INTRODUCTION:

The species used in the project was the Painted Lady Butterfly, which eats commercial food and hibiscus leaves. The Painted Lady butterfly is an appropriate organism for our study because we can really observe the life cycle of the butterfly, and it doesn’t take very long. The life cycle of the Painted Lady Butterfly goes from an egg to a larva (caterpillar), then from a larva to a pupa, from the pupa to an adult butterfly. It takes about two weeks for the larva to become a pupa and seven to ten days for the pupa to become an adult butterfly (Insect Lore Information Sheet). By changing types of food, we hoped to test whether one group would pupate faster than the other group because one type of food may have more protein in it and the protein will help the caterpillars form pupi faster. Also, one type of food could have more indigestible fiber.

Our null hypothesis was that there would be no difference in the time it takes for the control butterflies and the treatment butterflies to change from caterpillars to pupas. Our alternate hypothesis is that there will be a difference in growth between the two groups, from caterpillar to pupa. We predicted that the control butterflies that were fed commercial food would develop from caterpillars to pupas faster than the treatment butterflies that were fed the hibiscus leaves.
METHODS:

We received the Painted Lady Butterflies from Insect Lore, Inc. Our variable was the different types of food; the hibiscus leaves vs. prepared commercial food. We weighed the small 2-inch wide by 2-inch high plastic clear cups (containers) we received with our larva experiment. There were 32 organisms: 16 controls and 16 treatment.

We had 16 containers with 9.1-9.3 grams of commercial food each. We had 16 treatment containers with 9.1-9.3 grams of Hibiscus leaves each. We placed the treatment caterpillars in with the weighed amount of foods; we also did the same thing for the control group. We washed the hibiscus leaves with soap and water (rubbing front and back) dried it with clean and dry paper towel (we placed the leaf and of top of the paper towel and placed another paper towel on top carefully rubbed it to make it dry). We set up our organisms in their control food. We closed the lid and placed them in a cardboard box. We put aluminum foil on the edges of the box to keep the lights from moving.

We set our organisms in the treatment and control groups by using a long black narrow small watercolor paintbrush and carefully placed them in their containers and carefully placed them in the plastic cups with the hibiscus leaves in them. We closed the lid and carefully placed the control group in the cardboard box were the light was placed. The temperature stayed at 23 degrees Celsius to 25 degrees Celsius. We had one light and one timer for each group. The timer was set at 8 A.M- 8 P.M. our constant was the light (from 8A.M- 8P.M) and the temperature of the box stayed at 23 degrees Celsius to 25 degrees Celsius.

The only variable not held constant was the food that the butterflies ate (hibiscus leaves vs. commercial food). The caterpillars in the treatment group were given hibiscus leaves,
but we fed the control group commercial food. We measured the time it took for the caterpillars to change into pupas.

**RESULTS:**

On the 19th of July 4 treatment caterpillars pupated and on the 21st of July the rest of the treatment group pupated. In the wild, Painted Lady larvae are known to eat *Malva*, which are related to hibiscus, and so they probably could eat hibiscus leaves (Krempels pers. comm.), although in our experiment they died. The 16 treatment died; therefore we were unable to compare the time it took for the different groups to turn into pupae.

**DISCUSSION:**

We can’t accept or reject our null hypothesis because we were unable to compare the length of time to pupation for both groups. However, we can say that there was a significant difference in survival between the treatment and control groups. This was because the entire treatment group died. The reason why the treatment group may have died was that the hibiscus leaves had fertilizers or pesticides on them or the soap might have affected them. If there were leaves without any sprays or insecticides then we could have had better results. For future experiments people may want to use fewer leaves so that the caterpillars would have more space to breathe and move. Also they may want to use leaves that have not been sprayed with pesticides.