DRONEBLOCKS

Droneblocks in the classroom:
Math Editions

Lesson 1: There And Back Again

"The S.S Blue Waters cannot dock. A whale has popped up to say hello. The captain of the ship urgently needs to get some supply boxes to the yellow delivery dock area.

Luckily they have their very own Tello Delivery Drone.

The drone onboard can fly supplies to and from the dock as a back up plan. The drone will keep doing this until all the supply boxes are delivered. There are 20 supply boxes to deliver. It's a good thing the drone has a max payload of 5 supply boxes.

50 Yards

Max payload
5 Supply boxes
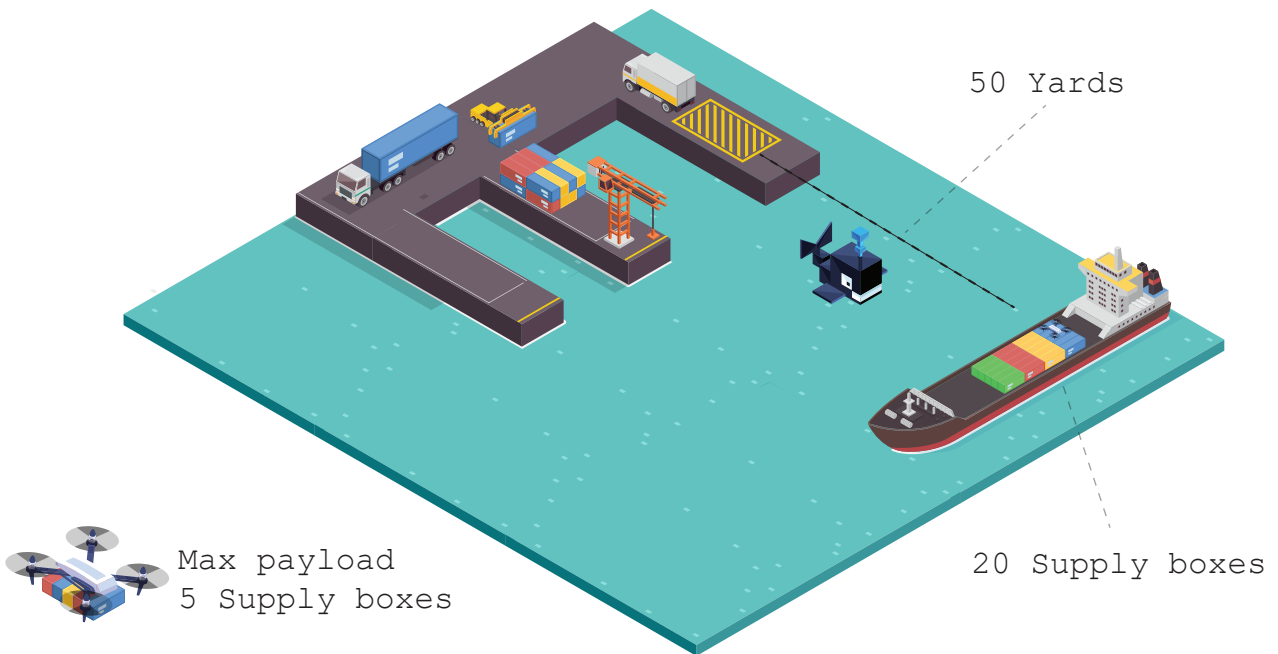
20 Supply boxes

