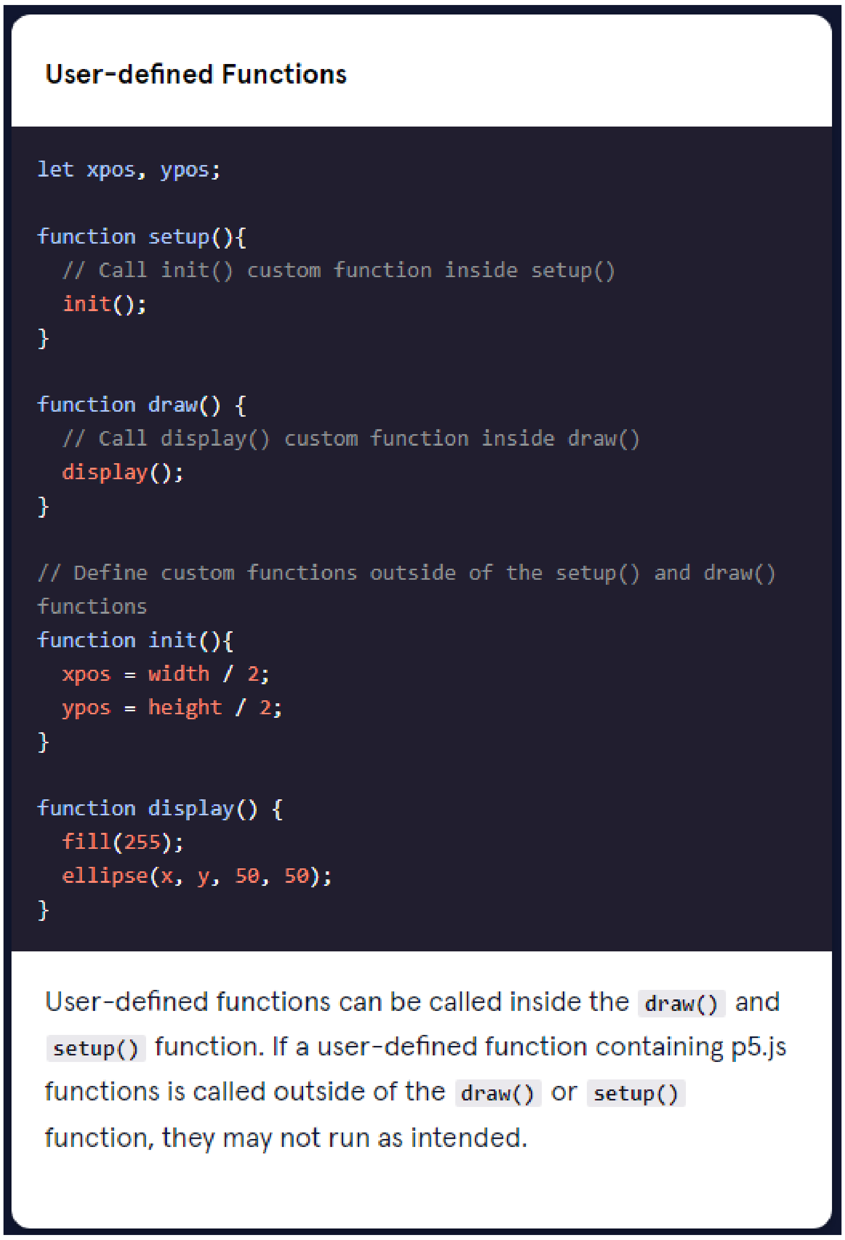
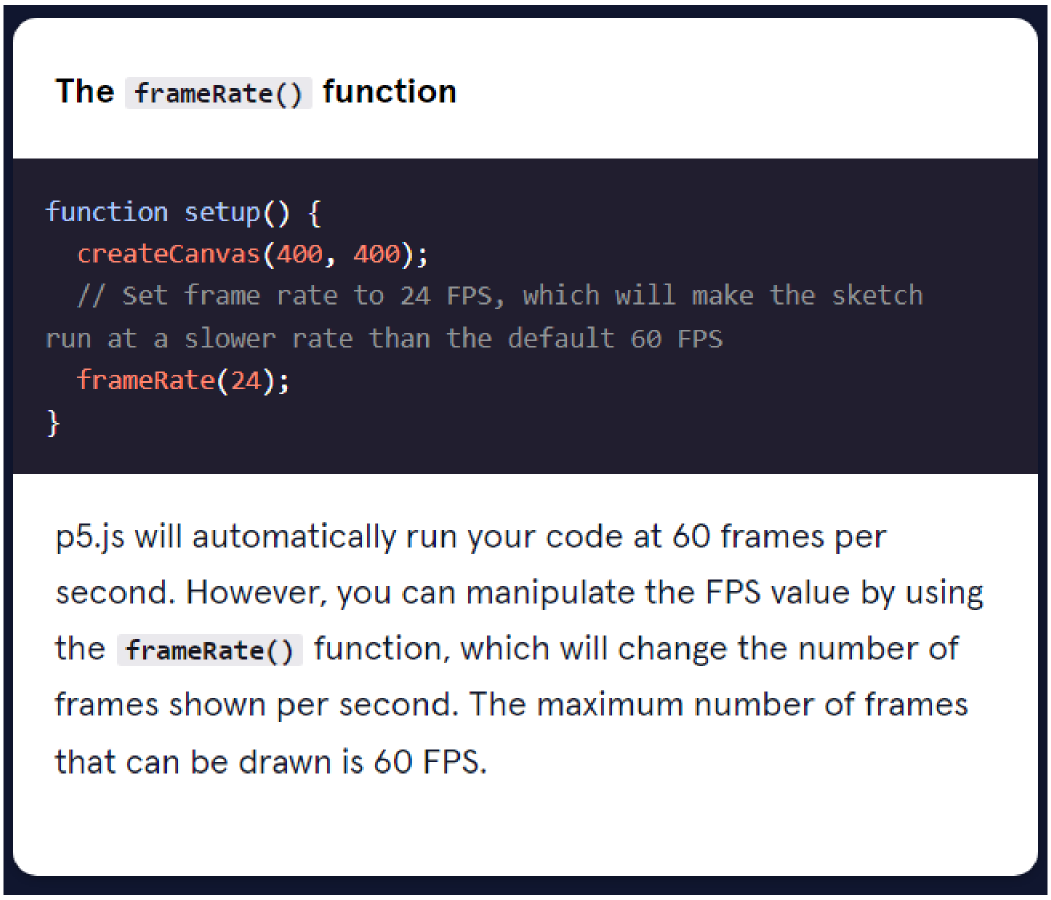
MODULE PRACTICE



