Javascript-Behind the scence

FIRST-CLASS-FUNCTION

👉 In a language with **first-class functions**, functions are simply **treated as variables**. We can pass them into other functions, and return them from functions.

```
const closeModal = () => {
  modal.classList.add("hidden");
  overlay.classList.add("hidden");
};

overlay.addEventListener("click", closeModal);
```

Passing a function into another function as an argument: First-class functions!

DYNAMIC

👉 **Dynamically-typed language:**

No data type definitions. Types becomes known at runtime

Data type of variable is automatically changed

```
let x = 23;
let y = 19;
x = "Jonas";
```

SINGLE THREADED AND NON-BLOCKING EVENT LOOP

- **Concurrency model**: how the JavaScript engine handles multiple tasks happening at the same time.

  ↓ **Why do we need that?**

- JavaScript runs in one **single thread**, so it can only do one thing at a time.

  ↓ **So what about a long-running task?**

- Sounds like it would block the single thread. However, we want non-blocking behavior!

  ↓ **How do we achieve that?**

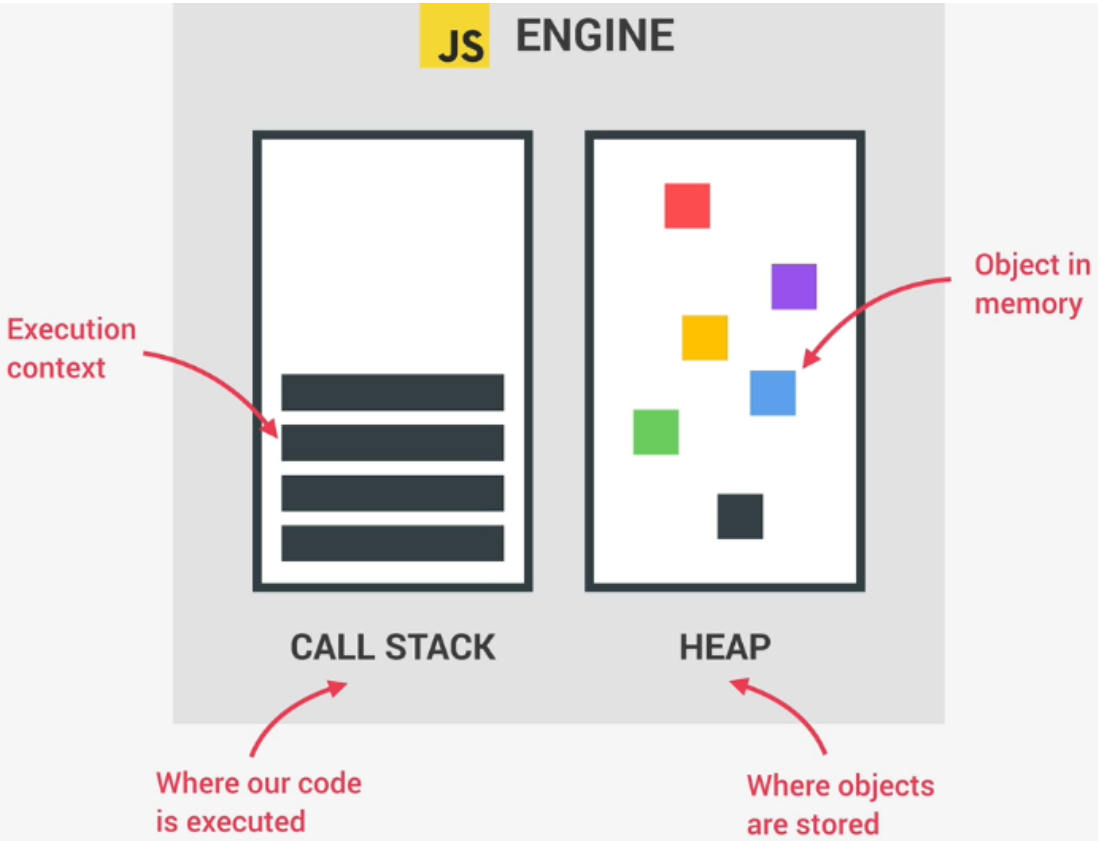
- By using an **event loop**: takes long running tasks, executes them in the "background", and puts them back in the main thread once they are finished.

