the Master Course

{CODENATION}

JAVASCRIPT FUNDAMENTALS

Arrays & Loops

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Learning Objectives

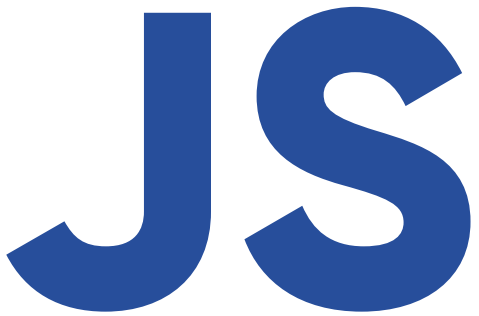
To explore the uses of Arrays

To recognise the syntax of creating an Array

To use a variety of methods to work with Arrays

To use Loops (for & while)

To write programs using Loops (for & while)



First Things First!

How did your challenges go?

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An array...

JS

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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Coffee Order:

JS

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);
```

JS

Like any good list

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

[ ]

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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:

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

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

JS

Properties

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

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Now try this:

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

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

... what happens?

JS

.length() on an array

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

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Have you ever gone shopping

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

.push method

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

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

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

Have you ever thought

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

.pop method

```
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()

.unsplice()

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Check out MDN for more!

Activity 1:

Make an **array** of 3 your favourite songs.
3 of them.
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?

Activity 2:

JS

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

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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Learning Objectives

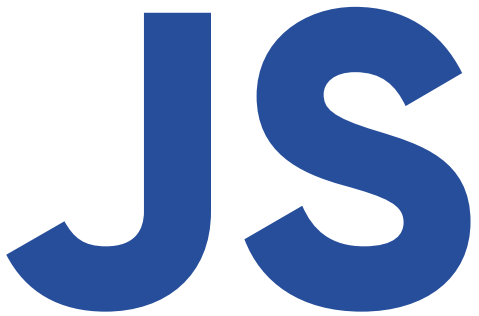
~~To understand the uses of Arrays~~

~~To understand the syntax of creating an Array~~

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

To understand and use Loops (for & while)

To write programs using Loops (for & while)



