arm

Autonomous Drones

Lesson 17

arm School Program

Objectives

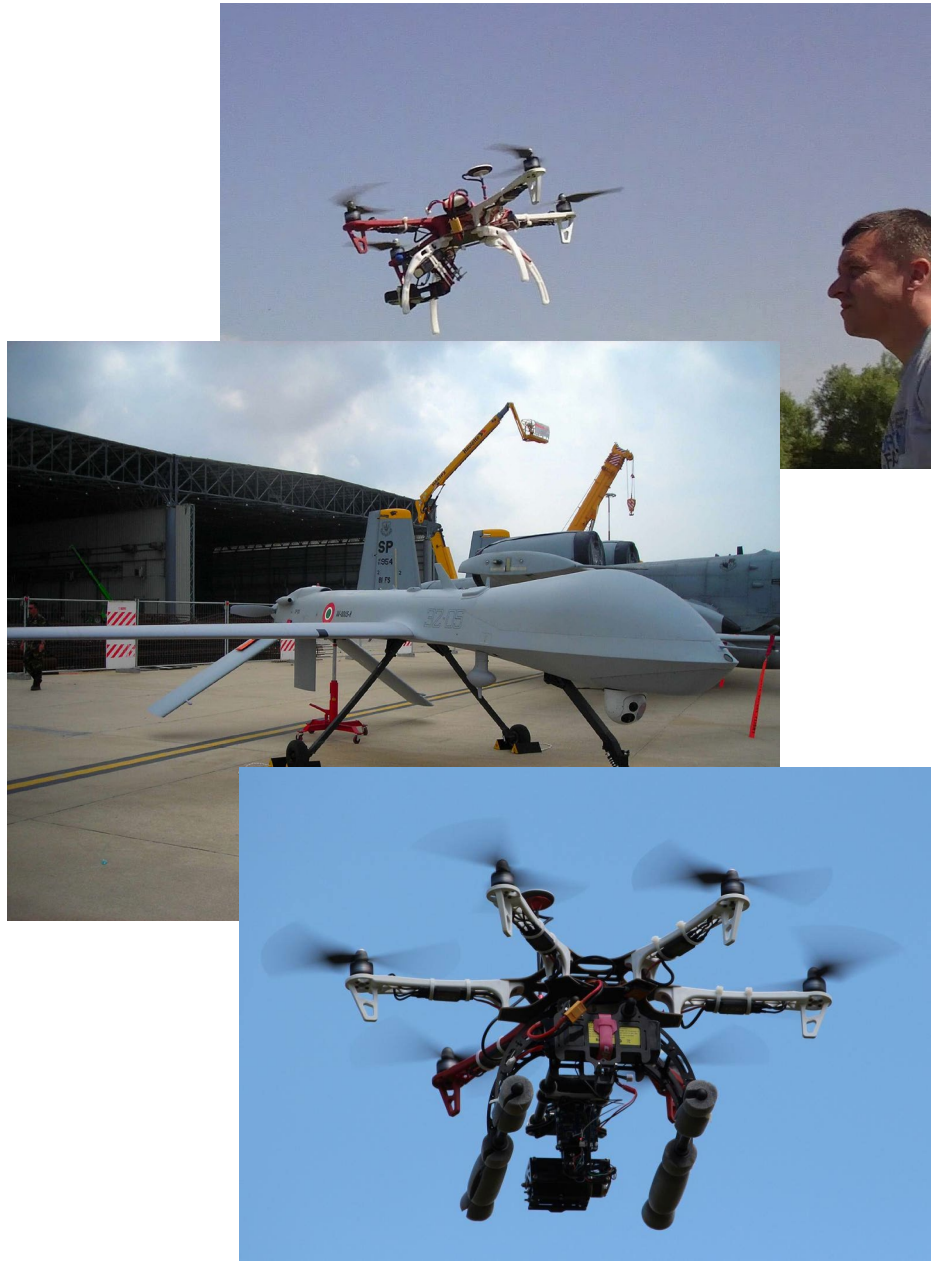
- Identify the practical uses of autonomous vehicles
- Produce a table of examples
- To create a recovery helicopter suitable to protect a Lego Minifigure

Drones

- Unmanned aerial vehicles, or **drones**, have been used by the military for some time to gather intelligence and as a weapon to protect combat soldiers
- Drones are now being developed for a wide range of commercial and agricultural purposes such as:
  - Delivery service – Amazon and Amazon Air offering drone delivery services suggesting click to delivery in 13 minutes
- Consider the technology currently available – eg micro:bit's built in technology or add on boards
  - GPS
  - High power/low drain batteries
  - Collision avoidance technology
  - Facial recognition
  - Accelerometers
  - Light and line following technology
  - Laser guided technology

