



## 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: Preventing the Tumble

Finalist's Name: Morgan Drullinger

School and City: Liberty school, Joes Colorado

Sponsor's Name: Linda Fogale

Category: Earth & Environmental Sciences

Division: Junior (grades 6 - 8)

Abstract (250 words or less):

The purpose of this project is to determine what herbicide or chemical would best destroy tumbleweed seeds and keep the grass and zinnia seeds alive. The hypothesis was that all three of the herbicides would inhibit seed germination because of the PH levels of the herbicides. Roundup and 2-4D have a weak PH of 4 to 5. Rejuvra has a weak PH of 9 to 10. They are all in range of killing the germination of the seeds.

This was tested by getting flower and grass seeds. The tumbleweed seeds were collected by taking tumbleweeds and then crushing them so that all of the seeds fall into a trash bag so they can be collected. Then there were ten of each seed placed into petri dishes and covered with a paper towel soaked in five milliliters of the herbicide. Every day for five days they were counted to see how many have germinated. The data was put onto a spreadsheet and graphed.

The data collected shows that the control did the worst because the control was water; plants need water to survive, so everything germinated. The worst out of the herbicides was the Rejuvra because it made the tumbleweeds germinate and the flowers and grass seeds died. That was the opposite of what was predicted. The best herbicide was the Roundup because it stopped the tumbleweed seeds from germinating and still had one of the flower seeds still germinate.

So in conclusion the data did not support the hypothesis and the best herbicide was Roundup; the worst herbicide was Rejuvra.

*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.**