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

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

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

JS

Or

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

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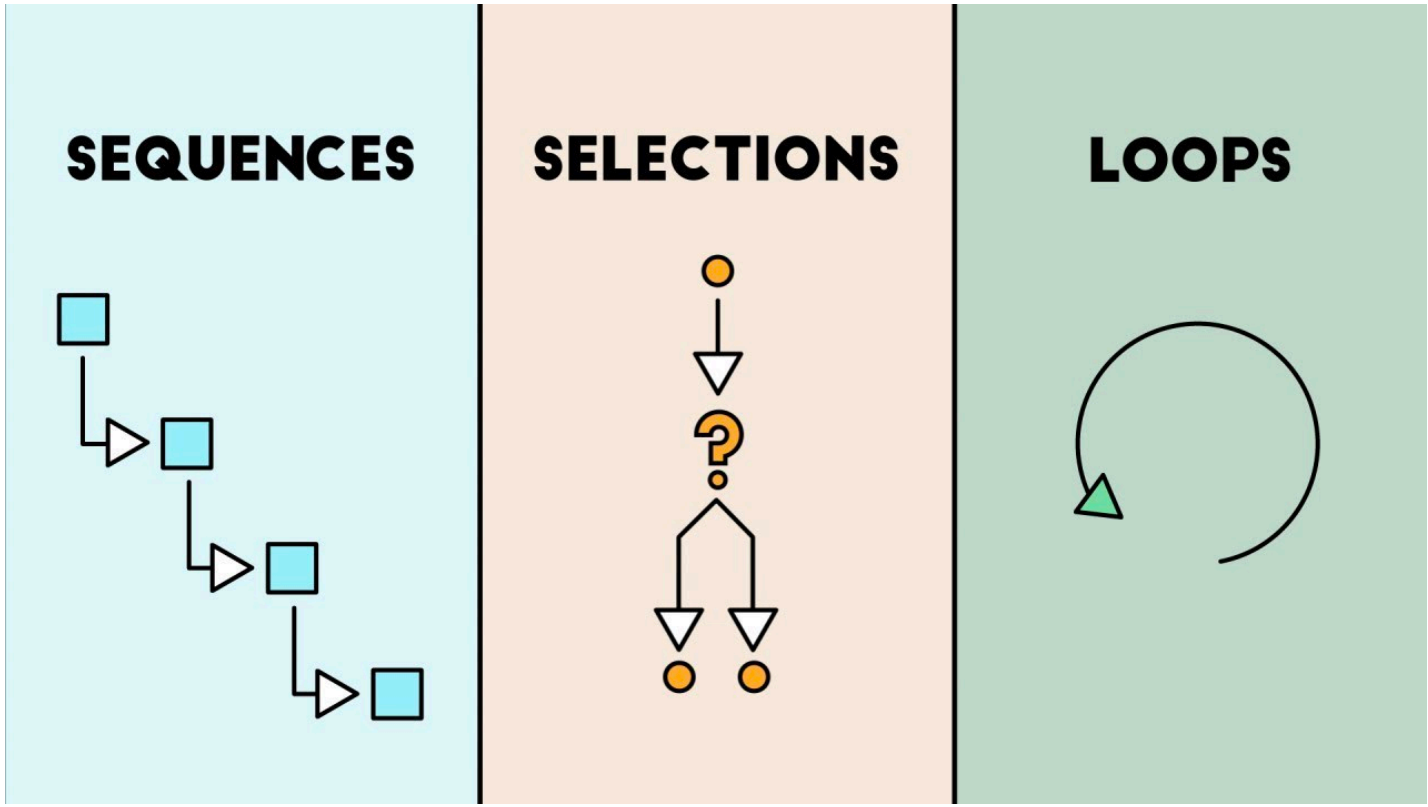
Iteration (loops)



JS

Try this

Make an array of your **3 favourite drinks** and **log each one 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.**

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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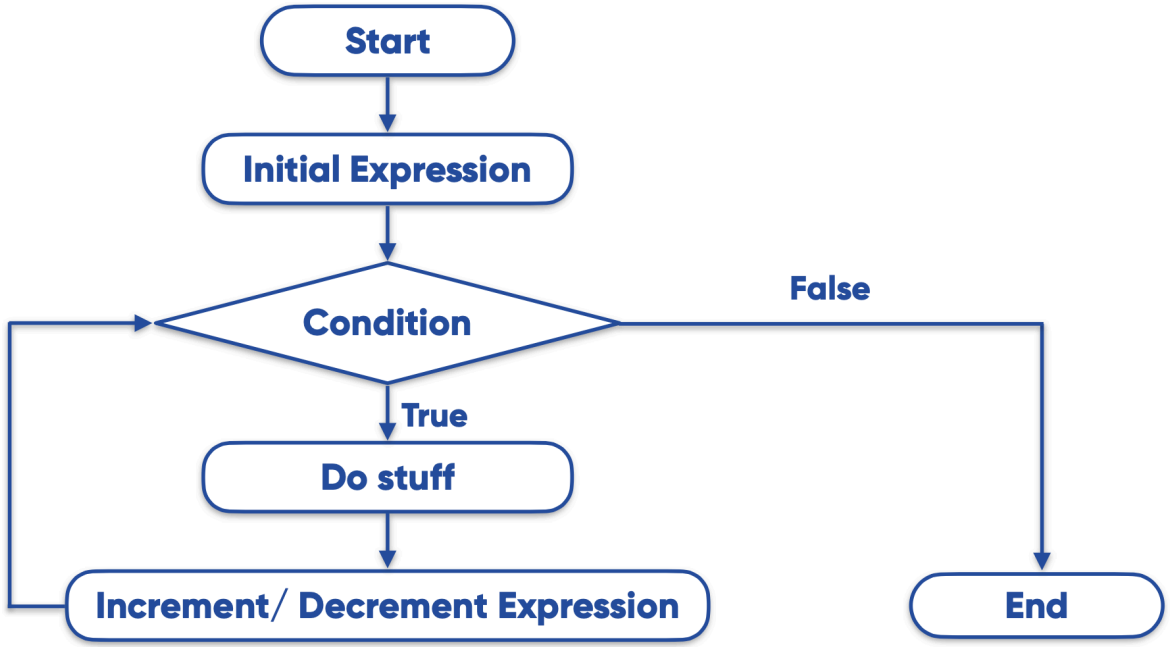
For loop in a flow diagram

