the Master Course

{CODENATION}

JAVASCRIPT FUNDAMENTALS

Arrays & Loops

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Learning Objectives

To identify the uses of Arrays

To experiment with the syntax of creating an Array

To use a variety of methods to work with Arrays

To write programs using Loops (for & while)

JS

First Things First!

How did your challenges go?

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JS

An array...

Coding is all about **data**. **Storing it**,
retrieving it and **doing stuff with it**.

...of riches

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JS

In the real world

... we make **lists!**

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JS

Coffee Order:

Alex - **Cortado**

Ben - **Cortado**

Charlie - **Whatever's new**

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Try this...


```
let coffeeOrder = [
    "Alex - Cortado",
    "Ben - Cortado",
    "Charlie - Whatever's new"
];

console.log(coffeeOrder);
```

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JS

Like any good list

... we can access **individual items.**

[ ]

Now try this...

```
console.log(coffeeOrder[2]);
```

Did it do what you expected?

JS

Javascript

... starts **counting at 0**. So 0, 1, 2 = our 3 list items in coffeeOrder

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JS

Arrays can be

... updated **like variables**!

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Try this...

JS

```
let coffeeOrder = [
    "Alex - Cortado",
    "Ben - Cortado",
    "Charlie - Whatever's new"
];

coffeeOrder[1] = "Ann - Vanilla latte";
```

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JS

Properties

... work just **like variables**!

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Now try this:

JS

```
let coffeeOrder = [
    "Alex - Cortado",
    "Ben - Cortado",
    "Charlie - Whatever's new"
];

console.log(coffeeOrder.length);
```

... what happens?

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JS

.length() on an array

... will output the **number of items** in the array, **not characters**

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JS

Have you ever gone shopping

... and just had to **add** those chocolate biscuits to the end of your list

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.push method

JS

```
let coffeeOrder = [
    "Alex - Cortado",
    "Ben - Cortado",
    "Charlie - Whatever's new"
];

coffeeOrder.push("Donna - espresso");
```

... adds to the **end of your array**

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JS

Have you ever thought

... I **don't want** that pointless broccoli

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.pop method

JS

```
let coffeeOrder = [
    "Alex - Cortado",
    "Ben - Cortado",
    "Charlie - Whatever's new"
];

coffeeOrder.pop();
```

... removes the last item from the **end of your array**

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There are LOTS of methods available to use in arrays...

JS

.map()

.unshift()

.shift()

.splice()

.slice()

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Check out MDN for more!

Activity 1:

Make an **array** of 3 of your favourite songs.
Log them to the console.

Stretch

Can you **add another two songs** to the list using a method and then **remove the last one** added?

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Activity 2:

JS

Using MDN choose one of the following methods: map(), shift(), unshift(), splice(), slice().

Create a **program to demonstrate the use** of the method.

(Note: Not all methods would permanently update/ make changes to the arrays themselves)

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To write programs using Loops (for & while)

JS

Imagine I asked you to do the same thing over & over again...

... for example, if I asked you to make a cup of tea.

...and then asked you to make everyone in the room a cup of tea.

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JS

Or

... **updating the stock** in a warehouse?

