



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Aamina Thasneem Khaleel	Project Number J2011
Project Title Investigating Harmful Artificial Food Coloring in Candies Using Agarose Gel Electrophoresis	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my project is to find out which candy (M&Ms or Nerds) has excessive amounts of artificial food colorings. My hypothesis is M&Ms uses excessive amounts of artificial colorings than Nerds. I also extended my project by comparing European candies with American candies because European candies contain natural food colorings (e.g. E100, E120, and E133). My project is to raise awareness about the artificial colorings in candies. From my research, I found out that artificial colorings are derived from coal, tar, and petroleum. M&Ms have artificial colors like Yellow 5, Yellow 6, and Red 40.</p> <p>Methods/Materials Neo Sci Biotechnology Lab Kit, Nerds, M&Ms, Skittles, and Smarties were used for my project. Compared M&Ms with Nerds candies to find out which candies has more artificial coloring. Agarose gel was poured into gel-casting tray, after 20 minutes the wells were formed. Gel-casting tray was placed into electrophoresis chamber and then poured 10x TBE running buffer into the chamber. Dissolve the candies and dispense the dyes into the wells in the chamber using pipette and the micropipette tips. Power supply was used for heating. During the heating process, bubbles of hydrogen gas would evolve at the negative electrode (cathode), and oxygen will be formed at the positive electrode (anode) causing the dyes to migrate. Measure the migration distance of each band after 45 minutes.</p> <p>Results Conducted my experiment 3 times and average data showed most of the M&Ms candies did not migrate to the positive end (anode), but Nerds candies were closer to the positive end in the electrophoresis chamber. My results showed that the molecules traveled in different rates depending on their weight and size. If the molecule is lighter, it will travel faster. My experiment proved that M&Ms candies have more artificial food coloring than Nerds. The results from my extended project proved that American candies have artificial food colorings and European candies have natural food colorings.</p> <p>Conclusions/Discussion The results obtained from my project supported my hypothesis. My investigation helped me understand that M&Ms has more artificial food coloring than Nerds that causes health problems and should be banned in US. I come to a conclusion that the Mars (M&Ms) and Nestle (Nerds) should replace artificial colorings with natural colorings. My extended project proved that European candies have natural colorings.</p>	
Summary Statement Candies manufactured in the United States have artificial food colorings that causes health problems.	
Help Received My parents purchased Neo Sci Biotechnology Lab Kit for my investigation and supervised my project. My teacher gave me guidance.	