

COME FLY WITH ME!

BIO

Dr. Lori Paluti

CEO/Owner of Pittsburgh Drone Services

FAA Certified Unmanned Small Aircraft Systems Pilot

27 years in Education

Elementary-Post-Secondary experience

OBJECTIVES

To prepare you to understand drone technology/software

To understand the FAA rules/regulations for drones

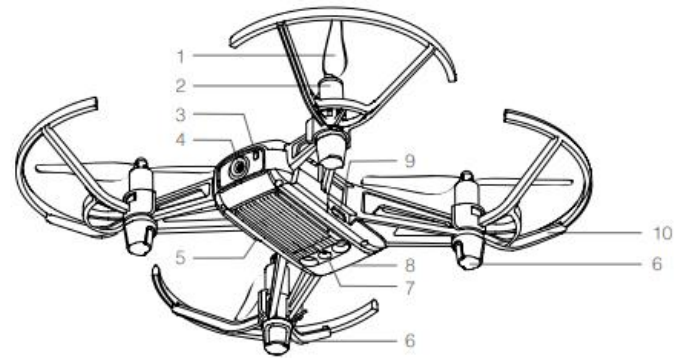
To examine the different parts of the drone and how they are used

To perform a series of skills relevant to aerial photography

To learn some basic flight skills for taking photos

BASIC SAFETY/ETHICS: BEFORE YOU FLY APP

- Fly no higher than 400 feet and remain below any surrounding obstacles when possible.
- Keep your sUAS in eyesight at all times, and use an observer to assist if needed.
- Remain well clear of and do not interfere with manned aircraft operations, and you must see and avoid other aircraft and obstacles at all times.
- Do not intentionally fly over unprotected persons or moving vehicles, and remain at least 25 feet away from individuals and vulnerable property.
- Contact the airport or control tower before flying within five miles of an airport. •
- Do not fly in adverse weather conditions such as in high winds or reduced visibility.
- Do not fly under the influence of alcohol or drugs.
- Ensure the operating environment is safe and that the operator is competent and proficient in the operation of the sUAS.
- Do not fly near or over sensitive infrastructure or property such as power stations, water treatment facilities, correctional facilities, heavily traveled roadways, government facilities, etc.
- Check and follow all local laws and ordinances before flying over private property.
- Do not conduct surveillance or photograph persons in areas where there is an expectation of privacy without the individual's permission (see AMA's privacy policy).



