(20 pts) Approx. 2 days

We've spent the semester talking about *fixed wing* aircraft and aircraft designs. Fixed wing vehicles have stationary wings like gliders and airplanes do. A group of flying vehicles have rotors instead of those fixed wings. The physics and design principles behind helicopters are tremendously complex and a very cool application of physics and calculus. On a smaller scale, quadcopters and other multi-rotor copters (like hexcopters or octocopters) are being used by hobbyists, scientists, and professionals for a wide range of flight-based tasks.

In this part of the unit, you'll take some notes on the physics, vocabulary, and flight principles behind the functioning of quadcopters. You'll also take a look at the different modern-day applications of quadcopters and other unmanned aerial vehicles (UAVs) before taking flight with our class's own professionally built quadcopter.

1. **Quadcopter Flight:** Start by watching the *How Quadcopters Fly* and *Quadcopter Forces* presentations. Take a full page of notes on these ideas. Make sure that your notes include some pictures of how the quadcopter rotors need to be arranged and the various vocabulary presented.
2. **UAV Applications:** Next, watch the *Quadcopter Research* and *Cool Quadcopter Applications* presentations. Take one more page of notes on the ideas and applications presented here. Brainstorm a few new applications for quadcopters that have not been discussed so far!
3. **Learn To Fly**: This is the fun part! With your group, talk to Mr. Benshoof to get the class quadcopter. Review the controls of the quadcopter with Mr. Benshoof and then begin taking turns to practice flying. Keep in mind that the battery only runs for about 15 minutes (maybe) on a single charge. You'll need to be patient and take turns so that everyone can practice flying and get used to the controls.

   When you feel good about the controls, practice and complete the flight test course without crashing! Have your classmates confirm your successful flight!

Part 1: Tasks	*5 points*	*4-3 point*	*2-1-0 points*
Notes on Quadcopter Flight	+ You took a full page of notes on *How Quadcopters Fly* and *Quadcopter Forces* + Your notes include a picture of the structure of a standard quadcopter	- Your notes do not cover all topics - Your notes are lacking important parts	- Your notes are missing - Your notes are missing many important parts
Notes on UAV Applications	+ You took a full page of notes on *Quadcopter Research* and *Cool Quadcopter Applications*	- Your notes do not cover all topics - Your notes are lacking important parts	- Your notes are missing - Your notes are missing many important parts
	10 points	*9-6 point*	*5-0 points*
Learn to Fly a Quadcopter	+ You successfully completed the flight test course + You did not destroy the quadcopter	- You were mostly able to complete the test course - You crashed the quadcopter	- You were not able to complete any of the course