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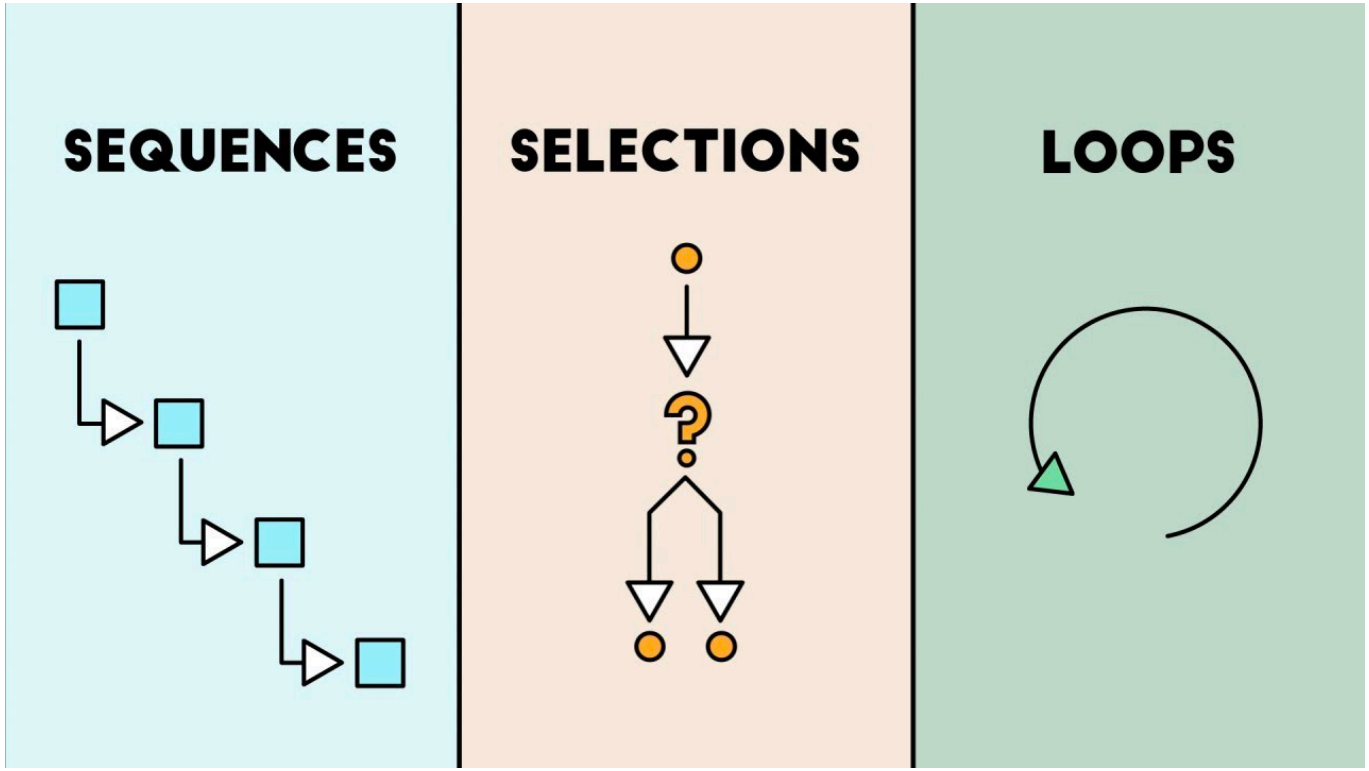
Iteration (loops)

JS



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JS

Try this

Make an array of your **3 favourite drinks** and **log each one individually to the console**.

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```
let favouriteDrinks = ["Coke", "Fanta", "Tonic"];

console.log(favouriteDrinks[0]);
console.log(favouriteDrinks[1]);
console.log(favouriteDrinks[2]);
```

Not too bad?

... now imagine if I said **1000 drinks.**

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For loop


```
let favDrinks = [
    "Coke",
    "Fanta",
    "Tonic",
    "Red Bull"
];

for(let i = 0; i < favDrinks.length; i++){

    console.log(favDrinks[i]);

}
```

*i stands for index, which is widely used in loops. However, it could be anything you like.

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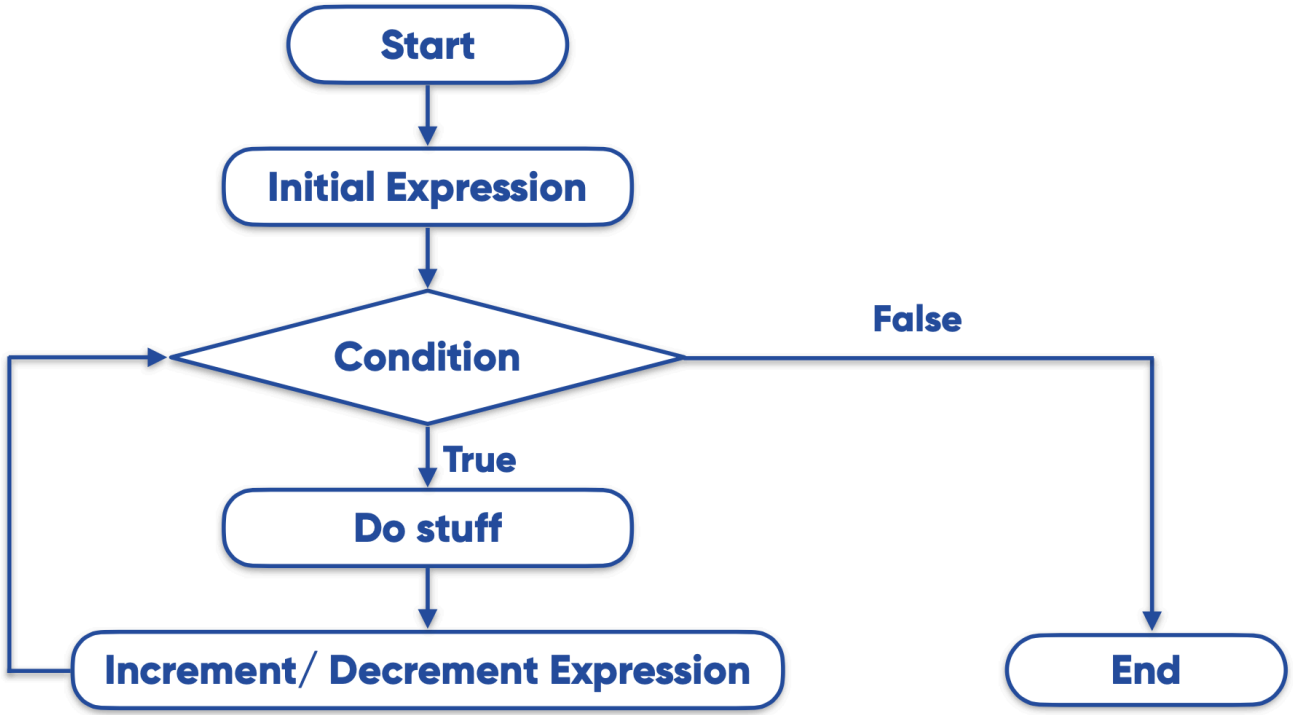
For loop in a flow diagram