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

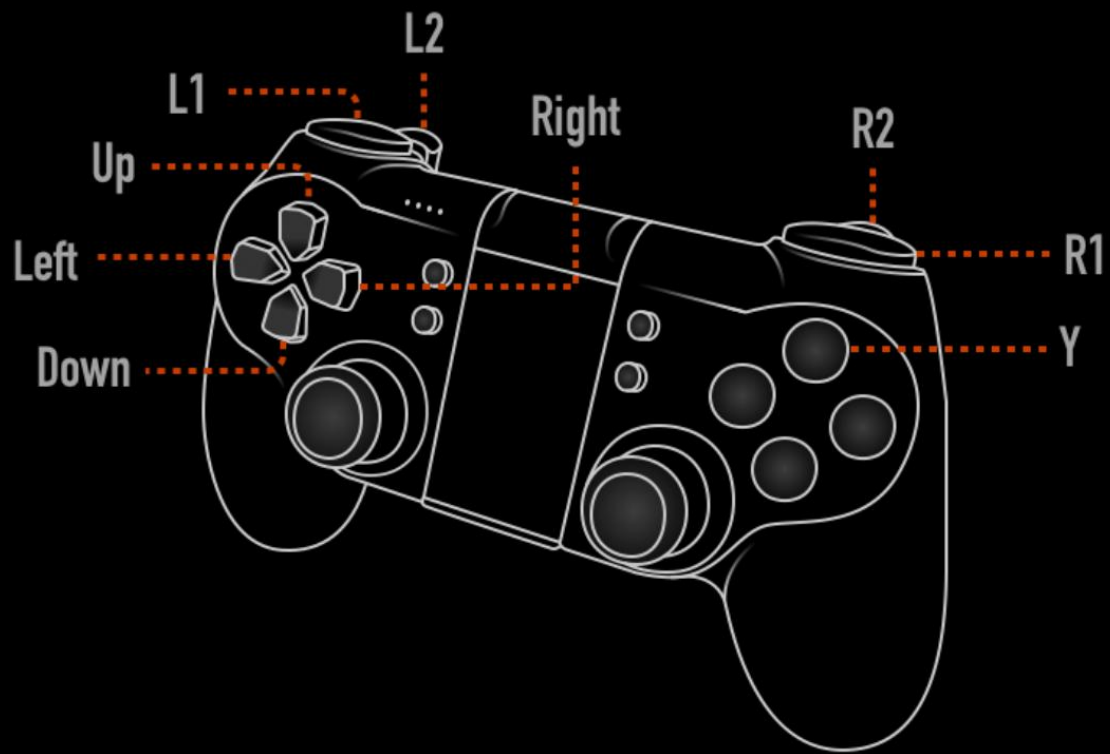
**TELLO APP: FREE ON ITUNES
AND GOOGLE PLAY**

ToGoCC





- R2+Y Take Off / Land
- L2+Up Flips Forward
- L2+Down Flips Back
- L2+Left Flips Left
- L2+Right Flips Right
- R1 Take Photo
- L1 Record video



BASICS

Auto take off and landing

Low battery protection

Vision positioning system

EZ shots

5MP photos



HS 0.0m/s H 0.0m



More



Flight Speed

Slow

Fast

VR



Bluetooth Controller Settings



Wi-Fi



More





More



IMU Status

Calibrate



Center of Gravity Calibration

Calibrate

Firmware Version

00.00.00.00

Update

Loader Version

00.00.00.00

App Version

1.3.0

FLIGHT TIME

The Tello drone has a 13-minute flight-time and is able to transmit 720 HD video footage up to **300 feet** away.

Fly your Ryze Tello drone to 100 ft+ (**30 m**) using a free app to adjust the altitude limit restricted by the Tello drone app (**10 m**).
IMPORTANT: Must use a wifi extender to maintain control of the Tello at higher altitudes.

FLIGHT MODES

Record coordinated short videos with:

Throw and Go

8D Flips

Up and Away

360

Circle

Bounce mode

Flying the Tello Manually

The Tello has two flight speeds that you can select when flying the aircraft manually:

- **Slow (default):** The maximum flight attitude angle is 9° and the maximum flight speed is 6.7 mph (10.8 kph).
- **Fast:** The maximum flight attitude angle is 25° and the maximum flight speed is 17.8 mph (28.8 kph).

When flying the Tello manually the aircraft utilizes its Vision Positioning System to automatically stabilize itself. If the conditions are such that the Vision Positioning System is unavailable the aircraft automatically changes to Attitude mode.

Bounce Mode

In Bounce mode the aircraft automatically flies up and down between 1.6 and 3.9 ft (0.5 and 1.2 m) above a flat surface. If the aircraft detects an object below it (such as your hand) it increases its altitude then continues flying up and down.

8D Flips

In 8D Flips the aircraft automatically flips in one of eight different directions.



Throw & Go

Throw & Go lets you launch the aircraft by gently throwing it into the air.

EZ Shots



Using 360

In 360, the aircraft records a short video while rotating 360 degrees.

1. Press the power button once to turn the aircraft on. Launch the Tello app and tap  to take off.
2. Tap  and then select 360. Read the information prompt and then select **Start**.

Using Circle

In Circle the aircraft records a short video while flying in a circle.

1. Press the power button once to turn the aircraft on. Launch the Tello app and tap  to take off.
2. Tap  and then select Circle. Read the information prompt and then select **Start**.

Using Up & Away

In Up & Away the aircraft records a short video while flying upward and backward.

