



# CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

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<b>Project Title</b> Memory and Intelligence: A Spatial Approach	
<b>Objectives/Goals</b> Can birds learn to recognize the position of a food hole or patterns in food holes on a food board and can they apply this knowledge intelligently to new environments? I believe that the birds will memorize the position and pattern of food holes and will progressively find the food faster. I also hypothesize that the birds will be able to apply the previous knowledge of a food board to the next board to find the food in a shorter amount of time. <b>Abstract</b> <b>Methods/Materials</b> Four food boards of different shapes and containing different amounts of holes were created. The birds were tested individually on one board at a time; the four boards in order of experimentation were the rectangular board with six holes, rectangular board with twelve holes, triangular board, and circular board. In the first two boards, one hole contained seeds, while in the latter two boards four holes contained seeds. Each hole on each board was covered with cotton; the birds had to lift the cotton and find the food below. During each trial of ten minutes, a bird was timed for the amount of time it took to find the food, and behavior was also noted. Each board required the birds to be tested once a day in the afternoon for ten days. <b>Results</b> The time in which the birds found the food hole or food holes on each board nearly consistently decreased as they completed more trials. The birds usually found the food hole in less than twenty seconds for the rectangular board with six holes, and in less than ten seconds for the rectangular board with twelve holes. The birds consistently found at least three of the four food holes on the triangular and circular food boards. <b>Conclusions/Discussion</b> Zebra finches can memorize the position of one food hole on a food board, and find it within a few seconds. They can also memorize at least three food holes in a pattern on the boards, but it is more difficult than a single hole. The birds use knowledge gained in exploring a previous board to adapt to the current board more easily and memorize the positions of the holes. This research can lead into other areas of study about memory and intelligence of birds.	
<b>Summary Statement</b> This project investigates the intelligence and spatial memory of zebra finches in finding food.	
<b>Help Received</b> Dad cut wood and drilled holes for boards, Mom occasionally cleaned cages, brother helped with technical difficulties (digital camera), Mrs. Goossens gave advice	