You need to write the code that will make the drone fly all the supply boxes from the ship to the dock.
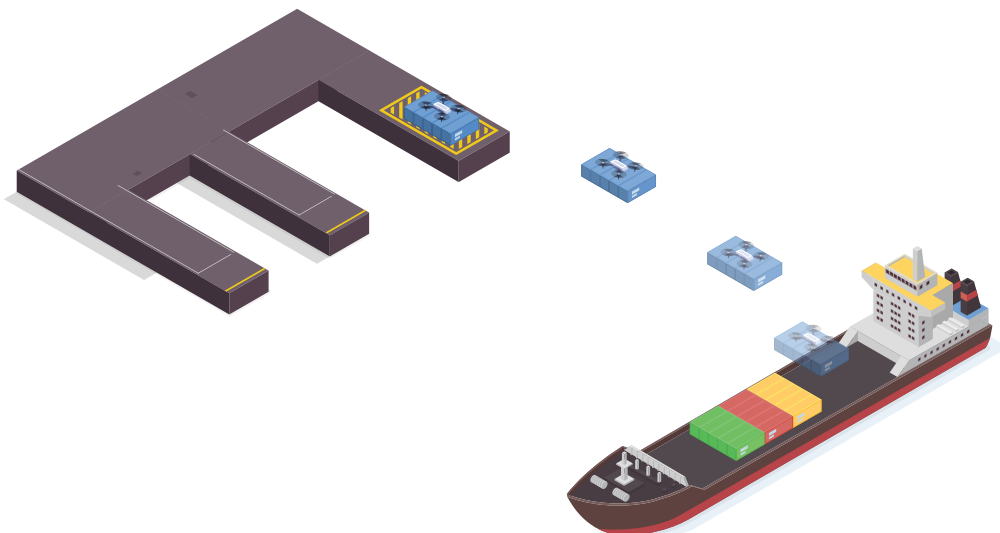
Tool Time:
Using the extracted data we can write out some pseudocode. Pseudocode is when we write out what our code / algorithm should do, in our spoken language, not the programming language.

Pseudocode:
```
    take off
    fly forward to the dock
    land and deliver payload then take off again
    turn around
    fly back to the ship
    land and collect another payload then take off again
    turn around
    repeat until all supply boxes are delivered
```

That looks great. Now let's replace this with some actual code blocks.

All droneblocks codes start with a takeoff and land.
In the code example 1 inch = 1 yard in real life.
Drag the following blocks in order:
fly forward 50 inches
land for 1 seconds then takeoff
yaw right 180
fly forward 50 inches
land for 1 seconds then takeoff
yaw right 180 degrees
land

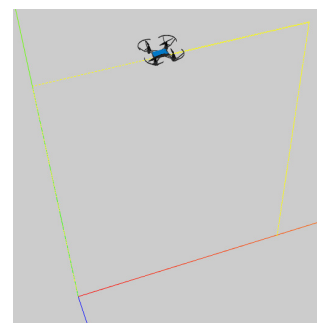We have to repeat this process until all the supplies are done.
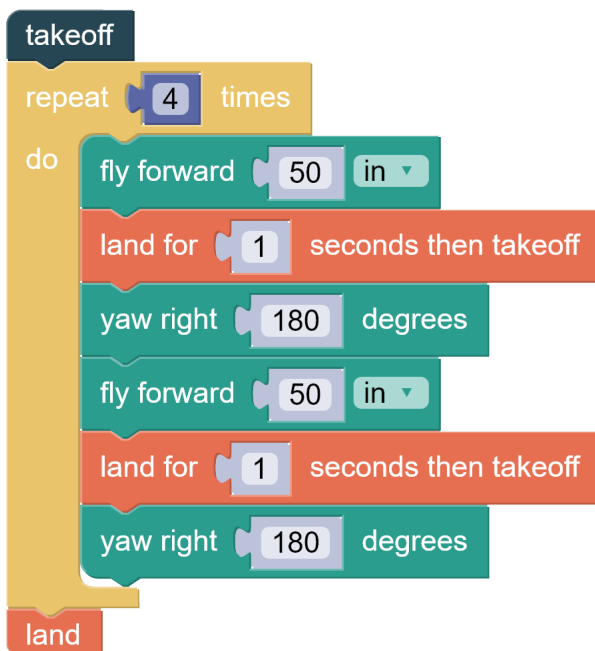
Our loop repeats 4 times in this example. **4 max payloads...**
5 supply boxes per payload = 20 supply boxes.

Let's test this code quickly in our droneblocks simulator.

The droneblocks simulator seriously hours of learning fun for students.

