Drawing with Sprites

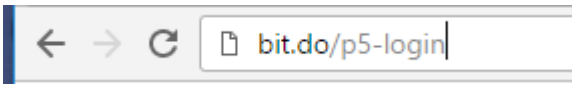
Overview: In this lesson we will be learning to use p5.js and addon library - p5.play. These are JavaScript libraries that we can use to make fun games and animations on the web! In this lesson we will be learning how to log in, start from a template and write some code to make a drawing!

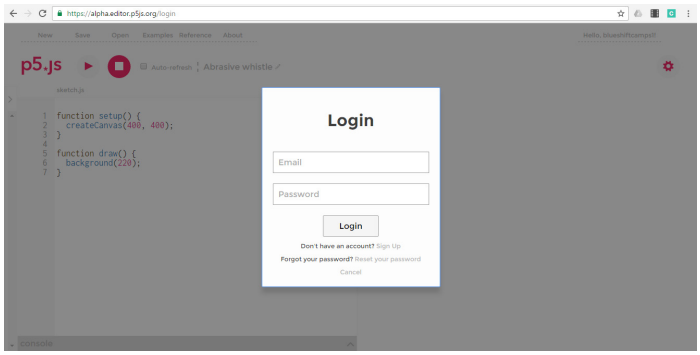
Step 1. Opening p5.js

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.

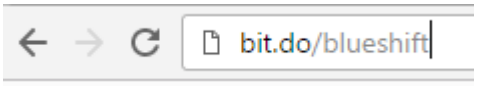




Now that you are logged in, you need to go to the URL where the blueshift template is stored.

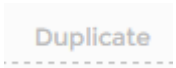
In your browser type the following:

bit.do/blueshift



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:

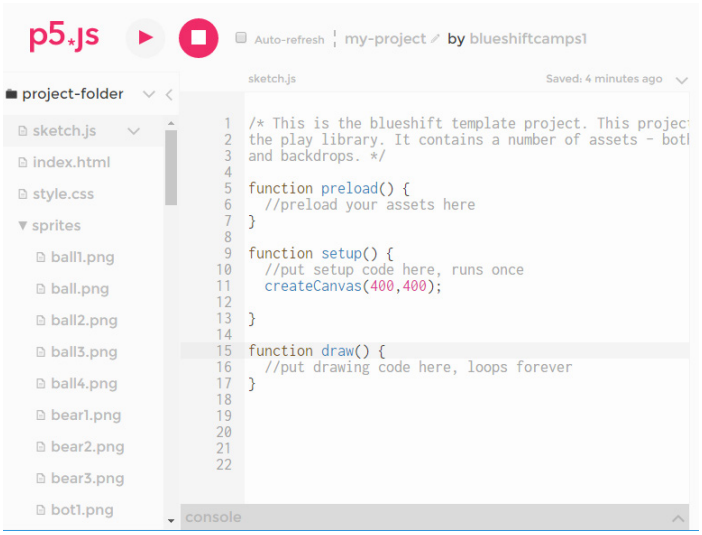
Give it a name - whatever name you want!

Take a look around. Click on the arrow down the left side of the window.

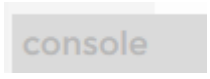
Here you can see all the files that we use to make our projects. We will be writing our code in the **sketch.js** file.

You will see there are **.html** and **.css** files - these are files that build and style the webpage around our project. We won't be changing these.

You will also see two folders with lots of different **.png** files - these are our sprite and background pictures that we will be using in our code later!

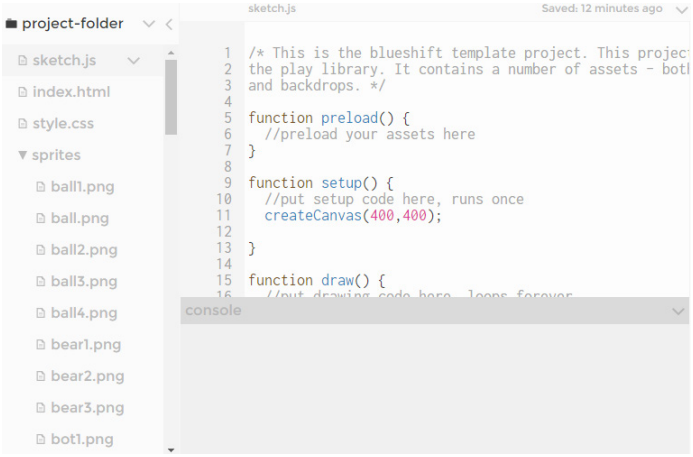


On the bottom of our code window you will see a console tab.



Click the arrow on the right hand side of this bar.

This is where we can read errors when we put our code in wrong. This gives us information to help us debug our code! The console is blank right now because there are no errors.



Step 2. Let's get coding!

Take a look at your code so far, it should look like this:

```
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
  drawSprites();
}
```

// - comments, these don't run, but give us information about the code!

`function preload()` – we will put code inside here that loads our sprite and backdrop images!

`function setup()` – we will put code inside here that only needs to run once, at the very start of the program. It already has some code - `createCanvas(400,400);` – this makes a canvas 400 by 400 pixels for us to use for our project.

`function draw()` - we will put code inside here that will continue forever - it is a forever loop! At the moment there is one line of code - `drawSprites();`- this line will draw sprites to the canvas continuously.

Step 3. Let's make a new sprite and backdrop!

Now we want to make a sprite and a backdrop. To do this we need to create variables to store our sprite, the sprite image and the backdrop.

At the **very** start of the code, before `preload()` type this:

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

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

```
function preload() {
  //preload your assets here
  sprImg = loadImage("sprites/bot2.png");
  bgImg = loadImage("backgrounds/bg4.png");
}
```

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

Now make the sprite and backdrop in `setup()`, and use the images we just loaded!

```
function setup() {
  //put setup code here, runs once
  createCanvas(400, 400);
  spr = createSprite(200, 200);
  spr.addImage(sprImg);
  background(bgImg);
}
```

We are creating a sprite named `spr` at the coordinates `200, 200` this means it will be right in the middle! We are adding `sprImg` - bot2.png - to the sprite, and setting the background to `bgImg` - bg4.png.

Press the run button to see your code in action!

You should now see a christmas background with a robot right in the middle!

Step 4. 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");
```

You will be given a list of the files you can change to.

Once you have changed your images press the run button. Try a few different images until you are happy with it. Your teacher will give you a set amount of time to do this.

Step 5. Changing the sprite's location

Let's change the location of the sprite, so that it matches our mouse pointer. In `draw()` add these lines above the line `drawSprites();`

```
  spr.position.x = mouseX;
  spr.position.y = mouseY;
```

Press the run button to see your code in action!

You should now be able to draw with your sprite using your mouse!

Step 6. Clear the background

The reason the sprite is drawn to the screen is because the background is only drawn once in setup(). To clear the drawings on the screen we need to redraw the background again. Let's do this when the mouse is clicked!

Add this code to your `draw()` loop, above the line `drawSprites();`

```
if (mouseIsPressed)
 {
   background(bgImg);
 }
```

Now when you click your mouse the background should redraw!

Step 7. Make the sprite change size when you press the arrow keys!

Add the following code to your `draw()` loop

```
if (keyIsDown(UP_ARROW))
  {
    spr.scale += 0.01;
  }

  if (keyIsDown(DOWN_ARROW))
  {
    spr.scale -= 0.01;
  }
```

This code will make the sprite get bigger if the UP ARROW is pressed and smaller if the DOWN ARROW is pressed!

Step 8. Challenge

The following line makes the sprite rotate, can you put it in the correct place in the code so that your sprite rotates if the mouse key is pressed?

```
spr.rotation += 5;
```

Hint > Your sprite should rotate when your background is cleared!

- » Can you rotate the sprite faster?
- » Can you rotate the sprite in the other direction?

Step 9. Your final code

```
function preload() {
  //preload your assets here
  sprImg = loadImage(“sprites/fox1.png”);
  bgImg = loadImage(“backgrounds/bg5.png”);
}

function setup() {
  //put setup code here, runs once
  createCanvas(400, 400);
  spr = createSprite(width/2, height/2);
  spr.addImage(sprImg);
  background(bgImg);
}

function draw() {
  //put drawing code here, loops forever
  spr.position.x = mouseX;
  spr.position.y = mouseY;
  if (mouseIsPressed)
  {
    background(bgImg);
    spr.rotation += 5;
  }

  if (keyIsDown(UP_ARROW))
  {
    spr.scale += 0.01;
  }

  if (keyIsDown(DOWN_ARROW))
  {
    spr.scale -= 0.01;
  }
  drawSprites();
}
```