# Study of Toroidal Propellers

Makings, Todd (School: Weldon Valley High School)
Ashlock, Dustin (School: Weldon Valley High School)

The purpose of the Study of Toroidal propellers has been to find the best angle for thrust using 3D printed toroidal propellers. This study of toroidal propellers will help for our next upcoming project which is to make a full scale drone and 3D print the full frame. Before designing or 3D printing anything we needed to decide on what type of propeller to test. We decided to test the toroidal propeller for the ease of 3D printing. This led to the 3D modeling and printing of the toroidal propellers. We then tested the propellers for every angel with the result of 60 degrees being the best. From our study we found that 3D printing propellers can be just as effective as buying them and it can open many doors to what propellers can be designed and reimagined. We also found that a 60 degree pitch works best. We found that our hypothesis of 45 degree angel toroidal propellers was not supported and that 60 degree toroidal propellers work better. The conclusions of this project are that 60 degrees performed the best. This will help the research for the best angels of this propeller. This will be the first step in making and finding the best toroidal propellers for the drone that we want to make next. This is only the first step for us into the research and development of toroidal propellers.

**Awards Won:**