Let’s make HTML5 & JavaScript Games!

credit: w3.org

HTML is a markup language

- Markup languages are code-based annotation systems
- HTML is the backbone of every website

idiosyncratic power. Brown and Duguid's contribution has given
studies, ~~still relatively little developed,~~ that seek to understand
situated activity.

The assumptions on which innovation may be considered as a con
situated in work practices are the following:

- Knowledge is produced through participation in a set of practice
- Participation in work practices leads to the development of a col
- Participation in a practice entails legitimate participation in the ne
  meanings of those practices and the ethical and aesthetic criteri

HTML is made of elements

opening tag

attribute

closing tag

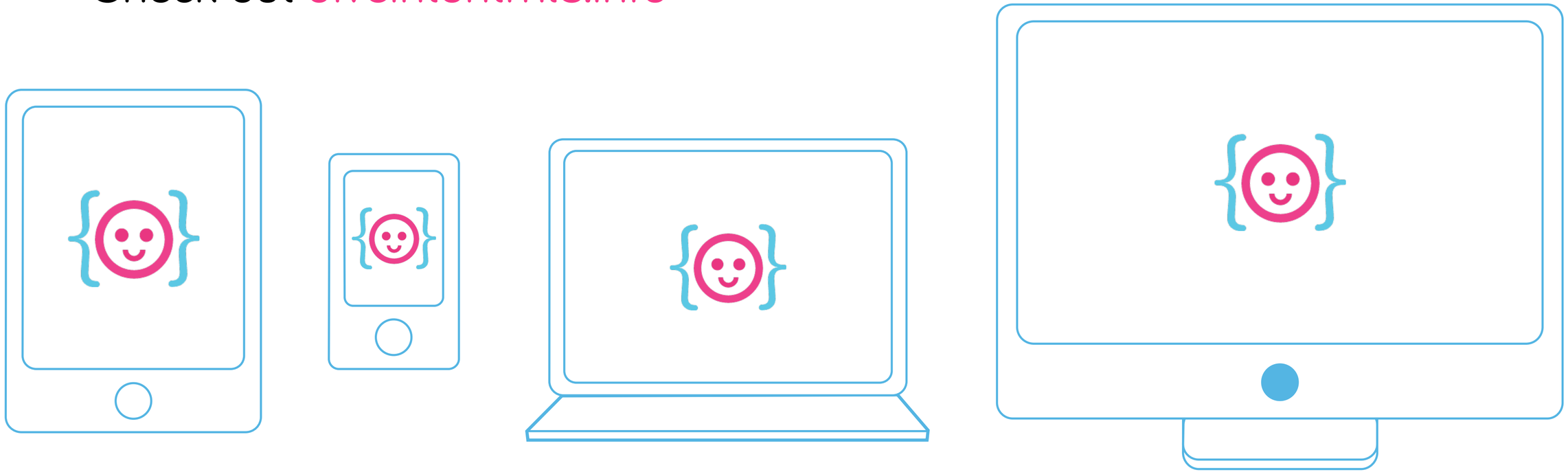
```
<section id="box">HTML is very easy to use!</section>
```

element

HTML is very
easy to use!

