blue { shift }

Sound Input

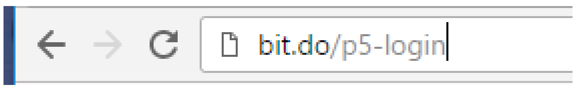
Overview: In this lesson we will be learning how to use the microphone to make our projects interactive! We will be discovering how to use map() to make our values useful, and make them control different aspects of our sprite such as size and location.

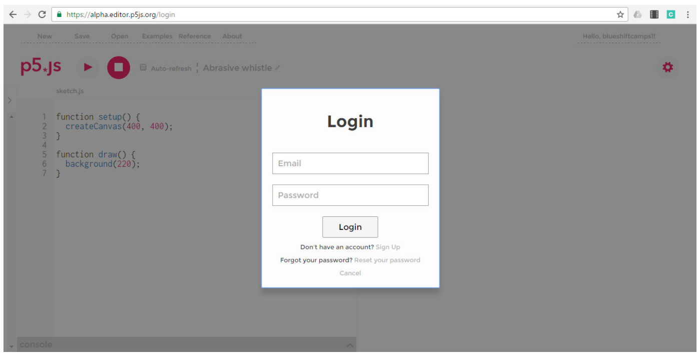
Step 1. Opening p5.js

To begin, open your browser and enter the following url:

bit.do/p5-login

This will take you to a website where you will add your login details given to you by your teacher.



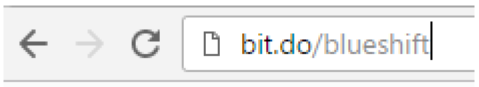


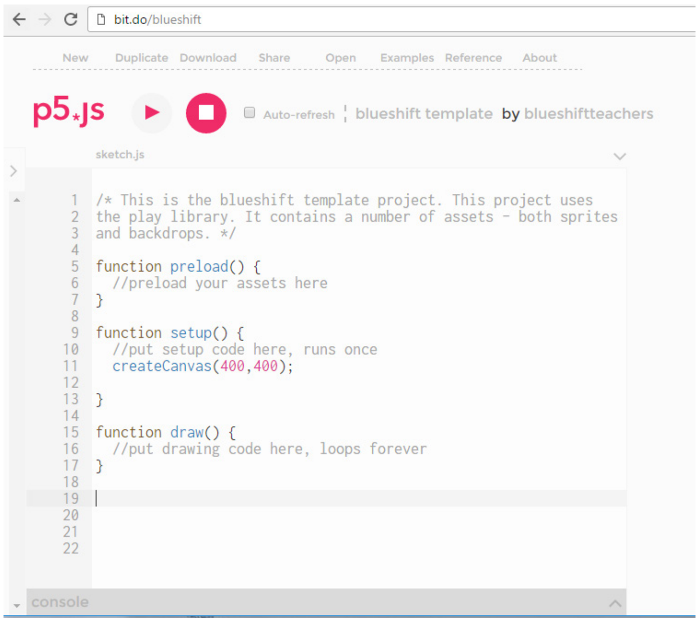
```
function setup() {
  createCanvas(400, 400);
}

function draw() {
  background(220);
}
```

Now that you are logged in, you need to go to the URL where the blueshift template is stored.

In your browser type:

bit.do/blueshift





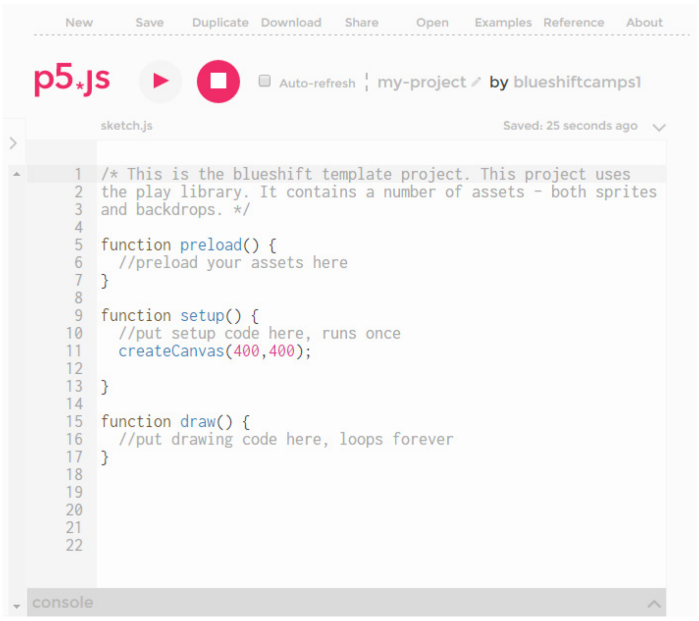
```
/* This is the blueshift template project. This project uses
the play library. It contains a number of assets - both sprites
and backdrops. */

function preload() {
  //preload your assets here
}

function setup() {
  //put setup code here, runs once
  createCanvas(400,400);

}

function draw() {
  //put drawing code here, loops forever
}
```

Now let's make a copy of this project by using the duplicate button, and rename it to something else!

Click the duplicate button:

Next click the edit button next to the name blueshift template:

Give it a name - whatever name you want!



```
/* This is the blueshift template project. This project uses
the play library. It contains a number of assets - both sprites
and backdrops. */

function preload() {
  //preload your assets here
}

function setup() {
  //put setup code here, runs once
  createCanvas(400,400);

}

function draw() {
  //put drawing code here, loops forever
}
```

Step 2. Let's get coding, make some variables

You should be familiar with the template code - it has three functions - `preload()`, `setup()` and `draw()`.