User-defined Functions

```
let xpos, ypos;

function setup(){
  // Call init() custom function inside setup()
  init();
}

function draw() {
  // Call display() custom function inside draw()
  display();
}

// Define custom functions outside of the setup() and draw()
functions
function init(){
  xpos = width / 2;
  ypos = height / 2;
}

function display() {
  fill(255);
  ellipse(x, y, 50, 50);
}
```

User-defined functions can be called inside the `draw()` and `setup()` function. If a user-defined function containing p5.js functions is called outside of the `draw()` or `setup()` function, they may not run as intended.



The `frameRate()` function

```
function setup() {
  createCanvas(400, 400);
  // Set frame rate to 24 FPS, which will make the sketch run at a slower rate than the default 60 FPS
  frameRate(24);
}
```

p5.js will automatically run your code at 60 frames per second. However, you can manipulate the FPS value by using the `frameRate()` function, which will change the number of frames shown per second. The maximum number of frames that can be drawn is 60 FPS.

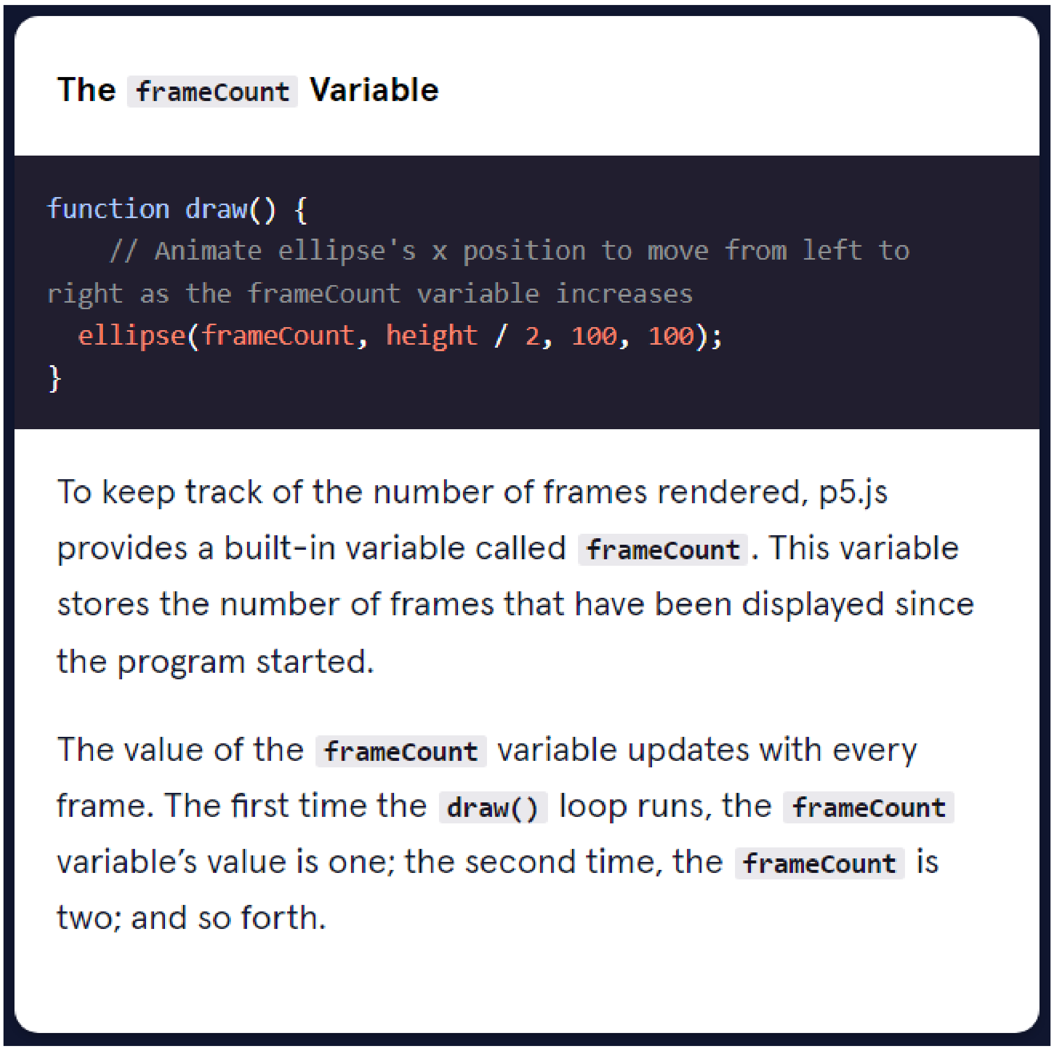