PROGRAMMING

PROGRAMMING LANGUAGES

- Python
- Raspberry PI
- Swift playgrounds

BASIC COMMANDS

```
takeoff();  
hover(5);  
fly("forward", 20, "in");  
flip("forward");  
flip("left");  
land();
```

CODING DASHBOARD

The screenshot shows a software interface for programming a drone mission. At the top left, there is a 'Battery: -' indicator. The top right corner features a 'Connect to Tello' button. A central header area displays 'Untitled Mission' next to a hamburger menu icon. On the left side, a vertical sidebar contains eight colored buttons: 'Takeoff' (dark blue), 'Navigation' (teal), 'Flip' (light blue), 'Loops' (yellow), 'Logic' (red), 'Math' (purple), 'Variables' (pink), and 'Land' (orange). The main workspace is a large white area. In the bottom right corner of this workspace, there is a vertical stack of four icons: a target symbol, a plus sign, a minus sign, and a trash can icon. A vertical scrollbar is visible on the right edge of the workspace.

CLICK ON SHOW MISSION CODE

The screenshot shows a mission editor application. At the top left, it says "Battery: -" and at the top right, "Connect to Tello".

Left Sidebar (Category Tabs):

- Takeoff
- Navigation
- Flip
- Loops
- Logic
- Math
- Variables
- Land

Central Workspace (Mission Script):

```
takeoff
yaw right 90 degrees
land
```

Right Sidebar (Mission Management):

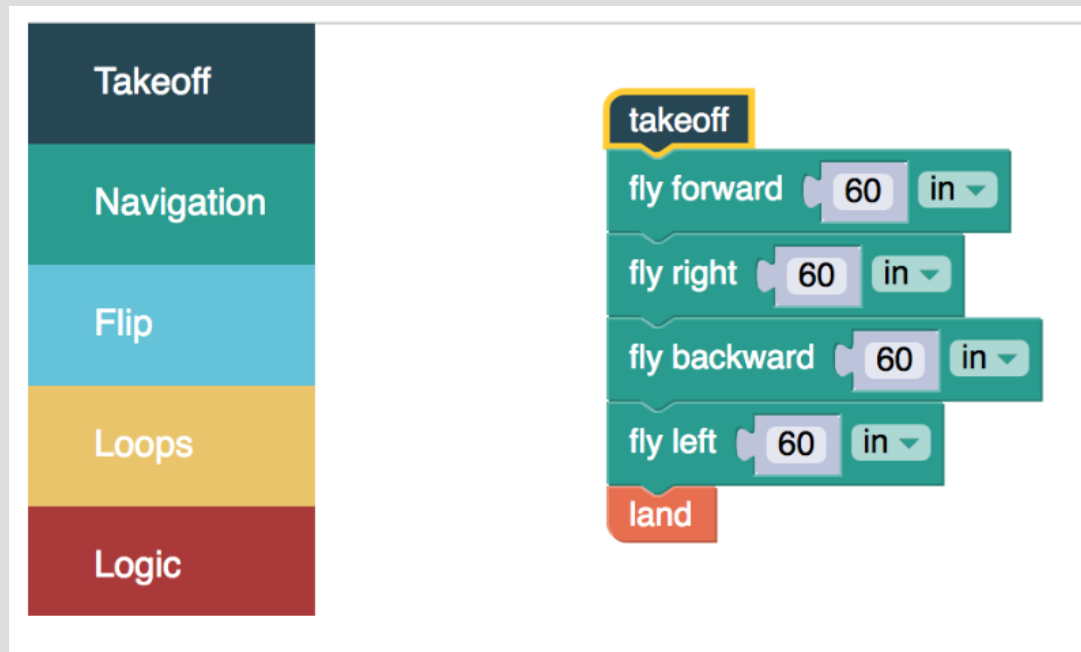
- [LOGIN](#)
- [New Mission](#)
- [Launch Mission](#)
- [Show Mission Code](#)
- [DJI Blocks](#)

ACCESS THE CODE

The screenshot displays the Tello mission editor interface. On the left is a vertical sidebar with categories: Takeoff, Navigation, Flip, Loops, Logic, Math, Variables, and Land. The main workspace shows a block-based mission sequence: a 'takeoff' block, a 'yaw right 90 degrees' block, and a 'land' block. On the right, a 'Code' window titled 'Untitled Mission' shows the equivalent code:

```
takeoff();  
yaw("right", 90);  
land();
```

BOX MISSION



The image shows a Scratch script for a "BOX MISSION". On the left is a vertical menu with five categories: Takeoff (dark blue), Navigation (teal), Flip (light blue), Loops (yellow), and Logic (red). The script itself is a vertical stack of blocks: a yellow "takeoff" block, four teal "fly" blocks (forward, right, backward, left) each with a "60" value and an "in" dropdown, and a red "land" block.

