



DRONEBLOCKS

VOCABULARY

Overview:

There are many words that are unique to the world of drones, in addition to that of programming and STEM education. Included below is a list of vocabulary with brief definitions to help educators and students become familiar with text that will be used throughout the DroneBlocks lessons.

Objective:

Students will:

- Learn basic vocabulary and related verbiage of flying, programming, photographing using drones and the DroneBlocks program.

Vocabulary & Definitions

- **Altitude:** Height in which the drone is programmed to fly
- **Aerial Photography (AP):** Taking photographs of the ground from an elevated/direct-down position; a photograph taken from an aircraft or satellite in flight
- **Autonomous Flight:** Aircraft is self-directed and programmed to fly independently, not physically or manually controlled
- **Autopilot:** A device or program that steers a ship, aircraft, or spacecraft in place of a person
- **Center of Gravity:** The point at which the entire weight of the drone is centered so that it will remain in equilibrium in any position

- **Digital Safety:** Internet safety, or online safety, is the knowledge personal safety when sharing private information or property associated with using the Internet and social media; often described as Digital Citizenship
- **Electric Speed Controller (ESC):** An electronic circuit that can vary the motor's speed and direction
- **F-mode:** "Function mode", which enables a third party app control for apps such as DroneBlocks. The PIC can switch back to "P-mode", causing the drone to hover until the mission is completed manually or the program is completed (in F-mode)
- **Flight Control System:** Controls, connecting linkages, and the necessary operating mechanisms to control an aircraft's direction in flight; controls are also considered as flight controls as they change speed
- **Flight Controller:** The system by which the pilot of an airplane controls movement of the drone
- **First Person View (FPV):** Also known as *remote-person view* (RPV), or simply *video piloting*, is a method used to control a radio-controlled vehicle from the pilot's viewpoint; aircraft is piloted remotely from the pilot's perspective via an onboard camera
- **Frame:** Body of the drone
- **Gimbal:** A platform that can pivot on a single axis; creates a balanced, smooth movement for the camera during flight
- **Global Positioning System (GPS):** A radio navigation system that allows land, sea, and airborne users to determine their exact location, velocity, and time 24 hours a day, in all weather conditions, across in the world
- **Ground Station:** A land-based radio station designed for extra-planetary telecommunication with a drone; reception of radio waves from astronomical radio sources
- **Gyroscope:** An apparatus consisting of a rotating wheel mounted so that its axis can turn freely, and is capable of maintaining the same absolute direction in space, regardless of the movements of the device in which it is mounted
- **Hovering:** Staying in the same position while airborne, achieved by controlling the throttle
- **Hypotenuse:** The longest side of a triangle, opposite the right (90°) angle. Calculated using the Pythagorean Theorem: $a^2+b^2=c^2$
- **Image Stitching:** To combine multiple photographs or pictures together to create a larger, panoramic or full view. This is often done with software that uses an algorithm to stitch the images together.
- **Image Overlap:** For panoramic stitching, images should be captured with a slight amount of overlap (at least 15 – 30%). This helps the lens distortion and provides detectable features for

the algorithms within the software. This set of images much have consistent exposure between frames to reduce the possibility of visible seams. (Source: [Wikipedia](#))

- **Input:** Where power or information enters a system
- **Interior Angles** – An angle formed by two adjacent sides within a polygon.
- **Line of Sight:** The pilot should be able to see the drone at all times, along with the flight path, to keep clear of any obstacles
- **Loop:** A repeat block that will execute the commands inside the block sequence a specified number of times and is used for repetitive tasks
- **Mission:** A quest, or completed assignment, in relation to the flying or final accomplishment of a programmed task
- **Motor:** An engine or motor is a machine designed to convert one form of energy into mechanical energy
- **Output:** Where power or information leaves a system
- **P-mode:** "Positioning mode", enables the drone to fly with the most stability; used during manual flight
- **Panorama:** A technique of photography that captures images with horizontally wider fields of view; may be a horizontal view or up to 360° view from a camera or other perspective.
- **Pitch:** The tilt of the drone forward or backward; also the steepness of a slope, as explained in engineering or mathematics; describes the gradient or angle in which the camera is set in order to photograph properly;
- **Propellers:** A device for lifting a drone into the air, consisting of a spinning shaft with spinning angled blades that push air in the direction *opposite* the desired direction of travel
- **Quadcopter:** Aircraft that uses four propellers and four motors which creates thrust which elevates the aircraft; two of the motors rotate clockwise (CW) and other two rotate counter clockwise (CCW)
- **Regular Hexagon:** A polygon with six equal angles and six equal sides.
- **Responsible Piloting:** The act of controlling or flying aircraft, especially drones, in a safe, educated manner with respect to laws, property, and personal safety
- **Roll:** The tilt of the drone left or right
- **Satellite:** A specialized wireless receiver/transmitter that is in orbit around the earth; used to access GPS information when flying drones

- **Simulator:** Software that artificially re-creates aircraft flight; enables the user to safely test a flight pattern before live flight
- **Software:** Information included in operating systems, programs, and applications that enable computers to function
- **Stabilize Test:** The aircraft stabilizes its altitude by itself using on-board sensors; also used in aerial photography for keeping the camera level
- **Supplementary Angles** - Two Angles are Supplementary when they add up to 180°.
- **Telemetry:** The process of using equipment to take measurements, such as pressure, speed, or temperature; results are often transmitted to receiving equipment for monitoring
- **Throttle:** Lift of the aircraft engaged by pushing the left stick forward and disengaged by pulling the left stick backwards when manually flying a drone; adjusts the altitude, or height
- **Throttle Up/Down:** Gives propellers of the drone enough power to become airborne
- **Transmitter (TX):** A transmitter is a hand-held controller that sends a signal to the drone, allowing the pilot to manually fly the drone and control its flight pattern
- **Unmanned Aerial Vehicle (UAV):** Also described as drones, these are aircraft without a human pilot on board, controlled with various levels of autonomy, either by remote control from an operator located on the ground, or fully autonomously by onboard computers
- **Variable:** In programming, a variable is a value that can change, depending on conditions or on information passed to the program. Variables hold a value and make it more efficient to change this value throughout a program.
- **WiFi:** The standard wireless local area network (WLAN) technology for connecting computers and electronic devices to each other and to the Internet
- **Yaw:** Degree in which the drone pivots or twists about its vertical axis; a movement around the axis of the drone that changes direction to the left or right of its direction of motion
- **Yaw Right/Left:** Movement that rotates the drone clockwise or counter clockwise; conducted by pushing the left stick to the left or to the right.

Additional Resources

Would you like to learn more about basic drone & flight vocabulary? Start by visiting these websites:

<http://howthingsfly.si.edu/flight-dynamics/roll-pitch-and-yaw>

<http://uavcoach.com/how-to-fly-a-quadcopter-guide/>