

Biology 9, Science as a Way of Knowing Term Paper Assignment

Instead of a final exam, you will be writing a term paper for this class. The paper should discuss some important, unanswered question concerning transgenic organisms in agriculture. Through exercises during the remainder of the semester, we work together to help each of you choose an appropriate topic. Sections of the paper will be due in draft form at different times, to be reviewed either by myself or by classmate(s).

The main goals of your paper will be to convince the reader(s) that the problem is important, place it in an historical context, restate the problem as two alternative, testable hypotheses and offer a schematic of an experiment or observational study that would result in data that could possibly refute one or both of the hypotheses, thereby making progress toward solving the problem. Note that the hypotheses might address only some small portion of a larger problem. The total length is about 10 pages *plus* bibliography.

Your term paper should follow this general structure:

Introduction: State the problem, explain why it is important and give an overview of the remainder of the paper. This section should be no more than 2 pages in length.

Background: Provide the historical context for the problem. Who else has worked on it, and what progress has been made? What remains to be done? If it is a very large problem, this is the section where you should “break it up” and choose one more manageable piece that can be restated as a testable hypothesis. End with this hypothesis. This section should be 2-3 pages long.

Testing the hypotheses: Restate your hypothesis and give an alternative explanation (alternative hypothesis) that is also testable. Then discuss what data could be collected that would potentially result in one (or both) of the hypotheses being rejected (i.e., that would test the hypotheses). Be sure to include the study system

(model system), the manipulated variable(s) and the response variable(s), the methods of data collection (experiment, observation), the treatment groups, the other variables that must be controlled for or randomized. Include in your discussion some consideration of the likely sample size that will be necessary to test the hypotheses. End with a discussion of the possible pitfalls – where would you expect there to be difficulties in the execution of this hypothetical experiment or observational study? This section should be about 2-3 pages long.

Conclusions: Restate the problem and its importance, your hypothesis and its relevance to the problem, and why testing your hypothesis would help solve the problem. This section should be no more than 1 page long.

Bibliography: I expect you to find and cite at least five articles, book chapters or books. In the body of the text, your citations should take one of the following forms:

Smith (1985) tested the hypothesis that spaghetti is good to eat. Many researchers have reached the same conclusion (Smith 1993, Jones 1995, Archer 2000).

Note that these are in the *active voice*.

In the Bibliography, you then give the details of what the paper is:

For a paper:

Smith, GM, 1985. Small children prefer spaghetti. Good Eats Volume 1 pages 3-7.

For a book:

Jones, SM, 1995. *People like food*. Viking, Inc. Boston. 25 pages.

For a chapter in a book:

Archer, TG, 2000. Tomatoes are fruit, too. pages 10-12 *in*: Gracious Eating, Edited by Smith GM and Jones SM. Heritage Books, New York. 250 pages.