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



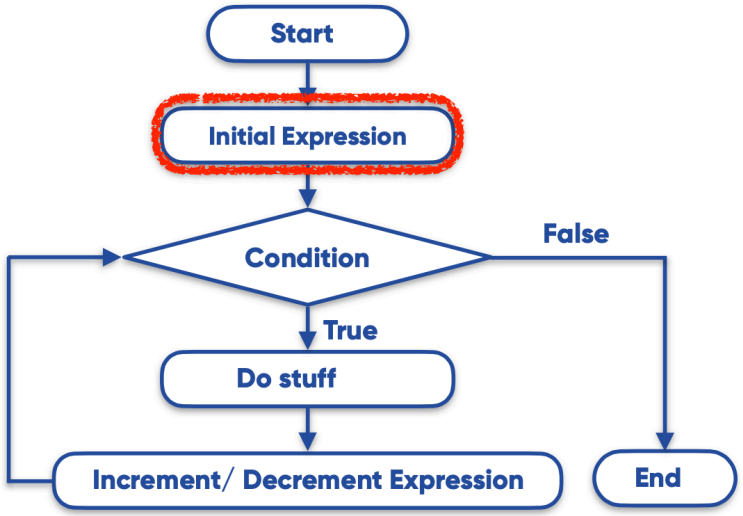
In practice...

```
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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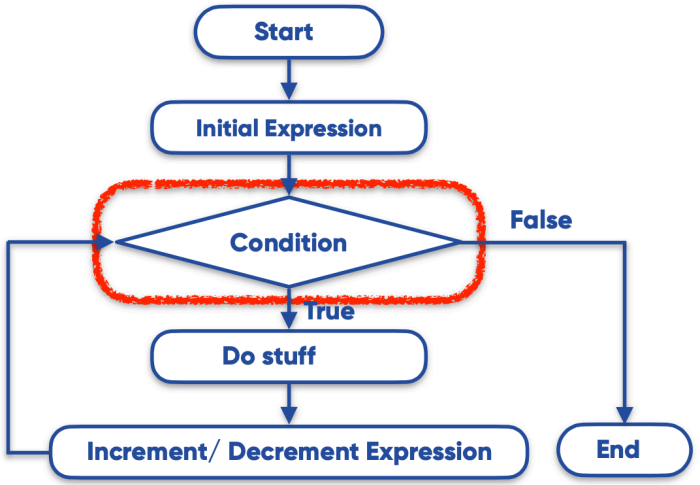
In practice...

