



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Christian T. Tanaka	Project Number J0628
Project Title Who's a Better Learner, Children or Adults?	
Objectives/Goals The objective is to find out who is a better learner, children or adults through three phases of chess.	
Abstract Methods/Materials Methods: I created a lesson plan specifically targeting the key ideas of chess principals: Opening (to test memory); Middlegame (to test problem solving skills); and Endgame (to test conceptual ideas). Following the lesson plan, an exam was administered covering the three main phases of chess. These exams were targeted to children and adults with little chess experience, at beginner's level. Materials: Chess board, chess pieces, demo board, demo board stand, lesson plan, and test/exam	
Results Children: Opening - % correct: 60%, Middlegame - 48%, Endgame - 62% Total average % of all categories - 56.67% Adults: Opening - % correct: 42%, Middlegame - 50%, Endgame - 50%, Total average - 47.33%	
Conclusions/Discussion The children proved to be the better learners, scoring higher in memory and conceptual thinking, yet the adults scored higher in problem solving. Opening: Part of the brain that controls memory is in the temporal lobe/hippocampus. As you grow older, the hippocampus is altered through structural and biochemical changes, causing memory loss. Maybe this is why the children dominated the adults in this area. Middlegame: Part of the brain that controls problem solving skills is in the frontal lobe, where calculation and specific details are processed. This is one of the last areas of your brain to develop, and proven true, with the adults scoring higher than the children in this phase. Endgame: Several parts of the brain control concepts, the frontal lobe (sequential execution of the endgame) and the temporal lobe. It appears that the adults used mainly problem solving skills, trying to solve the puzzles through calculation. They did not see/consider the #whole picture#. Attitude/Nature: Both groups were equal, in terms of strength, but the children had a greater motivation to do well on the exam. Some adults didn't put as much importance into the test, and some too embarrassed to take the test for fear of humiliation.	
Summary Statement My project compares children vs. adult learning capacity through chess	
Help Received Chess Palace and Laguna Woods Chess Club - attracted participants through e-mail flyers; Art House, science advisor - organizational improvements; John Schulte, friend - helped transfer my youtube visuals onto CD; mother - photographer at my lessons	