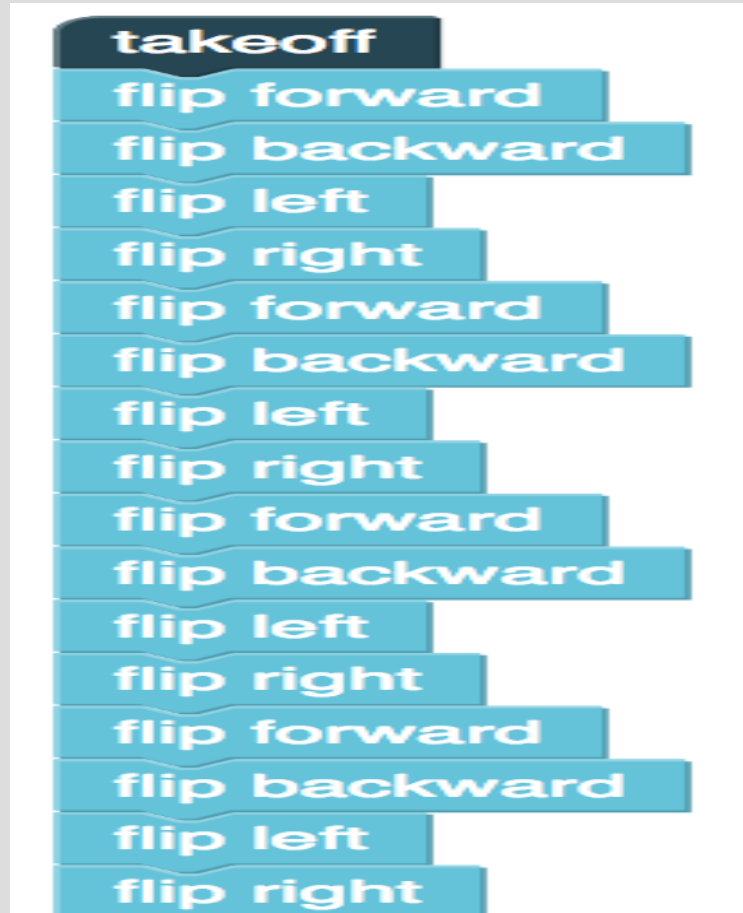
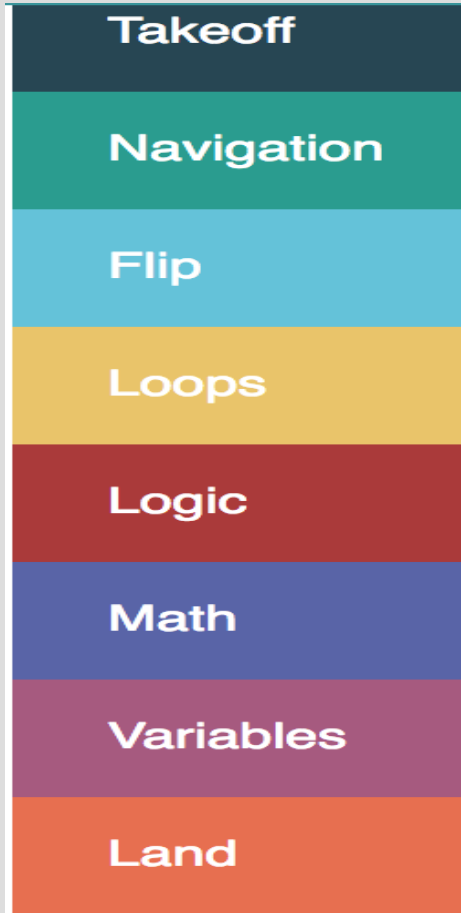
Category	Block	Value	Unit
Takeoff	takeoff		
Navigation	fly forward	60	in
Navigation	fly right	60	in
Navigation	fly backward	60	in
Navigation	fly left	60	in
Logic	land		

