



# DroneBlocks

## Getting Started Guide

2022

All you need to get started using Tello drones and DroneBlocks in your classroom! This Getting Started Guide will have you taking to the skies in no time!

# Lesson 01: Welcome To Tello



Welcome to the wonderful world of Tello Drones! Tello's are going to take your STEAM teaching to new heights.

Our mission in this guide is to help you get a hands-on understanding on what Tellos are and how to use them as a learning tool in your classroom. You are going to learn the ins and outs of these wonderful little learning tools.

Tello s have taken the education section by storm. A steam aligned device that engages students and challenges teachers. What a perfect match!

The DroneBlocks teams is extremely excited to walk with you along this amazing learning journey.

## Objectives



At the end of this lesson you will be able to do the following:

1. Identify the different types of Tello drones.
2. Identify the different parts of your Tello.
3. Change and store your Tello batteries
4. Propellers Maintenance
5. Safety First (although listed last)

Amazing! Let's get into the lesson!



# Which Tello is Which?

Tello currently comes in three different models:

1. Tello (2018)
2. Tello Edu (2018)
3. Tello Talent (2021)

Out of the box, the three drones come in different colors, which makes them really easy to identify:



## Tello - White

Manual Flight Controls  
Block Coding  
Script Coding  
Front Facing Camera  
DroneBlocks on PC/Mac, iOS, Android and Chromebook



## Tello Edu - Black

Everything from Tello  
Supports Swarm Mode  
Supports advanced SDK 2.0  
Supports Mission Pads  
Compatible with ES32 Board (not included)

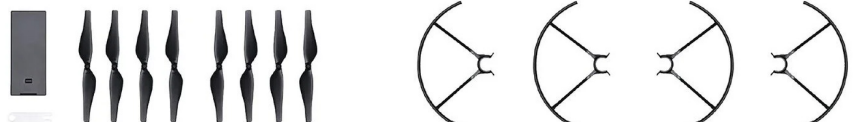


## Tello Talent - Red

Everything from Tello Edu  
8x8 red/blue LED Matrix  
RGB LED  
Embedded ESP32 module  
Improved Wifi  
Includes Expansion Board  
Arduino Compatible

Like well behaved siblings, the Tellos can share a few things such as:

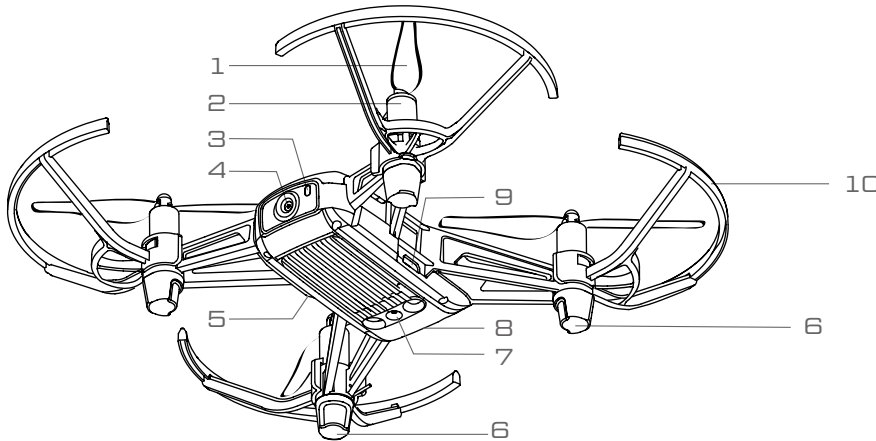
- Batteries
- Propellers
- Propeller guards
- USB Cables



# Parts of the Tello

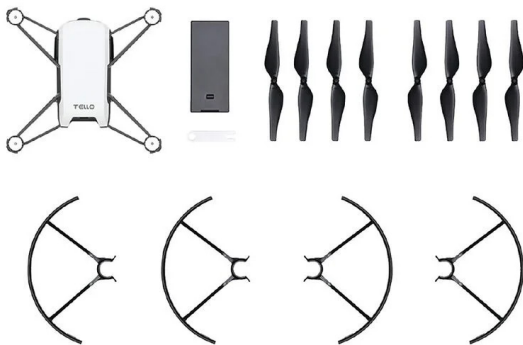
The Tello Drone is a very clever machine. Let's look at the different parts that make it work.

Once you have looked at the diagram below, you should be able to identify the different parts of a tello. The following applies to all three Tellos.



