



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) An-Chieh Cheng	Project Number S1907
Project Title Aggregation of Hippodamia convergens (The Convergent Lady Beetles)	
Abstract Objectives/Goals The purpose of this experiment is to investigate the aggregation behaviors of the convergent lady beetles by their specific temperature range of the seasonal hibernations. Methods/Materials Experiment 1: 1.Place some moist paper towels for the bug box's base. Attach the screen to the lid of the bug box to avoid lady beetles' escape. 2.Set the temperature between 17.0 degree C and 18.0 degree C. 3.Place forty convergent lady beetles into the bug box. 4.Record the observation of each group once an hour. The observation data will be the surface area that's covered by the aggregation of the lady beetles, the temperature, the condition of the lady beetles' behaviors, and the number of lady beetles that are aggregating (to measure density). Continually record the observation for 6 hours. Experiment 2: 5.Repeat procedure number 1. 6.Set the temperature between 15.0 degree C and 16.0 degree C. 7.;V8. Repeat number 3;V4. Experiment 3: 9.Repeat procedure number 1. 10.Set the temperature between 22.0 degree C and 23.0 degree C. 11.;V12. Repeat number 3;V4. Materials: Hippodamia convergens adults; Honeydew; Bug Boxes; Screen; Paper Towel; Heater; Dorm refrigerator; Ice packs; CBL-Calculated base lab unit; TI graphing calculator. Results The percentage of the aggregated lady beetles is approximately 25% in the experiment one. The percentage of the aggregated lady beetles is about 45% in the experiment two. The average percentage is 19% of all lady beetles in the experiment three. The average density of the experiment 1 is 5.07 lady beetles per square centimeter. It has 4.60 lady beetles per square centimeter for experiment two. For experiment 3 it has 4.67 lady beetles per square centimeter. Conclusions/Discussion The influence of temperature on Hippodamia convergens is relevant to the aggregation behavior. However, the result does not match the hypothesis. The number of aggregating lady beetles during the six hours experiment is relatively unstable. It shows that temperature might not be the factor of H. convergens's aggregation behavior. The possible explanation is that lady beetles are cold-blooded. Therefore slowing down their activities as reactions to the surrounding low temperature is not a behavioral specialty. The possible factor might be the length of day light. For the density of the aggregation area and the number of H. convergens, the result didn't show any direct or inverse proportion.	
Summary Statement This project is to find out the specific factor of Hippodamia convergens's (the convergent lady beetles) aggregation behavior.	
Help Received Mrs. Evans (research class teacher) helped to design the experiment; participant in Oak Grove high school research class (advanced science);	