BOX MISSION WITH YAW

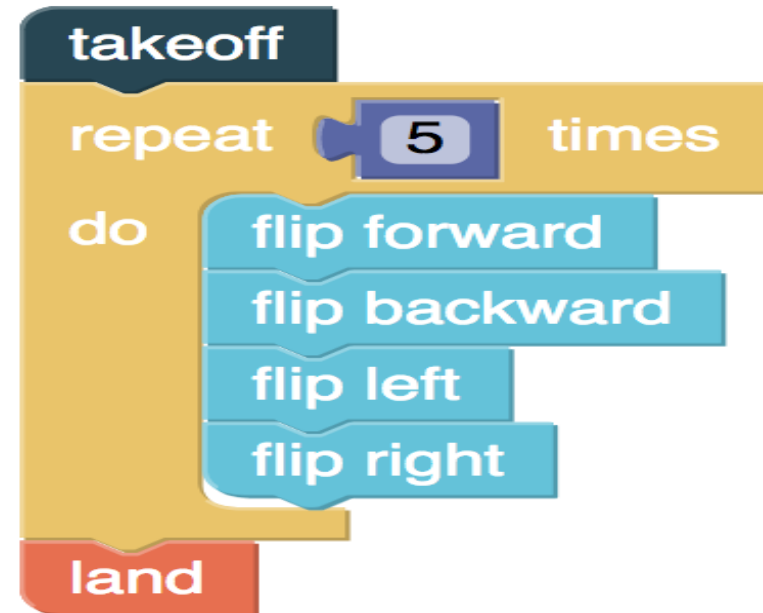
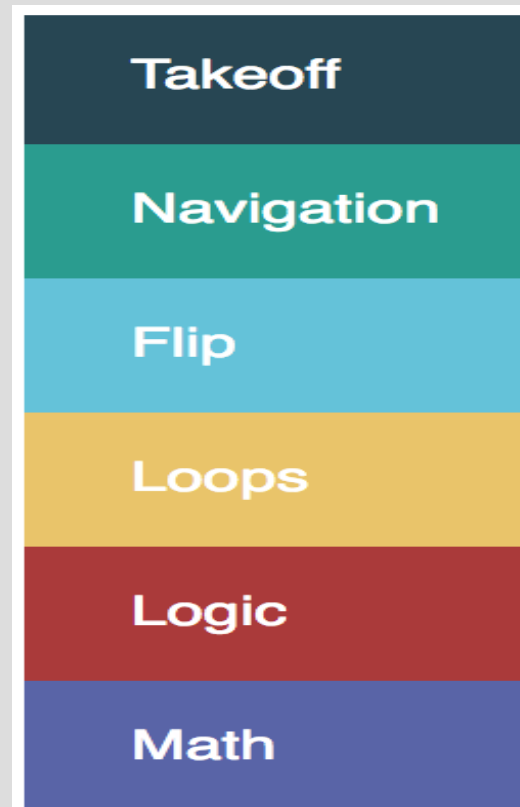
The image shows a Scratch script for a mission. On the left is a vertical menu with categories: Takeoff (dark blue), Navigation (teal), Flip (light blue), Loops (yellow), Logic (red), Math (purple), Variables (pink), and Land (orange). The script on the right starts with a 'takeoff' block, followed by a sequence of 'fly forward' (60 in) and 'yaw right' (90 degrees) blocks, repeating this pair three times, and ending with a 'land' block.

```
takeoff
fly forward 60 in
yaw right 90 degrees
fly forward 60 in
yaw right 90 degrees
fly forward 60 in
yaw right 90 degrees
fly forward 60 in
yaw right 90 degrees
land
```