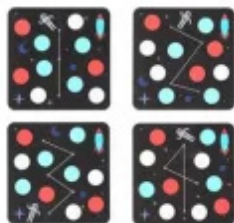
1. Propellers
2. Motors
3. Aircraft Status Indicator
4. Camera
5. Power Button
6. Antennas
7. Vision Positioning System
8. Flight Battery
9. Micro USB Port
10. Propeller Guards

Tello drones come in the box pre-assembled with 4 x propellers and 4 x propeller guards.

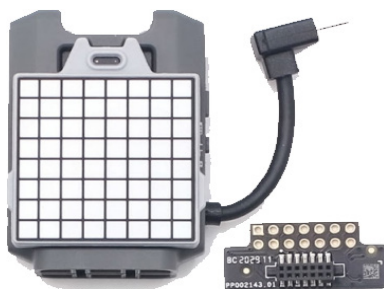


You will also notice that the battery is not installed in the drone, but rather packed away on the side. This is the best way to store the battery: outside the drone when not in use.

You also get a small pack of spare propellers and a propeller removal tool.



The Tello Edu and Tello Talent come with these really cool mission pads (don't worry we will teach you how to use them).



Tello Talent also comes with an AMAZING ESP32 open-source module, an RGB LED, an 8x8 red-blue LED dot-matrix and an expansion board allowing for extra sensors.



Tello's batteries give you around 10 minutes of flight time. Educators know that 10 minutes is not a long time when it comes to teaching a lesson. This is why we suggest you always have a few spare batteries up your sleeve.

You can buy combo packs that come with extra batteries as well as a battery dock that charges 3 batteries at a time. This is a must for any classroom that wants to invest in more than one drone.



To get the most out of your batteries, never store them in your Tellos. We suggest getting some containers and label them 100% and 0%, Charged / Used, etc... Once you have fully charged the batteries put them in the 100% / Full container. After a drone has been flying and exhausted its current battery, swap the empty battery with a full one and place the empty one in the 0% / Empty container.

You can also assign students task and responsibilities to make sure they have round up all the used batteries. Another student can be in charge of charging the batteries.

Now there will come a time when your batteries start to go bad or get damaged. There are reports of batteries swelling when they are left in direct sunlight or when left charging inside a Tello over a weekend (this is not a good idea). When a battery swells it looks like this:

The good battery is on the top.  
The bad battery is on the bottom.



On the right had side we have the same picture but I've highlighted the swelling in red.

You can integrate battery checks into your lessons. Get students to look closely at the batteries and see if they can identify any issues.

Page 9 of the Tello Manual covers everything else you need to know about the battery:

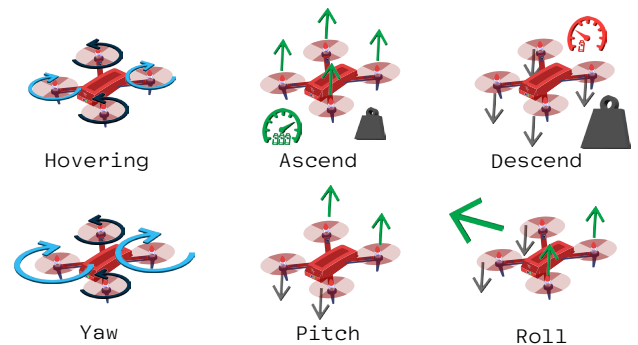
[Click here to see the manual](#)



When launched my first Tello I thought it flew by some strange form of tech-magic. Turns out it was just science and engineering.

The drone uses basic aerodynamic processes. Two motors and propellers rotate clockwise while the other two rotate counter-clockwise.

There are six movements that are made possible by these motors.



1. Hovering : hover in mid air
2. Fly up : ascend or fly straight up increasing throttle
3. Fly down: descend or fly straight down
4. Yaw: Turn the entire drone left or right
5. Pitch: Fly forward or backward
6. Roll: Fly left or fly right

One of the most amazing things about these Tellos is how many teachable moments you can create. We cover how Tellos fly in another video, in a later lesson.

There are two types of propellers. The Clockwise (CW) and Counter Clockwise (CCW).

The Clockwise propellers have a small notch on the top. This is to make sure the correct propellers are placed on the correct motor.

Sometimes the Tellos crash and the propellers can come off. As long as the propellers are not damaged you can simply put them back on by pressing them on the motor.

There is a technique to removing / replacing damaged propellers. You should practice this until it feels natural.

Simply place the removal tool under said propeller and gently leverage it off. You could also use your thumb and index finger. Place each finger under a blade and gently “pinch” upward. The propeller will slowly start to move as you pinch and viola! Propeller comes off.

