

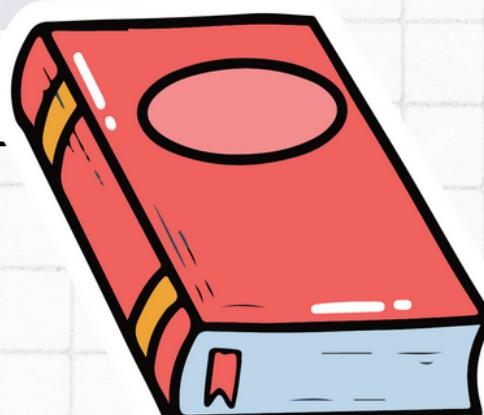
Science experiment

SABER AWN

Introduction



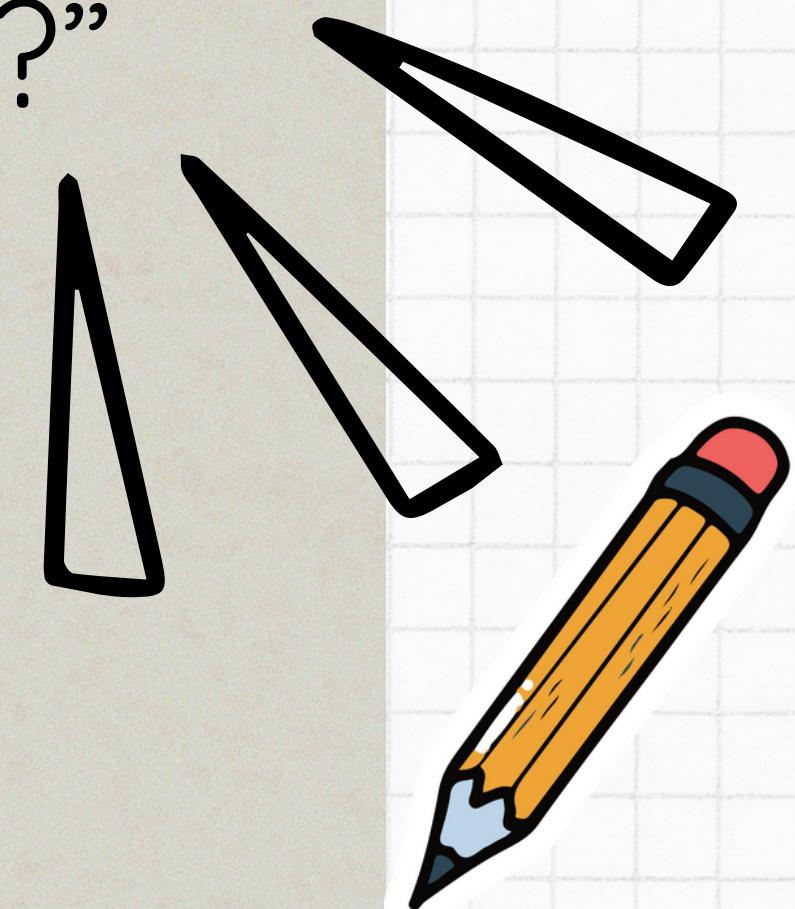
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- Plants need light, temperature, space, nutrients, and water.
- Water transports nutrients and is essential for photosynthesis.
- plants provide us with food, fiber, shelter, and “medicine”
- Salt water damages plants and leaves harmful residues.
- Plants can survive up to 7 days without water, depending on species and soil moisture.
- This experiment will explore how different types of water affect plant growth.
- We will use green bean seeds for this experiment, as they are a valuable source of protein, calcium, and iron.

THE TESTABLE QUESTION

“How do different types of water affect plant growth?”

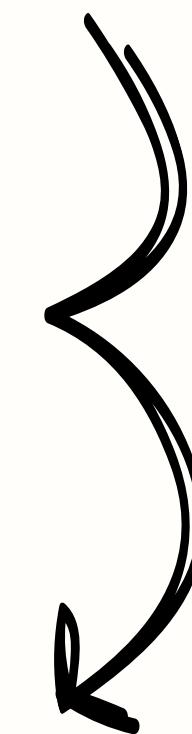
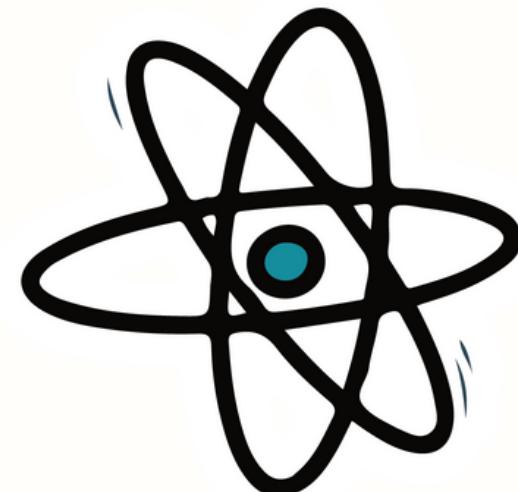


THE HYPOTHESIS

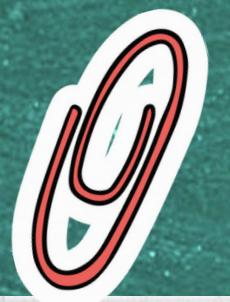
if the water type is salty then the plant will not grow fast and healthy or die because they cannot process it, and also when the water evaporates, the salt will remain in the soil and near the roots, and it is very dangerous for them.

Experimental Design

Question: (What is your testable question?)	How do different types of water affect the plant growth?	
Independent Variable (IV)	different types of water	
	control Group	experiment Group
Levels of IV	tap water	salt water
Trials	4 trials	4 trials
Dependent Variable (DV)	the growth of the plant	
Constants (Controlled Variables)	the same soil type, light and fertilizer levels, water quantity, location, temperature, timing, watering method, and measurement tools.	



Process



step 1: Soil, 8 seeds, tap water, salt water, gloves, cup, ruler, 8 pots (2-inch), paper, and fertilizer.



step 2: Label 4 pots for the experiment group (tap water) as T1, T2, T3, T4, and the other 4 for the control group (salt water) as T1, T2, T3, T4.

step 3: Fill each pot with 1.7 inches of soil mixed with fertilizer.

step 4: Place each seed head near the soil surface with the root at the bottom.

step 5: Water the experimental group with 20 ml tap water and the control group with 20 ml salt water.

step 6: Place all pots near a window for sunlight.

step 7: Water the experimental group with tap water and the control group with salt water daily for two weeks, excluding weekends.

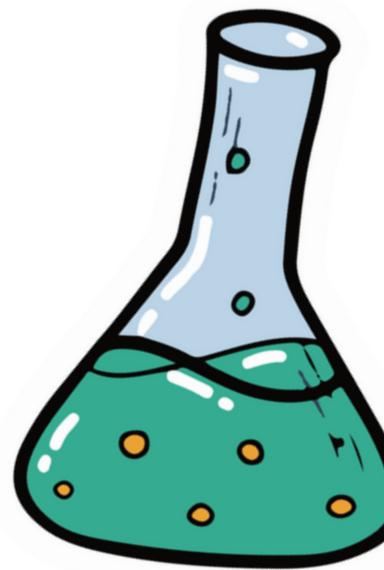
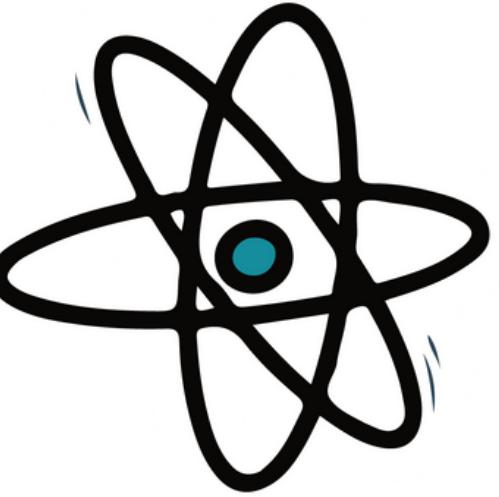
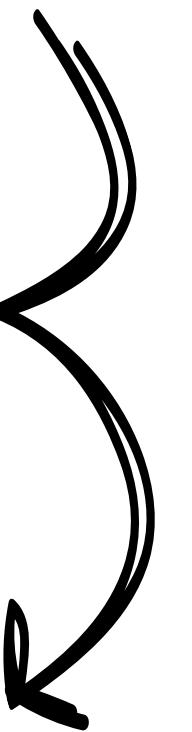
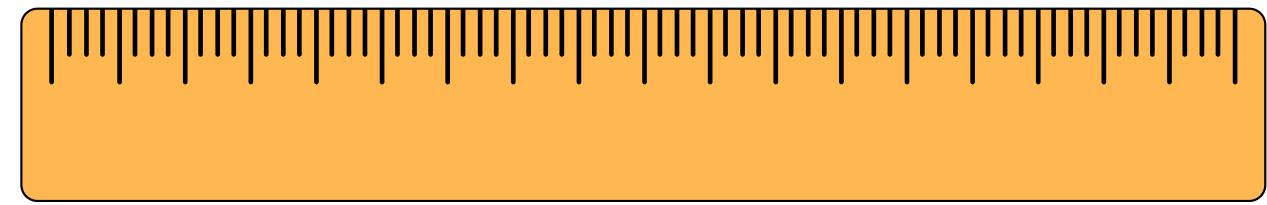
step 8: Measure plant growth daily for two weeks after they emerge, and record the data.



