What Will We Do Today?

Review
Data Types
Simple Math
String Operations
Functions and Declarations
Making Javascript talk to HTML
What did we do last week?

```javascript
alert("Hello World");  Hello World
alert(17);  17
alert(randomtext);  Hello There
```
Remember this simple program?

```javascript
var firstvariable;

firstvariable=256;

alert(firstvariable);
```
Let's make it a little more interesting

```
var firstvariable;
var secondvariable;
firstvariable=256;
secondvariable=128;
alert(secondvariable);
```
Let's make it a little more interesting

```javascript
var firstvariable;
var secondvariable;
firstvariable=256;
secondvariable=128;
alert(secondvariable-64);
```
Let's make it a little more interesting

```javascript
var firstvariable;
var secondvariable;
firstvariable=256;
secondvariable=128;
alert(firstvariable+secondvariable);```

Let's make it a little more interesting

```javascript
var firstvariable;
var secondvariable;
firstvariable=256;
secondvariable=128;
var thirdvariable=firstvariable+secondvariable;
alert(thirdvariable);
```
But *Beware* !!!

```javascript
var firstvariable;
var secondvariable;
firstvariable="256";
secondvariable=128;
var thirdvariable=firstvariable+secondvariable;
alert(thirdvariable);
```
Huh? What just happened

That's some strange Math!
Huh? What just happened

That's some strange Math!

Actually, it’s not Math at all....
Huh? What just happened
That's some strange Math!

Actually, it’s not Math at all....

Just a basic "String Operation"
Great. Another new term....

What is a String Operation?
Great. Another new term....

What is a String Operation?

You can do a lot of cool stuff with strings....
Great. Another new term....

What is a String Operation?

You can "concatenate" them, for example.
Great. Another new term.... What is a String Operation?

You can "concatenate" them, for example.

"Hello" + "World"
Concatenate?
Let's try that!

alert("Hello" + " World");
Concatenate?
Let's try that!

alert("Hello" + "World");

HelloWorld
Concatenate?
Let's try that!

alert("Hello " + "World");

Hello World
Concatenate?
Let's try that!

alert("Hello" + " " + "World");

Hello World
Wait. What?
That's not what we have here!

```javascript
var firstvariable;
var secondvariable;
firstvariable="256";
secondvariable=128;
var thirdvariable=firstvariable+secondvariable;
alert(thirdvariable);
```
Wait. What?
Let's simplify...

```javascript
var firstvariable;
var secondvariable;
  firstvariable="256";
  secondvariable=128;
var thirdvariable=firstvariable+secondvariable;
alert(thirdvariable);
```
Wait. What?
Let's simplify...

```javascript
var firstvariable;
var secondvariable;
var thirdvariable = "256"+128;
alert(thirdvariable);
```
Wait. What?
Let's simplify...

```javascript
var firstvariable;
var secondvariable;
var thirdvariable = "256" + 128;
alert(thirdvariable);
```
Wait. What?
Let's simplify...

```javascript
var firstvariable;
var secondvariable;
alert("256"+128);
```
Wait. What?
Let's simplify...

alert("256"+128);
Well, OK, but that's just one string

alert("256"+128);
Well, OK, but that's just one string and a number!

alert("256"+128);
Well, OK, but that's just one string and a number!

```
alert("256"+128);
```

What’s going on here?
It's all about data types!

So far, we've seen a few of them:

- **Strings**
- **Numbers**
- **Objects**

For the really cool stuff we'll later use...
It's all about data types!
It's all about data types!

So far, we've seen a few of them
It's all about data types!

So far, we've seen a few of them

Strings

Numbers
It's all about data types!

Most languages use very rigid typing.
It's all about data types!

Most languages use very rigid typing

So you could add two numbers together
It's all about data types!

Most languages use very rigid typing

So you could add two numbers together

Or divide them
It's all about data types!

Most languages use very rigid typing

So you could add two numbers together

Or divide them (but only if you have the right data type for your target number!)
It's all about data types!

Most languages use very rigid typing

So you could add two numbers together

Or divide them (but only if you have the right data type for your target number!)

You can do a lot of Math with number types
It's all about data types!

Most languages use very rigid typing

Or you could concatenate two strings
It's all about data types!

Most languages use very rigid typing

Or you could concatenate two strings

Or take certain characters out

Or search for character
It's all about data types!

Most languages use very rigid typing

Or you could concatenate two strings

Or take certain characters out

Or search for character

You cannot do any Math with strings
It's all about data types!

What are data types good for?
It's all about data types!

What are data types good for?

Different data types have different characteristics (or "shapes" if you like)
It's all about data types!

What are data types good for?

Different data types have different characteristics (or "shapes" if you like)

They can be stored more efficiently if the computer knows what they are
It's all about data types!

What are data types good for?

They are also very helpful in code verification.
It's all about data types!

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They are also very helpful in code verification.

The compiler can easily assess whether what you're trying to do is a legal operation or not.
It's all about data types!

What are data types good for?

They are also very helpful in code verification. The compiler can easily assess whether what you're trying to do is a legal operation or not.

And that helps prevent a lot of problems.
So what about JavaScript?

*JS uses very weak data typing.*
So what about JavaScript?

*JS uses very weak data typing.*

*You can even change variable types without ever declaring what you do.*
So what about JavaScript?
So what about JavaScript?