Let's start our code by creating some variables. At the **very start** of your code add the following:

```
var spr;
var sprImg;
var bgImg;
var mic;
```

The first three variables should be familiar - these are our sprite and image variables. The `mic` variable is new - this is where we will store the value of our microphone loudness!

Step 3. Load the images!

Now let's load some images in our `preload()` function! Make `preload()` look like this:

```
function preload() {
  //preload your assets here
  sprImg = loadImage('sprites/fox1.png');
  bgImg = loadImage('backgrounds/bg2.png');
}
```

Notice how we are using the .png files that are in our assets folders?

Step 4. Add some code to set everything up!

Now let's set everything up in `setup()`:

```
function setup() {
  //put setup code here, runs once
  createCanvas(400,400);
  spr = createSprite(200,200);
  spr.addImage(sprImg);
  mic = new p5.AudioIn();
  mic.start();
}
```

We are creating a sprite named `spr` at the coordinates `200, 200` and are adding `sprImg` - fox1.png - to the sprite. We are also making a new `p5.AudioIn()` object named `mic`. This will allow us to use your computer's microphone to control what happens in our project!

Step 5. Let's get drawing!

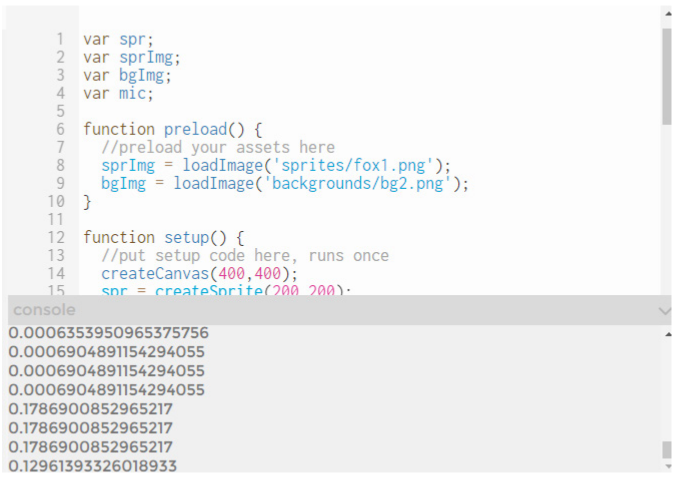
Make your draw() loop look like this:

```
function draw() {
  //put drawing code here, loops forever
  background(bgImg);

  var micLevel = mic.getLevel();
  console.log(micLevel);


  drawSprites();
}
```

Here we are setting our background image - because it is in `draw()` it will keep drawing to the screen so will not leave a trail behind when the sprite moves!

We are declaring a variable - `micLevel` - this is the loudness of the microphone. We are then printing this to the console so that we can see the values of `micLevel`!

Click on the console to view the numbers coming in. You might have to give your browser permission to use the microphone first!



```
var spr;
var sprImg;
var bgImg;
var mic;

function preload() {
  //preload your assets here
  sprImg = loadImage('sprites/fox1.png');
  bgImg = loadImage('backgrounds/bg2.png');
}

function setup() {
  //put setup code here, runs once
  createCanvas(400,400);
  spr = createSprite(200,200);
```

```
0.0006353950965375756
0.0006904891154294055
0.0006904891154294055
0.0006904891154294055
0.1786900852965217
0.1786900852965217
0.1786900852965217
0.12961393326018933
```

You can see that the number is very small, and not very useful to us. We want to move the sprite up and down the screen - from the bottom, which is about y = 300, to the top about y = 100. To do this we have to map our values from one range to another. Add the code below under the line `console.log(micLevel);`

```
  var y = map(micLevel,0,0.3,300,100);
  spr.position.y = y;
```

We are mapping the `micLevel` range to the range we need it to be useful. Then we are using this new mapped value to set the y position of our sprite. Press the run button and see what happens!

Step 6. Map another value

Let's change the size of the sprite depending on the microphone level! We want to scale the sprite from about half size (0.5) when it is quiet (0) to three times its size (3) when it is loud (0.3). Add the following lines of code below the last lines you entered:

```
  var size = map(micLevel,0,0.3,0.5,3);
  spr.scale = size;
```

Step 7. Change the sprite and the background

Let's use different images for our sprite and our background! In `preload()` change the name of the files to another file that is in the sprites and backgrounds folders. For example:

```
sprImg = loadImage(“sprites/bear1.png”);
bgImg = loadImage(“backgrounds/bg1.png”);
```

Step 8. Challenge

Add the following if statement inside your `draw()` loop.

```
  if(keyDown(“x”)) {
    tint(255,200,50);
  }
  else {
    tint(255,100,255);
  }
```

Change all of the numbers in `tint();` to any between 0 and 255. What happens?

For example, change one of them to `tint(255,0,0);` and the other to `tint(0,255,0);`

Step 9. Your final code

```
var spr;
var sprImg;
var bgImg;
var mic;

function preload() {
  //preload your assets here
  sprImg = loadImage('sprites/fox1.png');
  bgImg = loadImage('backgrounds/bg2.png');
}

function setup() {
  //put setup code here, runs once
  createCanvas(400,400);
  spr = createSprite(200,200);
  spr.addImage(sprImg);
  mic = new p5.AudioIn();
  mic.start();
}

function draw() {
  //put drawing code here, loops forever
  background(bgImg);

  var micLevel = mic.getLevel();
  console.log(micLevel);

  var y = map(micLevel,0,0.3,300,100);
  spr.position.y = y;

  var size = map(micLevel,0,0.3,0.5,3);
  spr.scale = size;

  if(keyDown("x")) {
        tint(255,200,50);
  }
  else {
    tint(255,100,255);
  }

  drawSprites();
}
```