

Javascript

- **debugging** (https://www.w3schools.com/js/js_debugging.asp)
 - **console.log()**
 - Set breakpoints in the debugger window using “**debugger**” keyword in program
 - In html, use: document.write(“msg”); and document.writeln(value);
- **Variable**
 - var vs. let
 - Scope
 - A variable declared outside a function, becomes **GLOBAL**. A global variable has **global scope**: All scripts and functions can access it.
 - Automatically global — assign a value to a variable without declaring that variable makes that variable automatically global
 - == vs === (equal value and equal type)
- **array**
 - array literal
 - **var array-name = [item1, item2, ...];**
 - array object
 - var cars = new Array("Saab", "Volvo", "BMW"); ← no need to use this form, slow
 - **access array element using index number**
 - array elements can be of different types
 - Associative Arrays ← do not use, use number indexed array instead
 - **array methods**
 - **often useful in WebGL :**
 - **pop** (remove the last element)
 - **push** (adds a new element at the end)
 - **length**,
 - valueOfarray, shift, delete, splice, slice
 - sort, reverse, defining the compare function: function(a,b)
- **Object** http://www.w3schools.com/js/js_objects.asp
 - define data and methods

```
var person = {
  firstName: "John",
  lastName : "Doe",
  id      : 5566,
  fullName : function() {
    return this.firstName + " " + this.lastName;
  } };
```
 - access data and methods by name: person.lastName

- **Math object**
 - Math.random() ← between 0 (inclusive) and 1 (exclusive);
 - **min**, **max**, round, ceil, floor,
 - Pay attention to the trigonometry functions: http://www.w3schools.com/js/js_math.asp
 - [Math.PI](#), [Math.sin\(\)](#), [Math.cos\(\)](#), etc.
- **function** http://www.w3schools.com/js/js_functions.asp
 - no need for function declaration
 - function is an object, it can be passed as parameter
 - number of parameters in the function call do not have to match the number in the function definition
 - parameters normally are passed by value only
 - To modify the parameter value, need to use an object, and put the parameter values in as members of the object (https://www.w3schools.com/js/js_object_definition.asp)

```
var person = new Object();
person.firstName = "John";
person.lastName = "Doe";
person.age = 50;
person.eyeColor = "blue";
```
- **Decision statements**
 - if statement, switch statement, if/else if/else ← exactly the same as C++
- **Loops**
 - for loop, while loop, do-while loops ← exactly the same as C++
 - for/in, loops through the properties of an object
- **string** http://www.w3schools.com/jsref/jsref_obj_string.asp
 - difference between string and string object? no need for string object (slows down execution), string literal can be used to call all the string member functions.
 - string methods: indexOf, lastIndexOf, search, slice, substring, substr, → not used much in WebGL programming