Loopy the Turtle

A Teknowledge Activity

Go to tinyurl.com/loopyPy in your internet browser.

If you aren't already, login to your trinket.io account!
After each challenge, run your code so you can see what it does!

Student Learning Goals:

- ***Learn about***: Turtles, For Loops, Loops, Variables(kinda)

1.0 Let's Loop… Loop… Loop…Loop…

Let's try to get Loopy the turtle to help us draw a square. Copy the following code.

```
loopy.forward(50)
loopy.left(90)
loopy.forward(50)
loopy.left(90)
loopy.forward(50)
loopy.left(90)
loopy.forward(50)
loopy.left(90)
```

- The int passed into the function forward is the number of pixels Loopy moves.
- The int passed into the function left is the number of degrees Loopy turns.

Maybe you're like us and you would prefer to ***reuse*** code by telling Python to run certain lines of code *over and over* again, like a ***loop***.

This is a template of a for loop. **Do not copy this code!**

```
for x in range(this many times):
    Do this multiple times,
    And do this multiple times!
Do this, too, but don't repeat it!
```

- Notice how everything **indented** after the for loop is done multiple times.

2.0 Let's Loop Once

Rewrite our square-drawing code from before to make it less repetitive.

```
for x in range(4):
    loopy.forward(50)
    loopy.left(90)
```

- Line 1 tells Python to repeat line 2 and line 3 exactly 4 times.
- Line 2 moves Loopy forward 50 pixels.
- Line 3 turns Loopy 90 degrees to the left.

2.1 Drawing Squares

Modify the for loop above to draw a square with a side length of 40.
Modify the for loop above to draw a square with a side length of -100.

3.0 Would you like a Side with that?

Modify your code to draw a hexagon (6 sides) with a side length of 50.

```
for x in range(6):
    loopy.forward(50)
    loopy.left(60)
```

- Notice that the number of degrees we want Loopy to turn changes every time we want Loopy to draw a new shape!

4.0 More Shapes

Get Loopy to draw an octagon (8 sides) with a side length of 15 using a for loop (use the table in the paper handout to get the number of degrees for Loopy to turn).

What happens when we try to draw a shape with a LOT of sides - 360 sides?
Modify your for loop to the following!

```
for x in range(360):
    loopy.forward(1)
    loopy.left(1)
```

Using a Python loop, we got Loopy to go around a loop!

5.0 Larger Loops

Get Loopy to draw a bigger circle using a for loop.
Hint: try changing the side length to something bigger than 1 (but less than 3).
(Also, don't worry if Loopy goes off the screen! Loopy knows the way back..)

6.0 What's the X?

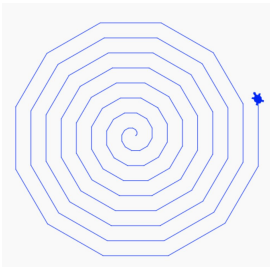
What is that 'x' doing in the for loop? Copy the following code and try to find out!

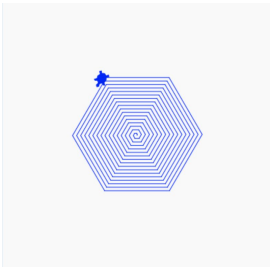
```
loopy.speed(100)
for x in range(360):
    loopy.forward(x)
    loopy.left(80)
```

- Before running this code, try to predict what loopy is going to do.
- Ask your mentor if you really aren't sure.
- **Hint: 'x' is becoming 0,1,2,3,4,...**

7.0 Bonus Challenges

- Make some cool shapes like these →
- Ask your mentor about importing random!





Explore! Make something awesome!

Key Takeaway: A for loop repeats indented code a <u>certain</u> number of times.