

01_03_circle_maneuvers_student_hs__

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Part of the InnovatED STEM and DroneBlocks Land, Air, and Sea Robotics Curriculum
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1 Circle Maneuvers – Student Version

In this lesson, you'll learn how to make the drone fly in a circle!

You'll use special commands like `circle_left()` and `circle_right()` and change the radius, speed, and angle.

Let's get started by learning what the commands do.

1.1 Circle Command Reference Table

Command	What It Does	Parameters (units/type)
<code>circle_left()</code>	Makes the drone fly left in a circle	radius (m/float), speed (m/s/float), angle (degrees/int)
<code>circle_right()</code>	Makes the drone fly right in a circle	radius (m/float), speed (m/s/float), angle (degrees/int)

```
[ ]: # Setup the simulator
from crazyflie_sim import CrazyflieSimulator
import time
drone = CrazyflieSimulator(real=True)
```

Connecting to real Crazyflie...

```
/opt/anaconda3/lib/python3.12/site-packages/libusb_package/__init__.py:51:
DeprecationWarning: is_resource is deprecated. Use files() instead. Refer to
https://importlib-resources.readthedocs.io/en/latest/using.html#migrating-from-
legacy for migration advice.
```

```
    if resources.is_resource(__name__, _LIBRARY_NAME):
/opt/anaconda3/lib/python3.12/site-packages/libusb_package/__init__.py:52:
DeprecationWarning: path is deprecated. Use files() instead. Refer to
https://importlib-resources.readthedocs.io/en/latest/using.html#migrating-from-
legacy for migration advice.
```

```
    path_resource = resources.path(__name__, _LIBRARY_NAME)
```

1.2 Example: Fly a Full Left Circle

This example flies a **full circle** to the **left** with a radius of 0.3 meters and a speed of 0.3 m/s.

```
[ ]: drone.takeoff(0.3, 0.2)
      drone.circle_left(0.3, 0.3, 360)
      drone.land(0.3)
```

1.3 Exercise 1: Full Right Circle

Fly a **full right circle** with: - Radius: 0.3 meters - Speed: 0.3 m/s - Angle: 360 degrees

```
[ ]: # Your code here:
```

1.4 Exercise 2: Half Circle Left

Fly a **half circle** to the **left**. - Radius: 0.3 - Speed: 0.3 - Angle: 180

```
[ ]: # Your code here:
```

1.5 Exercise 3: Circle Zig-Zag

Try flying a **left circle** then a **right circle** with: - Radius: 0.2 meters - Speed: 0.3 m/s - Angle: 180 degrees each

Hint: Take off first and land afterward!

```
[ ]: # Your code here:
```

1.6 Challenge: Shrinking Spiral

Fly 3 circles to the left, each one **smaller** than the last!

Try radii: 0.3 \rightarrow 0.2 \rightarrow 0.1 *Make sure to include a takeoff and a landing!*

```
[ ]: # Your code here:
```