LOOP AND FLIP



FOUR FLIPS REPEATED FIVE TIMES



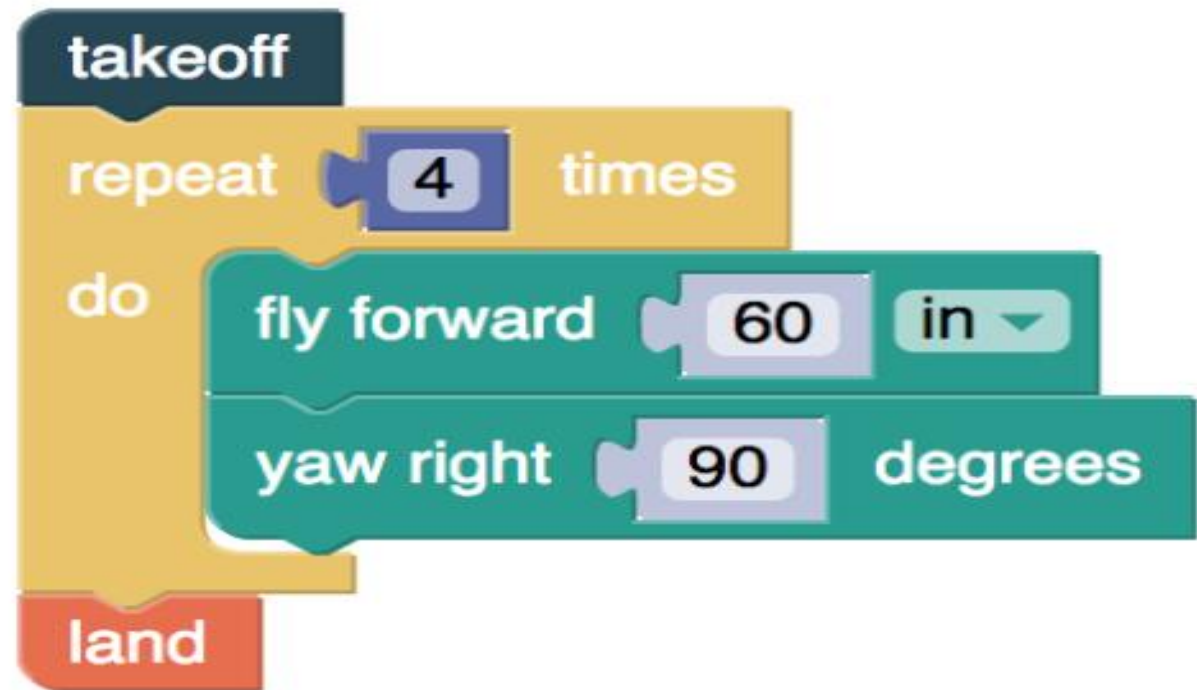
REFACTORED BOX MISSION WITH LOOPS

Takeoff

Navigation

Flip

Loops



ALTITUDE CHANGES

Alt: - | Sats: - | Batt: - | Dist: - | Head: - | No Aircraft Connected ?

Untitled Mission

- Takeoff
- Navigation
- Camera
- Loops
- Logic
- Math
- Variables
- Land

takeoff to 2 ft

hover for 5 seconds

change altitude to 5 ft

hover for 5 seconds

fly forward 25 ft at 10 mph

yaw right 90 ° at 30 °/sec

fly forward 25 ft at 10 mph

land

AERIAL SHUTTLE RUN CODE



```
takeoff
fly forward 12 in
yaw right 180 degrees
fly forward 12 in
yaw right 180 degrees
fly forward 24 in
yaw right 180 degrees
fly forward 24 in
yaw right 180 degrees
fly forward 36 in
yaw right 180 degrees
fly forward 36 in
yaw right 180 degrees
fly forward 48 in
yaw right 180 degrees
fly forward 48 in
yaw right 180 degrees
fly forward 60 in
yaw right 180 degrees
fly forward 60 in
yaw right 180 degrees
land
```

