



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) Alex R. Desbans	Project Number S1907
Project Title The Effects of Chicken Manure and Miracle-Gro Fertilizer on the Speed of Development of Pea Plants	
Abstract Objectives/Goals The objective of this study is to determine which amendment to soil, chicken manure or Miracle-Gro fertilizer, would help a snow pea plant develop quickest. Methods/Materials Grew 8 snow pea plants in each of 3 soil beds for 40 days. The first control bed had just garden soil, the second bed had soil amended with chicken manure, and the third bed had soil amended with Miracle-Gro Fertilizer. Measured the pH, nitrogen, phosphorus, and potash levels every 5 days using 3 HoldAll soil test kits. Each plant received the same amount of water and sunlight each day, so the soil and the amendments were the only variable in this experiment. Results The Miracle-Gro plants sprouted in an average of 6.67 days, with a final average height of 5.5 cm and 17.8 leaves. The chicken manure plants sprouted in an average of 9.38 days, with a final height of 10.56cm and 27 leaves. The control plants sprouted in an average of 7.88 days, with a final height of 6.01 cm and 16.5 leaves. Both chicken manure and Miracle-Gro plants had similar levels of pH, nitrogen, and potash, higher than the control. The chicken manure plants had the highest levels of phosphorus. Finally, the chicken manure plants grew approximately 0.345 cm per day, while the Miracle-Gro plants grew only 0.165 cm per day and the control plants grew about 0.187 cm per day. Conclusions/Discussion The plants grown with chicken manure developed the quickest in terms of height and amount of leaves due to the soils high level of phosphorus. With further background research, I learned that phosphorus plays an important role in root development. So, the plants grown with the chicken manure took the longest to sprout since it logically took longer for the plants stronger roots to develop, but grew quicker vertically because of the strong foundation that the roots provided. The importance of these results is that they demonstrate that chicken manure is a viable natural alternative to potentially hazardous artificial fertilizers like Miracle-Gro.	
Summary Statement My project determined that the addition of natural chicken manure to soil helps snow pea plants develop quicker than the addition of artificial Miracle-Gro Fertilizer to soil due to the manures naturally occurring high levels of phosphorus.	
Help Received After consulting my science teacher at school about what materials I would need, my parents assisted me in purchasing and obtaining these materials. I completed the rest of the experiment independently.	