step 9: Return all tools and materials for others to use.

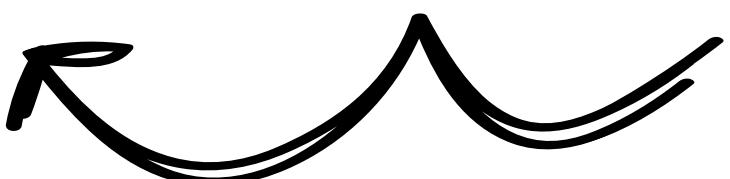
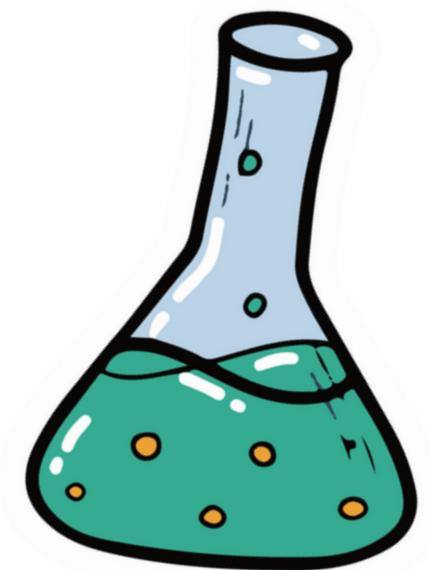
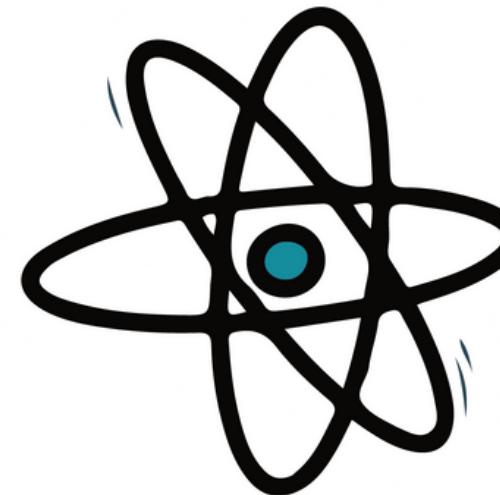
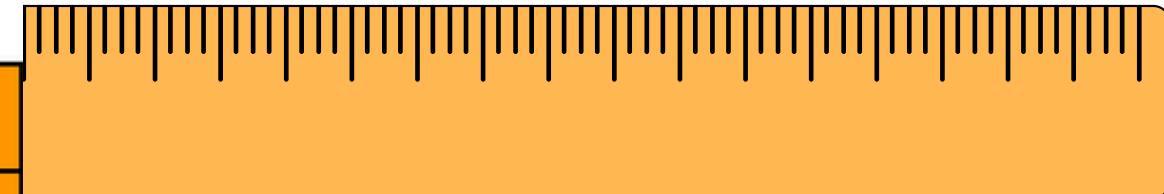
DATA TABLE 1: Height of plants with tap water and salt water during 14 days.

