Important things to know : Drone technology.
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Most common types of drone:
- **Quadcopter** (Consumer drones with 4 propellers, eg DJI phantom)
- **Military drones** (Larger, more similar to unmanned planes)

History of Drones (summarised)
- The First real drone was a retooling of the Havilland DH82B or "Queen Bee" Bi-plane.
- The term drone originated from a play on the "Queen Bee" name.
- The retooled plane was unmanned and had a radio and servo operated controls in the cockpit.
- There were 412 made between 1933 and 1943, and they were primarily used by the RAF as target practice for training artillery gunners.

Power Supply : Quadcopter - uses a battery supply to turn propellers.
Military Drone - Can either use a full blown jet engine **or** a hybrid design containing an engine and backup battery supply.

Generating lift : Quadcopter - *Doesn't technically generate lift* instead, it uses propellers to generate thrust.
Military Drone - Uses a wing system to generate lift identical to a plane. (Low pressure above the wing, High Pressure below the wing. High pressure tries to force its way through to equalise pressure but is restricted by the wing in turn, causing lift)

Flight Control : Both types of drone are typically equipped with an IMU (inertial measurement unit) system for stability which consists of a series of sensors to determine velocity and angle which is used by the flight controller to continuously balance the rotors. They also tend to use GPS for positioning and flight control

Accelerometer : A device capable of measuring the force of acceleration. Used to determine the speed, tilt and movement of the drone. This allows for the drone to control its movement in flight. Modern accelerometers use a series of capacitors opposed to older accelerometers which used a moving spring system.

Gyroscope : A wheel mounted inside of two or three axes gimbals used to measure angular velocity of individual axes and determining orientation. Gyroscopes are used for navigation in drones and can be found as microelectromechanical systems in consumer quadcopters.

GPS : Stands for 'Global Positioning System'. GPS is a satellite based system that uses at least 3 satellites to give the user an accurate position.
Accuracy can range from 10m to 10mm dependent on the receiver.
Drone GPS uses a trilateration system of intersecting spheres, each sphere centred at a satellite. If the controller can understand its distance to each sphere the common point between all three is the location of the drone in 3D space.

IMU Summary : Inertial Measurement Unit of most drones use six axis stabilisation to keep the drone flying smooth and level. 3 Accelerometers for X, Y and Z axis and a 3 axis gyroscope for rotation and movement ie. 'pitch', 'roll' and 'yaw'.

How do Quadcopter Drones differ from Helicopter drones?

Despite the resemblance, there's quite a big difference between how a quadcopter functions and how a helicopter drone functions. A quadcopter drone is far less efficient due to its size. A helicopter drone has large blades which allow it to move a lot of air at a relatively slow speed opposed to a quadcopter which has to spin its propellers incredibly fast as it can't move much air due to the small size of its propellers. Helicopter drones are more complex to control but benefit from having longer flight times on a single battery and the ability to do aerial maneuvers that are impossible to do with a drone. Quadcopters are also much cheaper to produce than helicopter drones as the rotors of a helicopter drone are incredibly intricate to allow for tilt of the blades. This tilt is unnecessary for a quadcopter as it controls its movement by varying the speed of each individual propeller.

Applications of Drones:

- Aerial videography (Music videos, Movies, Youtube etc)
- Parcel delivery (Amazon prime air)
- Police force (investigate crime scene, traffic accident, missing people)
- Military uses (obtaining information or as a weapon)
- Emergency internet services for battlefields and natural disaster zones
- Work site inspections
- Fire Brigade (infrared cameras to detect peoples location in burning buildings)
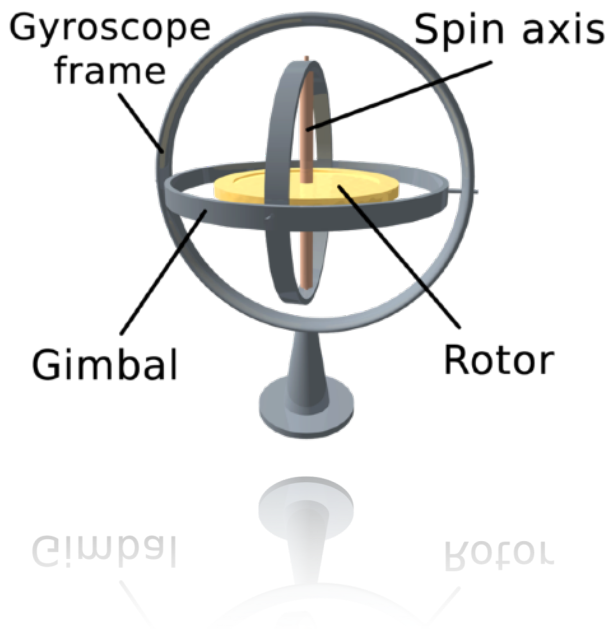- Air ambulance and first response

Advantages of Drones :

- Save lives
- Investigate crime scenes
- Aerial videography and photography
- Emergency relief
- Parcel delivery

Disadvantages of Drones :

- Privacy concern
- Ability to be spied on
- Often very loud
- Disturb conservation areas
- Used as weapons
- Ability to disturb aircraft facilities
- Very expensive

Need to know diagram :

Gyroscope