HTML5 is new & dynamic

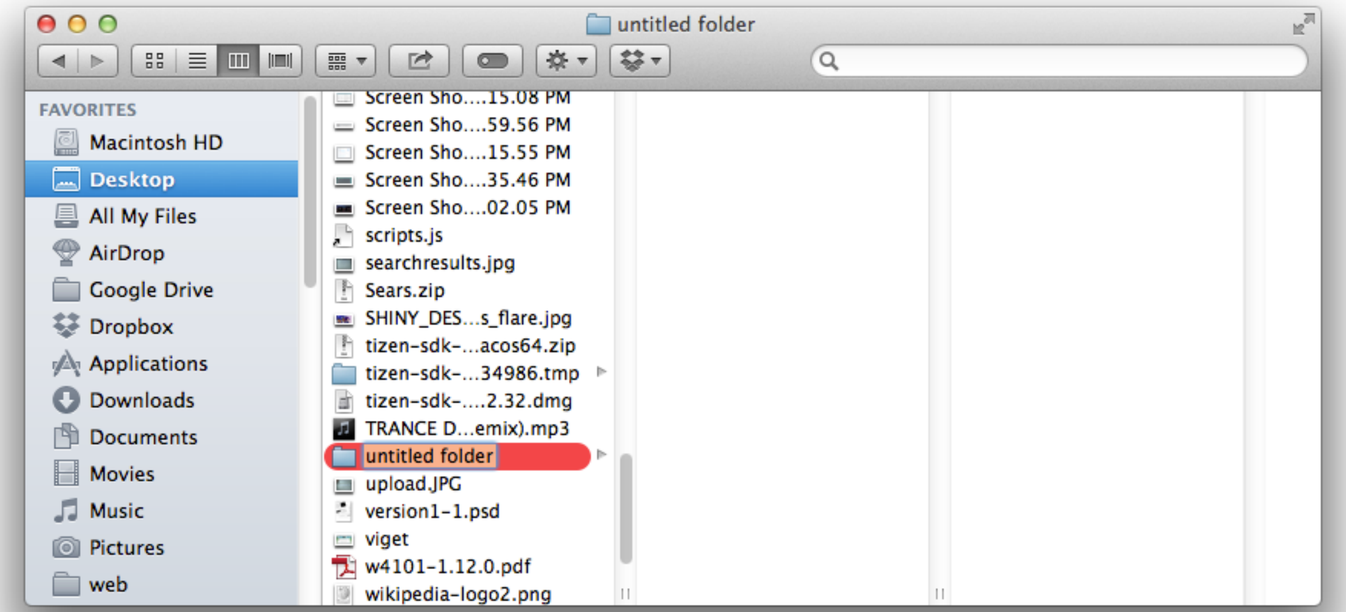
- HTML5 was designed for all of today's internet-capable devices
- Includes new tags for more types of content
- Check out diveintohtml5.info



