CollegeBoard
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Inquiry Instruction in the AP Science Classroom: An Approach to Teaching and Learning

AP inquiry instruction incorporates any teaching method that encourages students to construct and/or discover knowledge with an understanding of how scientists study the natural world. Inquiry teaching expands beyond investigations, experiments, and field experiments to include classroom experiences such as scientific model development and revision, and classroom explanation critique and revision. The approach to inquiry instruction may vary for investigations, field experiences and classroom experiences depending on: the science practices and content being developed, the amount of necessary content or skills scaffolding, the extent of teacher involvement to support that scaffolding, and student readiness.

Scientific inquiry experiences in the AP classroom should be designed and implemented with increasing student involvement to help enhance inquiry learning. Adaptations of Herron's approach (1971) and that of Rezba, Auldridge, and Rhea (1999) define inquiry instruction for investigations in four incremental ways:

- The first level of investigation is **Confirmation**. At this level, students confirm a principle through an activity in which the results are known in advance.
- The second level is **Structured Inquiry**. At this level, students investigate a teacher-presented question through a prescribed procedure.
- The third level is **Guided Inquiry**. At this level, students investigate a teacher-presented question using student designed/selected procedures.
- The fourth and final level is **Open Inquiry**. At this level, students investigate topic-related questions that are formulated through student designed/selected procedures.

The level of investigations in an AP classroom focuses primarily on the continuum between Guided Inquiry and Open Inquiry. Some Structured Inquiry may be required as students learn particular skills needed to conduct more student-directed forms of inquiry. Student activities that support the learning of science concepts through scientific inquiry[1] in AP classrooms may

[1] Scientific inquiry refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work (NSES, 2000).

include: reading about known scientific theories and ideas, generating scientifically-oriented questions, making predictions or posing preliminary hypotheses, planning investigations, making observations, using tools to gather and analyze data, constructing explanations, creating, critiquing and revising models, engaging in scientific argumentation, reviewing known theories and concepts in light of empirical data, and communicating the results (National Research Council, 1996; Grady, 2010; Grandy & Duschl, 2007; and Windschitl, 2008).

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