



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Brett W. Richey</b>	<b>Project Number</b> <b>J2420</b>
<b>Project Title</b> <b>Red Clawed Crabs: Can They Learn to Consistently Decrease Times in a Maze?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To effectively determine whether Red-Clawed Crabs have the brain capability to learn and retain information. Also, I would like to find out whether their times will decrease significantly each day, or have a lower margin of decrease as time passes.</p> <p><b>Methods/Materials</b> Using common household objects, I created a simple maze in which to test the three crabs. I used tuna and salt along the maze to keep the crabs motivated. Next, I filled the maze with 8 rocks and 3 hurdles to serve as obstacles. Each afternoon, I had each crab complete the maze, and I took detailed notes on their times and behaviors in my notebook. When the 5 day period ended, I used the crabs times and behaviors to create detailed conclusions and colorful graphs. The results of the experiment were astonishing and amazing!</p> <p><b>Results</b> Not only had the crabs gotten faster with time, they had gotten faster with each and every consecutive day. I plotted the crabs' times on a line graph, so I could visually see the steady decrease in time. I was then able to draw conclusions in my experiment. I figured out that the crab times had decreased by minutes each day at first, but after the first few days they had reached their personal best running speed, and could only improve their times by knowing what lay ahead in the maze. Over all, each crab decreased their times by minutes, which proves that crabs do have the brain capability to learn and apply information.</p> <p><b>Conclusions/Discussion</b> My hypothesis was proven correct: Red Clawed Crabs can learn and remember from day to day and apply this knowledge to consistently improve their times in a maze. This proves that Red Clawed crabs could be tested and used for lab experiments, in the place of small rodents. Also, this experiment proves that small invertebrates have a complex brain, complete with learning and memory ability. Knowing the capabilities of small invertebrates can help scientists find new animals to test and study.</p>	
<b>Summary Statement</b> I tested Red Clawed Crabs in a simple maze each day to determine if they had the brain ability to learn and apply knowledge to steadily decrease their maze times.	
<b>Help Received</b>	