Let’s make a simple HTML5 page

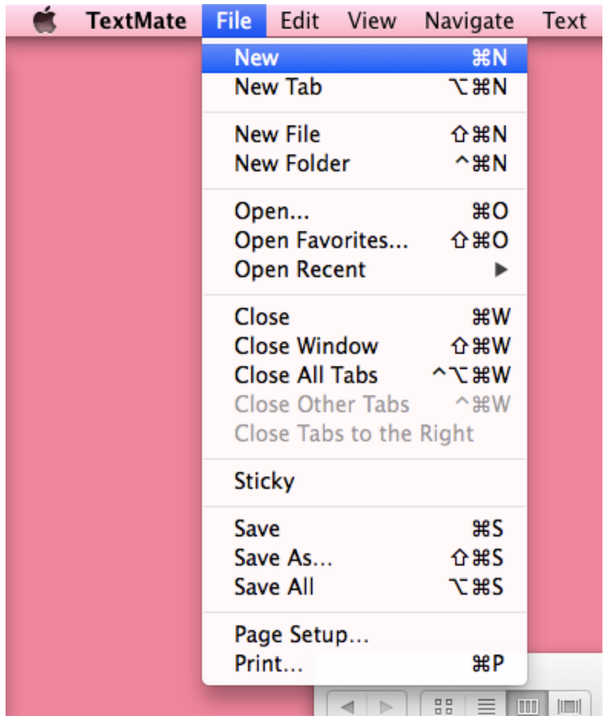
credit: The Matrix

Create a folder to work in



Name your folder CLF-html5-game

Create a new file in your text editor



Save it as index.html in your folder

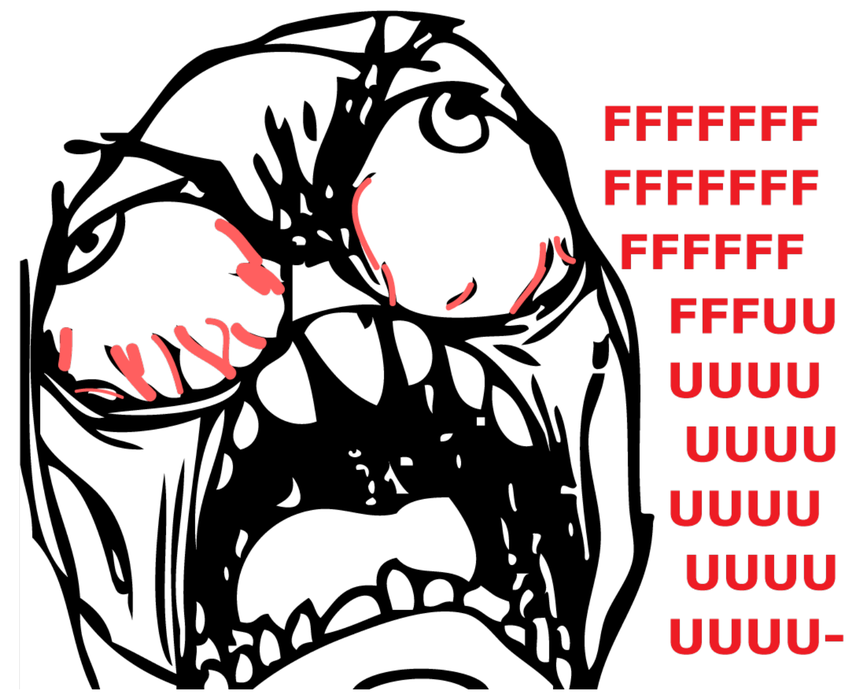
Components of an HTML5 page

- <!DOCTYPE html>: tells the browser it is looking at an HTML5 page
- <html>: begins the HTML code
  - <head>: the area where meta information will be located
    - <meta charset="utf-8">: the character encoding you want to use
    - <title>: the website title
  - <body>: the part of the page where we will be working!

Comment your code

5 minutes after you write code
without comments

When you come back to it
in 3 weeks



Commenting code is easy

- Preface your comment with < , a bang and two dashes (<!--)
- End it with two dashes and > (-->)
- Most text editors have shortcuts (like + /)

index.html

```
1  <!DOCTYPE html>
2  <html>
3  ▼   <head>
4      <meta charset="utf-8">
5      <title>My cool HTML5 game</title>
6  ▲   </head>
7  ▼   <body>
8      <!-- This is a comment -->
9      This isn't a comment!
10 ▲   </body>
11 </html>
```

The canvas element

credit: thesilverpen.com

What is it?

A canvas is a rectangle in your page where you can use JavaScript to draw anything you want.

credit: Nintendo

credit: Photon Storm

Create a <canvas> element

index.html

```html
<!DOCTYPE html>
<html>
   <head>
      <meta charset="utf-8">
      <title>My cool HTML5 game</title>
   </head>
   <body>
      <canvas id="myCanvas">Canvas not supported</canvas>
   </body>
</html>
```

Line: 9:9 | HTML | Tab Size: 3 | ID: myCanvas

Draw on the canvas with JavaScript

credit: Jandi Small

Variables

- Variables are useful for storing data that may change throughout the course of your app (e.g. your player's health, location)
- To create a variable, you have to tell JavaScript:
  - The name you're going to refer to it by
  - The value (information) that the variable contains

Variables

- Variables let you refer to the same information many times
- If you need to change that information, you only have to do it once

For example, best friends may change but the label stays the same:

```
var myBestFriend = “Isaiah”;
var myBestFriend = “Rebecca”;
var myBestFriend = “Aileen”;
```

Functions

- Function: a named section of a program that does a specific task
  - Wraps up code in an easy-to-reference way
  - Parameter: additional information you can give the function to change the output

Function structure

```
var fetch = function (dog) {
    run to the ball;
    pick up the ball;
    bring the ball back;
};
```

- Name of the function
- Parentheses: Hold any modifiers (also known as arguments)
- Brackets: What to do in the function
- Semicolon: end of line, move onto the next thing

Setting up the canvas

- document: refers to the HTML document the JavaScript is linked in
- getElementById: a native JavaScript function that looks for an ID attribute on the HTML document
- getContext: tells JavaScript whether we will make a 2d or 3d drawing
    - The d must be lowercase
- myCanvas.width: the width of our canvas
- myCanvas.height: the height of our canvas

Calculations

+ (add)

− (subtract)