Day	The height of the plant that watered by the tap water (control group) in cm					The height of the plant that watered by the salt water (experimental group) in cm				
	Trial 1	Trial 2	Trial 3	Trial 4	Average	Trial 1	Trial 2	Trial 3	Trial 4	Average
1	0	0	0	0	0	0	0	0	0	0
2	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-
4	<u>0.7cm</u>	0	0	0	<u>0.175</u>	0	0	0	0	0
5	2cm	1cm	0	0	0.75cm	0	0	0	0	0
6	-	-	-	-	-	-	-	-	-	-
7	10.7cm	9.2cm	0	0	4.98cm	0	0	0	0	0
8	16.5cm	14cm	0	1.3cm	7.95cm	0	0	0	0	0
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	24.6cm	23.8cm	0	3cm	12.85cm	0	0	0	0	0
12	26.5	24	0	3.2	13.42	0	0	0	0	0
13	27.178	26.67	0	4.3	14.54	0	0	0	0	0
14	28.7	27.1	0	4.3	15.025	0	0	0	0	0



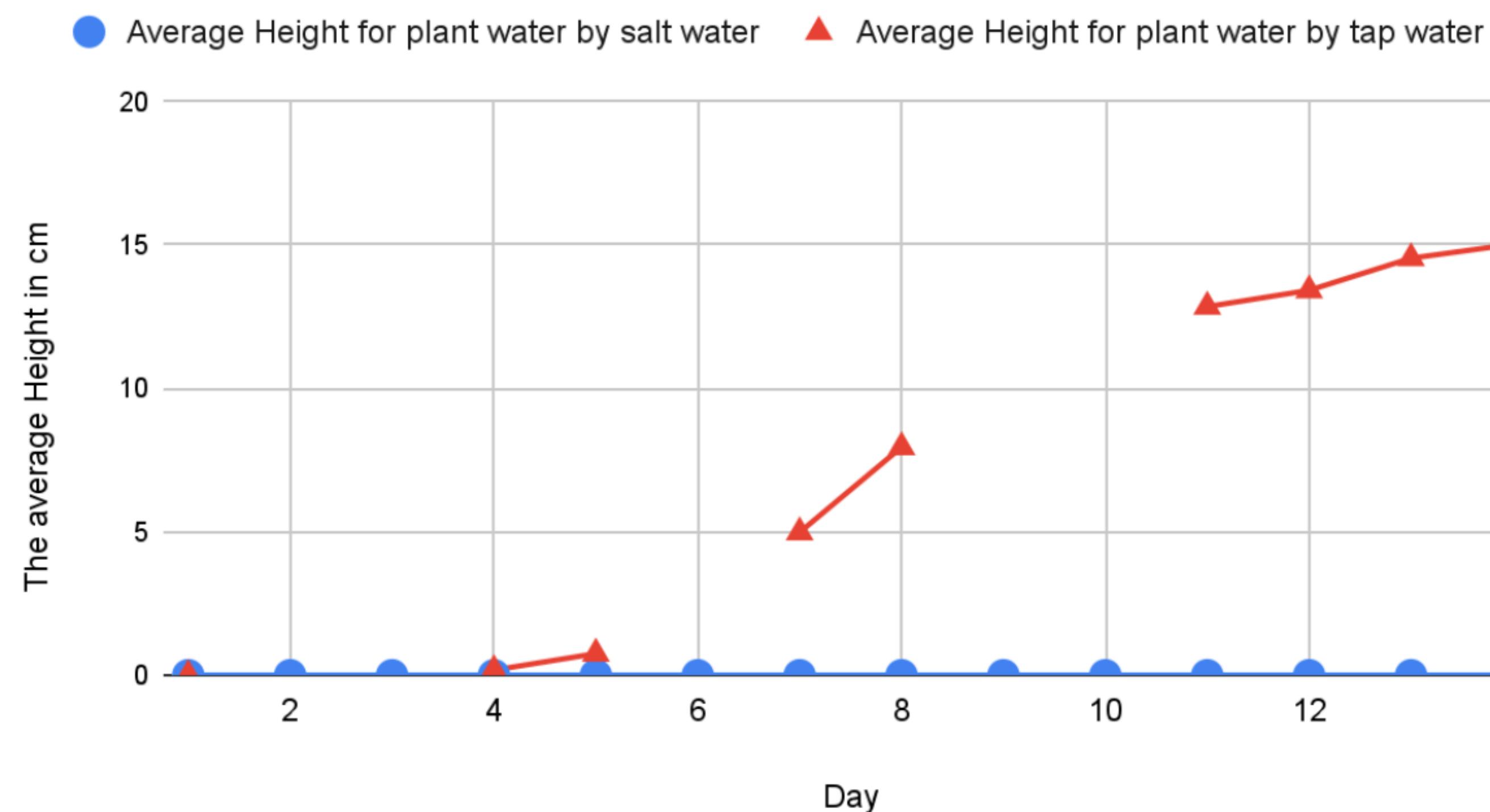
DATA TABLE 2: Average Height of plants with tap water and salt water during 14 days