The `random()` Function

```
function draw(){
  // Generate a random value between 0 and width
  let randomX = random(width);
  // Generate a random value between 15 and 100
  let randomSize = random(15, 100);

  circle(randomX, height / 2, randomSize);
}
```

The `random()` function returns a random decimal value between 0 and 1.

When one numeric argument is given to the `random()` function, it returns a random decimal value between 0 and the value of the given argument.

When two numeric values are given as arguments, the function returns a random decimal value between the first argument and the second argument.



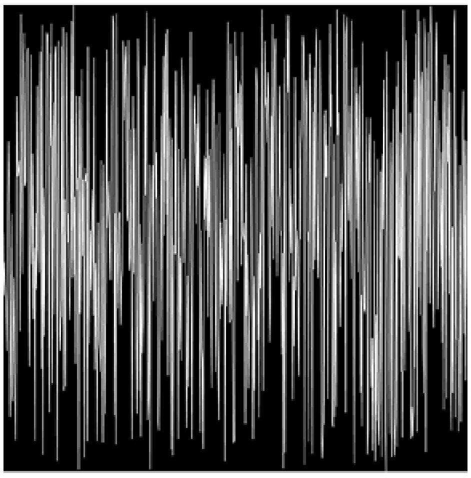
The `frameCount` Variable

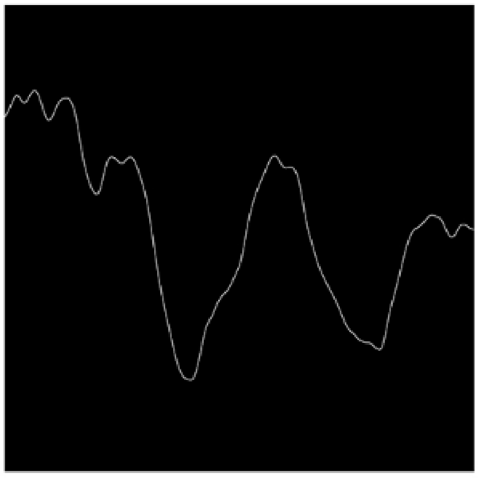
```
function draw() {
    // Animate ellipse's x position to move from left to
right as the frameCount variable increases
  ellipse(frameCount, height / 2, 100, 100);
}
```

To keep track of the number of frames rendered, p5.js provides a built-in variable called `frameCount`. This variable stores the number of frames that have been displayed since the program started.