```
for (initialExpression; condition; increment/decrementExpression){
    //do stuff
}
```



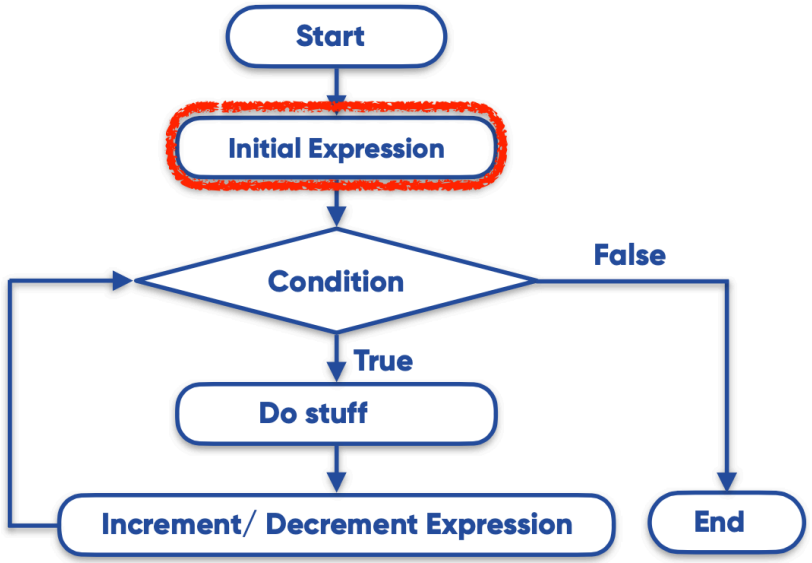
In practice...

```
let favDrinks = [
    "Coke",
    "Fanta",
    "Tonic",
    "Red Bull"
];

for(let i = 0; i < favDrinks.length; i++){

    console.log(favDrinks[i]);

}
```




```
for (initialExpression; condition; increment/decrementExpression){
    //do stuff
}
```

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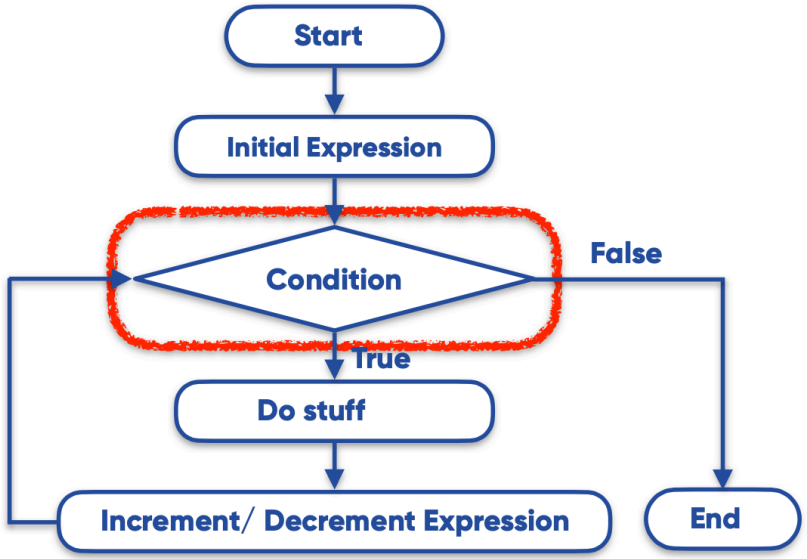
In practice...

