



## 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: The Use of Zeolites in Mitigating Red Algae Blooms

Finalist's Name: Augustus Gdantiz

School and City: Wray High School, Wray Colorado

Sponsor's Name: Danae Knust

Category: Micro & Molecular Biology

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

The purpose of this project was to investigate the efficacy of zeolites for the purpose of mitigating algae concentrations. Algae blooms can devastate local ecosystems by reducing oxygen levels, blocking sunlight, and releasing toxins into their environment. Algae blooms pose dangers to aquatic organisms, livestock drinking water from contaminated sources, and humans near toxic water sources. Currently, the main methods of algae removal include spreading a clay solution into water to flocculate, or clump together, the algae and bring it to the sea floor. Another current method is using species that prey on algae in order to biologically remove the algal blooms, but these methods are either ineffective or environmentally harmful. Zeolite is a mineral that has been proven effective at removing ammonia and nitrates from water. Because algae blooms depend on these chemicals to sustain growth, the removal of these substances with the use of zeolites was able to slow algae growth and deplete algae populations. During the experiment, freshwater algae samples were collected and then mixed with a zeolite solution. The zeolite solution proved to be 37 to 61% more effective at eliminating algae than the control group. These results indicate that zeolites may prove to be a more effective technique of algal removal than current methods. Further research will indicate if this current method is applicable to freshwater and saltwater algae alike. Overall, the experiment supported the hypothesis that zeolites would decrease algae concentrations and that greater concentrations of zeolites would be more efficient at algae removal.

*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.**