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Life's a Stage... And So Is The Classroom:

It is time to deploy some actual code and test it. Let us take a few minutes to clear some space in the classroom. Create your "ship" area and "dock" area. Space them around 50 inches apart if you have enough space. You can space them 25 inches apart just remember to adjust the scale when writing your code *(ie 1 inches = 2 yards).*
We will make a function to covert yards to feet to inches in an up coming lesson.
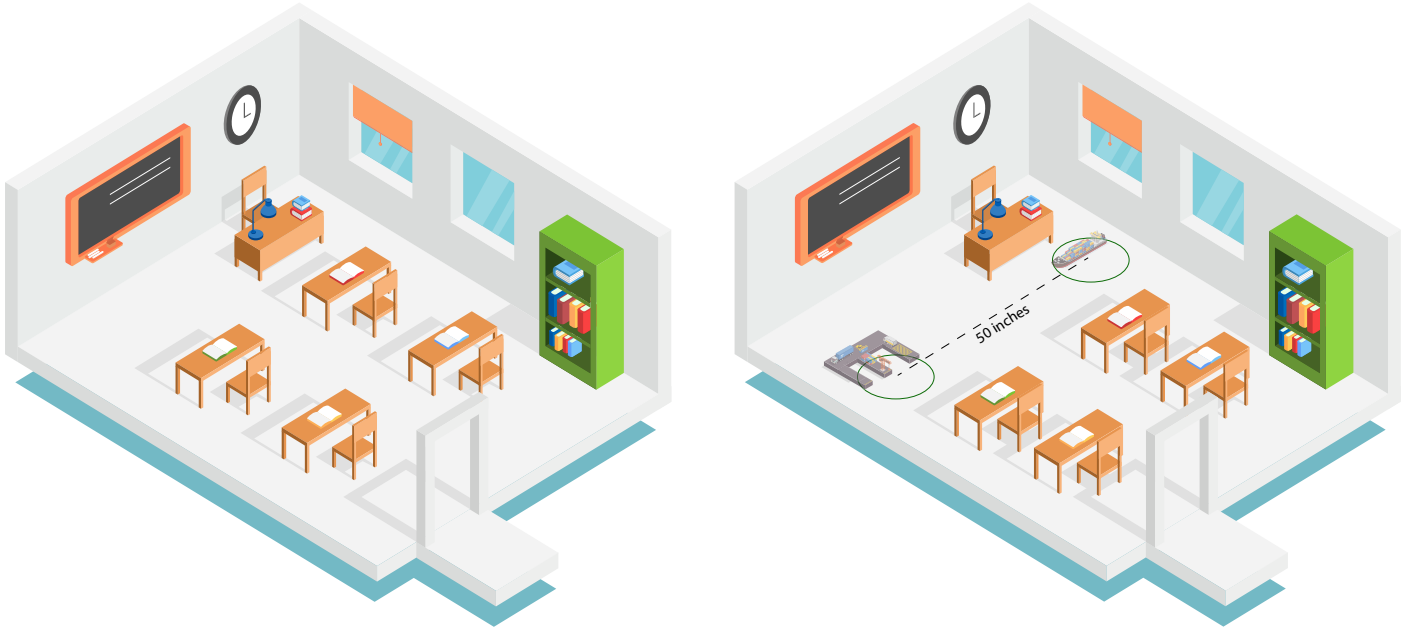
The Real Life Flight:

Load the code from earlier and send it to the drone. Remember to stand back and call out "Drones Up" or "Taking Off" or even "Clear?" and have the rest of the class repeat "All Clear" before take off.

The front of the classroom is a great fun to watch drones fly but not every student will have access to a drone. This is the reason why I am going to be using the Droneblocks Simulator for this video series, so every student can follow ago.

Watch your drone fly back and forth. The total amount of supply boxes and the max payload will determine how many deliveries the drone will make therefore how long the flight will be.

Job Done:

After 4 return flights the supply boxes are all delivered and the day has been saved.

And would you look at that. The whale had some babies.

