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Our experts explain how.Learn MoreThe Motorsport Images Collections captures events from 1895 to today's most recent coverage.Discover The CollectionCurated, compelling, and worth your time. Explore our latest gallery of Editors' Picks.Browse Editors' FavoritesBackground: One of the problems created by burning fossil fuels is acid rain. It affects organisms and ecosystems on many different levels. How does acid rain affect the germination of seeds? Germination- the process by which a plant begins to grow from a seed In this lab you will design your own experiment to determine the effects of acid rain on seed germination. We will allow the seeds to grow until Tuesday and then collect our data, analyze our results, and draw conclusions. The following materials are provided, you do not need to use them all. - Bean seeds (soaked overnight in water) - Paper towels - Ziplock sandwich bags - Rulers - "Acid Rain" (water with vinegar (acetic acid) added to it to change the pH values to 6.0, 5.0, and 4.0) - Non-acidic Rain (tap water) - Sharpie - Dropper - 10 mL Graduated Cylinder - Scissors Hints: * Wrap your seeds up in a paper towel which has been soaked in a solution to simulate being placed in soil with different acidities. Place this in a Ziplock bag to keep the moisture inside. *Label everything clearly. * Seeds need a good deal of moisture Think about: * Controlling your variables (seed number, amount of rain, amount of paper towels, etc.) * What you will use as a control group? * Good scientist like multiple trials, so include more than one bean in your Ziplock bag. * How much "rain" will you use? * What technique will you use to wrap up your seeds? * How will you measure your results? Number of seed germinated, length of root and/or shoot, etc. Things to write Friday in your composition notebook: - Lab Title - Problem - Hypothesis - Materials - Experiment (be SPECIFIC here; this should be a list of NUMBERED steps explaining what you did. Someone should be able to replicate your experiment by following the steps.) - Set up a Data Table that you will complete on Tuesday. 0 ratings0% found this document useful (0 votes)106 viewsThis document provides background information and instructions for a lab on the effect of acid rain on seed germination. Students will test the germination of seeds exposed to solutions with...AI-enhanced title and descriptionSaveSave Acid Rain Lab For Later0%0% found this document useful, undefined My Account Sign In New customer? Create an account. Summary In this lab experiment, students set up to investigate the effect of acid rain on plant life by comparing the germination of radish seeds in water with varying levels of acidity. Their hypothesis was that as the pH of water decreases, the number of seeds germinated will also reduce. The dependent variable was the number of seeds germinated, while the independent variable was the pH of water. Students controlled variables such as sunlight, air in the zip bag, and the method for control. They used 100 radish seeds, 10-15 filter papers, 5 petri dishes, and 5 beakers of 100ml each, along with a dropper, to conduct the experiment. They labeled 5 Petri dishes for each pH solution, placed filter paper with 10 seeds in each, and moistened them with the pH solution. The dishes were then placed in a sealed plastic bag and kept in a dark place for 1-5 days. They then counted the number of germinated seeds and measured their root length. The class averages were tallied for each pH for germination and root length, and the data was graphed. While there was an error in the experiment, the results showed that the least growth was in 2 and 4%, and the fastest was in 0 and 8%. The highest percentage of growing seed was in 0% in day 4 with a maximum of 10%. The students concluded that acid rain had a significant effect on plant life, and more research is needed to determine the long-term effects. To stimulate the effect of acid rain on plant life, students to set up a lab experiment to compare the effect of varying levels of acidity on plant seed germination. Hypothesis: as the pH of water decreases, the number of seeds germinated will reduce. Variables Units: Dependent variables The number of seeds germinated Independent variables The pH of water Controlled variables Units: Possible effects on results Sunlight Amount of air in zip bag as it is one of the sources of energy for the plants, its presence will accelerate seed germination Controlled variables: Method for control Sunlight The lab's to be conducted after the curtains are drawn and the bags to be placed in a wooden drawer in a cupboard. The vessels to be cleaned properly before use so that the water does not get contaminated and to test the pH of water before use so that water purity can be known. Gently press the bags before zipping them and make sure that the max amount of air is lost. Materials 100 radish seeds 10-15 filter papers 5 petri dishes 5 beakers, 100ml each 5 droppers Procedure Label 5 Petri dishes for each pH solution. Place filter paper in each the Petri dish with 10 seeds. Cover the seeds with another piece of filter paper. Use a dropper to moisten the filter paper through all layers with the 8.0 pH solution. Put the dishes in a sealed plastic bag and place them in a dark place. Repeat steps 1 & 2 for 6.0, 4.0, 2.0 & 0.0 pH Solutions. 1 - 5 days later, count the number of seeds that have germinated. Measure the root length of each of the seedlings. Record observations about seedling condition (color and overall growth and appearance of seedling leaves). Tally class averages for each pH for germination and root length. Graph your data and the class averages. Photograph seedlings. Discussion We had only one type of seed, which is radish. We took 10 seed of Radish and every seed and inserted it in zip-lock bag and added 0 to 8% of Acid rain water in all 5 bags. Then we checked the growth of seeds everyday and took the reading. Evaluation While doing the experiment my all the data was perfect. There was error, while doing the experiment. Radish should have grown in 2 and 4 % but even one seed did not grow. The acid rain water of each sample at each stage was different. There may be some external substances may have entered the sample and cause a variation in the salinity of the water of the sample. There was a more effect of acid rain water in 0% and 8% as is basic. As 0 and 8% of seeds grew faster than other three. Conclusion As we know that our experiment went wrong as there was an error in it. The least growth was in 2 and 4% and fastest was in 0 and 8%. And the highest percent of growing seed was in 0% in day 4 with maximum 10%. Bibliography Anaparti, Aruna Murthy. "The Effect of Acid Rain on Seed Germination and Plant Life | eHow.com." eHow | How to Videos, Articles & More - Trusted Advice for the Curious Life | eHow.com. N.p., n.d. Web. 16 Sept. 2011. < . Effect of Acid Rain on Seed Germination. (2017, Nov 16). Retrieved from Remember! This essay was written by a student You can get a custom paper by one of our expert writers Order custom paper Without paying upfront Download presentation The effects of Acid Rain On Seed Germination Background Info: Germination (sprouting) is the growth of an embryonic plant that is contained within a seed. The embryo inside the seed needs something to get its metabolism activated before it can start growing The first sign of germination is the absorption of water Since water plays such a important role in seed germination the p. H of the water can drastically affect the success of seed germination Background Info: Since water plays such a important role in seed germination the p. H of the water can drastically affect the success of seed germination Most seeds prefer water to be as close to neutral as possible Some seeds, like watermelon, can tolerate water conditions as acidic as a p. H of 5. 5 Background Info: Acid rain is any type of precipitation that has a p. H below 6 Acid rain forms when water vapor in the atmosphere combines with pollutants that are released by burning fossil fuels Acid rain can damage buildings, plant and animal life, and soil The purpose of this investigation is to determine the effect of acid rain on the rate of seed germination Lab: A paper towel was soaked with 5 ml of p. H 3 acid solution 5 watermelon seeds were placed on the paper towel and it was folded up, put in a petri dish, and placed on the window sill The same thing was done for the rest of the solutions (p. H 4, 4. 5, 5. 5, 5. 6, 6. 5, and 7) The seeds were checked everyday for 5 days and the paper towels were remoistened with 1 ml of the appropriate solution The results are shown on the following slides Day 1 Day 2 Day 3 Day 4 Day 5