



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Alex Nikolian	Project Number J0322
Project Title R.O.E.D. (Robotic Ocean Exploring Device)	
<p style="text-align: center;">Abstract</p> <p>Objectives Ever since I was a little kid, I loved our oceans, but as I got older, I realized how little we have discovered about them. Our oceans cover 70% of the Earth's surface, and mankind has only explored a measly 5% of that whole. This means that there is still 65% of Earth's surface that we have not explored, and 95% of our oceans have not been touched by mankind, so I created R.O.E.D.</p> <p>Methods R.O.E.D. is made up of three main parts: the body, electronics, and the tail fin. The shell of the body is made up of seven 1/4 inch by 3 feet wooden planks and seven 1 inch by 3 feet wooden planks. The shell is basically the foundation of R.O.E.D., and it holds all the electronics in it. The shell is later wrapped with fiberglass cloth, which is later brushed with Epoxy. To make the primary dorsal fin and the two pectoral fins I used high density polyethylene sheets and cut them out to my desired shape. The electronics include a 30 kg waterproof servo, two Savox waterproof servos, 6 volt battery and a 7 volt Lipo battery, Spektrum receiver and transmitter, Prophet Sport Mini 50W Multi-Chemistry battery charger, and a 6 inch standard reverser. These all play a part in the movement of R.O.E.D. The tail was made with high density polyethylene sheet, a hinge, L shaped metal piece, a one sided servo topper, and a 1 foot aluminum rod.</p> <p>Results After testing R.O.E.D., I noticed that the movement truly works and it is all waterproof. The average velocity was 0.107 m/s and the average acceleration was 0.002 m/s squared. This means that the shark's unique movement is possible to replicate and can be used in sea exploration devices, like mine.</p> <p>Conclusions Based on my results I found that I was able to replicate the shark's unique movement. Though, the results that I found were not quick and that efficient. I will now try to make my device quicker and much more of an efficient tool. R.O.E.D.'s shape and movement style can help further our knowledge about marine biology. The shape will allow marine animals to be more comfortable around my device because of its fish like depiction. This will allow marine animals to interact with my device like no other device has ever done.</p>	
Summary Statement I created a sea exploration device that is based on the shape and movement of a shark.	
Help Received I designed and created R.O.E.D. on my own. I received help from my father who taught me the basics of engineering, like foundations.	