JAVASCRIPT ENGINE

JS ENGINE

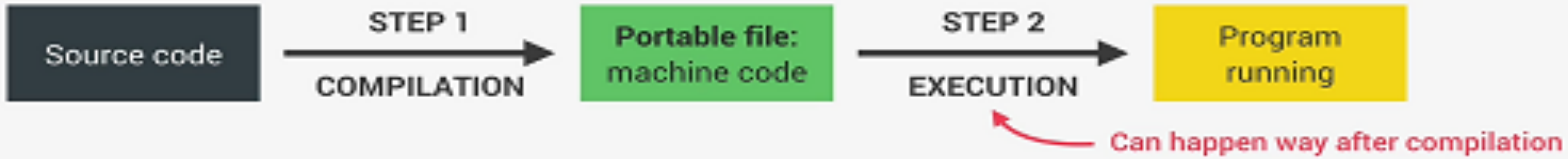
PROGRAM THAT **EXECUTES** JAVASCRIPT CODE.

👉 **Example: V8 Engine**

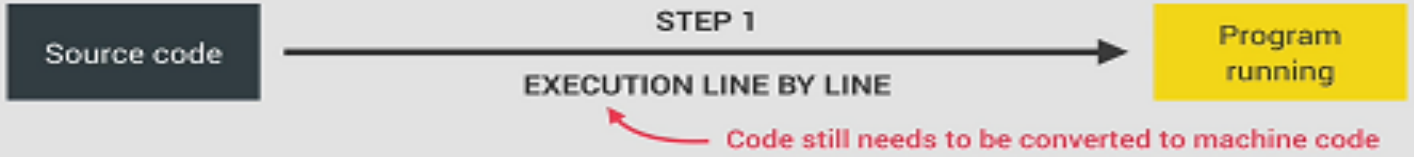


COMPILATION AND INTERPRETATION

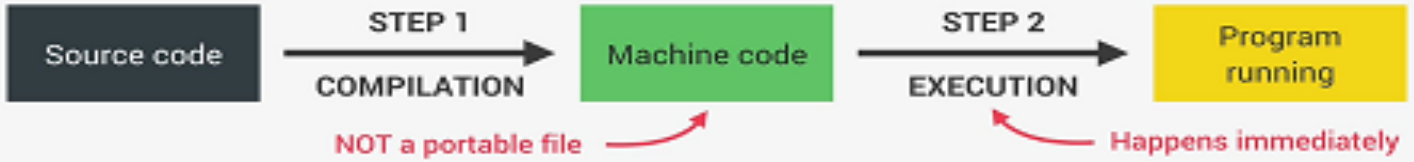
- **Compilation:** Entire code is converted into machine code at once, and written to a binary file that can be executed by a computer.



