

Coding with Parrot Mini Drones

Terminal Objective 2.1: Hover the Parrot mini drone

Performance Objective 2.1: Using an iPad or Android tablet, hover the Parrot mini drone at two specified heights \pm 1 foot.

Enabling Objectives:

1. Identify parts of the mini drone
2. Charge mini drone batteries
3. Connect mini drone to remote control (tablet)
4. Demonstrate the use of controls for throttle
5. Practice hovering the mini drone in safe manner

Materials and Supplies:

- iPad with iOS 8.0 or later or Android tablet with 4.0 or later
- Download and install Free flight mini app on tablet (found in app store)
- Safety glasses for all participants
- Parrot mini drone: Cargo or Mamba
- USB charging device
- *Activity Sheet 2.1: Parts of the mini drone* (for each student) and answer key
- *Hover challenge 2.1* (for reference) and *Performance Assessment 2.1: Hover challenge*
- Construction style tape measure with lock

Learning Activities:

1. Video ROAV mini 2.1 v1
2. Practice charging battery (if needed), connecting devices, and hovering the mini drone.
3. Complete *Activity Sheet 2.1: Parts of the mini drone*

Formative Assessment:

1. Practice charging battery (if needed), connecting devices, and hovering the mini drone.
2. Complete *Activity Sheet 2.1: Parts of the mini drone*

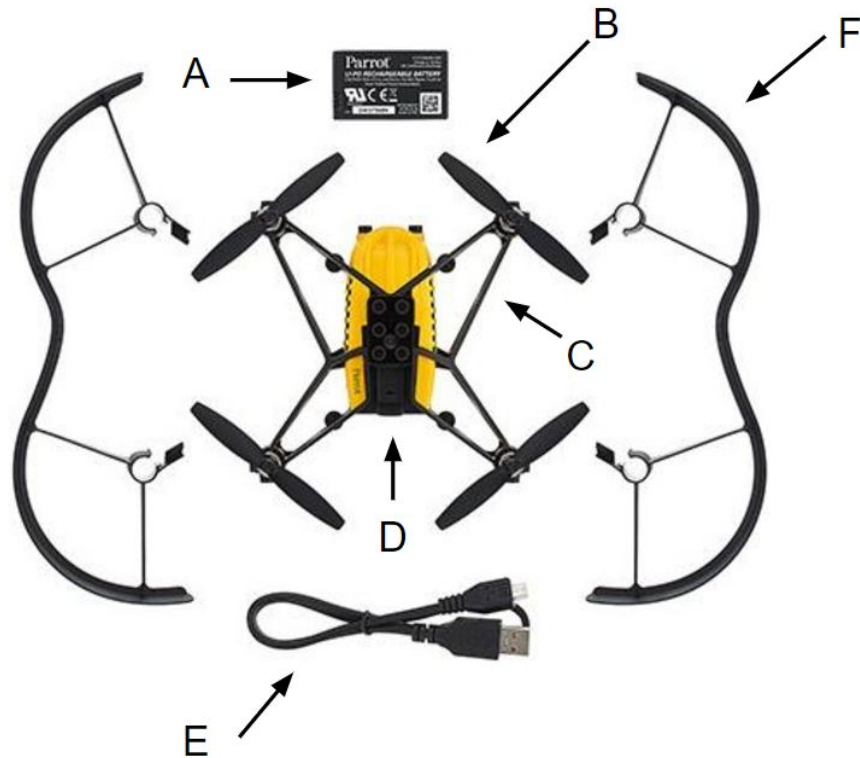
Summative Assessment:

1. Safely perform hovering maneuver at two specified heights. Evaluate students using *Performance Assessment 2.1: Hover Challenge*

Supplemental teacher resources:

- How do quadcopters and multicopters fly? Video
https://www.youtube.com/watch?v=Z_T6LBwuBKY
- Setting up minidrone from Parrot
<https://www.parrot.com/us/minidrones/parrot-Mambo#Tutorials>
- Getting started Parrot Mambo
<https://community.parrot.com/t5/Mambo-Knowledge-Base/Getting-Started/ta-p/145926>
- Updating firmware on mini drone
<https://community.parrot.com/t5/Mambo-Knowledge-Base/Update-Parrot-Mambo-Software/ta-p/153647>

Activity Sheet 2.1: Parts of the mini drone



Match the parts with the correct name by writing the letter in the space provided.

- | | | |
|-------------------|----------------|--------------|
| 1. ___ Prop Guard | 3. ___ Prop | 5. ___ Body |
| 2. ___ USB cable | 4. ___ Battery | 6. ___ Frame |

Answer the following questions regarding charging.

