



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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Project Title Does Radiation Impact Living Organisms?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Everyone says radiation is bad for you. Therefore, we wanted to study its effect on different types of organisms in our project. We predicted that exposing both unicellular (yeast) and multicellular (basil and lima beans) organisms to radiation will alter their growth. We chose two types of radiation - a low energy radiation (Microwave or MW) and a high energy radiation (ultraviolet or UV). Specifically: a) How does radiation affect living organisms? Is the effect positive or negative? b) Is the effect of UV different from MW radiation? c) Does radiation impact different living organisms the same way?</p> <p>Methods/Materials Lima beans and basil seeds, Active Dry yeast, Pots, Planting Mix, UV Sterilization lamp, Microwave Expose the basil, lima bean seeds, and yeast to 3 levels of UV (10 min, 60 min, 6h) and MW (20,40,60 sec) radiation. Keep a control for each type, with no exposure. Seeds: Plant the seeds. Take daily pictures since first sprout, and final measurements at the end. Yeast: Add yeast, sugar and warm water. Record height of yeast at 0,15,30, 45 min.</p> <p>Results MW exposure had a negative effect on the growth of lima beans. As the MW radiation level went up, the number of sprouted stalks decreased. There was no difference in number of stalks of basil seeds. Yeast exposed to MW radiation rose more and faster. UV radiation had a positive effect on the growth of plants. For the UV-exposed lima beans, all seeds sprouted to stalks. More stalks were observed for the UV-exposed basil, compared to the control. UV exposure did not effect the rising of yeast.</p> <p>Conclusions/Discussion Overall, our hypothesis that radiation affects both uni- and multicellular organisms, is true. Sometimes, the effect is positive, and sometimes negative. MW had a negative effect on growth of lima beans, did not affect the basil, but better for yeast. UV was better for the basil, but did not affect the yeast or lima beans. We learnt that radiation generally affects the sprouting, but not the actual height of the plants. For the yeast, radiation affected the speed of growth, more than the height.</p>	
Summary Statement Radiation alters the growth of living organisms in a good or bad way; this effect depends on the type of organism and the type and level of radiation exposure.	
Help Received We received help in ordering supplies. We also had help in exposing the yeast and plants to UV radiation, because it was dangerous for us. Our parents reviewed our data and plots and gave us advice on how we can make it more easy to follow.	