The value of the `frameCount` variable updates with every frame. The first time the `draw()` loop runs, the `frameCount` variable’s value is one; the second time, the `frameCount` is two; and so forth.

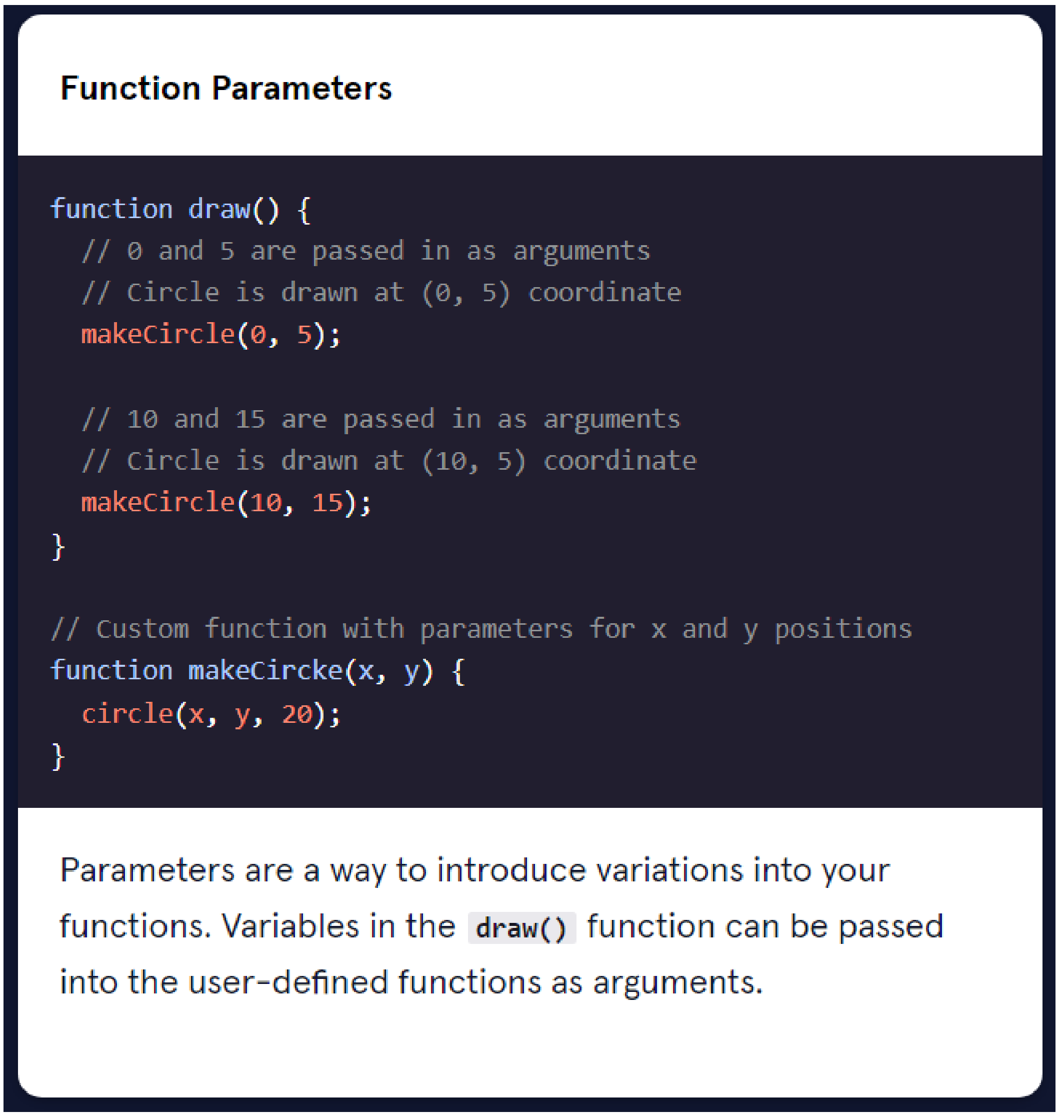
The `noise()` Function


Random


Noise

The `noise()` function returns a random decimal value between 0 and 1, based on Perlin noise.