```javascript
var someNumber=1290;
someNumber="Hello!";
alert(someNumber);
```
So what about JavaScript?

```javascript
var someNumber=1290;
someNumber="Hello!";
alert(someNumber);
```

In most languages this would throw an error.
So what about JavaScript?

```javascript
var someNumber=1290;
someNumber="Hello!";
alert(someNumber);
```

In most languages this would throw an error.

"Hey, you can't put a string into a number variable. That won’t fit!"
So what about JavaScript?

```javascript
var someNumber=1290;
someNumber="Hello!";
alert(someNumber);
```

JS, however, guesses what you want to do and just changes the type in the background.

This can be both a blessing and a curse.
And now for something completely different....

```javascript
var someNumber=1290;
someNumber="Hello!";
alert(someNumber);
```
And now for something completely different....

```
var someNumber=1290;
someNumber="Hello!";
alert(someNumber);
```
And now for something completely different....

alert(someNumber);
What is that, exactly?

`alert(someNumber);`
What is that, exactly?

`alert(someNumber);`

*Short answer: It's a function.*
What is that, exactly?

`alert(someNumber);`

Short answer: It's a function.

Functions are pieces of code that we can use over and over.
What is that, exactly?

`alert(someNumber);`

`alert`, for example, creates a nice popup box
What is that, exactly?

`alert(someNumber);`

`alert, for example, creates a nice popup box`

And we can display messages without much effort
What is that, exactly?

alert("Hello");
alert("This is fun!");
alert("Bye Bye!");
Let's make that even better!
Let's make that even better!

We can teach the computer to say Hello!
Let's make that even better!
We can teach the computer to say Hello!

greet("Martin");
Let's make that even better!
We can teach the computer to say Hello!

```c
    greet("Martin");
```

Well, that didn't work..... 😞
Time to build our first function
Time to build our first function
Time to build our first function

function greet
Time to build our first function

function greet()
Time to build our first function

```javascript
function greet() {
}
```
Time to build our first function

```javascript
function greet(){
    alert("Hello");
}
```
Time to build our first function

```javascript
function greet()
{
    alert("Hello");
}

greet();
```
Can we do that twice?

```javascript
function greet()
    alert("Hello");
}
greet();
greet();
greet();
```
So about that name...

```javascript
function greet() {
    alert("Hello");
}

greet();
```
So about that name...

```javascript
function greet()
{
    alert("Hello");
}

greet("Martin");
```
So about that name...

```javascript
function greet(visitor)
{
    alert("Hello");
}

greet("Martin");
```
So about that name...

```javascript
function greet(visitor) {
    alert("Hello " + visitor);
}

greet("Martin");
```
So about that name...

```javascript
function greet(visitor){
    alert("Hello " + visitor);
}

greet("Jennifer");
greet("Madison");
greet("Nicholas");
```
Let's make it talk some more...

```javascript
function greet(visitor){
    alert("Hello " + visitor);
    alert(visitor + " is a good student");
}

greet("Jennifer");
greet("Madison");
greet("Nicholas");
```
A Different Function

```javascript
function studentInfo(student){
    alert(student + " is student #"+1);
}

studentInfo("Alessandra");
studentInfo("Erik");
```
A Different Function

```javascript
function studentInfo(student, id) {
    alert(student + " is student #" + 1);
}

studentInfo("Alessandra", 5);
studentInfo("Erik", 8);
```
function studentInfo(student, id) {
    alert(student + " is student #" + id);
}

studentInfo("Alessandra", 5);
studentInfo("Erik", 8);
A Different Function

function studentInfo(student,id){
    alert(student + " is student #"+id);
}

studentInfo("Alessandra",5);
studentInfo("Erik",8);
A Different Function

```javascript
function studentInfo(student, id) {
    alert(student + " is student #" + id);
}

var id = 123;
studentInfo("Alessandra", id);
studentInfo("Erik", id);
```
A Different Function

```javascript
function studentInfo(student, id)
{
    alert(student + " is student #" + id);
}

var id = 123;
studentInfo("Alessandra", id);

id = 124;
studentInfo("Erik", id);
```
A Different Function

```javascript
function studentInfo(student, id) {
    alert(student + " is student #" + id);
}

var id = 123;
studentInfo("Alessandra", id);
id = id + 1;
studentInfo("Erik", id);
```