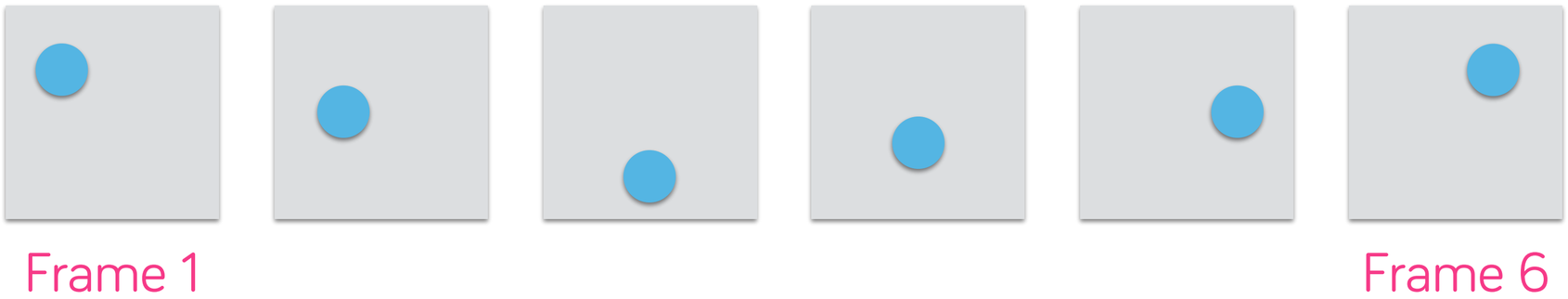
* (multiply)

/ (divide)

```
var addition = 13 + 22;
var division = 100/15;
```

Like a flipbook, the canvas animates with frames

Frames



Framerate and intervals

```
setInterval(function() {
    do stuff;
}, 1000);
```

- setInterval(): a native JavaScript function that runs a set of code once per set amount of time
    - JavaScript thinks of time in milliseconds
    - 1 second = 1000 milliseconds
- How do we get our canvas to redraw at 60 times in one second?