Since the `noise()` function generates a naturally ordered sequence of random numbers, this function is useful for creating more natural random movements.



Function Parameters

```
function draw() {
  // 0 and 5 are passed in as arguments
  // Circle is drawn at (0, 5) coordinate
  makeCircle(0, 5);

  // 10 and 15 are passed in as arguments
  // Circle is drawn at (10, 5) coordinate
  makeCircle(10, 15);
}

// Custom function with parameters for x and y positions
function makeCircke(x, y) {
  circle(x, y, 20);
}
```

Parameters are a way to introduce variations into your functions. Variables in the `draw()` function can be passed into the user-defined functions as arguments.

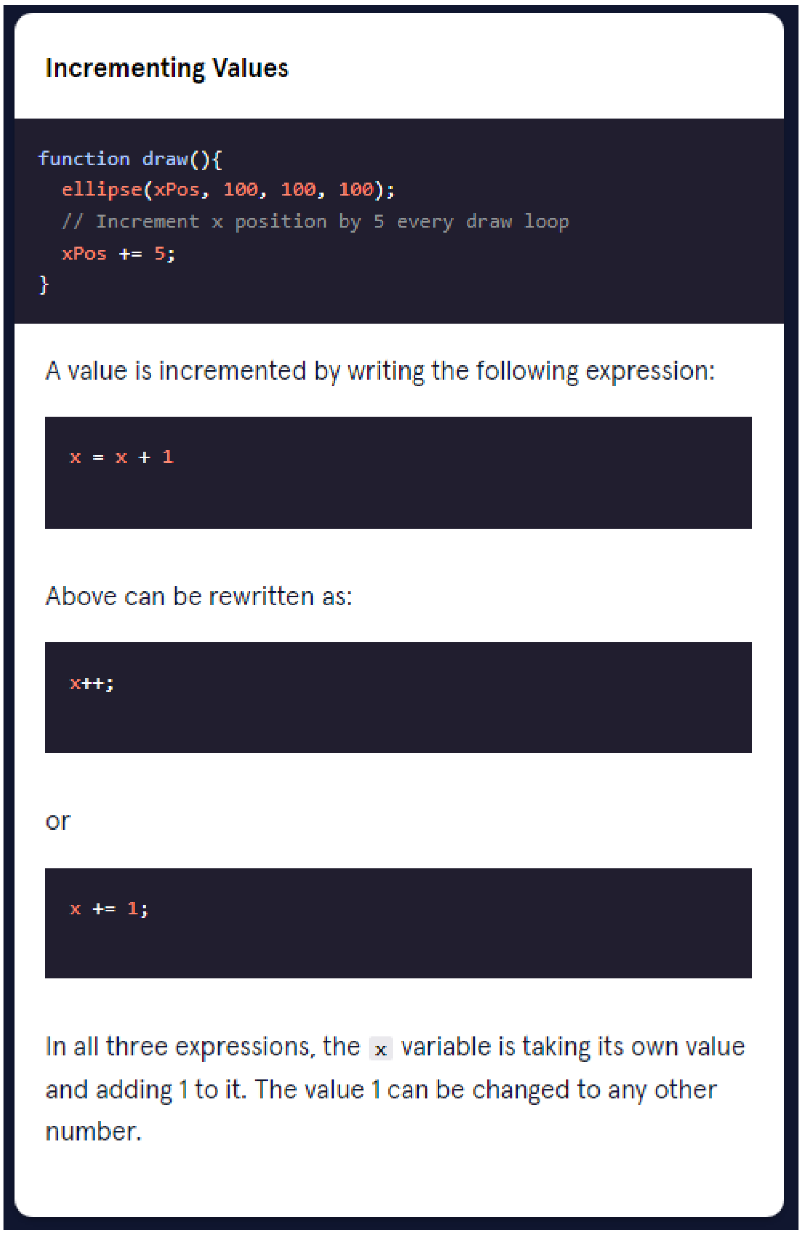
The `draw()` Function

```
function setup(){
  // Runs once at the start of the program
}
function draw(){
  // Loops infinitely after setup() is run
}
```

The `draw()` function is automatically called after the `setup()` function, which runs once at the program's start. The `draw()` loop infinitely runs the code block inside the function from top to bottom.

