



CALIFORNIA STATE SCIENCE FAIR

2013 PROJECT SUMMARY

Name(s) Montana A. Sprague	Project Number J2218
Project Title Can Fish Get Jet-Lagged?	
Objectives/Goals In this project, the effects of circadian rhythm changes on training goldfish was investigated. For this project to happen, one had to change the circadian rhythm of a tank of goldfish, and then train them to complete a simple trick. Then, compare the time it took to train both tanks of fish. The purpose of this experiment was to learn more about the effects of circadian rhythm changes. The more we know about circadian rhythm disruptions, the better.	Abstract This section is currently empty.
Methods/Materials In this project, there were two tanks with 10 goldfish in each. They were given two weeks to adjust to their new surroundings. Then, one tank was covered with a dark cloth from 7:00 AM to 7:00 PM, and had a light shining on it from 7:00 PM to 7:00 AM. The other tank had the opposite schedule. Both tanks of goldfish were fed at 7:00 AM and 7:00 PM. This was continued for two weeks. After the two weeks was up, the covers and lights were not used anymore, and the R2 fish school training kit was used to train both tanks of fish to swim through the hoop. They were trained every day for 5 minutes each. The training was continued for one week. First, the fish were taught to recognize the wand as a feeder by giving them their food for the day through the feeding wand. Then, they were lured through the hoop, and then rewarded after successfully completing the trick. The number of fish who swam through the hoop every day was recorded in the notebook.	This section is currently empty.
Results The results clearly show that the fish who were on a normal circadian rhythm before the test learned much more quickly than the fish with the disrupted circadian rhythm. However, the disruption did not affect the fish's ability to learn, the learning was simply delayed. The graph for how many fish went through the hoop from each tank was almost exactly similar, except that the switched circadian rhythm tank learned three to four days later than the other tank.	This section is currently empty.
Conclusions/Discussion The results of this experiment clearly supported the hypothesis. The fish in the tank on a normal sleep cycle learned the trick up to three times faster, therefore the amount of time it took for a fish to learn was negatively impacted by the reversing of the circadian rhythm. However, the ability the fish possessed to learn did not change. It was simply delayed for the fish in the tank that's sleep cycle had been disrupted.	This section is currently empty.
Summary Statement This project will investigate the effects of circadian rhythm disruptions on the training and memory of common goldfish.	This section is currently empty.
Help Received My Science teacher reviewed the different phases of the project.	This section is currently empty.