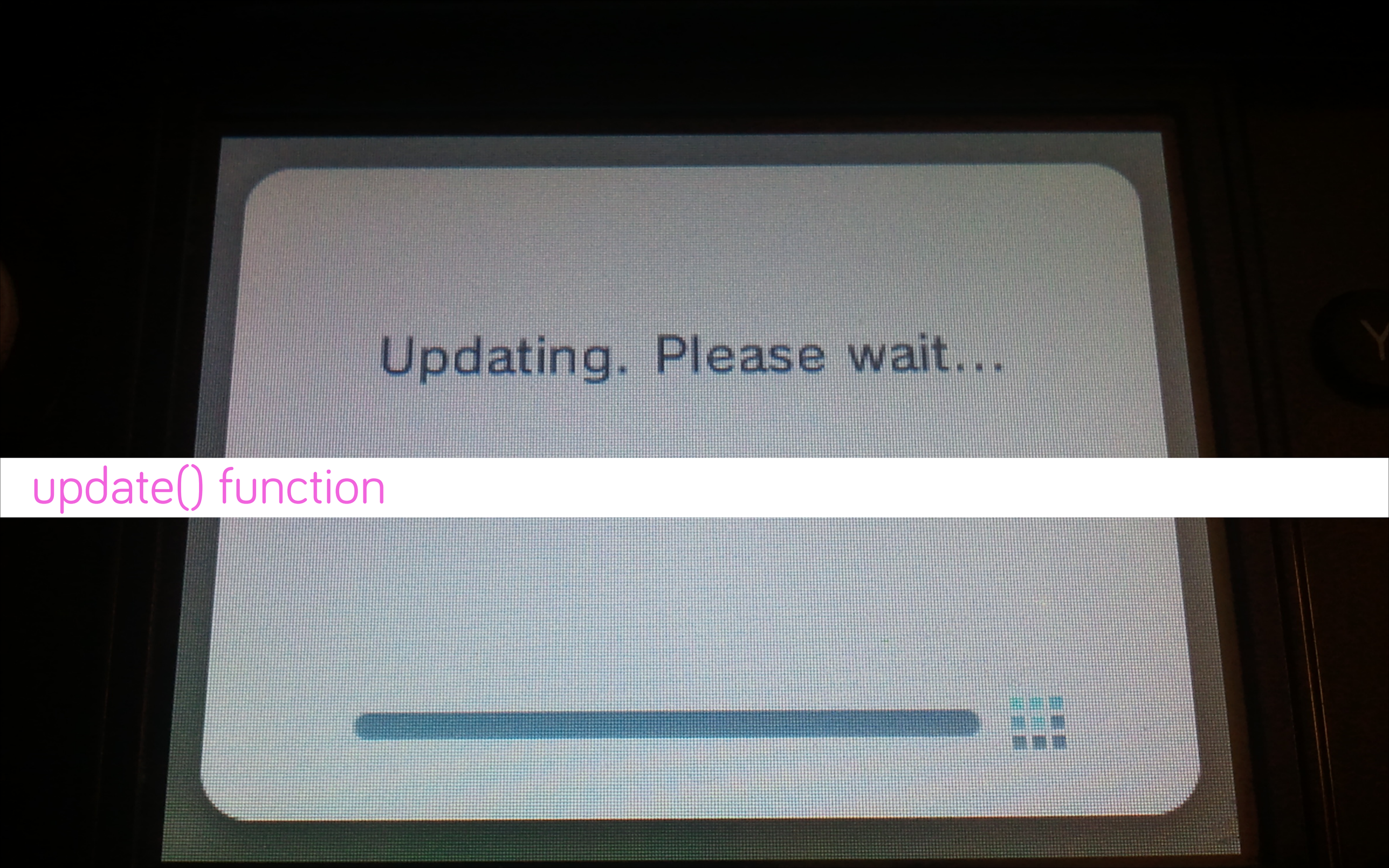
Framerate and intervals

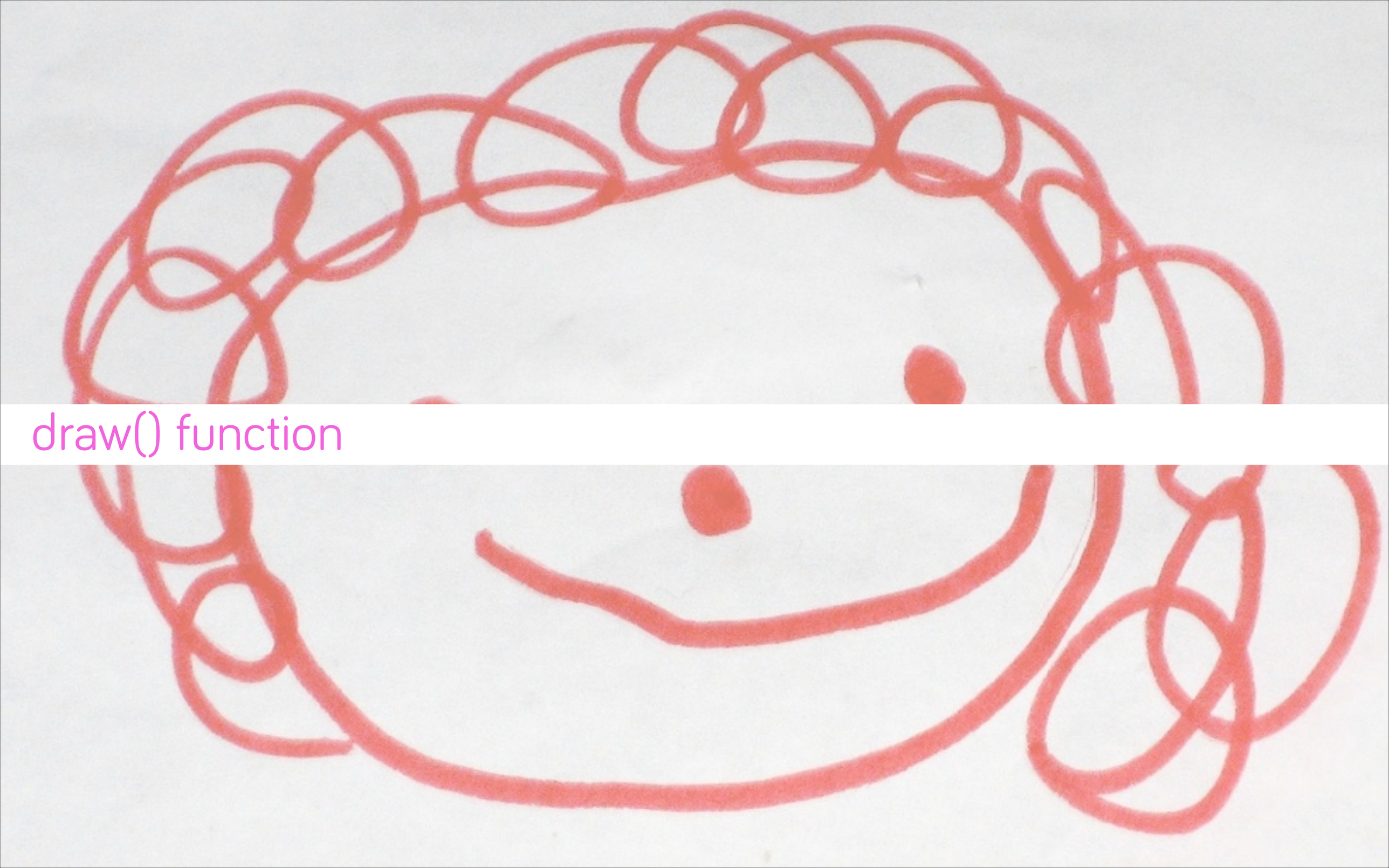
- How do we get our canvas to redraw at 60 times in one second?

