

INQUIRY-BASED LEARNING

INTRODUCTION

Do you have a desire to have your students move beyond asking the simple who, what, where, and when questions when working on assignments? Would you also like to spark their curiosity and tap into their interests? If you answered yes to one or both of these questions, then consider inquiry-based learning. Inquiry-based learning is a form of constructivist learning in which a learner researches ideas and gains information and insight on a chosen topic. This approach often stimulates curiosity and interest, enabling the learner to develop a deeper understanding of the concept and material.

A CLOSER LOOK

With inquiry-based learning, the learner selects a topic of interest, formulates questions, gathers resources, sifts through the resources for useful and relevant content, and synthesizes information. The process often concludes with a written report, presentation, or both.

To be implemented in your course, inquiry-based learning can be broken down into the following levels:

Level 1: Confirmation Inquiry

- This level is the most familiar and the easiest to do. At this level, you will develop both the questions and procedures that will guide students through an activity with known results.
- **Example:** You design an experiment where students determine how stopping distance is related to the slope of a surface.

Level 2: Structured Inquiry

- This level is similar to Level 1, but it involves developing a foundation for inquiry and critical thinking skills. You provide an initial question and an outlined procedure for students to follow. Important, however, is that the results are unknown.
- **Example:** You direct students to take soil samples from several different locations (e.g., home, school, park) and analyze the soil composition for differences.

Figure 1.
The four levels of inquiry and the information given to the student in each one.

Inquiry Level	Question	Procedure	Solution
1—Confirmation Inquiry <i>Students confirm a principle through an activity when the results are known in advance.</i>	✓	✓	✓
2—Structured Inquiry <i>Students investigate a teacher-presented question through a prescribed procedure.</i>	✓	✓	
3—Guided Inquiry <i>Students investigate a teacher-presented question using student designed/selected procedures.</i>	✓		
4—Open Inquiry <i>Students investigate questions that are student formulated through student designed/selected procedures.</i>			

Image source: Banchi, H., & Bell R. (2008). The many levels of inquiry. *Science and Children*, 46(2), 26-29. <https://engage.intel.com/docs/DOC-30979>

Level 3: Guided Inquiry

- This level allows students to take more ownership of an experiment and their findings. Students are responsible for designing the procedure and following it to answer the question that you provided. Learners build upon skills gained from earlier levels, as well as incorporate more problem-solving and critical thinking skills. Because learners now have more freedom in developing the procedure and finding useful content, it is important for you to provide guidance and feedback where necessary.
- **Example:** You ask students how the materials used in traditional and contemporary buildings in specific climates compare in terms of energy efficiency and minimization of resource usage.



Tips for Using Inquiry-Based Learning:

It is possible to use a variety of levels in your course depending on the type of outcome you will be assessing.

This will provide opportunities for learners to effectively develop inquiry skills.

Level 4: Open Inquiry

- At the highest level of inquiry-based learning, within broad parameters, learners establish ownership of an experiment and their findings. Students are allowed to choose a topic or idea that is of interest to them, formulate their own research question(s), and design a procedure to conduct their study. You might have students prepare a report or presentation detailing their results once their study is complete.
- **Example:** You direct students to choose an edible substance and analyze how it chemically interacts with the human body.

WORTH NOTING

Here are some considerations to be aware of before implementing inquiry-based learning in your course.

- Inquiry-based learning requires more interaction with students. This is because you need to spend more time and effort providing more feedback, guidance, expertise, and resources to create a successful learning experience.
- It can be challenging to adequately assess the learning that takes place. In addition to the content output, students will be using and learning research and analytical skills that are challenging to assess.
- Level 4 inquiry requires more time and extensive planning; therefore, it is important to ensure that the time frame of the project will allow enough time for students to determine and execute a procedure, gather information and resources, properly summarize information, and present findings and ideas.
- Despite the challenges, **inquiry-based learning offers the development of habits of mind that can last a lifetime and guide learning and creative thinking.**

ADDITIONAL RESOURCES

- [Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching in *Educational Psychologist Journal*](#)
- [Where do you want to go today? Inquiry-based learning and technology integration in *Reading Teacher*](#)