



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Caroline Edmonds	Project Number J2211
Project Title Blink and Run: Flashlight Fish	
Abstract Objectives/Goals Questions: When do flashlight fish light up the most and what may cause it? Hypothesis: I believe the flashlight fish will light up the most during a feed as flashlight fish supposedly light up to attract their food. Flashlight fish are small, black fish with light emitting organs (photophores) under their eyes and have split dorsal fins. They are carnivorous & live in dark caves in the Indo-Pacific region about 1000ft down. Little research was available to learn about these fish.	
Methods/Materials 1)Observe & record Flashlight Fish for 5 min videos of baseline rest, all feeds,times,cleanings,distractions 2)Narrate video& write notes in journal 3)Process each video with special effect to be able to count light-ups per frame 4)Count number of light-ups every 5 seconds over each 5 min video. Record data points in spreadsheet to compute average light ups/5 min 5) Repeat for each video-94 captured over 14 different days 6)Compare light-up avgs from various activities & times over multiple days.	
Results Light up Counts Avg/5 min: Rest-defined as no activity in the tank=1.05 avg. School was 14# dia. Feed=3.79 avg. Active, aggressive, dispersed behavior Post Feed rest=1.68 avg. 14# school Cleaning=2.85 Vertical schooling Night time rest= 0.3 tight school 4.03=frozen mysids & 2.08 for live Other distractions noted.Time of Day counts varied. More active in AM. Calm at night in sleep mode. Find darkest part of tank.	
Conclusions/Discussion Conclusions:hypothesis is supported. Feeding had highest counts of all the different activities. This has not been quantified before in flashlight fish studies.Feed increased 135% over baseline. Cleaning count slightly higher maybe due to stress. Behaviors:Schooling patterns noted. AM Aggressive behavior observed, more related to intervals between their last feeding. The fish burn energy lighting up & have high metabolism, so eat often. Scatter plot of rests vs times of day= no correlation but high counts before feeding times, so possibly the fish are expecting to be fed.Sleep behavior noted in late night observations. Fish may possibly prefer different	
Summary Statement I studied when flashlight fish (Anomalops Kapotron) light up the most and what may cause it by sample counting their number of lights-up over 5 min videos and observing behaviors through different activities, times of day, and diets.	
Help Received Mom helped by driving me back and forth to aquarium. Aquarist helped me coordinate feeding times with observations. Dad helped with printing of some display items. Friend helped with clay model for display	