



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Ciara A. Dwyer	Project Number J2008
Project Title What Drives a Seed?	
Objectives/Goals Are seeds driven by Gravity (Geotropism) or by Light (Phototropism)?	
Abstract Methods/Materials METHODS: 1. You must germinate your bean seeds by placing the seeds in a damp paper towel. Put this in a warm place for 2-3 days. If the paper towel starts to dry out add more water. 2. While your seeds are germinating you must make a place to put your seeds. I chose to make mine out of cardboard. With slots to put the Petri dishes in. 3. Stretch three cotton balls across the smaller half of each Petri dish. 4. Put 30 ml. of water on the cotton in each Petri dish. 5. After your seeds are germinated place one seed in each of the 24 Petri dishes. 12 of the seeds are placed up-side-down and the other 12 right-side-up. 6. Place the Petri dishes in the prepared holders. 7. Put one holder in a box with the light under the trays, one tray with the light above and one tray with the light to the side. The last tray of six dishes will be in a box that gets no light. 8. Leave the boxes for one day and take pictures the next. 9. Take pictures every other day until the seed#s shoots# reach the top of the Petri dish. 10. Repeat all steps with corn seeds. MATERIALS LIST: 30 or more Corn and Bean Seeds, 1 Adult to help, An Exact-o-knife Card board, 1 role of duct-tape, 3; 18# fluorescent tube lights, 1 blanket, 72(100% cotton) Cotton balls, 24 Petri dishes, 1 large bowl of water, A measuring devise of 30ml. (liquid), A measuring tape or yard stick	
Results The results of this project were that regardless of the position of light or lack of light the stems of both corn and bean seeds grew opposite of gravity and the roots pointed down or with gravity.	
Conclusions/Discussion In conclusion the seeds all ended up being geotropic. This means that my hypothesis was incorrect. Roots of bean and corn seeds grow with positive geotropism and stems grow with negative geotropism. Meaning roots go toward gravity or downward and stems grow away from gravity or upward. The direction the light came from did not affect the direction of the growth of the stems or roots of the seeds. They are driven by gravity alone!	
Summary Statement My project is about finding out if seeds react to light (phototropism) or gravity (geotropism) or both when growing.	
Help Received Mother proofread report; uncle helped make cardboard trays and light boxes.	