**📘 Node.js Basics – Developer Notes**

**1️⃣ Installing Node.js**

* First, install Node.js by visiting:  
  🔗 https://nodejs.org
* Node.js includes **npm** (Node Package Manager), which allows you to manage and install packages for your JavaScript projects.

**2️⃣ Verification After Installation**

* After installation, verify Node.js and npm by running:

node -v

npm -v

**3️⃣ Writing Code with Node.js**

* Use the **Node REPL** (Read-Eval-Print Loop) — an interactive shell to write and execute JS code quickly.
* Just type node in your terminal and start coding.
  + You can try:

let x = 10;

x + 5;

* Ideal for:
  + Testing JS logic quickly
  + Understanding variable behavior
  + Exploring without writing a full script

**4️⃣ What is Node.js?**

* Node.js is a **JavaScript runtime environment**.
* It lets you run JS **outside the browser**, i.e., on the server.
* Built on the **V8 engine** (same as Chrome):
  + Converts JavaScript to **machine code**
  + Enables fast execution of JS code

**🧠 Key Concepts:**

**➕ It's Similar to Browser Consoles:**

* Like browser dev tools console, but **runs outside the browser**
* Allows:
  + Testing code quickly
  + Server-side JS development
  + File and network operations

**➕ Why Use Node REPL?**

* REPL is great for:
  + Quick experiments
  + Testing syntax
  + Learning JS
* Provides:
  + Syntax highlighting
  + Auto-completion
  + Real-time execution feedback

**5️⃣ Sample JavaScript Code in Node**

let name = "NodeJS";

let a = 10;

let b = 20;

let c = a + b;

console.log(name);

console.log(c);

To run this, save it in a file and execute with:

node filename.js

**6️⃣ Global Object in Node.js**

**🟡 What is a Global Object?**

* A **global object** contains values and functions available anywhere in a Node.js program.
* Similar to window in the browser.
* In Node.js, it’s called **global**.

**🧩 Global Object in Node.js Contains:**

* setTimeout()
* setInterval()
* console
* process
* etc.

**🔴 Difference Between Browser and Node.js Global Object:**

| **Feature** | **Browser** | **Node.js** |
| --- | --- | --- |
| Global Object | window | global |
| Scope | Available in browser environment | Available in Node runtime |
| Provided By | Browser engine | Node.js (on top of V8) |
| Access DOM? | Yes | ❌ No DOM in Node.js |

**🧠 Important Notes:**

* Node.js runs on V8 but adds **extra capabilities** to interact with:
  + File system
  + Operating system
  + Network
* These features are not part of the V8 engine itself, but added by Node.js runtime.

**⭐ Summary:**

global in Node.js is like window in browsers — both provide access to globally available functionalities, but suited for different environments.