FPS

Frames Per Second (FPS) specifies the number of frames displayed every second. p5.js automatically runs the program at 60 frames per second. This means that the `draw()` function runs repeatedly 60 times per second.



Incrementing Values

```
function draw(){
  ellipse(xPos, 100, 100, 100);
  // Increment x position by 5 every draw loop
  xPos += 5;
}
```

A value is incremented by writing the following expression:

```
x = x + 1
```

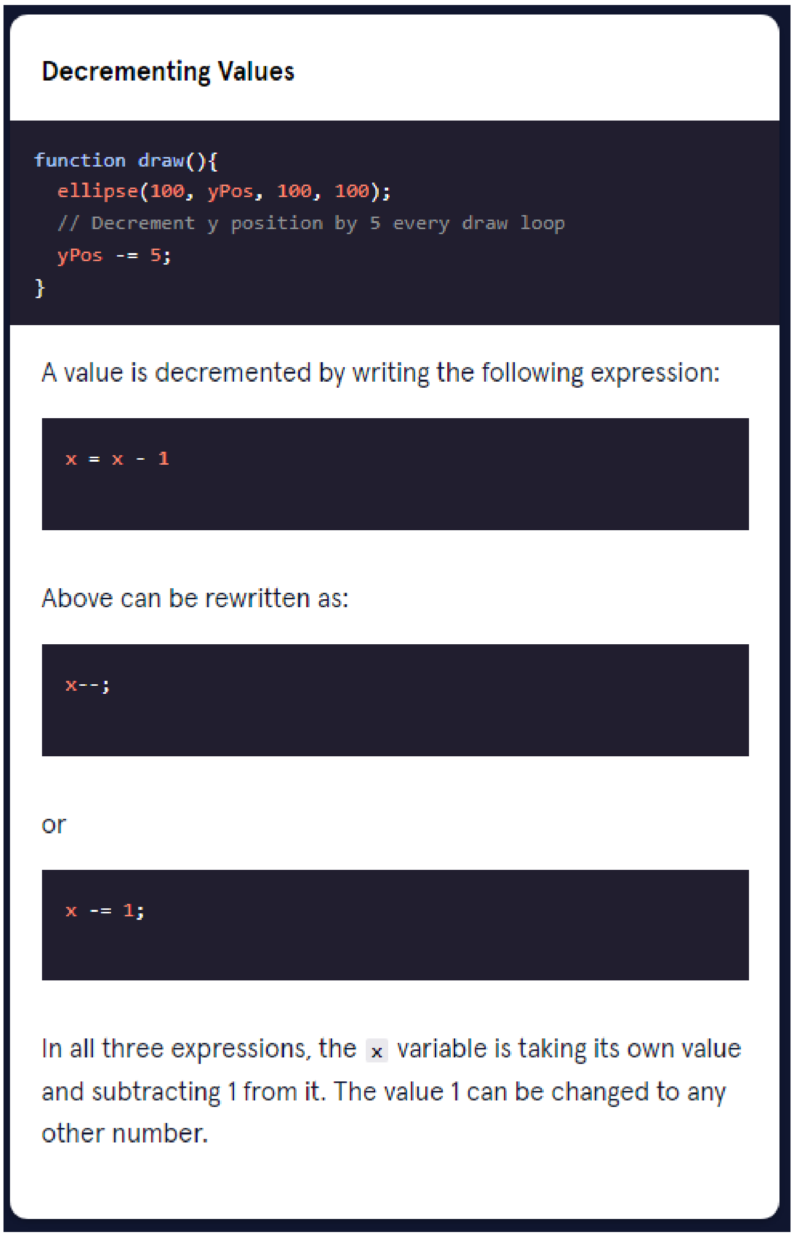
Above can be rewritten as:

```
x++;
```

or

```
x += 1;
```

In all three expressions, the `x` variable is taking its own value and adding 1 to it. The value 1 can be changed to any other number.



Decrementing Values

```
function draw(){
  ellipse(100, yPos, 100, 100);
  // Decrement y position by 5 every draw loop
  yPos -= 5;
}
```

A value is decremented by writing the following expression:

```
x = x - 1
```

Above can be rewritten as:

```
x--;
```

or

```
x -= 1;
```

In all three expressions, the `x` variable is taking its own value and subtracting 1 from it. The value 1 can be changed to any other number.