

Lesson Objective:

Halloween themed activity for students to practice previously learned coding concepts. This will be a break from the regular semester project and should ideally be completed in 1-2 meetings.

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Introduction Video:

 [Illuminating the Creative Side of Code](#)

Women in Tech Spotlight on - Miral Kotb and her project, iLuminate, which joins her love for dancing and coding and turns it into a masterpiece.

Discussion Questions:

- 1) Have you ever heard of Miral Kotb, this project, or similar projects?
- 2) What did you like most about the video?
- 3) In what other ways can we combine art and code?
- 4) How would you like to combine your other interests with code?

Teaching Guides:

Using Python

Have students draw a halloween bat with code!

Completed Bat Drawing: <https://trinket.io/library/trinkets/1feb73d60c>

Teaching Steps:

- 1) Import library and create turtle object

```

1 #import turtle library
2 import turtle
3
4 # Make a turtle named 'pen'
5 pen = turtle.Turtle()
6 pen.shape("turtle")

```

- 2) Spend a moment discussing what shapes will be needed to draw the bat
- Triangles
 - Circles

- 3) Create a function for making a triangle
- Inputs should be x, y, size, and color
 - Review what an **input** is

```

8 # This is a function to make triangles of a color and size
9 # and x,y is the position we choose
10 def make_triangle(x, y, size, color):

```

- Turn on the turtle object (that we named pen) with .penup, send it to a specific location with .goto, use the .begin_fill, change to the inputted color with .color and then use .pendown

```

10 def make_triangle(x, y, size, color):
11     pen.penup()
12     pen.goto(x,y)
13     pen.begin_fill()
14     pen.color(color)
15     pen.pendown()

```

- Use a loop to draw the 3 lines of the triangle, size to define the length of the lines and .left to define the angle the pen should move after each line is drawn (120 for a triangle).

- Review what a **loop** is

```

15     pen.pendown()
16     for lines in range(3):
17         #Amount forward determines size
18         #Decrease/increase as needed
19         pen.forward(size)
20         #120 is the angle to move for a triangle
21         #DO NOT change
22         pen.left(120)

```

- Outside of the loop, end the filling with .end_fill

```

22         pen.left(120)
23     pen.end_fill()

```

- 4) Create a function for making a circle

- a) Inputs again should be x, y, size, and color

```
25 # This is a function to make circles of a color and size
26 # x,y is the position we choose
27 def make_circle(x, y, size, color):
```

- b) This function is simpler. It needs the pieces used to draw a triangle, but does not need a loop. Instead use .circle, which takes in size as the radius

```
27 def make_circle(x, y, size, color):
28     pen.penup()
29     pen.goto(x,y)
30     pen.color(color)
31     pen.begin_fill()
32     pen.circle(size)
33     pen.pendown()
34     pen.end_fill()
```

- 5) Now make the bat body by calling the circle function

```
36 # The Bat Body:
37 make_circle(0, -150, 60, 'black')
38 pen.left(180)
```

- 6) The wings with 2 triangles

```
40 # The Wings:
41 make_triangle(-50, -80, 80, 'black')
42 make_triangle(130, -80, 80, 'black')
```

- 7) The teeth with 2 small triangles

```
44 # The Teeth:
45 make_triangle(-5, -120, 15, 'white')
46 make_triangle(20, -120, 15, 'white')
```

- 8) The eyes with 2 medium circles

```
48 # The Eyes:
49 make_circle(-20, -55, 15, 'white')
50 make_circle(20, -55, 15, 'white')
51 pen.left(180)
```

- 9) The pupils with 2 small circles

```
53 # The Pupils:
54 make_circle(-20, -85, 5, 'black')
55 make_circle(20, -85, 5, 'black')
```

10) The ears with 2 medium triangles

```
57 # The Ears:  
58 make_triangle(-40, -45, 30, 'black')  
59 make_triangle(10, -45, 30, 'black')
```

If your student finishes early, you can:

- 1) Have them try another drawing
 - a) Completed Pumpkin Drawing:
<https://trinket.io/library/trinkets/347f7b2c6d>
- 2) Add/change items on their current drawing
 - a) Colors
 - b) Sizes
- 3) Add functionality to their drawing
 - a) Add a draw button
 - b) Add a clear button

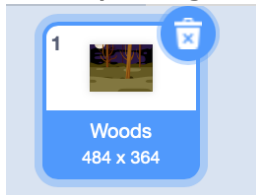
Using Scratch

Have students code a halloween dance.

