**Name(s)**
Duke J. Wu

**Project Number**
38723

**Project Title**
# The Effect of Changing the Number of Propellers and Number of Blades on Each Propeller on a Drone's Lift Force and Speed

## Abstract

**Objectives/Goals**
The goal for this experiment was to find the capabilities of different types of drones. The usage of multiple drones allows for the comparison to find which drone is best compatible with which situation.

**Methods/Materials**
The experiment was done with the construction of a cardboard contraption that would surround the drone. Underneath the drone was a 9.5 cm rubber band that was attached to the drone. The drone would be flown up, and the rubber band would b.e measured in order to compare against the results for the other drone.

The drone was next tested by seeing how fast it could complete a one meter distance. The drone was timed and reviewed through a camera to determine the speed.

The motors also had the propellers replaced with two, three, and four bladed propellers to provide a wider range of data.

In order to create the hexacopter and octocopter, I designed the added on section to the quadcopter as well as soldering on the extra motors needed for the drone.

**Results**
The drones had the consistent pattern that is expected when considering quadcopter, hexacopters, and octocopters. There was a slow increase in height, at about 0.1 cm between most of the averages that were taken. For the speed, the drone got faster with the decrease of motors, ranging from 0.90 seconds to 1.5 seconds.

**Conclusions/Discussion**
The hypothesis for the experiment wasn't supported by the data, as the octocopter with two blades on each propeller provided the most average results between the two sets of data, making it most optimal for usages within delivery systems. The octocopter is able to travel relatively quickly while producing much force, allowing it to carry heavier objects.

**Summary Statement**
This experiment allows for the understanding of the capabilities of different types of drones through tests involving the drone's speed and lift force.

**Help Received**
Mr. Michael Lim, Xuqiang Wu, and Tongyi Shen