Quick Question:
What's a baby whale called?
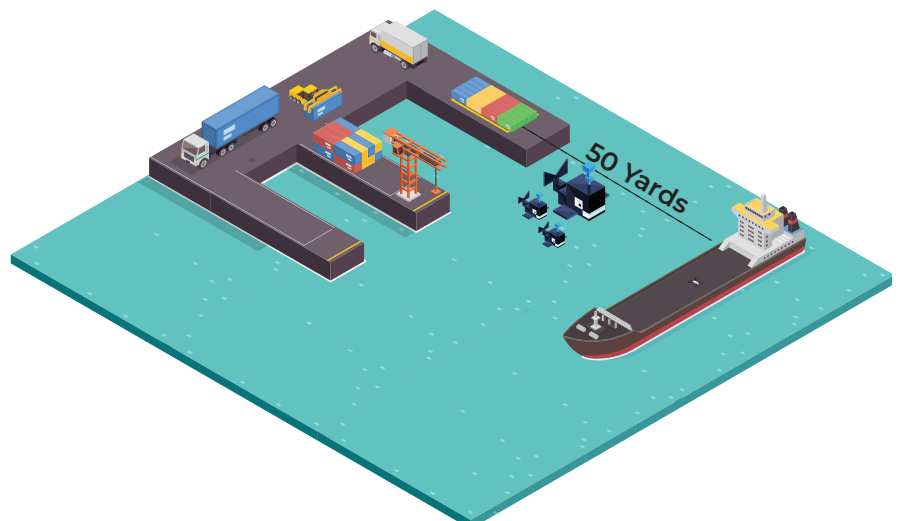
Deconstructing the Math:

In this lesson we have written some basic code. You are going to see some of the many examples of how code written in Droneblocks can be integrated into your math lessons. They can be used (but not limited to) to touch on the following math lessons:
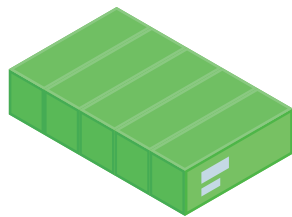
Equal Groups | Skip Counting | Multiplication by Addition
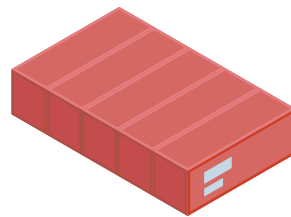
Helpful Manipulatives:

The drone has 20 supply boxes to deliver. Each payload can be grouped into equal groups of 4. Each group will have 5 supply boxes. They can be represented as follows:
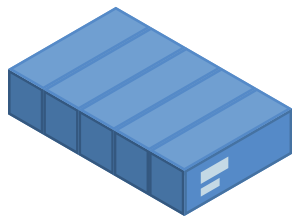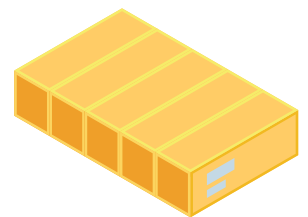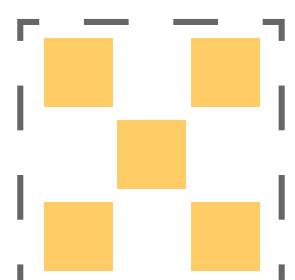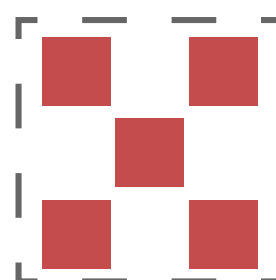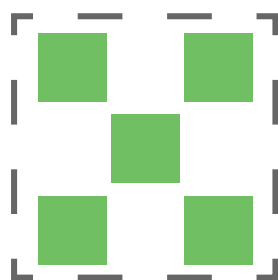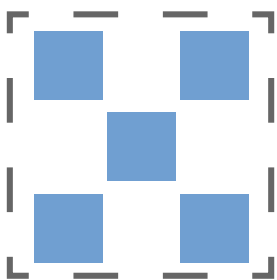

5   5   5   5

When we start looking at the drone deliveries and payloads like this, math problems can start jumping out of the page.

Converting to Math Problems:

The drone has a max payload of 3. How many total supplies are delivered after:
3 deliveries (3 x 3 = __)   5 deliveries   (3 x 5 = __)
9 deliveries (3 x 9 = __)   12 deliveries   (3 x 12 = __)

The drone has made 4 deliveries. What was the max payload after the following total boxes have been delivered:
8 supply boxes (8 ÷ 4 = __)   12 supply boxes   (12 ÷ 4 = __)
24 supply boxes (24 ÷ 4 = __)   48 supply boxes   (48 ÷ 4 = __)

Bonus Questions:
How many yards has the drone flown after the following deliveries:
2 deliveries   5 deliveries

In the next lesson we are going to introduce variables to the code which will give you an easy way to create new math problems for your students to solve.