Example Proposal: The Relationship Between Beetle Populations and Standing Water

Question:

For our research project we want to figure out what the relationship is between the population of beetles and the centimeters of standing water. Our group is curious as to how standing water is related to the amount of beetles we find and if there is any correlation between the two.

Background Information:

Beetles are among the most numerous organisms on earth. They play a crucial role in the environment including functioning as scavengers, decomposers, and predators. There are hundreds of thousands of different beetle species, and each has its own environmental niche. (From http://en.wikipedia.org/wiki/Beetle.)

Standing water is water that has pooled up and is no longer flowing from a particular spot. Standing water can sometimes be breeding grounds for disease, but also provides critical habitat for some species that require it. (From http://en.wikipedia.org/wiki/Standing_water). We are expecting to find standing water at the Noyes Property since it is classified as a wetland.

The Noyes property lies alongside Highland Drive and Harmon Lane. This site has lots of trees, both deciduous and evergreen. A lot of the site has been taken over by Himalayan blackberries and there are patches of poison oak littering the property. Walking paths are strewn around the site, helping the viewer to see the different sites. Part of the property is a grassy wetland. This wetland attracts many types of birds and animals, going to the wetland for food. The woodland also attracts many different types of birds and animals, including Black Capped chickadees. Small animals like rabbits and field mice can be heard or seen in the undergrowth. The site has a resident population of Dusky-Footed Woodrats, a species of concern in the Willamette Valley.

Methods:

To measure standing water, we will follow these steps:

1. We will find a flag on the Noyes Property.
2. We will use a meter stick to measure the depth of the water that surrounds the flag (in centimeters).
3. We will measure the deepest part of the water.

To count the population of beetles, we will use pitfall traps:

1. We will get two plastic cups and cut the bottom off one of them to create a funnel.
2. We will dig a hole in the ground the size of the cup and place the cup in the ground and placed the funnel in the so beetles will fall inside.
3. We will place bait at the bottom of the cup (molasses) to attract beetles.
4. We will use a piece of wood placed over the trap to keep out larger animals and rainwater.

Data Form:

Date:	Flag #:	Amount of standing water (cm):	# of beetles trapped:

Materials:

We will need the following materials:

1. Plastic cups (provided by the science department)
2. Meter sticks (provided by the science department)
3. Molasses (our group will bring this from home)
4. Insect identification guides (provided by the science department)

Proposed Analysis:

To analyze our data, we will create a graph that compares the amount of standing water to the population of beetles we found. We expect that there are three possible answers to our question: 1) the population of beetles could increase as the amount of standing water increases; 2) the population of beetles could decrease as the amount of standing water increases; 3) there might be no relationship between the two factors.

Our data will tell us the answer to our question because we will be able to identify which possible answer is most appropriate by looking at the slope of the line on our graph. If the line slopes up and to the right, the answer is (1). If the line slopes down and to the right, the answer is (2). If the line is horizontal, the answer is (3).