1000/60

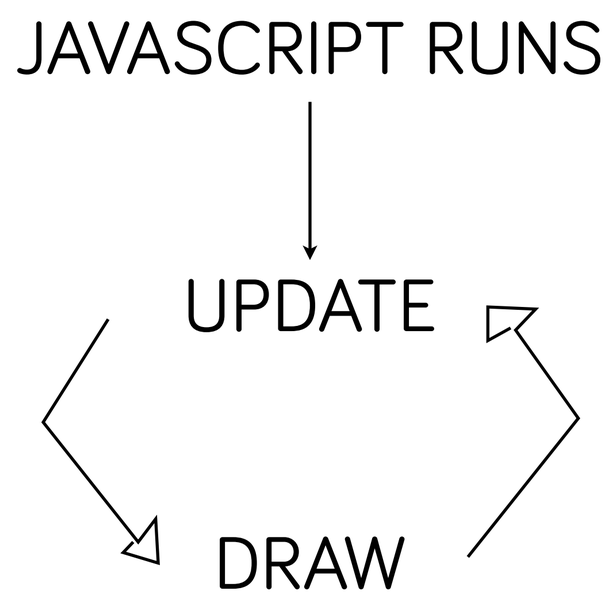
```
setInterval(function() {
    do stuff;
}, 1000/60);
```