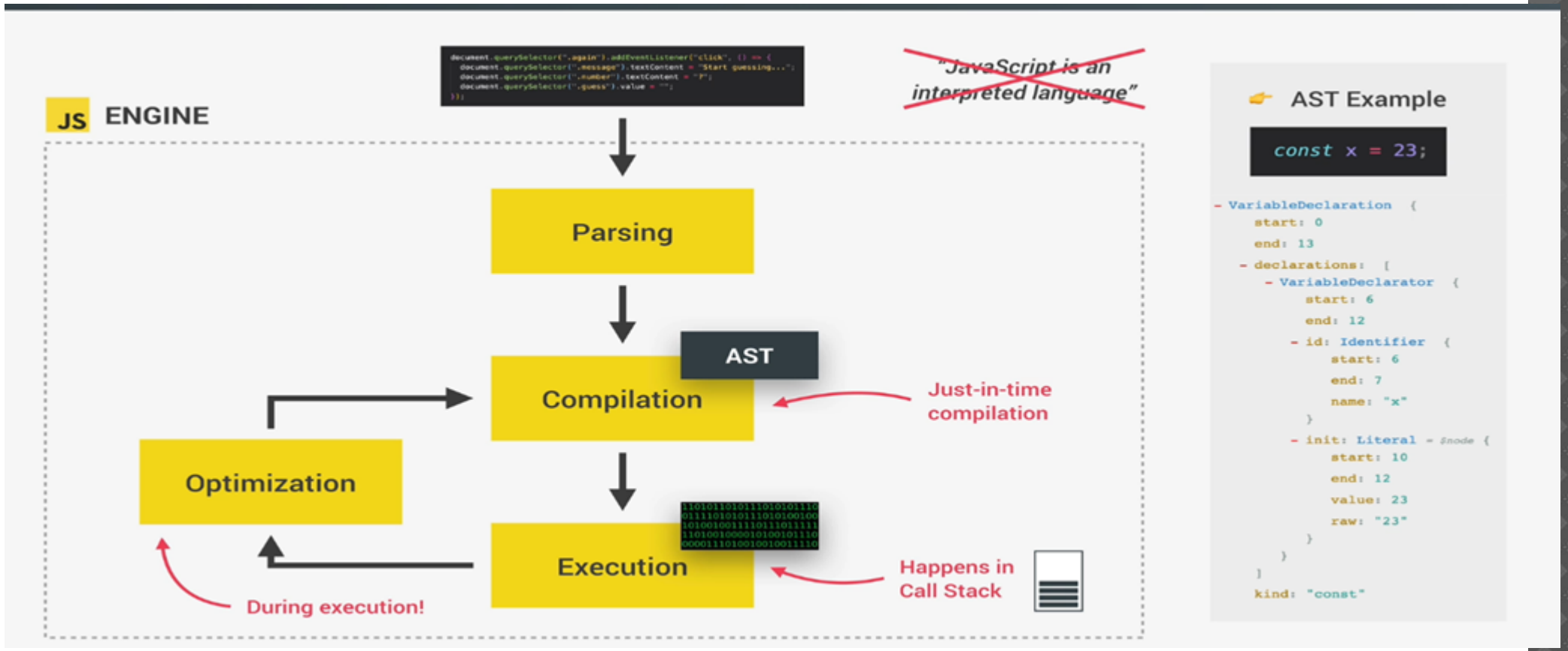
- **Interpretation:** Interpreter runs through the source code and executes it line by line.



