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# Growing and Graphing: Scientific Method

**Background:**

Ritchie wanted to know the best amount of water to provide for his tomato plants. He decided to vary the amount of water they received and then measure the height of each plant as a result. He grew Harvest Red Tomatoes outside last year, and gave them 500 mL of water each day. They died, and his neighbor told him they died because they didn't have enough water. Using this as a guide, he made a hypothesis; (you fill in what he would predict)

1. "If I give tomatoes _____ water, then the tomatoes will _____."

2a. The independent variable in Ritchie's experiment is the:_____

2b. The dependent variable in Ritchie's experiment is the:_____

3. What could Ritchie use as a control group to compare his changes this year to? _____

_____

For his experiment, Ritchie grew some tomatoes indoors and some outdoors, and tried two different types of tomato plants. Each plant was given a different amount of water every day, and he carefully recorded the height of each plant daily in his data table:

**Effect of water amount on height of tomato plants**

| **Plant type /location:** | **Daily Water Amount** | **Height (cm) Day 1** | **Day 2** | **Day 3** | **Day 4** | **Day 5** | **Day 6** |
|---|---|---|---|---|---|---|---|
| Big Boy / Indoors | 500 mL | 0 | 1 | 1 | 2 | 3 | 4 |
| Harvest Red / Outdoor | 1000 mL | 0 | 2 | 4 | 5 | 7 | 9 |
| Harvest Red / Indoor | 1500 mL | 0 | 2 | 5 | 7 | 9 | 11 |

4a. If Ritchie continues his experiment, which plant would be expected to be around 13 cm tall on day 8?

_____

4b. Does Ritchie's data support or reject his hypothesis? Can you tell? Explain. _____

_____

5. Ritchie obviously has some problems with his experiment. Explain, using **detailed, complete sentences**, how he could make his experiment more reliable.

_____

_____

_____

_____

6. If Ritchie wanted to graph his data, what type of graph would best represent his data?
a.) multi – line graph b.) bar graph c.) pie graph d.) single line graph

7. Explain your reasoning behind which graph type you chose.

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8. Graph Richie's data. Make sure your graph is <u>complete.</u>

: Table 1: **Effect of water amount on height of tomato plants**

| **Plant label:** | **Daily Water Amount** | **Height (cm) Day 1** | **Day 2** | **Day 3** | **Day 4** | **Day 5** | **Day 6** |
|---|---|---|---|---|---|---|---|
| Big Boy Indoors | 500 mL | 0 | 1 | 1 | 2 | 3 | 4 |
| Harvest Red Outdoor | 1000 mL | 0 | 2 | 4 | 5 | 7 | 9 |
| Harvest Red Indoor | 1500 mL | 0 | 2 | 5 | 7 | 9 | 11 |