update() function



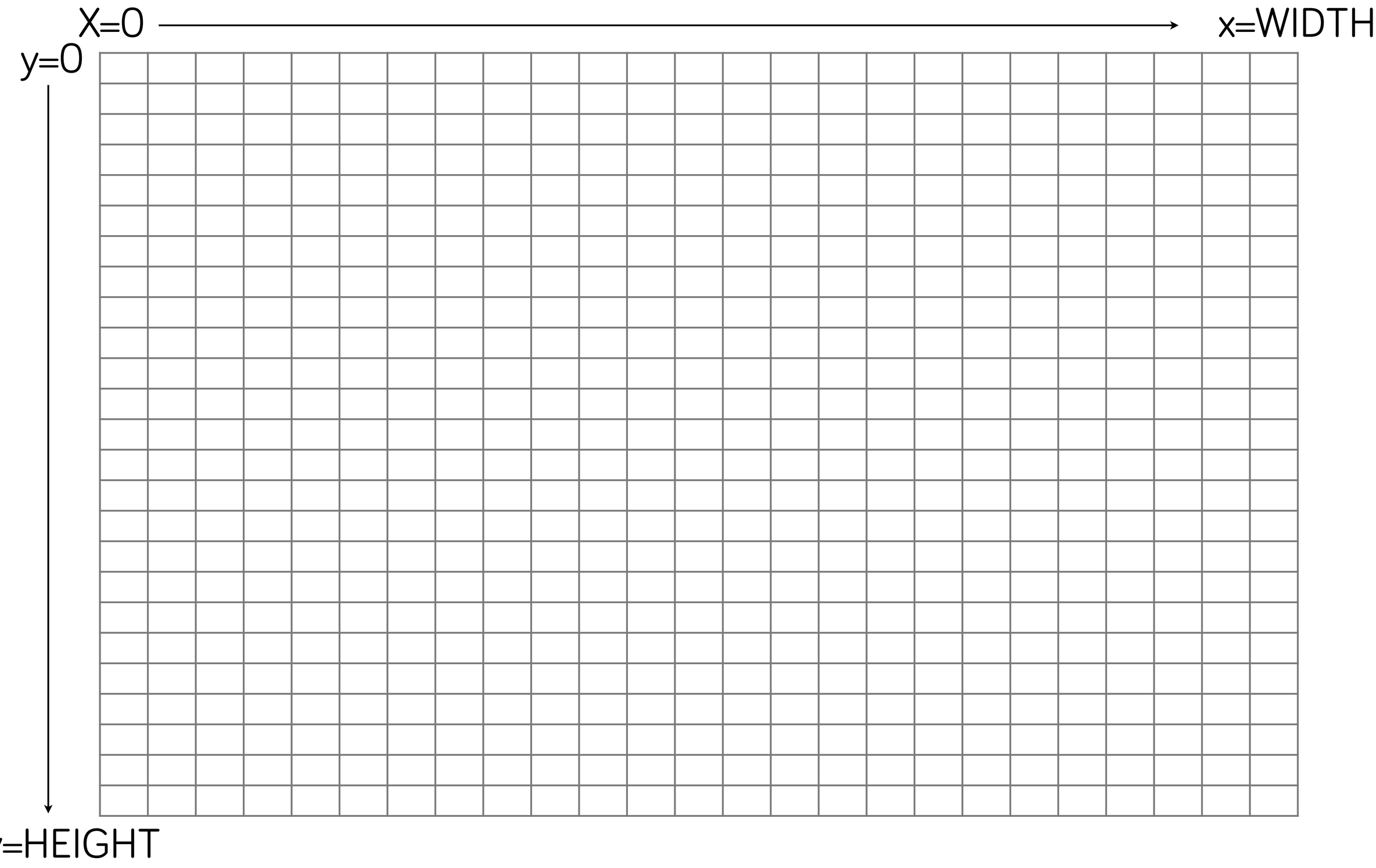


draw() function



60 times per second

How does positioning work?


X=0
x=WIDTH
y=0
y=HEIGHT


X=0
x=WIDTH
y=0
(3,2)
y=HEIGHT

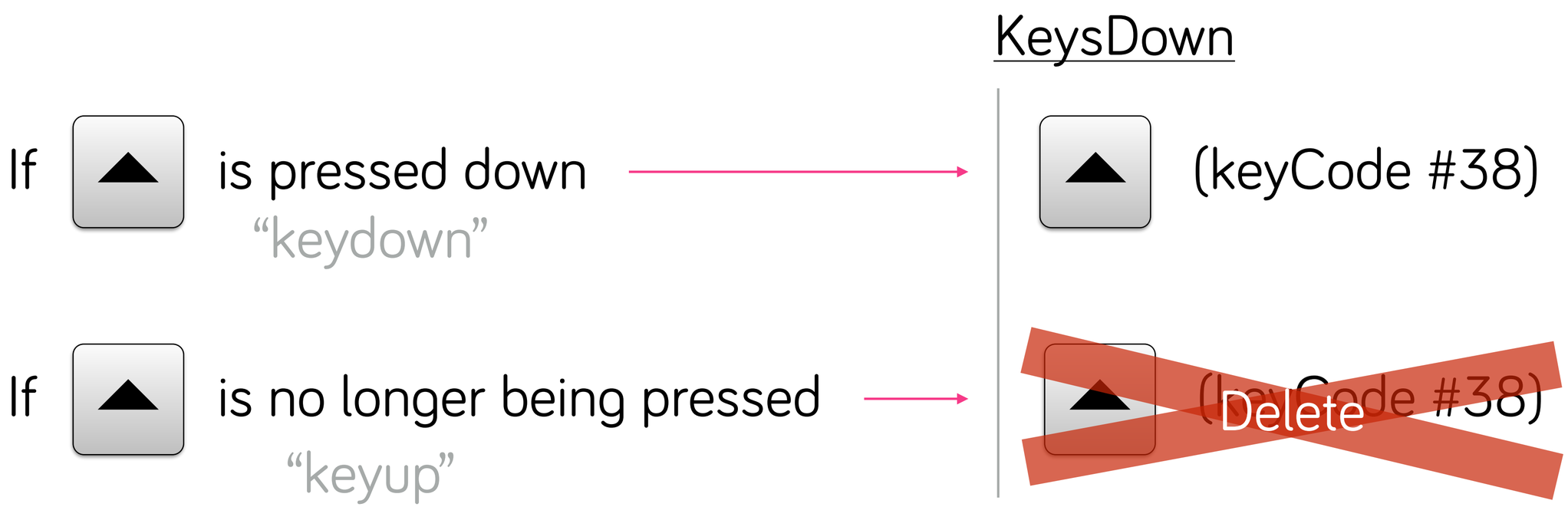
How can I incorporate interactivity?

