



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Jonathan R. Glicksberg	Project Number S1005
Project Title Is Flaw Recognition Genetic?	
Abstract Objectives/Goals Members of four generations of my family have the special ability to easily find four-leaf clovers, leading me to hypothesize that flaw recognition has a genetic basis. I designed this experiment to determine if the ability to recognize visual flaws is inherited as a Mendelian trait. Methods/Materials I designed five repetitive geometric patterns and made three replicates, each with a deleted segment in a different position. The patterns were: 1 - circles, 2 - small repeats of stars, 3 - dogbones, 4 - large repeats of stars, 5 - angular flower petals with central spokes. Informed consent was obtained from 18 males and 18 females from eight families. Subjects searched for the flaws in 15 timed trials and were classified as finders for a specific pattern if they found the flaw a minimum of two times out of three trials. Results After classifying the individuals by their finder or non-finder phenotypes for each pattern and comparing their time scores, standard deviations and Student's t-tests showed that the phenotypes were significantly different. The flaw-detection scores were independent of age and gender, but did correlate with self-evaluation of visual-spatial ability. The inability to find the flaws in patterns 1 and 2 is consistent with autosomal recessive inheritance of two different traits. Conclusions/Discussion When finder vs. non-finder phenotypes for all five patterns were superimposed on pedigree drawings, intrafamilial similarities were obviously more common than interfamilial similarities. In addition, the inability to recognize flaws in patterns 1 and 2 both exhibited possible autosomal recessive inheritance, although these traits are not linked. My hypothesis was correct. There appear to be genetic components for the ability of humans to detect flaws in circular and small-repeating patterns.	
Summary Statement I found a likely genetic basis for the ability to recognize visual flaws in two geometric patterns.	
Help Received Parents provided transportation. Mother helped with Excel.	