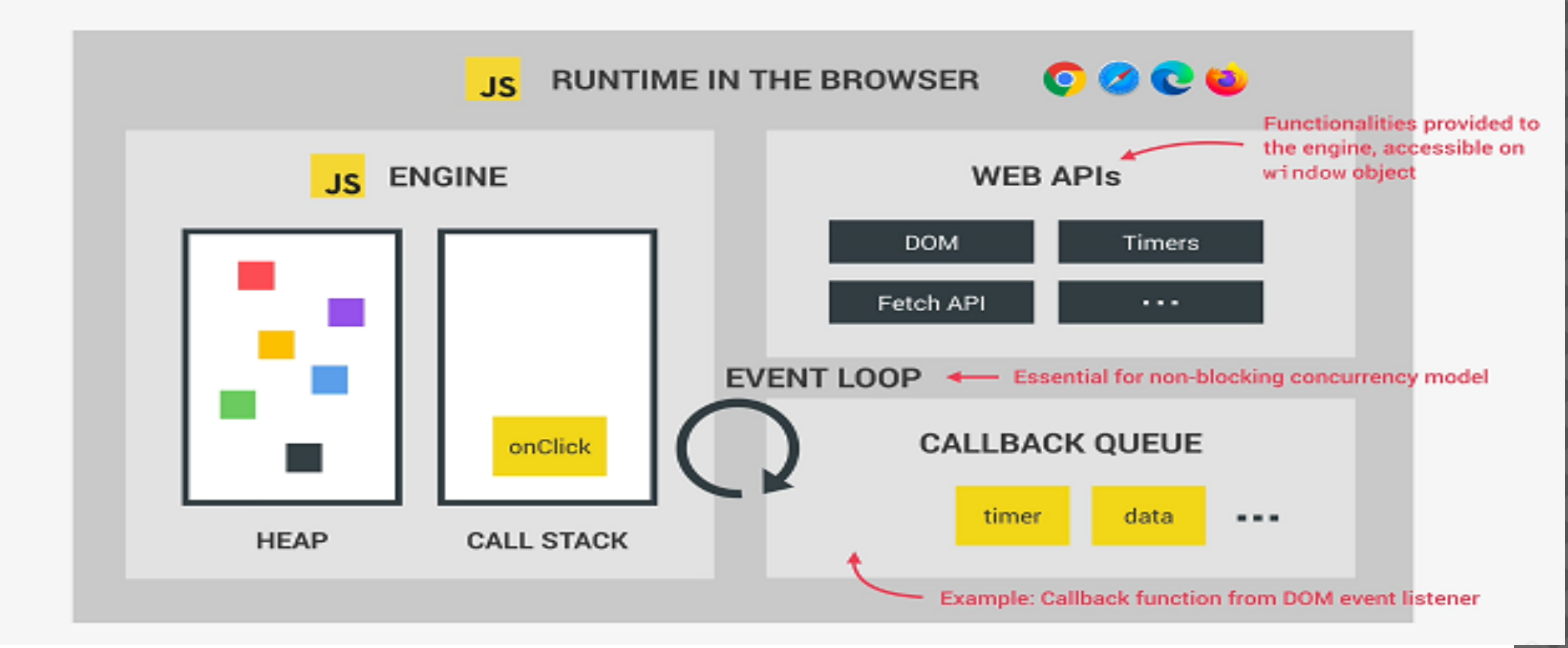
- **Just-in-time (JIT) compilation:** Entire code is converted into machine code at once, then executed immediately.