```
let favDrinks = [
    "Coke",
    "Fanta",
    "Tonic",
    "Red Bull"
];

for(let i = 0; i < favDrinks.length; i++){

    console.log(favDrinks[i]);

}
```




```
for (initialExpression; condition; increment/decrementExpression){
    //do stuff
}
```

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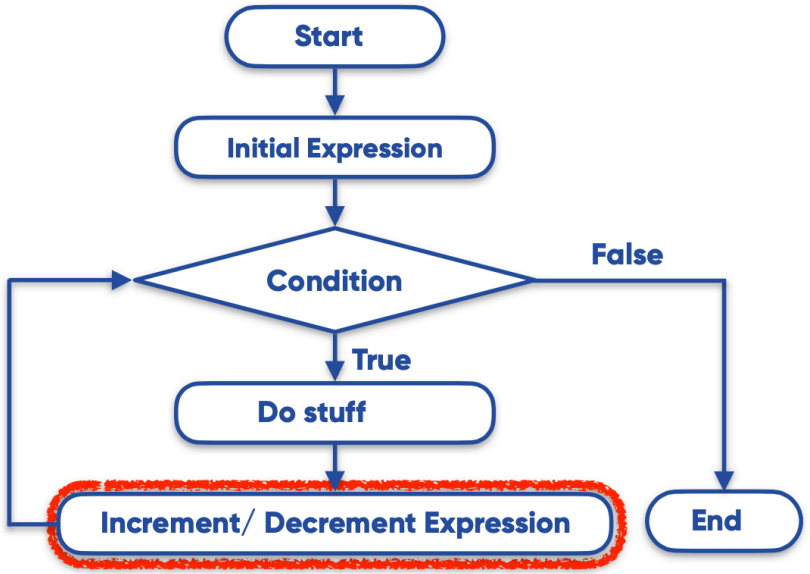
In practice...

```
let favDrinks = [
    "Coke",
    "Fanta",
    "Tonic",
    "Red Bull"
];

for(let i = 0; i < favDrinks.length; i++){

    console.log(favDrinks[i]);

}
```




```
for (initialExpression; condition; increment/decrementExpression){
    //do stuff
}
```

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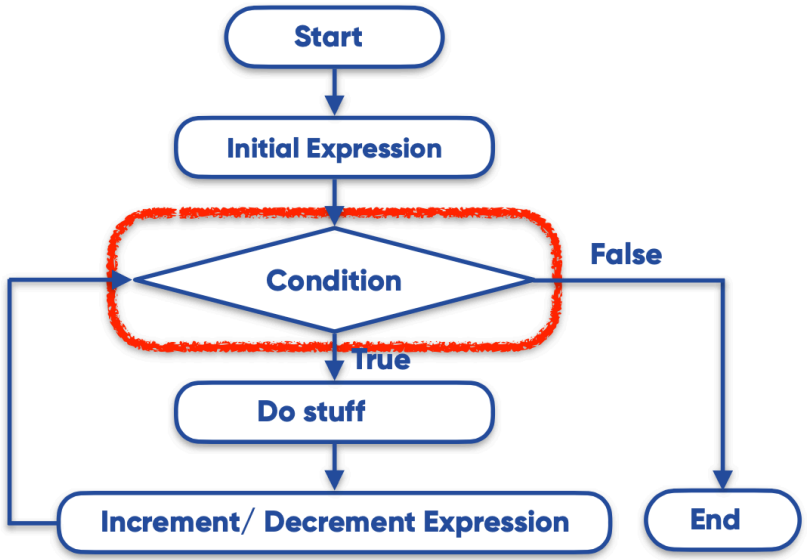
And repeat if the condition is not met!

