

## Independent Project Proposal Assignment

As the culmination to ecology lab, you will work in pairs to plan and conduct an independent research project. Because planning is an essential part of research, you will write a research proposal before beginning your research project. Your proposal should present an interesting question in ecology, describe a system in which to study one aspect of this question, and explain in detail a feasible experiment. . ***Due Nov. 8 by 2pm; 25 points possible***

***Your proposal will have five sections:***

***Introduction*** – Develop the background for your topic. Explain why your topic is interesting and relevant to ecology. Describe previous work on the topic, using at least four primary literature sources. Discuss what previous research has revealed about your topic and how previous work leads up to your research question.

***Hypothesis*** – Describe your *hypothesis* (your proposed answer to your research question, which you will test in your experiment). Explain why you think this hypothesis may be correct. State a *specific critical prediction* of the hypothesis. A critical prediction is a result that will occur if your hypothesis is correct, but not if your hypothesis is incorrect. Your experiment should be a test of the critical prediction.

***Methods*** – Describe your proposed experiment. Include enough detail that someone else could actually do the experiment and get good results. Explain *why* you've designed the experiment in the way you have; try to convince the reader that your experiment is the best way to test your hypothesis. If you have collected pilot data, use it to justify the feasibility of your proposed project. Consider including a diagram, drawing, or table, if it will help you explain your experiment or study.

***Possible results*** – Describe the result that you expect *if* your hypothesis is true; in other words, results that would support your hypothesis. Include enough detail that someone unfamiliar with your study could look at the actual results and determine whether they support your hypothesis. Include a graph or table to show the expected results. Then describe the result that you would expect if your hypothesis is *not* true; in other words, results that would fail to support your hypothesis. Again, include plenty of details and include a graph or table.

***Literature cited*** – List the sources that you referred to in your proposal. Follow the formatting guidelines provided for the research report.

***Important guidelines:***

- You and your partner will work as a team throughout the project. You will turn in one proposal, and you will receive the same grade.
- Take inspiration for your project from lectures, previous labs, observations that you've made in the field, or research articles that you've read.
- Your proposal must cite at least four primary research articles that are directly relevant to your proposed study. These articles may also serve as inspiration for your hypothesis and experimental design. Recall that primary literature articles describe an experiment or study, rather than reviewing other results. You may also choose to cite additional works, including books, review articles, or additional primary research articles.
- In designing your experiment, start with a specific hypothesis. Design an experiment that will allow you to distinguish between a prediction that would occur if the hypothesis is correct and an alternative prediction that would occur if the hypothesis is incorrect.
- Your experiment must be feasible within the constraints of this course. If you have questions about available equipment, consult with me before turning in your proposal.
- It may be helpful to collect pilot data to verify that your study system and methods are feasible.
- Although your proposal will not be graded on length, it will probably take you at least four double-spaced pages to write a solid proposal.
- A checklist detailing what should be included in the proposal is attached.

## **Independent Project Proposal Checklist**

### **Introduction**

- organized from general to specific
- introduces the general topic
- explains how the topic is relevant to ecology
- cites previous studies that are relevant to the topic and/or study system
- clearly explains:
  - what is already known about the topic and study system
  - what is not yet known (i.e., what your study will address)

### **Hypothesis**

- clearly states a testable hypothesis:
- explains why this hypothesis may be correct, based on what you already know about the topic
- clearly states a critical prediction of your hypothesis (something expected only if the hypothesis is correct)

### **Methods**

- experiment is explained in detail, including:
  - species used,  location,  time frame,  data collected,  data analysis
- justifies why this experiment is a good way to test the hypothesis
- justifies the feasibility of your experiment

### **Possible results**

- describes two sets of results:
  - results expected if the hypothesis is correct
  - results expected if the hypothesis is not correct
- includes enough detail that an outsider could evaluate whether your results support the hypothesis
- shows all expected results graphically:
  - at least one graph per result
  - graphs include labeled axes and legends

### **General**

- correct grammar and spelling
- ideas are communicated clearly
- ideas are presented in a logical order, and  similar ideas are kept together
- avoids unnecessary wordiness
- literature cited appropriately