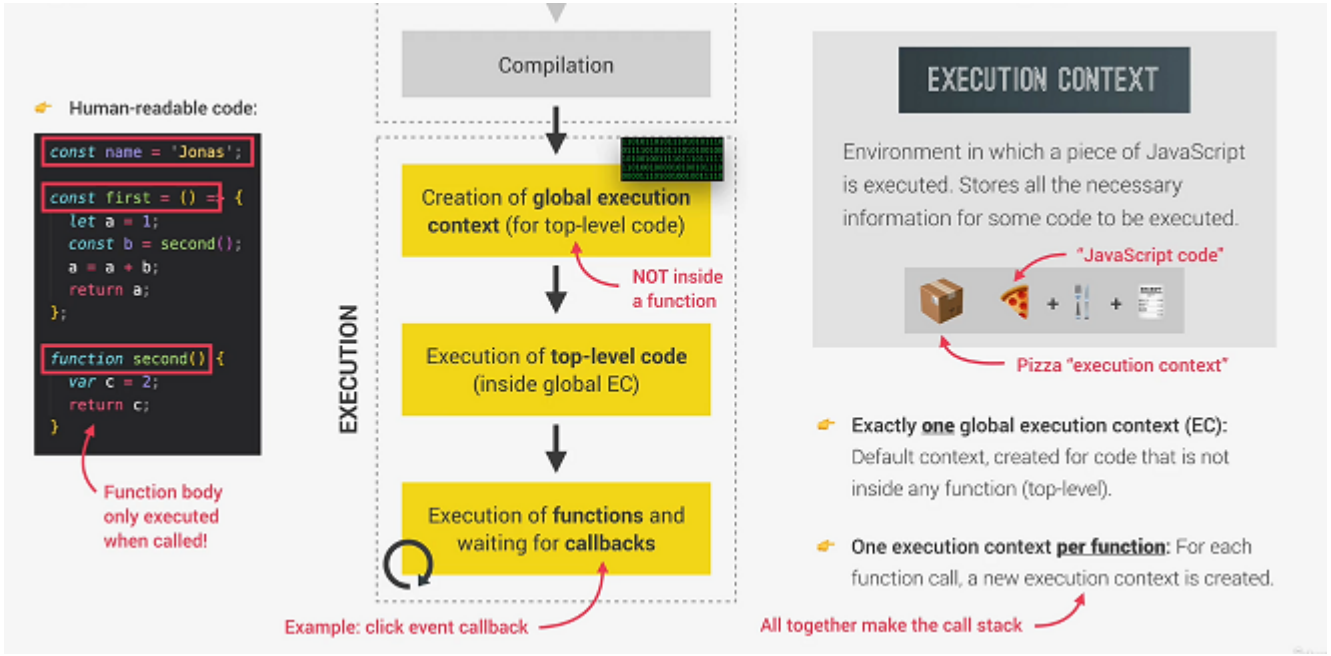
COMPILATION OF JAVASCRIPT



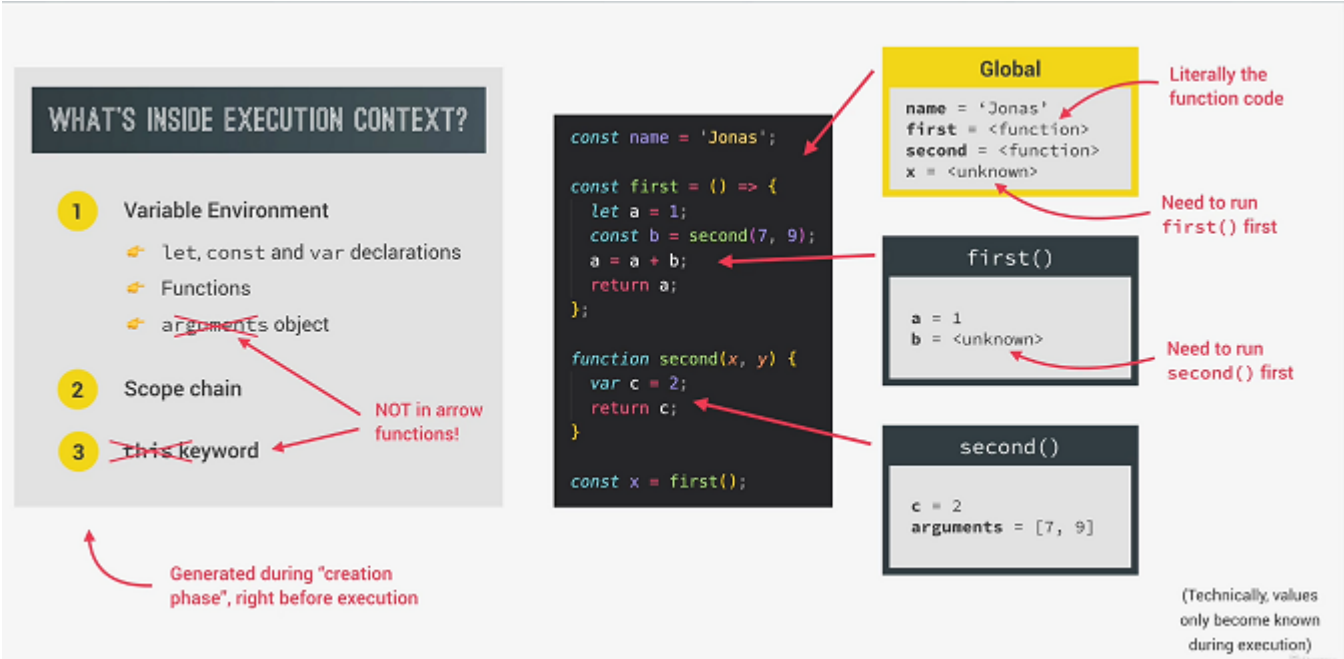
JAVASCRIPT RUNTIME



EXECUTION CONTEXT



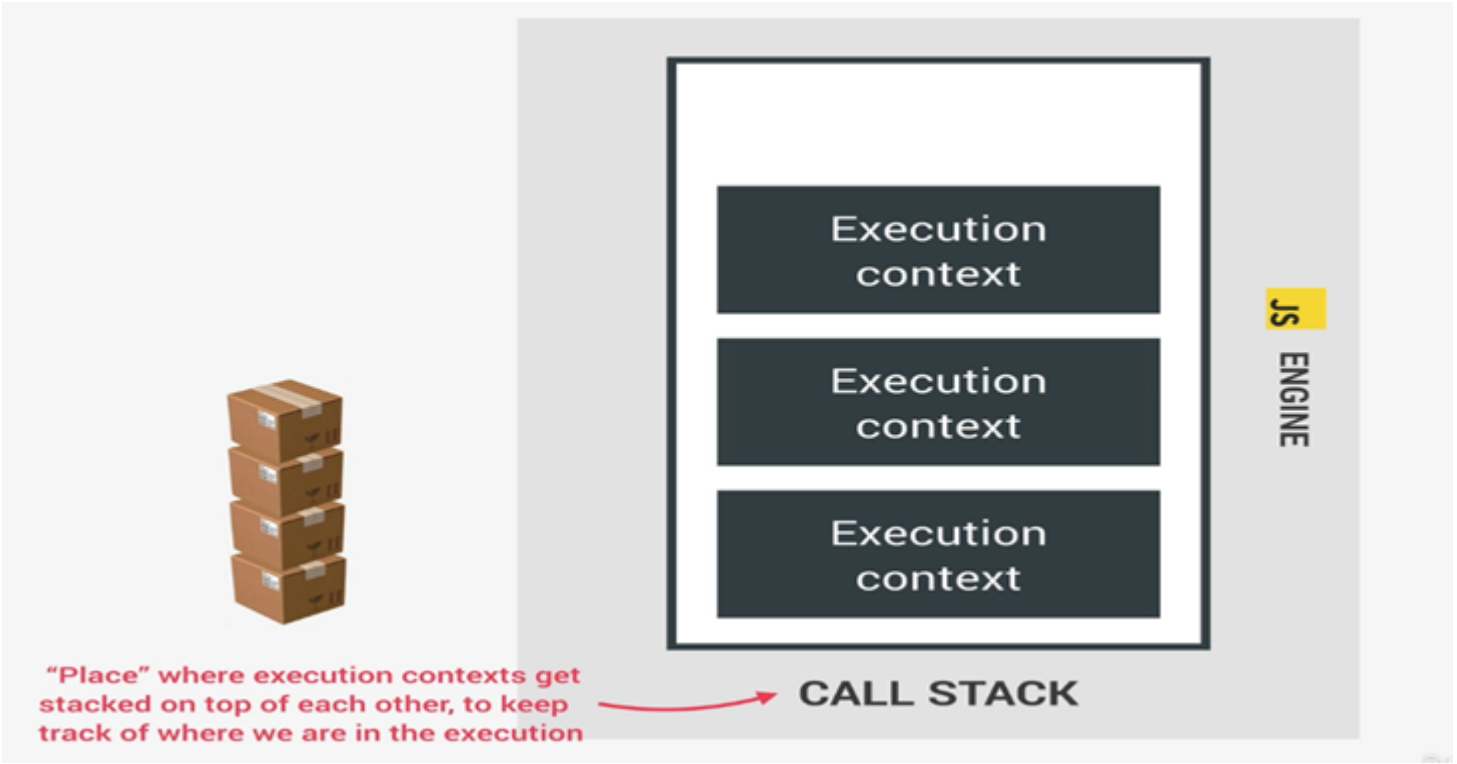
