

Biology Lab: Acid Rain and Seed Germination

Background: Pollution from burning fossil fuels included nitrogen and sulfur compounds. They combine with water vapor in the atmosphere to form low pH solutions, like sulfuric acid and nitric acid. When this water falls to the ground it is called acid rain. It affects any organism living there, especially plants. It can damage forest, crops, soil, and buildings. In this investigation, you will perform an experiment to simulate and test the effect of acid rain on the germination of seeds.



Purpose: How does acid rain affect the germination of seeds?

Materials: 4 pea seeds, plastic bags, paper towels, diluted acid, water

Hypothesis: How do you think the pea seeds placed in a pH of 4 or lower will germinate compared to pea seeds placed in normal water?

Procedure: *note – wash your hands after this lab*

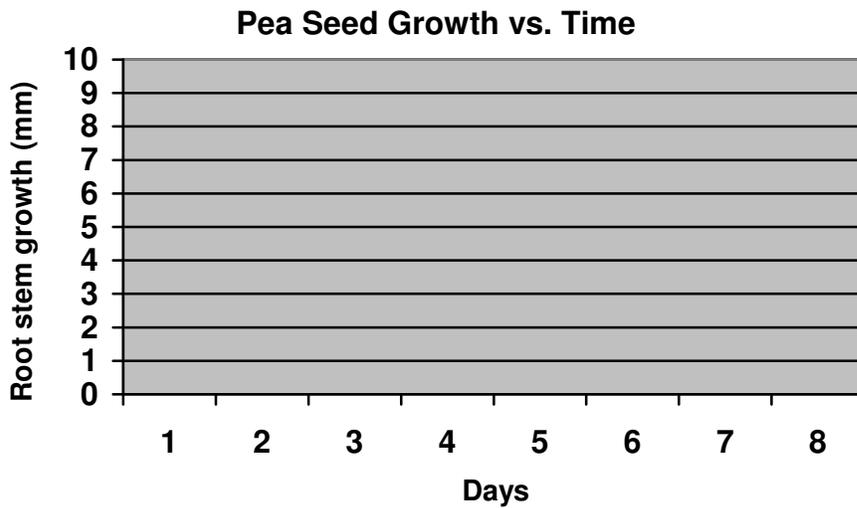
1. Place a paper towel and 2 peas into a plastic bag.
2. Wet the inside of the bag with the acid solution.
3. Get another plastic bag and place a paper towel and 2 peas into it.
4. Wet the inside of the bag with water.
5. Label each bag with your period, group #, and whether it contains water or acid
6. Place the bags aside and measure growth of the root stem in mm every day.

Data:

Day	Growth of Pea Seedlings (mm)			
	Acid		Water	
	Pea 1	Pea 2	Pea 1	Pea 2
1				
2				
3				
4				
5				
6				
Average growth per day				

Class Data	Growth of Pea Seedlings (mm)	
	Acid	Water
Average growth per day		

Graph your results: Graph the growth of your four pea seeds over time. You might set up your graph like this. Use four different colors for the four seeds



Questions and Analysis:

1. How many of the control seeds germinated? How many of the acid-treated seeds germinated?
2. Describe the changes you observed in the seeds from beginning to end. Was there a difference between the control and experimental group?
3. What do your results imply about the short-term effects of acid rain?
4. Would you expect acid rain to injure plants after they have completely germinated? Explain your answer.
5. Study the class data. Is the group data similar to yours?
6. Which pH solution acted as a control?

Conclusion: Briefly explain what you did and what you found out in this lab. Was your hypothesis supported or refuted? Discuss the data that caused you to decide whether your hypothesis was valid or not. What possible sources of error in your experiment might have affected your results? If you were to conduct a similar experiment again, would you do anything differently? If so, what would you change?