TELLO SNAKE MISSION

Takeoff

Navigation

Flip

Loops

Logic

Math

Variables

Land

takeoff

fly forward 20 in

fly right 20 in

fly forward 20 in

fly left 20 in

fly forward 20 in

fly right 20 in

fly forward 20 in

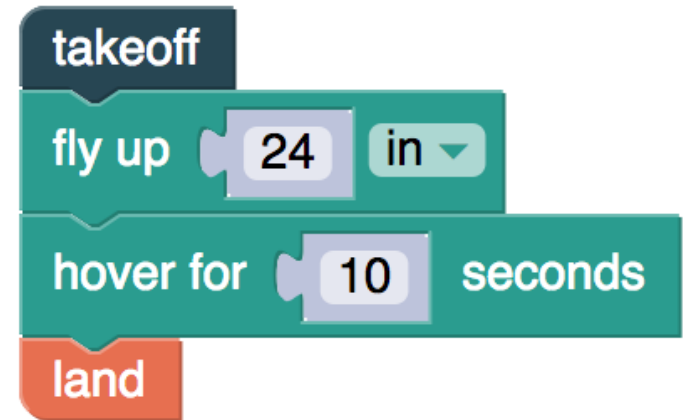
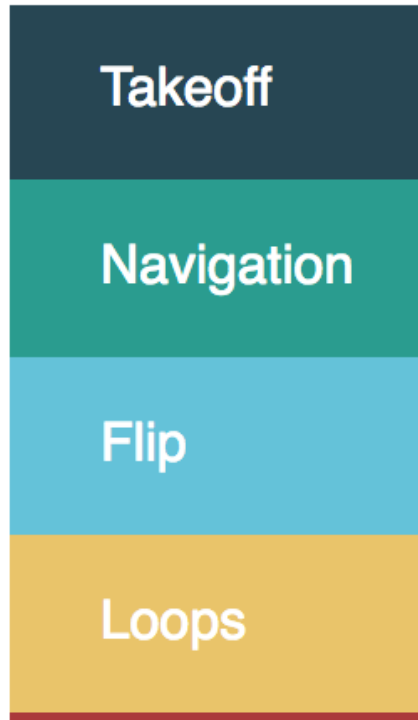
fly left 20 in

yaw right 180 degrees

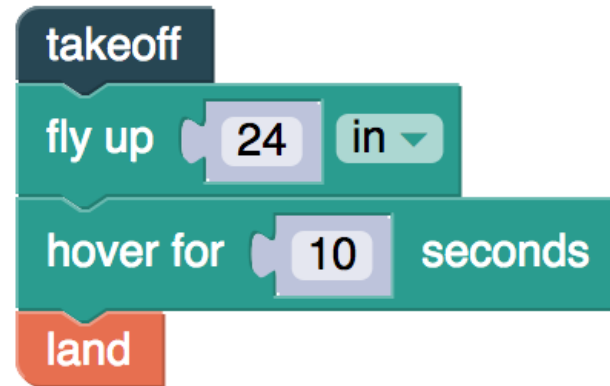
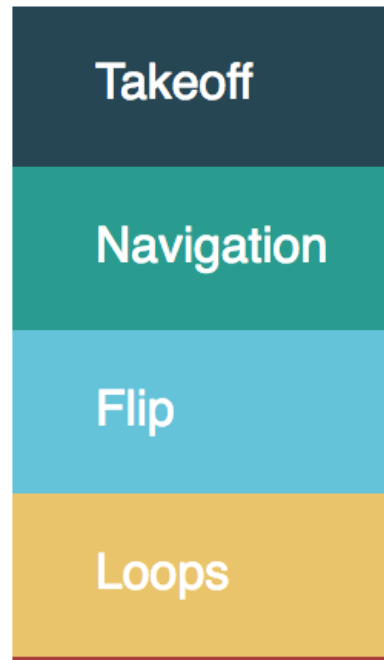
fly forward 80 in

land

**A SIMPLE TAKE
OFF AND "LAND
IN YOUR HAND"
MISSION**



A SIMPLE TAKE OFF AND "LAND IN YOUR HAND" MISSION



LAUNCHING THE MISSION

Power on Tello and place on a flat surface in an open area indoors.

Double tap your home button and go to Settings > Wifi

Tap on the Tello, which will create a hotspot that will look similar to: Tello-XXXXXX.

Double tap your home button and return to DroneBlocks

Click "Connect To Tello"

Now that you are ready to execute your mission click the hamburger icon (the blue icon with three lines.)

Click "Launch Mission"