

Purpose:

- To employ the concept of the null hypothesis in a scientific experiment.
- To determine the Shannon-Weiner Diversity Index for two groups of "species."
- To compare and analyze the two samples using the Shannon-Weiner method.

Background:

A central theme in ecology is **biodiversity**, which often serves as a measure of the overall health of an ecosystem. Declining biodiversity can indicate that the ecosystem is undergoing some type of environmental stress. Further study may then help to pinpoint that stress.

There are many methods that ecologists use to calculate species diversity. The Shannon-Weiner Diversity Index is a common way of showing that diversity involves not only numbers of different species, but also how well each of these species is represented in different "habitats." The Shannon-Weiner value "H" can range from no diversity at 0.0 to a maximum diversity of 4.0. These values have no real meaning by themselves, but can be used to compare two communities or the same community at different times. A large value of H indicates that if you randomly pick in your test area, the odds are the second individual will be different from the first. In this investigation your group will collect data from the vehicles in the student and faculty areas of parking at the school.

You need to begin with a good hypothesis. This statement needs to show cause and effect between two aspects of the situation being investigated. The standard hypothesis is an "if... then" statement that connects the two aspects being discussed. Experiments of this nature attempt to agree or disagree with the hypothesis. For this lab we will employ a second type of hypothesis, called the **null hypothesis**. This is a statement that there is **no relationship** between the two aspects of the situation under consideration. Experiments of this format are designed to disprove the null hypothesis. Theoretically in science it is easier to disprove something than it is to prove something. The null hypothesis is often the reverse of what the experimenter actually believes; it is put forward to allow the data to contradict it.

**State your null hypothesis here:**

Materials: vehicles parked at the school, calculator with natural log function