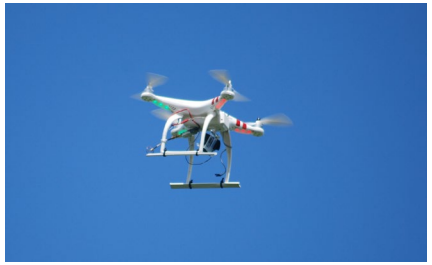
What is a Drone

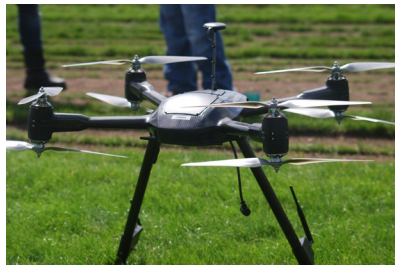
- Drones are made of light composite materials, so the vehicle to have a reduced mass and are more maneuverable
- Drones can be equipped with different ‘state of the art’ equipment and technology including heat and infrared cameras and GPS
- Because there is no requirement for a human pilot the drone can be compacted to a very small size
- Drones can be controlled from a remote control system or pre-programmed to follow a set route and return to its starting point

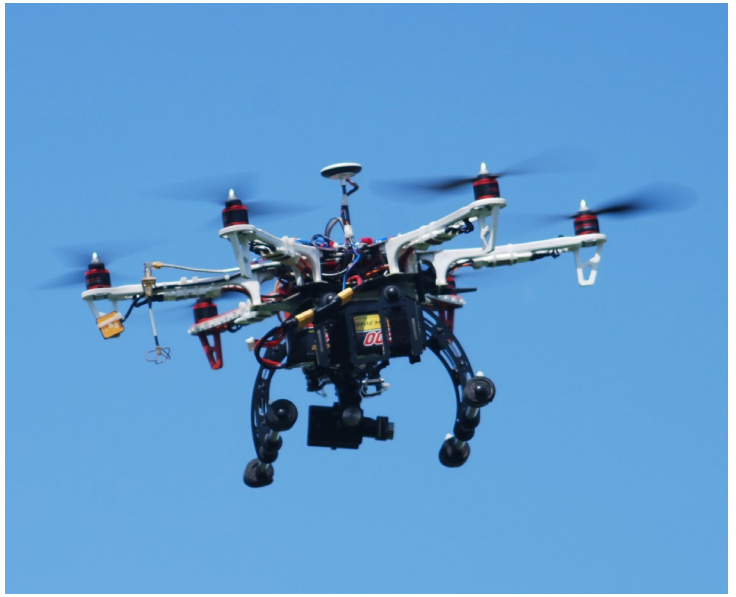


How Drones Fly

- Drones use rotors for propulsion and control
- A rotor works like a fan pushing the air down. As all forces come in pairs, when the rotor pushes down on the air pushes up on the rotor. This is called lift.
- By controlling the upward and downward forces by spinning the rotors faster or slower we can control lift





