



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Adam B. Kaplan	Project Number J1717
Project Title Space Farming	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To complete an investigation to determine if vegetable seeds under artificial gravity or an electromagnetic field germinate faster or grow better. The product of these effects could then be used to grow fresh food, improving the physical and emotional health of future long-distance astronauts. My goal is to have an advanced version of this experiment travel into space on a NASA Space Shuttle or be installed on the International Space Station for thorough operational testing.</p> <p>Methods/Materials Germinating seedlings will be placed on static, slow and fast rotating turntables and other samples will be placed in, and isolated from, an electromagnetic field. The seedlings will be observed and measured daily to chart growth or germination. Seedlings will be extracted from the soil and examined. These observations will be compared to a control group that will not be rotated or exposed to electromagnetic energy.</p> <p>Results ELECTROMAGNETISM - The electromagnet did not make all of the seeds germinate more rapidly. However, the electromagnet gave some of the seeds an initial jump-start. HYPERGRAVITY - Rotation has a beneficial affect on seedling germination. The radishes on the rotating turntables had both larger and longer stems and roots.</p> <p>Conclusions/Discussion The Hypergravitational effect definitely had positive results and would be a great thing to have in space where there is zero-gravity. My hypothesis appears partially right; hypergravity using rotation could be more advantageous than regular germination and growth. It is likely additional water will be required due to increased evaporation with this method. The Electromagnet did not make the seeds germinate faster overall, it provided a jump-start in the beginning. Light is key to germinating seeds. My hypothesis appears to be somewhat incorrect. It is unresolved whether electromagnetism has an overall beneficial affect on germinating seeds.</p>	
Summary Statement Providing a healthy, fresh food source for future long-distance astronauts, thereby improving their physical and emotional wellbeing.	
Help Received Father helped build apparatus. Teacher provided encouragement and advice.	