



Title: Effects of pH on Germination of Radish Seeds

Purpose: to determine how pH level affects the germination rates of radish seeds.

Materials:

- dilute HCl (hydrochloric acid) solution
- dilute NaOH (sodium hydroxide) solution
- H₂O (water)
- Petri dishes
- paper towels circles
- forceps
- wax marking pencils
- pH paper

Procedure:

1. Obtain 3 Petri dishes per group.
2. Write your initials on the top and bottom of each dish.
3. Label the dishes 1, 2, and 3.
4. Cut paper towel circle to fit into the Petri dishes.
5. Prepare a data table to record your results (see sample in **Results** below).
6. Using a forceps, dip 1 circle in H₂O and place in Petri dish #1.
7. Test the pH with the pH paper and record in data table.
8. Using a forceps, dip 1 circle in the HCl solution and place in Petri dish #2.
9. Test the pH with the pH paper and record in data table.
10. Again, using the forceps, dip 1 circle in the NaOH solution and place in Petri dish #3.
11. Test the pH with the pH paper and record in data table.
12. Arrange 10 radish seeds in each Petri dish. *Make sure you separate the seeds so they are not touching each other!*
13. Observe seeds daily for the rest of the week and record the number of seeds that germinate (seed cracks and roots or shoots emerge from the seed). You may need to use a magnifying glass to detect germination!
14. Graph your data
 - What is the independent variable?
 - What is the dependent variable?

Results: (data chart and graph)

1. In your lab NB, construct a data chart similar to the one below:
2. Use the data to construct a graph of the results

Group	pH	Day 1		Day 2		Day 3	
		# Seeds Germinated	%	# Seeds Germinated	%	# Seeds Germinated	%
1 (H ₂ O)							
2 (HCl)							
3 (NaOH)							

Discussion:

1. Summarize what you did.
2. Identify the control and experimental groups.
3. Compare and contrast the germination rate of radish seeds in control and experimental groups. Use specific information from your data chart and graph to support your answers!
4. Identify sources of error.
5. Suggest improvements.

Conclusion:

1 sentence testable statement about the relation of pH and seed germination in radishes
(Limit your statement to 10 words or less!)

Reflection: (personal statement)

