

ADVANCED DRONEBLOCKS PRACTICE

MODULE 2

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COMMANDS OVERVIEW

AVAILABLE COMMANDS



Takeoff	Take off immediately or after 5 seconds
Navigation	Set speed, then fly any direction
Flip	Flip any direction
Loops	Repeat command a set number of times
Logic	Do an action if certain things are true
Math	Check odd/even, use random number, etc
Variables	Create a variable (speeds up repeated number use)
Functions	Advanced; not available with all subscriptions
Land	Land permanently or for a set amount of time

Figure 1. DroneBlocks Commands



PRACTICE ACTIVITIES

PRACTICE ACTIVITIES: INTRO



- Use the engineering design process
 - Define your problem, brainstorm solutions, and continue to refine until you have the perfect solution!
- Work together to bounce ideas off each other
- Program in DroneBlocks, then run your code in the Simulator

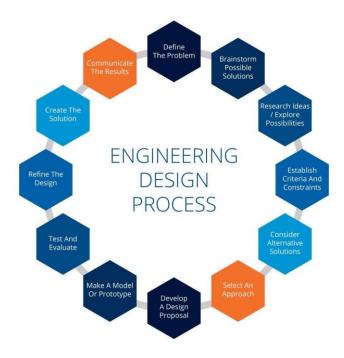


Figure 2. Engineering Design Process

PRACTICE ACTIVITIES



- Activity 1: Fly in a Square
 - Fly forward and turn right four times
 - See figure below
- Activity 2: Flips!
 - Flip forward, backward, left, and right five times
 - Can you think of multiple ways to solve this problem?
 - Solutions on next slide

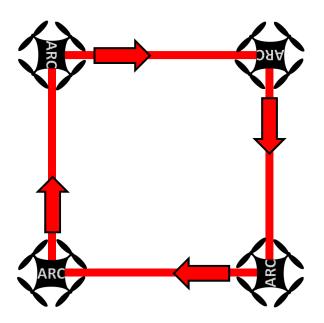


Figure 3. DroneBlocks Activity: Fly in a Square

ACTIVITY 2 SOLUTION



```
takeoff
flip backward
flip backward
flip left
flip backward
land
```

Figure 4. Flips

```
repeat 5 times

do flip forward
flip backward
flip left
flip right
```

Figure 5. Flips using Loops



MORE EXAMPLES TO TRY

VARIABLES AND LOOPS



```
takeoff
set distance to
set one_foot > to
                     12
repeat
     set distance to
do
                            distance -
                                               one_foot -
     repeat
     do
                       distance - in -
          fly forward
          yaw right
                             degrees
                      180
land
```

Figure 6. Variables and Loops

ADD LOGIC



```
takeoff
set forward_distance v to
                           20
set side_distance v to
                        20
set loop_count - to
                     0
                 forward_distance >
     fly forward
     loop_count -
                                is even -
     do
           fly right
                     side_distance -
                                      in -
     else
                    side_distance -
           fly left
                                     in -
     set loop_count v to
                             loop_count - + - 1
yaw right
           180
                  degrees
                                                         in
fly forward
                                   forward_distance -
              loop_count - x -
land
```

Figure 7. Add Logic



RESOURCES

MORE RESOURCES



- More Quadcopter Dynamics:
 - https://www.youtube.com/watch?v=DNc8o9CZLHU
- DroneBlocks: https://www.droneblocks.io/
- Download DroneBlocks: https://www.droneblocks.io/app
- Download DroneBlocks Code:
 - https://www.droneblocks.io/droneblocks-code



SOURCES

SOURCES



• **Figure 2:** https://www.twi-global.com/technical-knowledge/faqs/engineering-design-process