| Name(s) | Project Number |
|---|---|
| **William J. Milcovich** | **S1009** |

**Project Title**

**Is Mus musculus Capable of Developing a Cognitive Map of Its Environment?**

**Abstract**

**Objectives/Goals**
The purpose of this experiment was to determine if Mus musculus has an ability to form a cognitive map of an elevated maze in order to recognize and recall each pathway to receive a reward of food and/or water.

**Methods/Materials**
I utilized two sets of mice, six male and six female mice and I was able to test my hypothesis. My hypothesis states: After each mouse is tested several times to each indiviual platform, they would naturally learn and memorize certain paths leading to food or water, thus forming a cognitive map of the maze and environment. After teaching them to follow a specific route for a specific reward, I wanted to find evidence that Mus musculus was able to put two pathways together as an alternate route, when the direct route was obstructed. Over a period of two weeks, every other day, I timed and recorded each individual mouse as it crossed the tubing to reach a platform.  Before doing this, I deprived them of food andor/water the night before.  This process was repeated three times for each platform on different days.

**Results**
The mice achieved their goal of food and water from their memory of the textures on each platform.  After analyzing the data results, my hypothesis was proved.  The average trial times for both males and females progressively decreased, showing the ongoing learning and memorizing of the elevated maze, thus forming a cognitive map. The results show that the mice in the first series of trials traveled at a rate of 1 cm/sec, but by the final series of trials, they traveled on the average over three times as fast! All 12 mice were successful in combining the two pathways to create an alternate route to the goal of food and water in the final series.

**Conclusions/Discussion**
My conclusion is that Mus musculus is capable of learning to form cognitive spatial maps to help them find food and water in a maze.

**Summary Statement**

The purpose of this experiment was to determine if Mus musculus has an ability to form a cognitive map of an elevated maze in order to recognize and recall each pathway to receive a reward of food and/or water.

**Help Received**

Mr. Otterstedt, who is the Chair of Guidance Services for my school helped me focus, organize and fine tune my ideas. Mr. and Mrs. Oyama helped me to organize  my charts, and fine tune my graphs as well as design the graphics for the project board.