# How JavaScript Works

* What is a Program?
  + Allocates memory
  + Parse and execute scripts
* JavaScript Engine
  + Each browser has a JavaScript Engine.
  + It reads the JavaScript that we write and changes it into machine readable instructions.
  + Consists of two parts:
    - Memory Heap.
      * Where Memory allocation happens.
    - Call Stack.
      * Where our code is read and executed.
      * Tells you where you are in program.
* JavaScript is a single threaded language that can be non-blocking
  + Single threaded: Has only one call stack.
  + Is synchronous programming language. One line gets run, then the next, then the next and so on.
* JavaScript Run Time Environment
  + Is part of the browser
  + Consists of the JavaScript Engine, additional functionality for input and output and other things the runtime needs. It has Web API’s, a Callback Queue, and an Event Loop.
* JavaScript is non-blocking
  + JavaScript code can run asynchronously with callback functions.
  + A callback function is sent from the call stack to the callback queue. An event loop is then constantly checking if the call stack is empty. If it is it then looks to see if an event is occurring. If there is an event telling us the timer is done it then puts the relating callback into the call stack. That call back function is then run.