



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

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| Name(s) Garrett C. Gaines | Project Number J1908 |
| Project Title Fertilizer and Water | |
| Objectives/Goals My objective was to determine how different types of water (tap vs. distilled) and fertilizer (organic vs. inorganic) affected plant growth. | |
| Abstract Methods/Materials Experiment was done in two stages. Stage one was the germination process, growing 150 Alaska Pea Plant (<i>Pisum Sativum</i>) seeds in a greenhouse kit to seedlings in a 14 day period using tap and distilled water. Stage two, seedling to plant, was 15 days long and involved 8 different conditions of 32 seedlings (91 total trials) that were grown in 18 ounce plastic cups. One organic and two inorganic potting soils (independent & categorical variables) were used, as well as soil from my front yard that wasn't fertilized, which was the control condition. Each soil mix was watered with distilled and tap water (independent & categorical variables). Measurements were taken weekly in centimeters(cm) to ascertain which of the 8 conditions resulted in the Alaska Pea Plant growing the most (dependent & continuous variables). | |
| Results The second stage of the experiment provided the data that enabled me to determine if my hypothesis was supported. A detailed data summary analysis (Table 5) highlights the mean, median, minimum and maximum plant growth of Pea Plants grown in the four soil mixes by liquid type (Tap or Distilled). | |
| Conclusions/Discussion My hypothesis was proven correct. Seedlings planted in inorganic potting soil and watered with distilled water resulted in the Alaska Pea Plant growing the most. Soil mix and liquid type both contribute positively to plant growth, but the liquid type chosen has more impact on plant growth than any soil mix. When compared with the control soil mix, real dirt, there's a 36.4% increase in the average plant growth rate of all inorganic and organic soil mixes whose liquid source is distilled water vs. 6.9% growth rate when tap water is utilized. All water is not equal. Distilled water's impact on plant growth is much greater than tap water. The chemicals and impurities that are in tap water(chlorine,fluoride,etc.) obviously can negatively impact the growth rate of plants. The type of water used is more important with household plants than outdoor plants because of the chemical buildup that takes place in the soil around the root ball. The results of my experiment are very relevant to the household gardener, who should carefully evaluate the best type of liquid source for indoor plants. | |
| Summary Statement To determine the effect different types of water (tap vs. distilled) and different types of fertilizers (embedded in organic & inorganic "potting soils") have on plant growth. | |
| Help Received My dad bought the materials for the experiment, assisted in setting up the experiment, and helped edit my report. | |