Intro #1: Numbers

Getting Started

You should have `you-win` running, with:

- a text editor, with a new game file open (e.g. a file called `game.js`).
- a Chrome window open (probably on `http://localhost:8000/`)
- (optional) a phone running Chrome or Safari, with your computer opened.

Put your text editor and Chrome window side-by-side, if you can (and/or keep your phone open in front of you!). Whenever save in your text editor, `you-win` will automatically refresh the page.

Make sure you have line numbers turned on in your text editor.

Your Chrome window should have a white screen. This is a blank canvas in which we can start making mobile games!

Have a look at the template that's open in your text editor. It should look like this:

```
import * as UW from 'you-win'
import {forever, Phone, World, Sprite, Text, Polygon, Rect, Sound}
from 'you-win'

// var phone = new Phone

UW.init({
})
.then(() => {

    var world = new World
    world.title = ''
    world.background = 'white'

    // ...

})
```

Look closely at these parts:

1. ```
   // var phone = new Phone
   ```

   This is a comment! Lines starting with `//` are ignored by JavaScript.

   You can use comments to write messages for yourself, to remind yourself what different bits of your code do.

2. ```
   UW.init
   ```

   This is where we can load in any extra sounds or images for our game.

3. ```
   new World
   ```

   This is where we make the `World`. The world represents the screen. We can set its `width` and `height` to change the size of the screen. (It's like the *Stage* in Scratch.)

Let's do that now!

- Set the `width` and `height` of the world.
   ```

```
// ...
```

```
world.width = 300
world.height = 460
```

Add this where the comment with three dots '...' is.

To change the attributes of an object in JavaScript, we write the name of the object, followed by a dot, and then =, and then the new value.

Save, and your world should change shape. It's now a white box, roughly the shape of a mobile phone in portrait, with black bars around the edges.

Sprites

First, we need to know how to add things to the world, so they appear on the screen.

In JavaScript, you create new things using the `new` keyword, followed by the kind of thing you want to make (such as `World`, `Sprite`, or `Text`).

We can add images to the World by creating `Sprites`. A Sprite is an image on the screen, which we can move about, rotate, flip, scale, make transparent, and so on. Let's make our first sprite.

- Add this code, after the block which makes the World.

```
var poop = new Sprite
poop.costume = '💩'
```

Save. Have a look at Chrome—now there should be a tiny poop in the middle of the screen!

We use the `var` keyword so we have a name to refer to our Sprite with.

As before, we can set object attributes using "dot notation", and giving it the new value.

Here are some kinds of values: *(These are just examples, don't type them in!)*

- **Boolean**: either `true` or `false`.

```
foo.flipped = true // face the other way
```

- **Number**: e.g. `123` or `3.14`.
- **String**: some text, written in quotes: either single `'` or double `"`.

```
poop.costume = '⛄'
foo.text = 'birb'
foo.text = "potato"
```

Now try this.

- **Challenge**: Set the `scale` property of your sprite (which is a number, starting at `1.0`).

When we make a sprite, we get to specify its initial values. We can change any of them later, too (more on that in the next chapter).

Here are some other properties you can try:

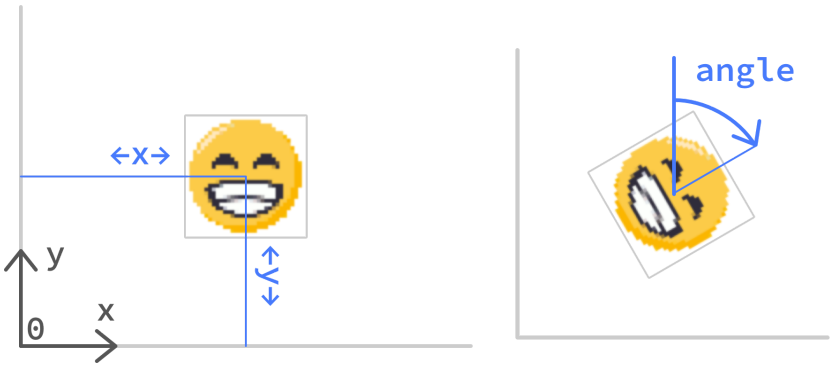
- `opacity` (a number between 0 and 1, starting at `1.0`)
- `angle` (a number, in degrees, starting at `0`)
- `flipped` (a boolean, initially `false`)

Coordinates

Let's move our sprite about. We can do this using the attributes `poop.posX` and `poop.posY`.

These are the co-ordinates of the center of the sprite, starting from the bottom-left corner of the screen.

Here's a quick diagram introducing coordinates:



- Move your poop to the position `(100, 100)`.

```
poop.posX = 100
poop.posY = 100
```

We can add other Sprites, too!

- Add a second sprite, called `cow`.

```
var cow = new Sprite
cow.costume = '🐄'
```

Edges

So we use `.posX` and `.posY` to set the **center** of the sprite.

As well as those, we can use `.top`, `.bottom`, `.left`, and `.right`–which are the co-ordinates of the **edges** of the sprite.

- Move the cow to touch the left side of the screen.

```
cow.left = 0
```

- Move the poop to be to the right of the cow.

```
~~poop.posY = 100~~
```

Delete this line.

```
poop.left = cow.right
```

*Add this line. Make sure it's after **both** of the `poop` and `cow` variables have been created.*

This moves the poop so that his left edge is the same as the right edge of the cow.

Randomness

Let's introduce some uncertainty into our creation.

We can use `UW.randomInt(1, 10)` to pick a random number between `1` and `10`. (This is just like `pick random _ to _` from Scratch.)

- Move your poop to a random `posX` position.

```
poop.posX = UW.randomInt(0, world.width)
```

- **Challenge:** Move your poop to a random `posY` position.

Refresh the page; every time you refresh, the position of the poop should change!

Now try copy/pasting the code for the poop, to make a couple more random ones.

- Make two more poops.

Text

We've seen how to do images; now let's add some text to the screen.

When you're a beginner programmer, it's traditional to introduce yourself by saying "Hello world!", so let's do that.

- Create a `Text` object.

```
var label = new Text
label.text = "Hello world!"
```

- Change its color.

```
label.fill = 'red'
label.fill = '#007de0' // whatever you fancy really
```

The End

Good job! Now you know how to:

- Make JavaScript objects with the **`new` keyword**
- Use **`var` to name them**, so you can refer to them later
- **Set their attributes**, using dot notation and `=`
- Use `Sprites` and `Text`
- Set the **position** of objects inside the world
- How to **pick random numbers** using `UW.randomInt`

Let's continue on to chapter two!