Event listeners

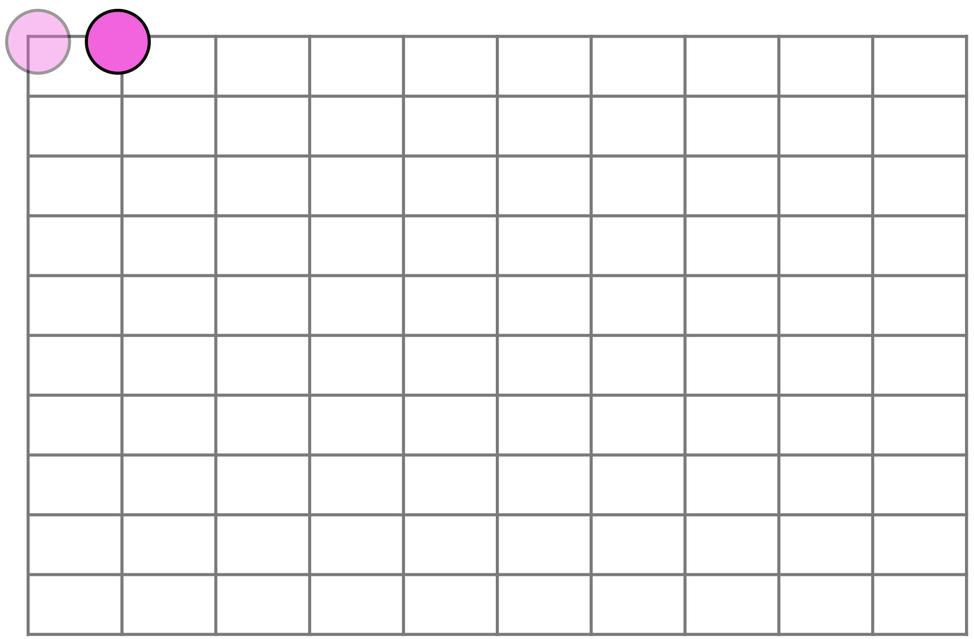
```
addEventListener("britishAreComing", function (numberOfSoldiers) {
    paulRevere.ride(horse);
    town.alert(numberOfSoldiers);
});
```

- addEventListener: JavaScript waits for something to happen
    - When the event happens, the contained function will run

Keyboard interactivity



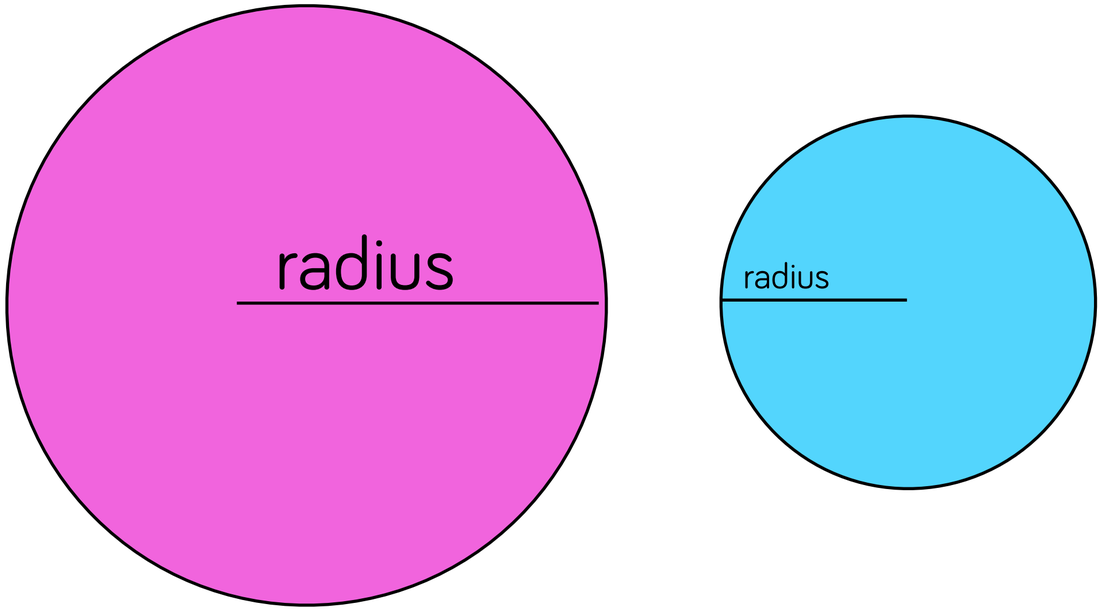
Movement



New position = old position + speed

How can I test for collisions?

Have these circles collided yet?



How about now?