



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Rishika Singh	Project Number J0620
Project Title Eyes, Nose, or Mouth: Measuring Their Effectiveness in Face Recognition	
Abstract Objectives/Goals The objective is to find out which facial features help the most in face recognition. Methods/Materials In the initial procedure, respondents had to remember the names and faces during the test. Because memory played a role in this setup, the method was redesigned. In the final procedure, 50 respondents were given two sheets of paper containing a total of ten pictures, two each for five different faces. Then, they were given 15 cards with the "eye" features of the five faces (3 per face) and asked to recognize the face within 30 seconds. This step was repeated for the remaining feature sets in the following order: nose, mouth, eyes and nose, nose and mouth, and lastly all three together. Finally, the respondents rated their familiarity with the five faces on a scale of one to ten. Results Measurement of average precision showed that eyes were the most effective at face recognition. Paired t-tests indicated the following ordering of features in increasing effectiveness: nose, mouth, eyes, nose and mouth, eyes and nose, and finally all three features taken together. When comparing across gender, males generally had a slightly better average precision. There was a wider variance in males than in females. When comparing across age groups, kids and adults were split evenly at recognition. Variances were small and similar across age groups. Finally, there was a strong correlation between familiarity and recognition. Conclusions/Discussion The eyes clearly helped the most in face recognition. Comparative performance of the features was maintained across gender, age, and level of familiarity.	
Summary Statement Facial features (eye, nose, mouth) were compared for their effectiveness in face recognition.	
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