



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Michael A. Salmond</b>	<b>Project Number</b> <b>S2410</b>
<b>Project Title</b> <b>When Half a Worm Is Not Enough: Effects of Magnetism on Planaria Regeneration and Growth</b>	
<b>Objectives/Goals</b> If I expose six sets of (5) bisected Planaria to 3 different magnetic fields of increasing strength (2 sets of 5 bisected Planaria per magnetic strength), will the Planaria's ability to regenerate and grow be adversely affected?	
<b>Abstract</b> <b>Methods/Materials</b> At least 50-60 live Planaria, Ice, Scalpel, Spring water, 9 Petri dishes with lids, 9 Circles of steel sheet metal, 175 disk Neodymium magnets (50 strength 1, 50 strength 2, 75 strength 3), Micrometer Caliper, Tin snips, Marker Pen, Eyedropper, Tweezers, Table Top Magnifier with light, Eggs, Cooking Baster, Labels  Cut 9 tin circles the size of the Petri dishes and number them 1A, 1B, 2A, 2B, 3A, 3B, 4, 5, and 6. Place 25 magnets of strength 1 on 1A and 1B, 25 magnets of strength 2 on 2A and 2B, 25 magnets of strength 3 on 3A and 3B, and 25 magnets of strength 3 on 6. Fill each dish with ½ cup spring water. Bisect 35 Planaria halfway between head and tail taking care to not cut the nucleus and place 5 heads and tails in each of dishes 1A through 4. In Dishes 5 and 6 place 5 whole Planaria. Place the dishes over the matching tin magnetic fields. Change 35 ml of the water each day and measure the Planaria whole and bisected parts each day for 14 days. Record all results. Feed the whole Planaria a small amount of hard boiled egg yolk every 4 to 5 days. On the 7th and 14th days count how many whole Planaria have regenerated in dishes 1A through 4. <b>Results</b> The only Planaria that had positive growth rates were Dishes 1A, 1B and 4 (no magnets). Dishes 5 and 6 suffered a great loss of size. Dishes 1A, 1B, and 4 had almost all bisected Planaria regenerate. Dishes 2A through 3B had respectively poorer results. The stronger the magnets, the worse the regeneration rates and growth. The ability to measure the Planaria was somewhat difficult due to the Planaria's ability to expand and contract during measurement. The ability to count regenerated Planaria was reliable. <b>Conclusions/Discussion</b> The magnetic fields had a huge negative impact on both the bisected Planaria's ability to regenerate as well as all Planaria to grow. Also, bisected Planaria without magnets had more incentive to grow than whole Planaria without magnets. Further study in this area would definitely be worthwhile especially when considering future applications of magnetism in the medical field and the environmental field.	
<b>Summary Statement</b> Increasing magnetism negatively impacts Planaria's ability to regenerate and grow.	
<b>Help Received</b> Sister / cousin (helped record measurements on 2 days); mother (helped with graph design); father (helped with equipment purchasing)	