```
let favDrinks = [
    "Coke",
    "Fanta",
    "Tonic",
    "Red Bull"
];

for(let i = 0; i < favDrinks.length; i++){

    console.log(favDrinks[i]);

}
```




```
for (initialExpression; condition; increment/decrementExpression){
    //do stuff
}
```

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JS

Lets level up

... with some **maths!**

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Using for loops with an if statement

JS

```
let multiplesTwo = [];

for(let i = 0; i < 20; i++){
    if (i % 2 == 0){
        multiplesTwo.push(i);
    }
}

console.log(`Numbers divisible by 2 between 0 and 20 are: ${multiplesTwo}.`);
```

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Using for loops with an if statement

JS

```
let multiplesTwo = [];

for(let i = 0; i < 20; i++){
    if (i % 2 == 0){
        multiplesTwo.push(i);
    }
}

console.log(`Numbers divisible by 2 between 0 and 20 are: ${multiplesTwo}.`);

//Numbers divisible by 2 between 0 and 20 are: 0,2,4,6,8,10,12,14,16,18.
```

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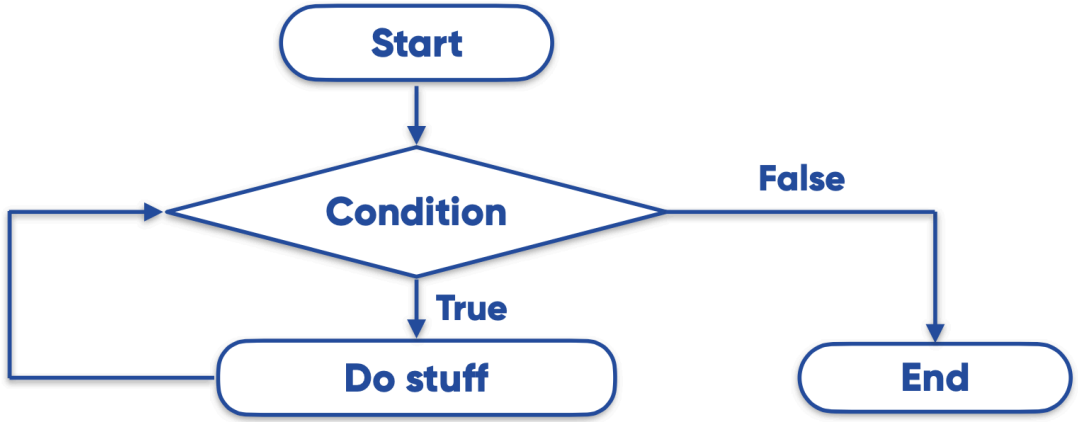
While loops

JS

```
while (condition){
    //do stuff
}
```



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Loops

JS

For Loops

... run a **finite or limited** number of times

While Loops

... run **while** a condition is met (or not)

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Try this


```
let age = 15;

while( age < 18 ){

    console.log("You're a child!");
    age++;

}

console.log("You're an adult!");
```

What happens here?

```
let cards = ["Diamond", "Spade", "Heart", "Club"];
let currentCard = "Club";

while(currentCard != "Spade"){

    console.log(currentCard);
    currentCard = cards[Math.floor(Math.random()*4)];

}

console.log(currentCard);
```

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Learning Objectives

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~~To use a variety of methods to work with Arrays~~

To write programs using Loops (for & while)

Activity 1:

JS

Create an **array** that lists your favourite films, up to 5 elements.

Add **2 more** using a method

Use a **loop** to cycle through the array

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Activity 2:

Generate **6 random numbers** between 1 - 50 and log them to the console using a for loop

Activity 3:

If we can create a loop to put 0 - 9 on the screen, how **can we count from 9 - 0**? Create a program that does this

Activity 4:

Displays 4 films stored in an array.

Use a **for loop** to show each film in the array

Use an **if statement** to check if the 3rd film in the array is Ghostbusters.

If it is, return “Yay its Ghostbusters”. If it isn't return “Boo! We want Ghostbusters”

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Activity 5:

Generate a **random number** between **1 - 30** six times.

For each random number generated, **check if this number is divisible by 7 or not**.

Log out a message to the console if it is divisible by 7 or not.

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Activity 6:

JS

Imagine you're a programmer for a social media platform! You have been tasked with building a prototype for a mutual followers program.

> Create 2 arrays of followers e.g. bobsFollowers & hannahsFollowers. In these arrays place 4 names as strings. Make sure there are 2 names that are in **BOTH** arrays.

> Using a **nested loop** iterate over both arrays and console.log out the matching followers

Activity 7:

JS

Research on **do...while** loop, find out about the difference between for loop, while loop and do... while loop. Give an example of each. What are the pros and cons?

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For next time...

JS

... take a look at **functions.**

https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide/Functions

https://www.youtube.com/watch?v=N8ap4k_1QEQ

What is a function and **why do we use them?**
How do you **create a function?**

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