



Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Breaking Down Light: Investigating the Effects that Different Wavelengths of Light Have on Plant Growth and Mitosis.

Finalist's Name: Gerardo Rodriguez Ramriez

School and City: Boston K-8, Aurora, CO

Sponsor's Name: Devon Conradson

Category: Earth & Environmental Sciences

Division: Junior (grades 6 - 8)

Abstract (250 words or less):

Climate change impacts on the natural processes that humans depend on such as agriculture and food production. Increase of pollutants in the atmosphere that can affect the amount/type of light that reaches Earth's surface^{1,2}. Decreased food production influences the amount of food for humans and on the economies of many countries. Finding ways to maximize food production is crucial to reducing the impacts of climate change. All living organisms grow through a process known as 'mitosis' including plants³ leading to the duplication of the cell's DNA and its organelles to form two cells⁴. This process is what allows animals and plants to grow: by increasing the number of cells they have in each of their tissues. Also, while animals depend on food for fuel, plants use the sun's light for energy through a process called 'photosynthesis'—a process that's facilitated through chloroplasts^{5,6}. The purpose of my project is to determine if pollution that interferes with light's interaction with our atmosphere affects the growth of plants on the ground and, specifically, their ability to undergo mitosis and produce light-absorbing pigments like chlorophyll. I will test this by growing bean plants and onion plants under different wavelengths of light and at different intensities. I will grow both under red, blue, green, and normal/ambient sunlight and vary the intensity of each light source. I will then use chromatography and DNA staining to quantify the amount of plant components in the leaves of the bean plants and mitosis in the roots of the onion.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**