



# Colorado Science and Engineering Fair

## 2025 Team 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: The Effects of Nanoparticles on Plant Growth

Team Leader's Name: Janet Bajikijay

Team Member 1: Mayssan Salim

Team Member 2: Nayibe Burciaga Buhaya

School and City: Lotus School For Excellence, Aurora

Sponsor's Name: Mehmet Ates

Category: Plant Sciences

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Nanotechnology has been revolutionized in various fields. This includes agriculture, where nanoparticles are increasingly being used to enhance crop production. This study investigates the effects of nanoparticles on plant growth, focusing on their impact on growth rates, root lengthening, and overall biomass. We specifically evaluated the influence of Zinc Oxide (ZnO) and Silicon Nitride (Si<sub>3</sub>N<sub>4</sub>) nanoparticles on the growth of bush seed plants, which are known to have a fast growth rate.

The plants were grown in controlled room-temperature environments with varying concentrations of nanoparticles (low, medium, and high), while a control group received no nanoparticles. Data was collected over multiple weeks, measuring and tracking everything from the length of the roots to the number of leaves.

Our findings highlight the dual role of nanoparticles in agriculture, offering both opportunities and challenges. While they can enhance plant growth at optimal levels, excessive exposure may harm the plants and their eco-systems. This study shows the importance of understanding nanoparticle-plant interactions to harness their benefits responsibly in agriculture.

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

Team Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Team Member 1's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Team Member 2'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 your Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**