EXECUTION CONTEXT



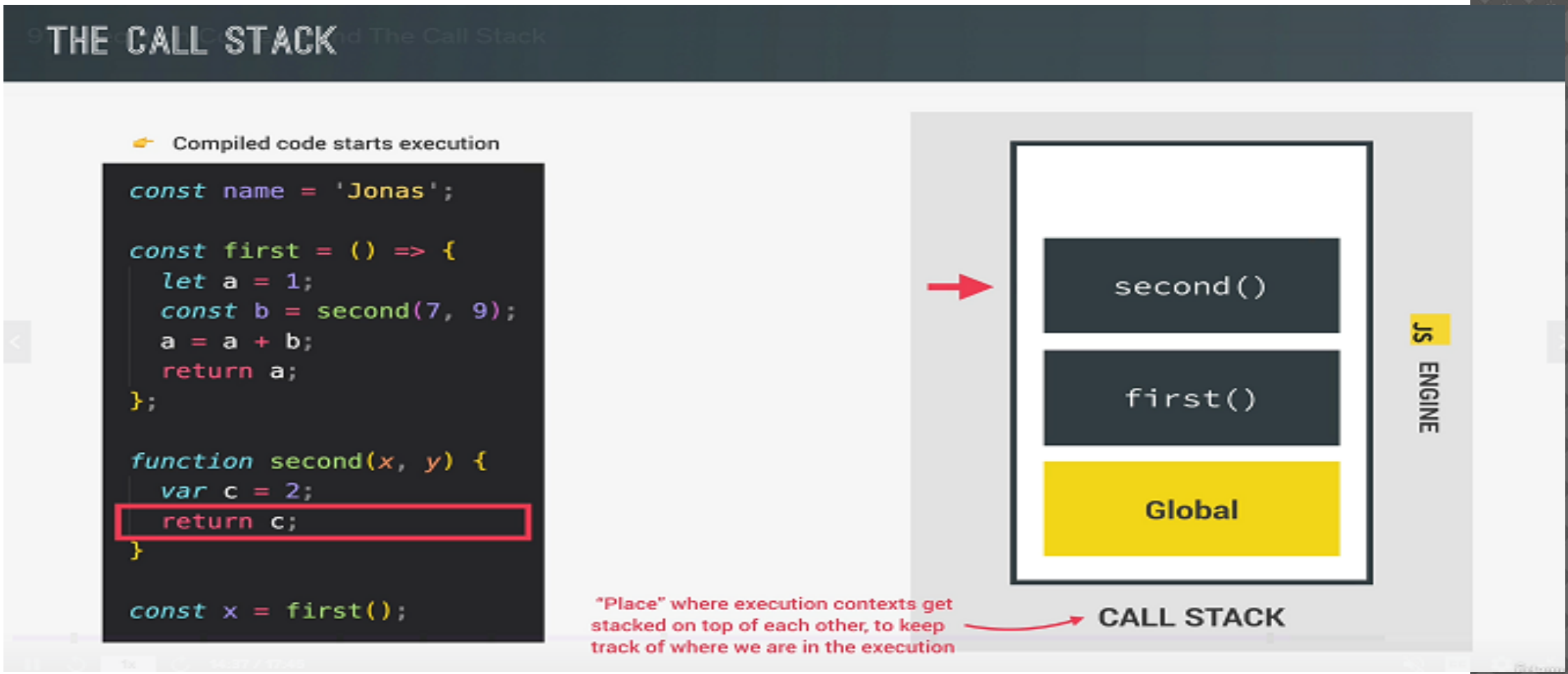
NORMAL FUNCTION AND ARROW FUNCTION

```
<script>
    let obj={
        firstName:"akash",
        normalFunction:function(){
            console.log(this.firstName);
        },
        arrowFunction:()=>{
            console.log(this.firstName);
        }
    }
obj.normalFunction();
obj.arrowFunction();
</script>
```

