

# Coding with Parrot Mini Drones

**Terminal Objective 4.4:** Retrieve data autonomously using mini drone and space board

**Performance Objective 4.4:** Retrieve data autonomously using mini drone and space board to remotely read sensor values.

## Enabling Objectives:

1. Define what sensors do
2. Identify different types of sensors
3. Set up an ArduSat sensor experiment
4. Record sensor data

## Materials and Supplies:

- Laptop with internet connection using chrome browser (plugin required for arduino)
- ROAVcopter sensor-kit <https://www.becauselearning.com/>
- 3D printed mount for space board or building block alternative(from lesson 4.2)
- 8 inch wire tie to secure Moteino
- LED bucket assembly (see RGB bucket document)
- Peltier hot/cold plate assembly (see hot/cold bucket document)

## Learning Activities:

1. Video: ROAV mini 4.4 v1
2. *Data Retrieval Mission Experiment* <https://ehub.ardusat.com/experiments/4487>

## Formative Assessment:

1. Activity sheet 4.4: *Autonomous Data Mission*

## Summative Assessment:

1. Evaluate students using *Performance Assessment 4.4:Autonomous Data Mission*

## Supplemental teacher resources:

- ROAVcopter sensor-kit
- <https://www.becauselearning.com/>
- ArduSat experiment hub  
<https://ehub.ardusat.com/experiments/overview>

## Activity Sheet 4.4: Autonomous Data Mission

Name: \_\_\_\_\_ Date: \_\_\_\_\_

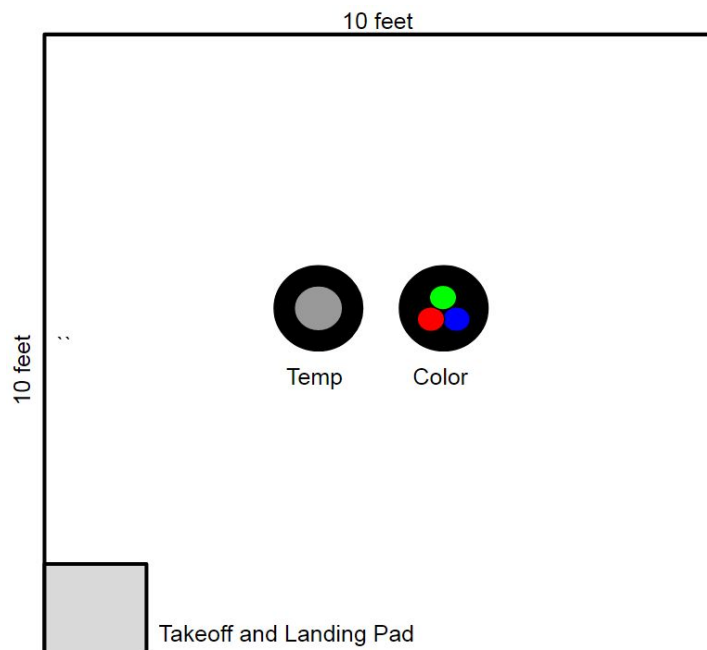
### Situation

You and your team are working with a group of farmers to quickly and accurately gather data from a crop field. This data is critical to the planning and production of the crops. Your team is required to retrieve temperature readings from various places in the field as well as color readings from the plant leaves. This information will be used to assess the health and nutrition levels of the crop. Your team has decided to use a drone for the vehicle because of speed and its ability to be programmed autonomously.

### Challenge

Your team's goal is to retrieve the various readings using the Parrot mini drone and ArduSat Space board. Your team will attach the necessary hardware to the mini drone, program the mini drone and collect the data. For this challenge, there will be an electric plate representing the crop that you will fly over and determine if the plate is hot, cold or room temperature. There will also be a bucket containing a light source that you will need to determine if the light is red, green or blue. This data will be sent to the laptop wirelessly where it can be viewed by a team member. Your goal is to retrieve the data autonomously as quick as possible. Keep in mind flight time of mini drones will now be reduced due to the extra load.

### Field set up



Ambient temperature reading: \_\_\_\_\_

**Data retrieved:** Indicate the reading by placing a checkmark in the correct circle.

<b>Temperature</b>	<b>Cold</b>	<b>Room</b>	<b>High</b>
Reading	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Color</b>	<b>Red</b>	<b>Green</b>	<b>Blue</b>
Reading	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3) Reflection** What was the hardest part of this challenge? What would you do different?