Day	Average Height for plant water by salt water	Average Height for plant water by tap water
1	0	0
2	-	-
3	-	-
4	0	0.175
5	0	0.75
6	-	-
7	0	4.98
8	0	7.95
9	-	-
10	-	-
11	0	12.85
12	0	13.42
13	0	14.54
14	0	15.025



Graph 1:

Average Height for plant watered by salt water vs. tap water



CAPTION:

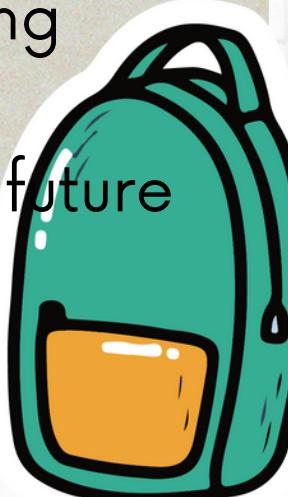
This graph shows the average Height for plants watered with salt water and plants watered with tap water. for 14 days

DATA ANALYSIS:

- Axes: Days (X-Axis) vs. Average Growth in cm (Y-Axis)
- Groups: Tap Water (Triangles, Experimental) vs. Salt Water (Circles, Control)
- Days 1-3: No growth (seed germination period).
- Day 4: Tap water plants grow to 0.17 cm; salt water plants show no growth.
- Day 5: Tap water plants reach 0.75 cm; salt water plants remain at zero.
- Day 7: Tap water plants grow to 4.98 cm; salt water plants show no growth.
- Day 8: Tap water plants double to 7.95 cm; salt water plants still show no growth.
- Day 11: Tap water plants reach 12.85 cm; salt water plants remain at zero.
- Days 12-14: Tap water plants grow by 1 cm each day, ending at 15.025 cm; salt water plants show no change.

Conclusion

- The plant watered with salt water died, supporting the hypothesis.
- Salt water affects plants by causing drought conditions, preventing plants from benefiting from the water.
- Errors :One tap-watered plant didn't grow, affecting the average height calculation and Excessive salt in the water likely killed the plants.
- Future Improvements :Research the appropriate amount of salt to use and Use different salt concentrations to observe effects.
- Error Avoidance :Ensure seeds are the same size and Use gloves to handle seeds.
- Knowledge Gained :Excess elements disrupt plant growth. Rainwater is optimal for plant growth due to salt separation during evaporation.
- Future Questions: Exploring which plant species can endure elevated levels of salt in water and determining effective strategies to counteract the adverse impacts of salty water on plant vitality are essential areas for future inquiry.



Thank
you

