



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Shannon E. Murphy	Project Number J1921
Project Title Finding Nemo's Respiration Rate	
Abstract Objectives/Goals The purpose of this experiment was to determine how changes in water temperature affect the respiration rate of fish. The hypothesis of this experiment is that, if the water temperature decreases, then the respiration rate of the fish in the water will decrease also. This result was expected for two possible reasons: (1) the decrease in the metabolism rate of the fish as the water temperature got colder, and (2) the increase in the percent of oxygen per unit of water volume as the water temperature got colder. Methods/Materials Materials: two goldfish, a fish bowl, a thermometer, a watch with a second hand, plastic bag, and ice cubes. Methods: Three trials were performed to determine the change in the respiration rates of two fish when the temperature of the water was decreased by 5 degrees Fahrenheit. For each trial, the results from five thirty-second intervals were determined, and these results were averaged. Results The data collected during the three trials, when averaged together for each fish, showed that the respiration rate, measured in "gulps" per thirty-second interval, decreased by about 15%-20% when the temperature of the water was decreased by 5 degrees Fahrenheit. The pattern in the data collected in each observation was fairly consistent. Conclusions/Discussion The experiment supported the hypothesis that the respiration rate of fish will decrease when the temperature of the surrounding water is decreased. As noted above, this decrease in the respiration rate was expected based on two factors: (1) the decrease in the metabolism rate of the fish as temperature decreases, and (2) the increase in the percent of oxygen per unit of water volume as water temperature decreases. Problems which could affect the results included variations in the activity level of the fish, and difficulty in observing the number of gulps taken by each fish. The effect of these problems was reduced by taken a number of readings during each experiment, and repeating the experiment three times.	
Summary Statement This experiment is about the effect of changing water temperatures on the respiration rate of fish.	
Help Received Dad helped me by timing the thirty second intervals; Both parents helped glue various things to the board.	