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| Introduction  In this experiment, we hope to learn if bigger seeds germinate faster and produce bigger plants. We chose this topic because we had developed an interest in plants and we wanted to research plants further. We selected this idea, of seed size affecting growth performance, when one of us was planting pansies in her garden. She noticed that the seeds had different sizes and began to wonder if the little seeds would grow just as fast and as big as the bigger seeds. We hope our experiment will show a quick way to germinate seeds and to grow bigger plants.  For our experiment, we used peas. We wanted a plant that could grow in the winter, grow fast, and grow under artificial light (Thiel). We found that peas need rich soil, constant moisture, and cool seasons to grow and develop well (Reid). Peas belong to the plant family called legumes, which also include beans, soybeans, peanuts, clover, and alfalfa. Legumes are of "great economic importance throughout the world" (Austin) serving as food and yielding medicine and other important products. Legumes take in nitrogen from the air to their roots. Bacteria called rhizobia live in nodules found along the roots of legumes. The rhizobia supply the legume with nitrogen, and the plant provides the bacteria with carbohydrates and other organic compounds. Both the legume and the bacteria benefit from this relationship (Campbell 722). Legumes are valuable in agriculture because farmers use them as manure and as crop covers to improve poor soil (Austin). Farmers rotate their crops between legumes and nonlegumes. Legumes are planted to restore the concentration of fixed nitrogen in the soil, and act as a "green manure" (Campbell 723).  In the National Corn Handbook, under the Seed Corn Quality and Size section, authors J.S. Burris of Iowa State University, D.R. Hicks of University of Minnesota, and Ivan Wikner believe that seed size, which is genetically controlled, may have an effect on plant performance. Smaller seeds usually have a smaller seed growth rate. In many instances, "seed size has significant consequences in the performance of a number of crop species" (Burris). Also, Gary E. Pepper of the University of Illinois believes that seed size may have an effect on plant performance. After his 1996 experiment with soybeans, Pepper found that "the overall effect of soybean seed size, on establishment, growth, and yield potential, appears to be minimal" (Pepper). However, he believed that a large seed, which has a greater amount of stored energy than smaller seeds, might grow greater in height than smaller seeds later in the season (Pepper).  Plants are an essential part in the environment of life. During the Paleozoic Era, over 430 million years ago, the first land plants appeared on earth. Plants, like animals, compete for sunlight, water and other necessities of life. Plants act as food for many organisms. Also, plants produce oxygen, which is essential for life on earth. Plants changed the physical environment of the earth on a global scale. One important effect was a great decrease in the amount of carbon dioxide in the atmosphere, which made the earth cooler. Therefore, other organisms could inhabit and survive in the new environment. Robert Berner of Yale University proposed that the relationship between the drop of carbon dioxide and the time plants colonized on land is not a coincidence. In the atmosphere, carbon dioxide contributes to the warming of the earth�s surface, which is also known as the green house effect. Carbon dioxide allows solar radiation to penetrate the earth�s atmosphere at a faster rate than it allows the heat to radiate back into space. Therefore, by lowering carbon dioxide concentration, the temperature of the earth is lowered, which allows more terrestrial locations to be habitable for plants and animals (Campbell 571).  Plants are also an essential part of human life. Studies have shown that the healthiest diets are loaded with plant foods, such as vegetables, fruits, beans, and grains. Walter Willett, chair of the nutrition department at the Harvard School of Public Health, says that "a diet rich in fruits and vegetables plays a role in reducing the risk of all major causes of illness and death" (Liebman). Statistics have shown that 800 million people in the world today, which is about one-third of the world�s population, are malnourished. Two billion people have a diet that lacks essential vitamins and minerals. 18 million people, mainly women and children, die of starvation each year ("Making a Meal of It!"). Therefore, if our experiment shows that bigger seeds do produce bigger plants, we can propose this to farmers as a new method of producing a greater crop yield. A greater crop yield would be able to feed more hungry people around the world. Seeds are the beginning of plants, which serve as a major source of food for millions of people around the world.    ([Intro1](http://docs.google.com/introduction.html))([Intro2](http://docs.google.com/intro2.html))([Intro3](http://docs.google.com/intro3.html))([Intro4](http://docs.google.com/intro4.html))  [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2002 Projects](http://docs.google.com/AP2002/index.html)][[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |