Testing the Effect of Caffeine on Plant Growth

Name: _____ Date: _____

QUESTION

Does caffeine affect plant growth?

HYPOTHESIS

If plants are given caffeine, then their growth will be _____ because _____

MATERIALS

- 10–12 fast-growing seeds (radish, bean, or sunflower recommended)
- 2 small pots or cups with drainage holes
- Potting soil
- Caffeine source (one of the options below)
  - Coffee (brewed, cooled)
  - Black or green tea (brewed, cooled)
  - Caffeine tablets dissolved in water (follow package directions)
- Water
- Ruler
- Labels or masking tape & marker
- Notebook or data sheet (this page)
- Sunny window or grow light

PROCEDURE

1. **Plant the Seeds:** Fill both pots with soil. Plant the same number of seeds in each pot at the same depth. Label one pot "Control (Water)" and the other "Caffeine."
2. **Prepare the Caffeine Solution:** Brew coffee or tea (or dissolve caffeine tablets) and let it cool. This is your caffeine solution.
3. **Water the Plants:**
   - Water the Control pot with plain water.
   - Water the Caffeine pot with the caffeine solution. Use the same amount for both pots.
4. **Keep Conditions the Same:** Place both pots in the same location with the same light and temperature.
5. **Water Daily:** Water each pot once a day with the same amount of liquid (water for Control, caffeine solution for Caffeine pot).
6. **Measure and Record:** Once a day at the same time, measure the height of the tallest seedling in each pot from the soil line to the top of the plant. Record your data in the table below.
7. **Observe:** Look for any other differences in color, leaf size, or overall plant health. Record your observations.
8. **Continue for 7–14 Days:** Continue collecting data for at least 7 days. Two weeks is even better!

DATA TABLE – Plant Height (cm)

Day	Control (Water) Height (cm)	Caffeine Height (cm)	Observations
1			
2			
3			
4			
5			
6			
7			
8–14 (optional)			

ANALYSIS & CONCLUSION

1. What did you observe about the growth of the plants?
   _____
   _____
2. How did the caffeine affect the plants compared to water?
   _____
   _____
3. What do you think might explain your results?
   _____
   _____
4. Would you like to test anything different next time?
   _____

THINK FURTHER

Try testing different concentrations of caffeine (weaker or stronger).

_____

Or try a different plant species!

_____

What other substances could affect plant growth?

_____

TIP: Be consistent and patient! Plants may take several days to show differences.