The put back on, simply press down until you hear a tiny click and then see if it comes off with a very gentle pull.

The propeller guards can be removed using your index finger and thumb. Press and squeeze a corner of the guard like you’re opening a can of soda. Gently pull back and the guard should pop off. To put it back on, line it up and rotate it back on until you hear a click.



Tellos are amazing learning tools and are really fun to learn with but that doesn't make them toys. It's really important to make sure your students know the difference.

Drone's in general can be dangerous and require a certain amount of respect while using them. Each country has its own regulations and rules as part of their aviation rules.

Tellos aren't as dangerous as most of the drones on the market but they are most likely going to be your students first experience with a drone. It is highly recommended that safety is baked into all your classroom practices.

Here are some examples of how you can integrate safety:

1. Never operate a Tello alone. Always work in pairs or groups with roles such as an observer and a pilot.
2. Create a fly zone. Use tape to create a square / rectangle in your classroom that will be the fly zone. Humans are not allow in the fly zone as long as a drone is in the air
3. Always call out before taking off. You can say "Drones Up", "Drones Away", "Watch Out", etc...
4. Never fly over people or cars
5. Long hair should be tied back or wear a cap
6. Always keep your eyes on your drone
7. Safety goggles make you look cool and protect your eyes

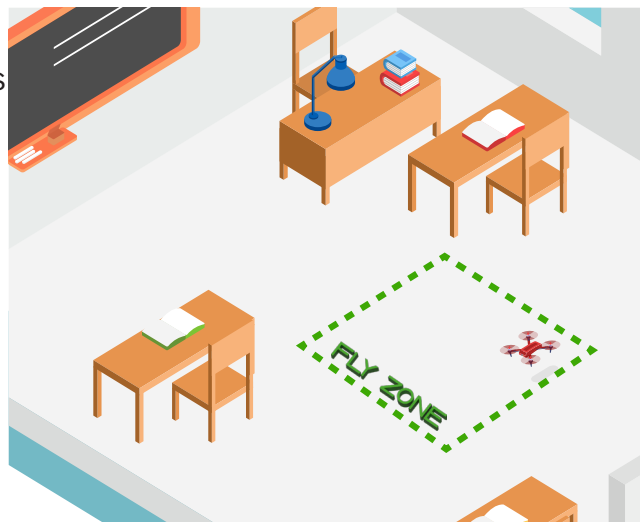
You might have noticed that all the Tello drones come with the propeller guards already attached. We highly recommend only flying with the guards installed. The propeller guards are replaceable. When I first attempted to remove the guards it was no picnic. I decided to engage in a little bit of deliberate practice and now I can replace a guard in a few seconds.

1. Pick one Drone from your fleet to practice on
2. Practice over and over. If you accidentally break an arm, don't worry, you have three more arms you can use. This way you can practice without fearing of damaging more drones.

The last bit of safety is to do a physical inspection of your drones before use. Check the propeller guards are secure, check the propellers are not loose and lastly make sure the battery is inserted and clicked in.

And that takes us to the end of this lesson. Next, we are going to look a Q&A and then the lesson summary.

Well done on making it this far!





Well done on making it to the end of this lesson!

Before you sign off, let's quickly see if you can answer the following questions:

What color are the following drones:

Tello Talent: \_\_\_\_\_  
Tello Edu : \_\_\_\_\_  
Tello : \_\_\_\_\_

Where is the best place to store Tello batteries when not in use? \_\_\_\_\_

How many propellers are installed on the drones out of the box? \_\_\_\_\_

List 3 safety tips for any student flying a drone:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

List 3 drone movements:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

What does the Vision Positioning System do?

\_\_\_\_\_

How can you charge more than one battery a time?

\_\_\_\_\_

Name two things that you can share between all Tello models:

1. \_\_\_\_\_
2. \_\_\_\_\_







Let's have a look at the answers!

What color are the following drones:

Tello Talent: Red  
Tello Edu : Black  
Tello : White

Where is the best place to store Tello batteries when not in use? Not in the drone but rather in a container labeled "empty" or "full"

How many propellers are installed on the drones out of the box? Four

List 3 safety tips for any student flying a drone:

1. Never fly over another student
2. Don't touch the propellers
3. Never operate the drone alone

List 3 drone movements:

1. Pitch (forward / backward)
2. Roll (move left / move right)
3. Yaw (turn left / turn right)

What does the Vision Positioning System do?

Helps the aircraft maintain its current position and fly with more precision indoors.

How can you charge more than one battery a time?

USB battery hub

Name two things that you can share between all Tello models:

1. Propellers
2. USB Cables