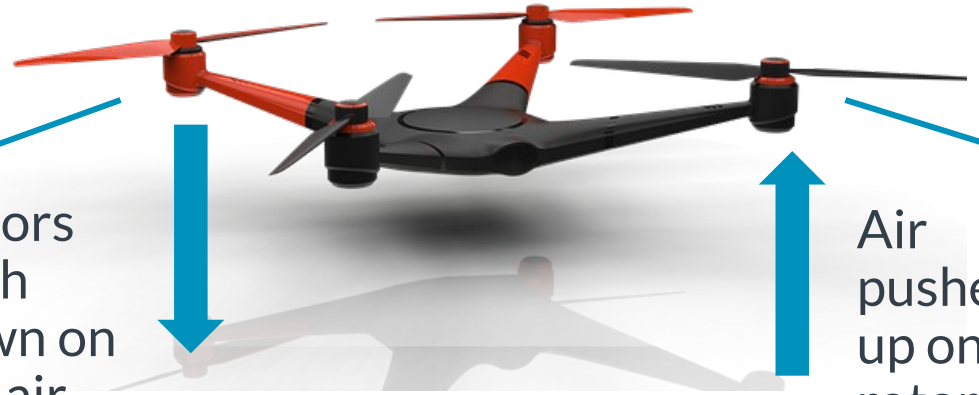


How Drones Fly

All Rotors turn faster = more lift = climb

All Rotors turn slower = less lift = descend

Lift



Make these two rotors turn faster

This side rises

The drone moves right

Rotors push down on the air

Air pushes up on the rotors

Make these two rotors turn faster

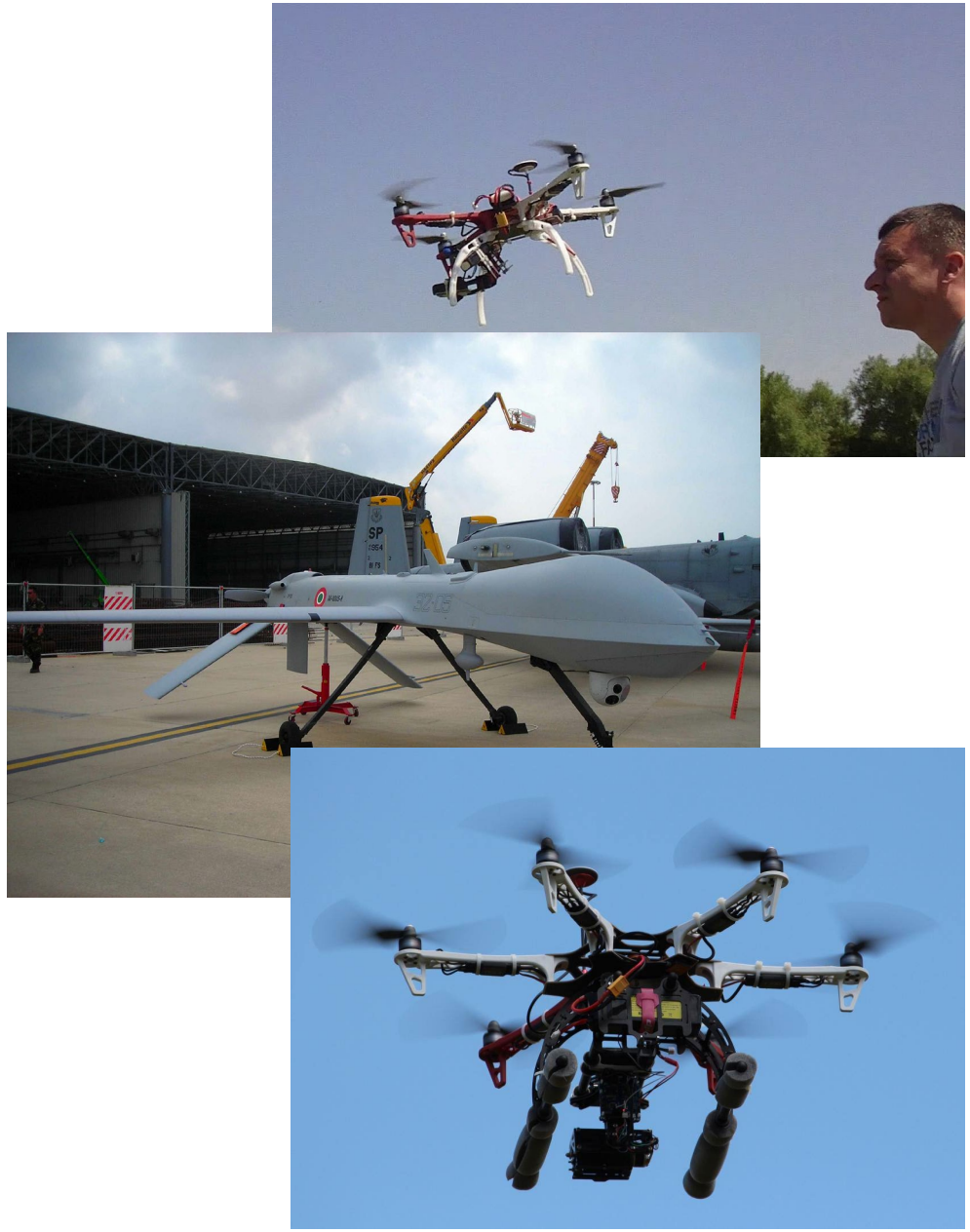
This side rises

The drone moves left

If lift = force of gravity the drone will hover

Success Criteria

- Identify the practical uses of autonomous vehicles
- Using the build instructions and template, create a recovery helicopter suitable to protect a Lego Minifig
- Identify the optimal build for a recovery helicopter



Thank You
Danke
Merci
谢谢
ありがとう
Gracias
Kiitos
감사합니다
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