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Lesson Plan

PETE Indigenous Fellows Institute 2013

Community Based Science Projects

Students will go through all the steps of the scientific method; creating a question and hypothesis, research design, methods formation, etc. They will create a tri-fold science-fair poster, which they should present at a community awareness event. The following lesson plan was created for a semester-long or 3-month long project.

Title: Using the Scientific Method

Objectives:

- Explain the criteria needed in order to create testable and biologically relevant biological questions and hypotheses
- Develop a testable question(s) and hypothesis(es) for a biology science project
- Create an experiment or project design
- Collect quantitative and qualitative data
- Collect and organize data on an Excel spreadsheet
- Create at least one table and at least one figure
- Write a science report with an introduction, methods, results, discussion, and references sections
- Create and present a tri-fold, science-fair poster

Procedure

Students will need a week, during lab, to learn the criteria for creating testable questions and hypotheses. The teacher can show that testable questions are biologically relevant, quantifiable, include at least one biotic factor, are specific, and can be tested within 1-3 weeks. They will form groups and create their own testable questions and hypotheses during class, which can be reviewed and discussed as a class. It's helpful for students to see their classmate's examples.

During the second week, students will hone their questions and hypotheses as well as form a project design or methods. These will be reviewed in class by the teacher for accuracy and to make sure that materials are available for completing the projects. In the meantime, students should be researching at least three references related to their topic and be able to write up summaries of their findings to show to the teacher. Before they start collecting data, the teacher should help students create a data collection sheet(s). Ideally, students should be able to start

collecting their data for experiments or surveys during the third week of their project and have 3-4 weeks to collect data and organize and analyze their results. Students will need help looking at their excel data and creating a table(s) and/or figure(s) in a computer lab. They can start creating their posters on the 5th or 6th week of their project and should be able to finish their posters in two weeks. Throughout the project, students will be writing introduction, methods, results, discussion, and reference sections that they will then format for their poster presentation.

Assessment

The students are assessed weekly on their progress as well as based on their final group research article, poster, and presentation. They are assessed as a group; with each student receiving grades his/her group's effort. The teacher needs to make sure each student in the group is assigned specific tasks by the teacher and/or group throughout the course of the project.