



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Prabhdeep Kaur	Project Number J0510
Project Title Grainy Gluten	
Abstract Objectives/Goals Gluten is a protein found in wheat, barley, and rye. It has a high content of iron. Gluten is important for humans because it contains the vitamins, minerals, and fibers that are necessary for our health. The purpose of my experiment was to find which type of flour, whole wheat, all-purpose, or whole wheat graham flour, has the most gluten. Methods/Materials For my experiment, I mainly used whole wheat flour, all-purpose flour, whole wheat graham flour, a strainer with small holes, a ruler, and a scale (grams). I added water to the flours while stirring with a fork. Then, I kneaded each ball of dough for five minutes. The kneading process is essential because it helps form the gluten. After letting the dough sit for 10 minutes, I ran cold water over the balls of dough, which caused the starch to wash away and left the gluten. The starch is water soluble and gluten is insoluble. Then, I measured and weighed the gluten from the three different types of flour. Results After conducting five trials, I found that the average diameter of the gluten from the whole wheat flour was 4.7 centimeters, the average diameter for the all-purpose flour was 3.8 centimeters, and the average diameter for the whole wheat graham flour was 4.5 centimeters. The average mass of the gluten from the whole wheat flour was 55 grams, the average mass for the all-purpose flour was 39 grams, and the average mass for the whole wheat graham flour was 50 grams. Whole wheat flour had the most gluten. Conclusions/Discussion My results supported my hypothesis. This project expands our knowledge of the vital benefits of gluten. My experiment contributed to the scientific community by representing human life and shows that whole wheat flour contains more gluten than all-purpose flour and whole wheat graham flour.	
Summary Statement By using water and the kneading technique, I discovered that whole wheat flour has more gluten than all-purpose flour and whole wheat graham flour.	
Help Received My science teacher reviewed my project and instructed me in how I could improve it. My siblings acted as timers and held the strainer as I rinsed the dough.	