EXECUTION CONTEXT - CALL STACK



EXECUTION CONTEXT : CALL STACK - 1



EXECUTION CONTEXT : CALL STACK - 2

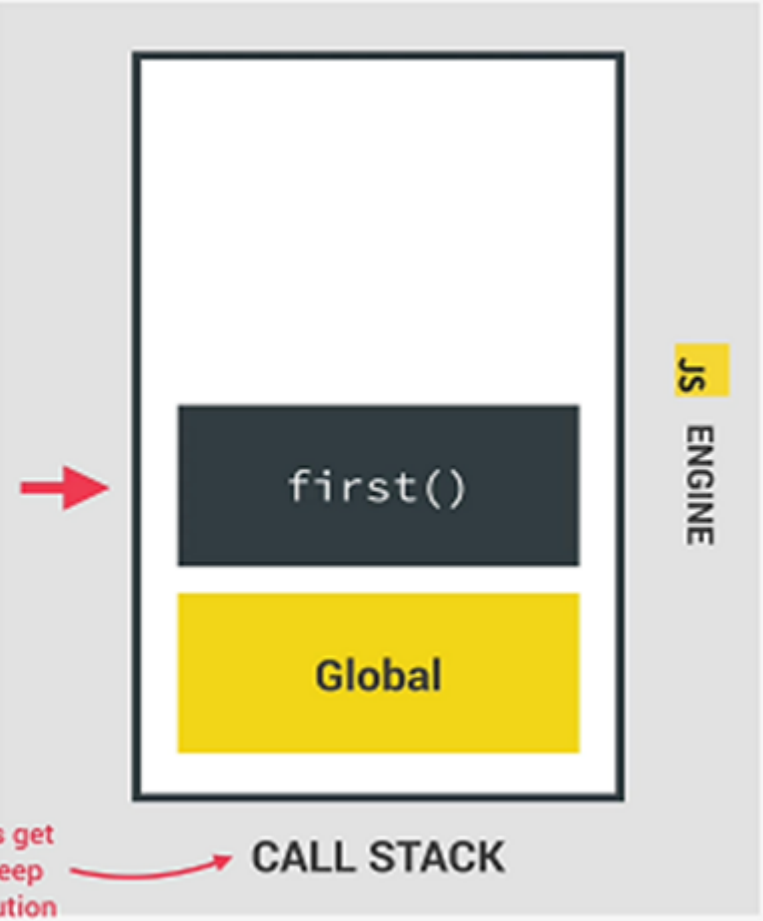
👉 Compiled code starts execution

```
const name = 'Jonas';

const first = () => {
  let a = 1;
  const b = second(7, 9);
  a = a + b;
  return a;
};

function second(x, y) {
  var c = 2;
  return c;
}

const x = first();
```



"Place" where execution contexts get stacked on top of each other, to keep track of where we are in the execution

EXECUTION CONTEXT : CALL STACK - 3

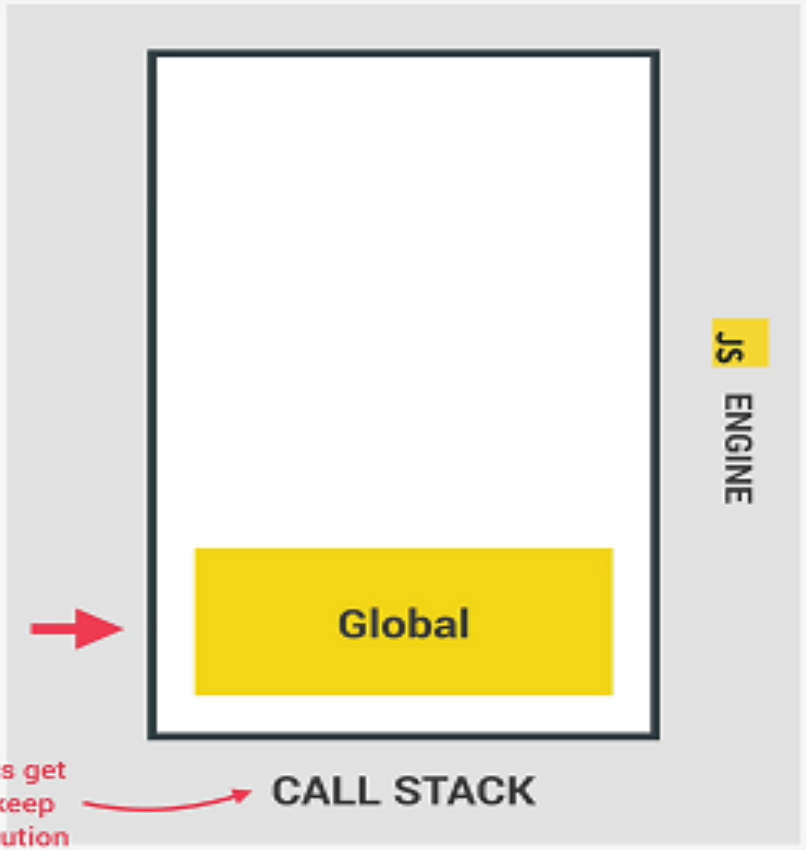
👉 Compiled code starts execution

```
const name = 'Jonas';

const first = () => {
  let a = 1;
  const b = second(7, 9);
  a = a + b;
  return a;
};

function second(x, y) {
  var c = 2;
  return c;
}

const x = first();
```



"Place" where execution contexts get stacked on top of each other, to keep track of where we are in the execution

EXECUTION CONTEXT : CALL STACK - 4