STEM Stats v1 - Day 2

Research Idea: I want to know whether tomato plants grown with the fertilizer OptiGro yield juicier, tastier, tomatoes than plants raised in otherwise similar conditions but without the fertilizer and if additional watering impact the results.

To determine cause and effect we need to conduct a properly designed and executed experiment.
The ~~dependent~~ (response) variable is juiciness and tastiness (judges rate on scale of 1-7 for each).

List all possible questions(variables) you can think of regarding the design of an experiment to test the idea. (things that could affect the response variable)

	answers(levels)
explanatory variables: How much OptiGro fertilizer will the plants receive?	None 1/2 Dose Full Dose
explanatory variables: How much water will the plants receive?	Normal 50% more
potential confounding variables: ✓ How many plants will be tested?	(a multiple of # of factors = 3Lx2L = 6, this exp. 36)
✓Will they be exposed to similar temperatures?	yes. They will be planted in the same location.
✓Are the plants of the same variety?	yes?
Where were the plants purchased?	24 from Home Depot and 12 from OSH
Did the plants receive similar care before purchase?	I don't know.
Are they planted in similar soil conditions?	I think so. They came in soil from the store.
✓Will they receive the same amount of sun?	yes. They will be planted in the same location.
Will I test the same plant with and w/o fertilizer?	No. I only have 1 growing season.
Are there genetic differences between plants?	I don't know.

Circle any questions(variables) being tested in the research idea. These are the explanatory ~~independent~~ variables
Check off any remaining questions(variables) you can control.
Confounding variables are variables other than your explanatory variable(s), which might have an effect on your response variable.
Box any remaining questions(variables) where you can identify specific plants with potential differences.

How can we keep these identifiable potential differences from influencing the response variable?

isolate potential variability between stores by testing the plants separately. Blocking (parallel experiments)

What about the remaining questions(variables)? Is there any way to prevent them from confounding our response variable?

Random Assignment

Let's diagram our experiment: