2.2 Drawing With Code

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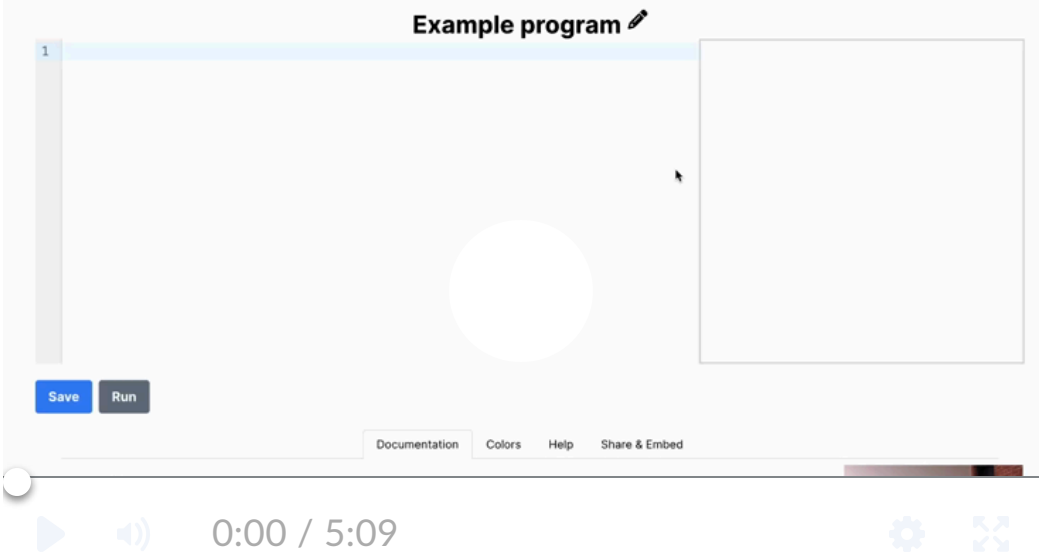
Introducing Drawing With Code. In this video, you'll learn the basics of drawing with code using JavaScript, specifically focusing on how to use the `ellipse()` function to create shapes on a digital canvas. The instructor walks through building a simple smiley face step-by-step, explaining how each part of the code affects the drawing. You'll see how to position and size shapes by adjusting parameters like x and y coordinates, width, and height. You'll also learn how the coordinate system works in this environment, where (0, 0) starts at the top-left corner of the canvas.

By the end of the video, you'll understand how to draw using the `ellipse()` function, how to tweak shapes using numbers (called parameters), and how to build up a complete drawing—like a smiley face—by combining multiple shapes in the right positions. This video is a great first step in learning how code and art can work together.



Example: X,Y Coordinates. When you're working with the canvas, it's important to understand how the x and y values work. The x value is the horizontal position, and the y value is the vertical position.

Note that the canvas is 400 pixels wide and 400 pixels tall, with the origin (0, 0) at the top left corner. Try moving your mouse around the canvas below to see what the x and y values are at different points.

```
draw = function () {
  background(255, 255, 255);

  fill(255, 0, 0);
  textSize(20);
```

```
  text("X: " + mouseX, 200, 200);
  text("Y: " + mouseY, 200, 220);
};

```

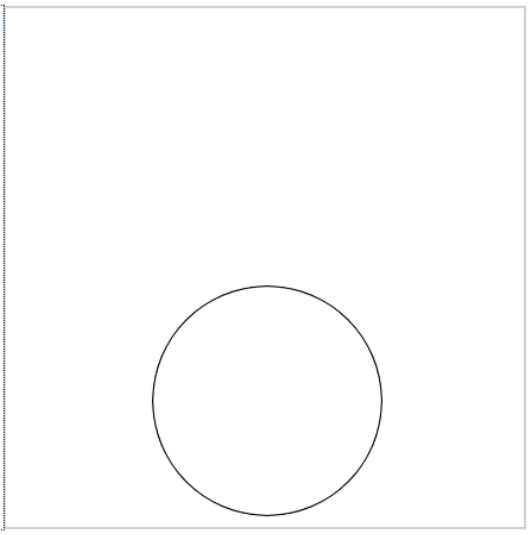
X: 84
Y: 128

(https://trycodelab.com/lessons/03.1-Drawing-and-Animation/02-read-canvas-values.md)

Coding Practice: Simple Snowman. Time to practice your coding skills! Click the image below to go to Code Lab and follow the steps to draw a simple snowman.

In this challenge, you'll draw a snowman using the ellipse() command. Start off by making a circle, for the bottom of the snowman, with an ellipse() command. This should be the first ellipse() command in your program.

```
ellipse(200,300,175,175);
```



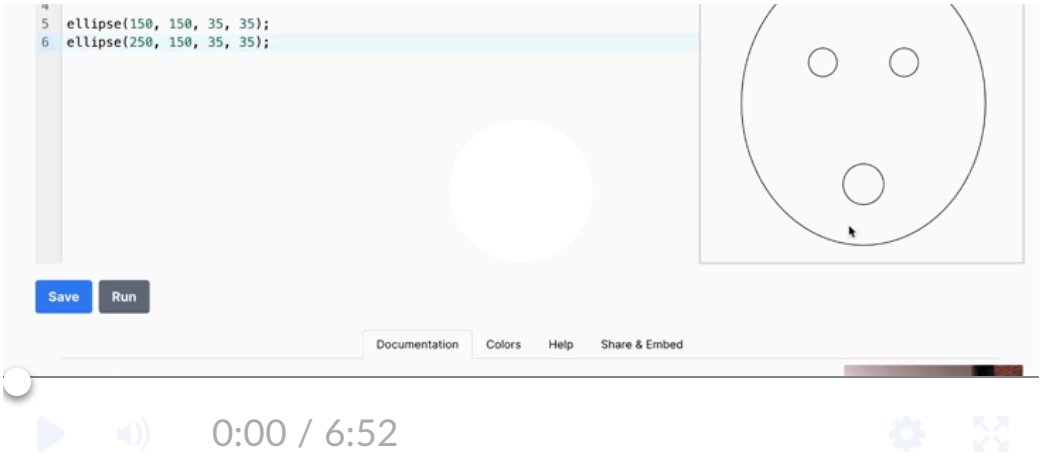
(https://trycodelab.com/lessons/03.1-Drawing-and-Animation/03-challenge-simple-snowman.md)

Learning More About Drawing. This next video builds on earlier lessons by showing how to enhance and organize your code using **comments**, while also exploring **new shapes** beyond ellipses. The instructor begins by cleaning up a "shocked smiley face" into a friendlier version, demonstrating how to label each shape with comments using `//` so it's easier to understand later. You'll learn how to adjust parameters like width and height to reshape the smile, and how commenting out lines helps identify or isolate shapes. The video then introduces the `rect` (rectangle) function and explains the key difference from `ellipse`: while ellipses are centered on their x/y values, rectangles start from the top-left corner. After turning the smiley into a robot-like face using rectangles, the lesson introduces the `line` function to draw a "unibrow" and explains how its parameters define the start and end points of a line. It ends with a helpful reminder that the **order of drawing commands matters**—later shapes can cover earlier ones, which is important to consider when designing your scene.

Example program

```
ellipse(200, 200, 300, 350);

ellipse(200, 300, 50, 50);
```



Coding Practice: Waving Snowman. Time for another coding challenge - the waving snowman. Click the image to do the challenge.

(https://trycodelab.com/lessons/03.1-Drawing-and-Animation/05-challenge-waving-snowman.md)

Coding With Color. Color is a powerful tool in design, and in this lesson, you'll learn how to bring your drawings to life by adding color with code. Starting with the background, you'll explore how to use the `background()` function and understand how colors are represented on the screen using RGB values—combinations of red, green, and blue light. You'll see how to mix these values to create different shades and learn about helpful tools like the RGB color picker. The video then introduces the `fill()` function for adding color to shapes like ellipses and rectangles, and shows how fill settings affect all subsequent shapes unless changed. You'll also learn how to customize outlines using `stroke()` and `strokeWeight()`, and how to remove them

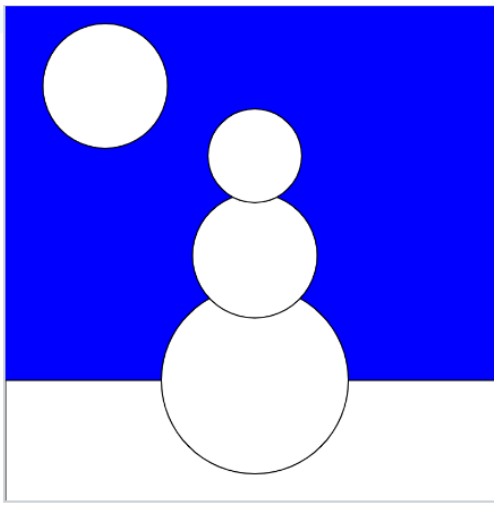
with `noStroke()`. By the end, you'll be able to control both the color and appearance of shapes on the canvas, creating more expressive and polished drawings.

Coding Practice: Sunny Snowy Day. Time to try out color by coloring the scene for the snowman. Click on the image below to do the challenge in Code Lab.

```
background(0,0,255)// The ground
rect(0, 300, 400, 100);

// The sun
ellipse(80, 64, 100, 100);

// The snowman
ellipse(200, 300, 150, 150);
ellipse(200, 200, 100, 100);
ellipse(200, 120, 75, 75);
```



(https://trycodelab.com/lessons/03.2-Color,-Fill-and-Background/03-challenge-sunny-snowy-day.md)

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