together without direct instruction from the teacher. You should act as a facilitator helping students to frame questions by asking questions and observing. Using Piaget's theory, this is the time for disequilibrium. Students should be puzzled. This is the opportunity for students to test predictions and hypotheses and/or form new ones, try alternatives and discuss them with peers, record observations and ideas and suspend judgment.

Explain: During **Explain**, you should encourage students to explain concepts in their own words, ask for evidence and clarification of their explanation, listen critically to one another's explanation and those of the teacher. Students should use observations and recordings in their explanations. At this stage you should provide definitions and explanations using students' previous experiences as a basis for this discussion.

Extend: During **Extend** students should apply concepts and skills in new (but similar) situations and use formal labels and definitions. Remind students of alternative explanations and to consider existing data and evidence as they explore new situations. **Explore** strategies apply here as well because students should be using the previous information to ask questions, propose solutions, make decisions, experiment, and record observations.

Evaluate: Evaluation should take place throughout the learning experience. You should observe students' knowledge and/or skills, application of new concepts and a change in thinking. Students should assess their own learning. Ask open-ended questions and look for answers that use observation, evidence, and previously accepted explanations. Ask questions that would encourage future investigations.