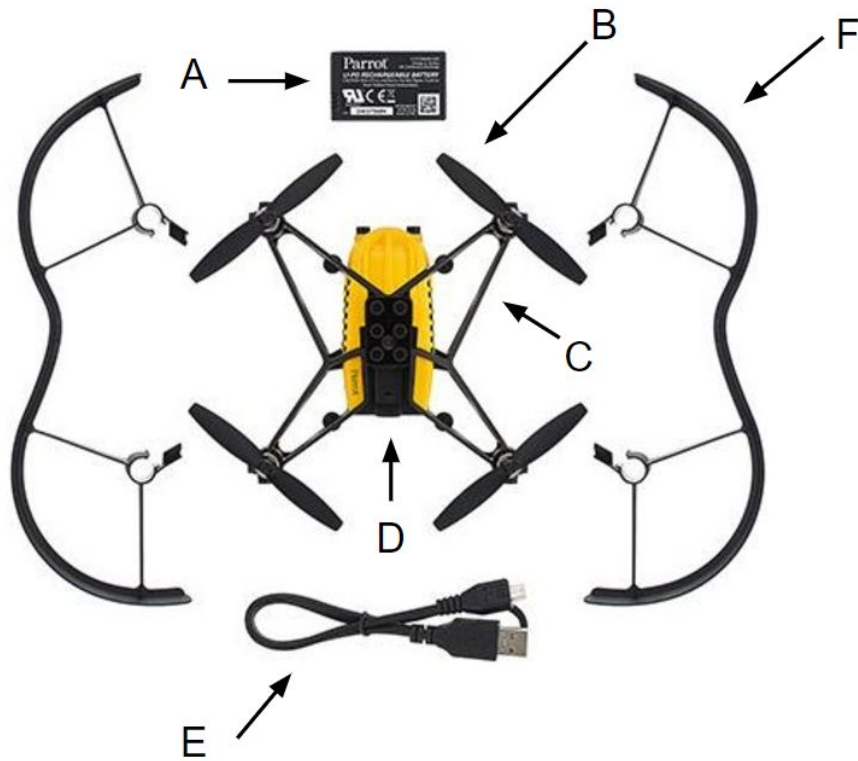
7). Order the steps for charging the mini drone

a)

b)

8). What indicates that the battery is done charging?

Activity Sheet 2.1: Parts of the mini drone
Answer key



Match the parts with the correct name by writing the letter in the space provided.

- | | | |
|----------------------------|-------------------------|-----------------------|
| 1. <u> F </u> Prop Guard | 3. <u> B </u> Prop | 5. <u> D </u> Body |
| 2. <u> E </u> USB cable | 4. <u> A </u> Battery | 6. <u> C </u> Frame |

Answer the following questions regarding charging.

- 7). Order the steps for charging the mini drone
- Insert battery into mini drone
 - Connect USB to charger or computer
- 8). What indicates that the battery is done charging?
The red charging light will change to green.

Hover Challenge 2.1

To set up this challenge you will need a tape measure or some way to determine a specified height. For this example we will use a common construction tape measure with a working lock.

Steps:

1. Establish designated fly and safe zones in an open area
2. In the fly zone, extend tape measure to 7 feet and lock
3. Place tape measure with the end on the ground so tape is extended into the air. (fig 1.1)
4. Have operating student place mini drone in the fly zone
5. Move to the safe zone
6. Have student practice the task of hovering at 3 feet. and 7 feet heights
7. Evaluate student's performance using *Performance Assessment 2.1: Hover*

Figure 1.1



Performance Assessment 2.1: Hover Challenge

Name: _____ Date _____

Terminal Objective 2.1: Hover the Parrot minidrone

Performance Objective 2.1: Using an iPad or Android tablet, hover the Parrot minidrone at two specified heights.

Assessment

Skill Check	Pass	Retry
Followed safe practices	<input type="radio"/>	<input type="radio"/>
Demonstrated proper power up and power down procedures	<input type="radio"/>	<input type="radio"/>
Hovered at 3 feet \pm 1ft.	<input type="radio"/>	<input type="radio"/>
Hovered at 7 feet \pm 1ft.	<input type="radio"/>	<input type="radio"/>

Note: To pass this objective, all skill check items must receive a pass.

Assessed by: _____ Date: _____

Outline for Video 2.1: Hover

- I. Terms:
 - A. Throttle - controls the speed of the props which determines how high and fast the mini drone moves
- II. Objectives
 - A. Using an Ipad or Android tablet, hover the Parrot mini drone at two specified heights ± 1 foot.
- III. Parts
 - A. Body
 - B. Props (propeller) and guards
 - C. Battery
 - D. USB cable for charging
- IV. Charging the batteries
 - A. Insert battery into battery slot on the mini drone
 - B. Connect the USB cable to drone and computer or usb charging adapter
 - C. Red light indicates charging
 - D. Green light indicates fully charged
- V. Power up and down procedures
 - A. Power up
 1. Place drone in the designated fly zone on level ground
 2. Turn on mini drone by pressing power button
 3. Lights will blink
 4. Move into the safety zone
 - B. Power down
 1. Make sure props are not spinning and mobile device is in possession
 2. Locate the power button on side of mini drone and press
 3. Lights will turn off
 4. Drone can now be retrieved safely
- VI. FreeFlight 3 mini App
 - A. Follow power up procedures
 - B. Turn on bluetooth on device
 - C. Open App on device
 - D. App should connect to drone automatically
 - E. Swipe right to see controller
 - F. To fly, touch "take off"
 - G. Move the throttle up by using the go up control "joystick"
 - H. Hover at one elevation then go down to ground.
 - o Use "landing" control to softly land at any time