

Helping students discover the implications of biology laboratory investigations

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Abstract

I will discuss methods we have developed in our introductory biology laboratories to teach students how to critically evaluate biological knowledge and apply it to personal, academic, societal, and professional issues. We have developed these methods in order to more explicitly teach students how to develop and discuss the implications of biological knowledge. I will present examples of methods we use to facilitate student discussions of hypotheses which they have created and evaluated, to help students critically evaluate biological information and apply it to topical issues, and to transition students from discussing to doing as they develop and conduct service learning activities.

In some of our laboratory exercises, groups of students develop a hypothesis, as well as design and conduct a test of their hypothesis. Their hypotheses relate to the same general theory, and use the organisms and systems available in the laboratory. Oral presentations at the end of the experiments, help students learn to discuss their work and provide them with relevant information from other groups that they can cite as they write the discussion section of their laboratory report.

In other exercises, the entire period is devoted to developing the ability to critically evaluate and apply biological information to a societal issue. In a human demography laboratory activity each group of students accesses information about a different country from web sites, graphs their data, and participates in a poster session comparing the demographic characteristics of a variety of countries.

In service learning exercises which we are incorporating into our laboratory series, students develop a project to address a societal issue. For example, in Biology 101L students research, develop, and conduct a recycling project on campus. In these projects they apply scientific information, and use scientific methods, as they investigate and respond to a societal issue.