SCIENCE LEARNING MANAGEMENT

Science learning management

- Inquiry-Based Learning
- Practice-based science teaching
- Lecture Discussion and Demonstration
- Context-based learning
- Competency - based Education

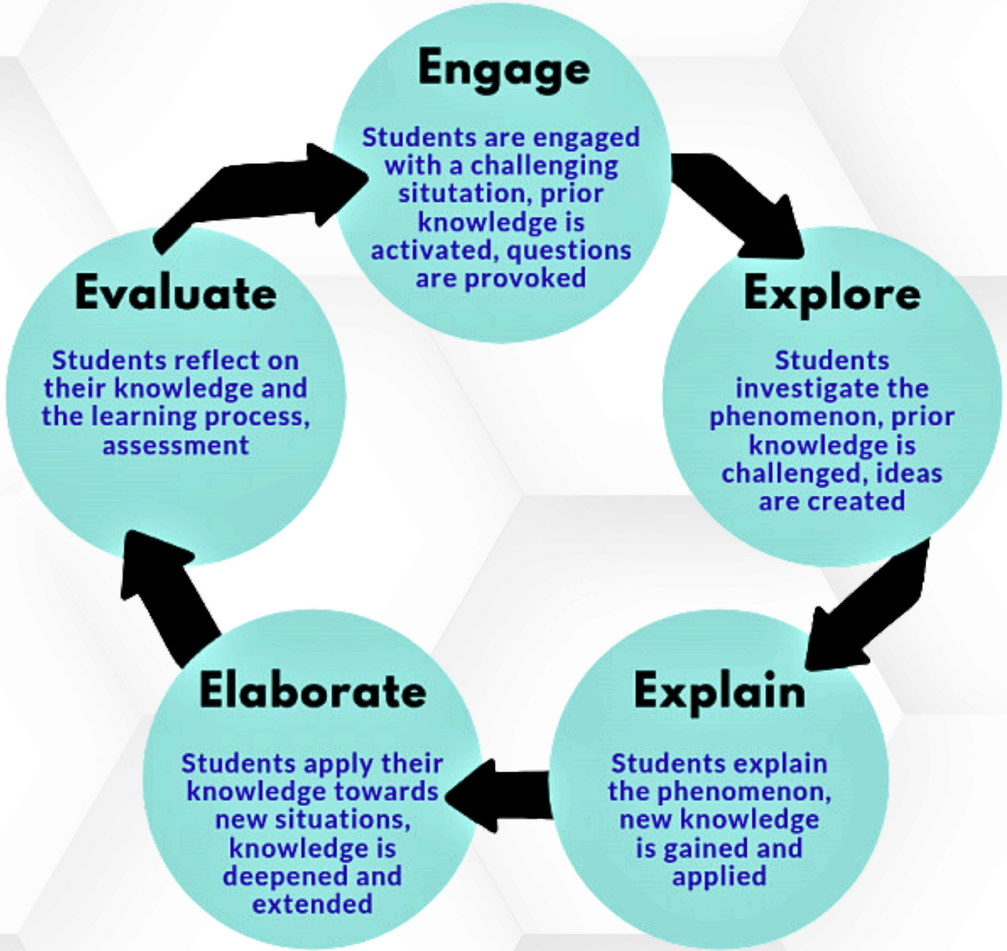
Inquiry-Based Learning

Inquiry-based learning

Inquiry-based learning is a student-centered teaching method that encourages students to ask questions and investigate real-world problems. In this type of learning environment, students are actively engaged in the learning process and are given the opportunity to explore their natural curiosities.

This type of learning is often hands-on and allows students to connect what they are learning in the classroom and the real world. Inquiry-based learning has been shown to improve critical thinking skills, problem-solving skills, and creativity.

Inquiry-based learning



The 5Es of Inquiry-Based Learning

The 7Es of Inquiry-Based Learning

IV. PROCEDURES	5E Model	7E Model
A. Reviewing previous lesson or presenting the new lesson	ENGAGE	ELICIT
B. Establishing a purpose for the lesson		ENGAGE
C. Presenting examples/instances of the new lesson		
D. Discussing new concepts and practicing new skills #1	EXPLORE	EXPLORE
E. Discussing new concepts and practicing new skills #2		
F. Developing mastery (leads to Formative Assessment 3)	EXPLAIN	EXPLAIN
G. Finding practical applications of concepts and skills in daily living	ELABORATE	ELABORATE
H. Making generalizations and abstractions about the lesson		
I. Evaluating learning	EVALUATE	EVALUATE
J. Additional activities for application or remediation	ELABORATE	EXTEND

Practice-based science teaching

Practice-based science teaching

1. Experimental Method

Science experiments are a type of scientific investigation that seeks to answer a question through observation and experimentation. The term “scientific experiment” is used in a precise way in the scientific method, but it has also been used more generally to mean an activity performed to test a hypothesis about how two or more variables interact. There are many types of experiments: lab or field, true experiments, observational studies, and surveys.

Practice-based science teaching

How to Teach with Classroom Experiment

1. Instructor Preparation

- Decide how to best incorporate experiments into course content.
- Designate the appropriate amount of time for the experiment
- Match the experiment to the class level, course atmosphere and the personalities and learning styles of your students.
- Choose a strategy for dealing with the classroom environment: room layout, number of students, whether the class is taught online, etc.

Practice-based science teaching

2. Student Preparation

- Read instructions that explain the experiment and the student's role
- Complete a pre-class reading and/or write about their role in the experiment
- Make predictions about the outcome of the experimen

3. Conducting the experiment and collecting data

Working through the logistics of carrying out the experiment can be key to students having a successful experience. It is often helpful to have a teaching assistant present during an experiment to help answer questions and keep things moving.

Practice-based science teaching

4. Analyzing the data and Extending the Experience

After collect the data, communicating the results to students and linking it to what they are learning in class is very important. Just doing the experiment isn't enough - the teacher need to guide students through the process of interpreting and learning from what happened.

5. Assessing student achievement of learning goals

Standard tests, quizzes and homework assignments can be used to measure what students are learning in class.

- Adding additional assessment measures, for example ask students Test questions about the experiment itself
- Open Ended questions that allow students to reflect on their experience and give you an idea of what they did and did not get from the experiment.

Practice-based science teaching

2. Field experiment or field trial

Field experiments bridge the highly controlled lab environment and the messy real world.

Practice-based science teaching

field trial based on inquily process

1. teacher-led field work
2. project –based fieldwork
3. competency-basedfield work

Instructional steps by field trial

1. preparation and briefing
2. engagement in the activity
3. processing of the result of theactivity
4. interpretation and presentation of results
5. debriefing and feedback