```
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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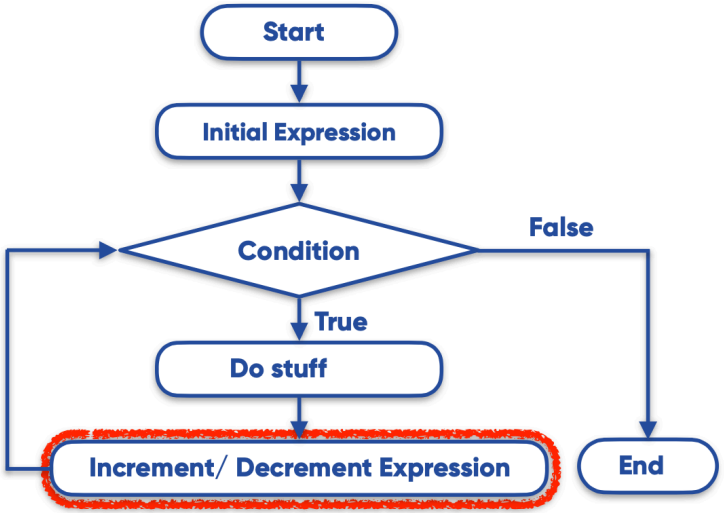
In practice...

```
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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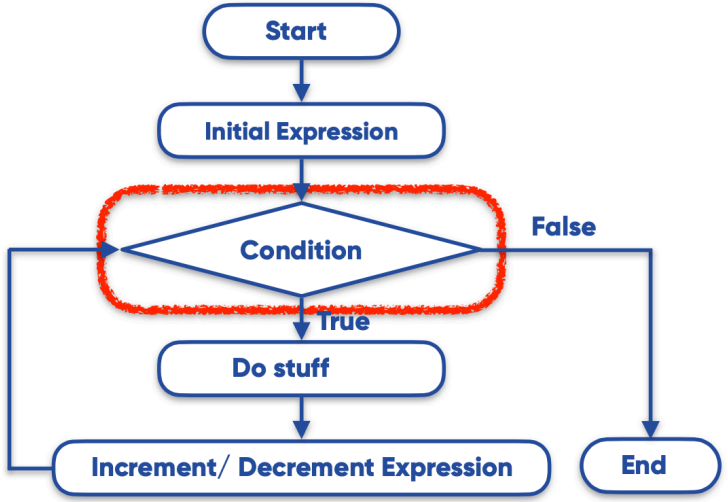
And repeat if the condition is not met!

```
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
}
```

Lets level up

... with some **maths!**

JS

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Using for loops with an if statement

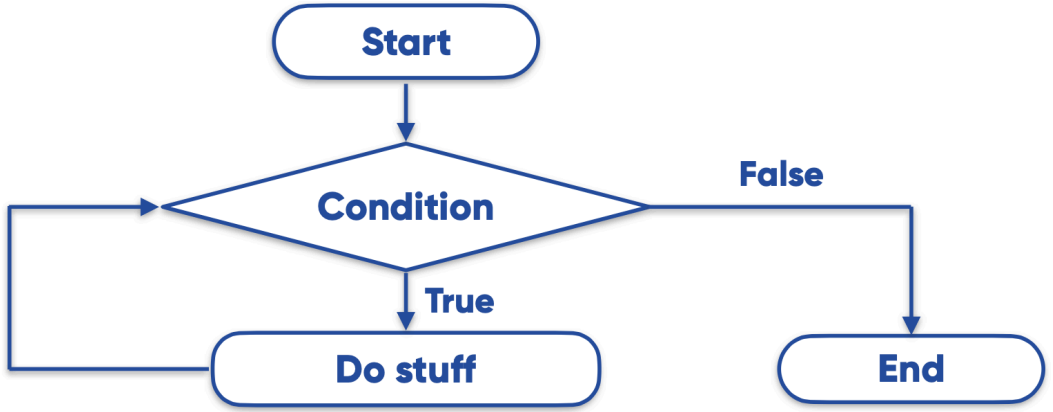
```
let multiplesTwo = [];

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}.`);
```

Using for loops with an if statement

```
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.
```

While Loops

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



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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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:

JS

Generate **6 random numbers** between 1-50 and log them to the console.

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.

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Activity 4:

JS

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 it’s Ghostbusters”. If it isn’t return “Boo! we want Ghostbusters!

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Activity 5:

JS

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

For each random number generated, **check if this number of 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 follower.

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?

Further Reading...

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

JS

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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