Completed Example: <https://scratch.mit.edu/projects/590323770/>

Teaching Steps:

- 1) Pick any background



- 2) Have students pick any sprite, make sure the sprite has several costumes (or that you and the student can make several costumes with it). It will help for the dancing portion.



- 3) Make sure the student uses at least one loop with a combination of steps, the most important being changing of the sprite costume.
 - a) Review the concept of **loops**

```
when clicked
repeat 4
  go to x: 92 y: -1
  switch costume to skeleton-a
  wait 1 seconds
  switch costume to skeleton-b
  wait 1 seconds
  switch costume to skeleton-d
  change y by 30
  wait 1 seconds
  change y by -30
  switch costume to skeleton-e
  wait 1 seconds
```

The image shows a Scratch script starting with a 'when clicked' event block. This is followed by a 'repeat' loop with a count of 4. Inside the loop, the sequence of blocks is: 'go to x: 92 y: -1', 'switch costume to skeleton-a', 'wait 1 seconds', 'switch costume to skeleton-b', 'wait 1 seconds', 'switch costume to skeleton-d', 'change y by 30', 'wait 1 seconds', 'change y by -30', 'switch costume to skeleton-e', and 'wait 1 seconds'. The script ends with a return arrow.

4) Now pick a sound to go with the dancing

```
when clicked
repeat 2
  play sound Dance Celebrate until done
```

The image shows a Scratch script starting with a 'when clicked' event block. This is followed by a 'repeat' loop with a count of 2. Inside the loop, there is a 'play sound Dance Celebrate until done' block. The script ends with a return arrow.

5) The student can also add background changes

```
when clicked
switch backdrop to Woods
repeat 2
  play sound Dance Celebrate until done
  next backdrop
```

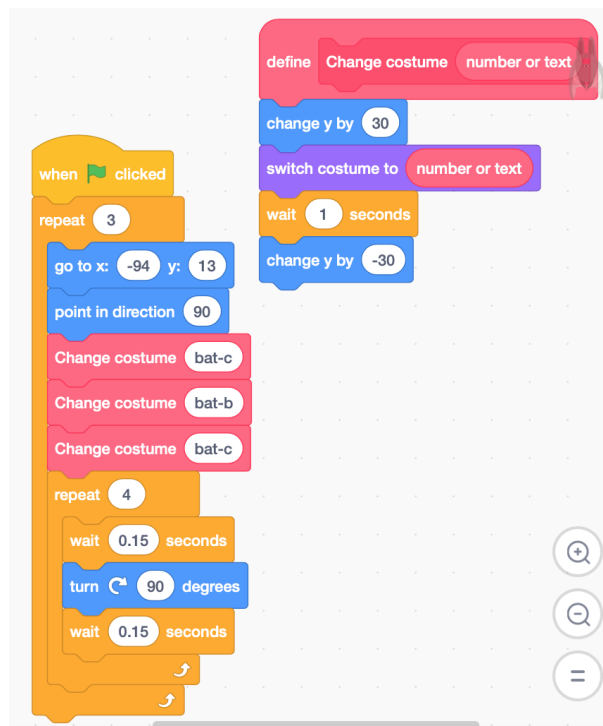
The image shows a Scratch script starting with a 'when clicked' event block. This is followed by a 'switch backdrop to Woods' block. Then, there is a 'repeat' loop with a count of 2. Inside the loop, the sequence of blocks is: 'play sound Dance Celebrate until done' and 'next backdrop'. The script ends with a return arrow.

6) Add another sprite



7) And on the new sprite, make the dance combination more complicated. By for example using nested loops and/or functions.

a) Review the concept of **functions**



If your student finishes early, you can:

- 1) Have them try adding more sprites
- 2) More animated objects to the scene
- 3) A story aspect where there is dialogue exchanged between sprites

Wrap-Up:

Have students come back 5-15 minutes before the end of the session and share their projects.