

JavaScript DOM Manipulation: Complete Guide with Real-Life Project Examples

Before moving on to JavaScript Events, it's crucial to understand how to **select and modify HTML elements** using JavaScript.

This guide will cover **all essential DOM methods** with **real-world project examples**, making it easy for students to understand **where and why** they should use them.

1. Selecting Elements in JavaScript

`getElementById()` – Selecting an Element by ID

This method selects an element using its **ID**.


Real-World Project Example:

- In a **portfolio website**, updating the **welcome message** dynamically.

Code Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Portfolio</title>
</head>
<body>

  <h1 id="welcomeMessage">Welcome to My Portfolio</h1>
  <button onclick="updateMessage()">Update Message</button>

  <script>
    function updateMessage() {
      let message = document.getElementById("welcomeMessage");
      message.innerHTML = " Welcome to My Professional Portfolio!";
    }
  </script>
```

```
</body>
</html>
```

👉 `getElementsByClassName()` – Selecting Multiple Elements by Class

This method selects **multiple elements** that share the same class.

🔧 Real-World Project Example:

- **E-commerce Website:** Highlight all "on sale" products.

👤 Code Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>E-Commerce</title>
</head>
<body>

  <p class="sale">Product 1 - $50</p>
  <p class="sale">Product 2 - $30</p>
  <p>Product 3 - $100</p>

  <button onclick="highlightSales()">Highlight Sale Items</button>

  <script>
    function highlightSales() {
      let saleItems = document.getElementsByClassName("sale");
      for (let item of saleItems) {
        item.style.color = "red";
        item.style.fontWeight = "bold";
      }
    }
  </script>

</body>
</html>
```

👉 `querySelector()` – Selecting the First Matching Element

This method selects the **first element** that matches a **CSS selector**.

🔧 Real-World Project Example:

- **Blog Page:** Selecting the first featured post to style differently.

👤 Code Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Blog</title>
</head>
<body>

  <p class="featured">🔥 Featured Blog Post</p>
  <p class="featured">New Blog Post</p>

  <button onclick="highlightFeatured()">Highlight Featured Post</button>

  <script>
    function highlightFeatured() {
      let featured = document.querySelector(".featured");
      featured.style.backgroundColor = "yellow";
    }
  </script>

</body>
</html>
```

👉 `querySelectorAll()` – Selecting All Matching Elements

This method selects **all elements** matching a **CSS selector**.

🔧 Real-World Project Example:

- **To-Do List App:** Styling all completed tasks.

👤 Code Example:

```

<!DOCTYPE html>
<html lang="en">
<head>
  <title>To-Do List</title>
</head>
<body>

  <ul>
    <li class="done">Task 1</li>
    <li class="done">Task 2</li>
    <li>Task 3</li>
  </ul>

  <button onclick="highlightDone()">Mark Completed</button>

  <script>
    function highlightDone() {
      let tasks = document.querySelectorAll(".done");
      tasks.forEach(task => {
        task.style.textDecoration = "line-through";
      });
    }
  </script>

</body>
</html>

```

2. Modifying Elements in JavaScript

`innerText` – Change Text Content

Changes the **text** inside an element.

Real-World Project Example:

- **Weather App:** Updating the temperature dynamically.

Code Example:

```

<!DOCTYPE html>
<html lang="en">
<head>

```

```
<title>Weather App</title>
</head>
<body>

  <h2 id="temperature">Temperature: 25°C</h2>
  <button onclick="updateTemp()">Update Temperature</button>

  <script>
    function updateTemp() {
      document.getElementById("temperature").innerText = "Temperature:
30°C";
    }
  </script>

</body>
</html>
```

👉 innerHTML – Change HTML Content

Allows adding **HTML** elements dynamically.

🔧 Real-World Project Example:

- **News Website:** Dynamically adding **breaking news**.

💻 Code Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>News Website</title>
</head>
<body>

  <div id="newsSection"></div>
  <button onclick="addNews()">Add Breaking News</button>

  <script>
    function addNews() {
      let news = document.getElementById("newsSection");
      news.innerHTML = "<h2>🚨 Breaking News: JavaScript is Awesome!
</h2>";
    }
  </script>
</body>
</html>
```

```
</script>
```

```
</body>
```

```
</html>
```

👉 style – Change CSS Dynamically

Changes the **style** of an element dynamically.

🔧 Real-World Project Example:

- **Portfolio Website:** Changing the theme color.

👤 Code Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Portfolio</title>
</head>
<body>

  <h1 id="heading">Welcome to My Portfolio</h1>
  <button onclick="changeTheme()">Change Theme</button>

  <script>
    function changeTheme() {
      let title = document.getElementById("heading");
      title.style.color = "blue";
      title.style.backgroundColor = "lightgray";
    }
  </script>

</body>
</html>
```

👉 createElement() – Adding New Elements

Dynamically creates new elements.

🔧 Real-World Project Example:

- **E-commerce Website:** Adding a new product dynamically.

👤 Code Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>E-commerce</title>
</head>
<body>

  <ul id="productList">
    <li>Product 1</li>
    <li>Product 2</li>
  </ul>

  <button onclick="addProduct()">Add New Product</button>

  <script>
    function addProduct() {
      let newProduct = document.createElement("li");
      newProduct.innerText = "New Product";
      document.getElementById("productList").appendChild(newProduct);
    }
  </script>

</body>
</html>
```

👉 remove() – Removing an Element

Deletes an element from the DOM.

🔧 Real-World Project Example:

- **Social Media App:** Deleting a comment.

👤 Code Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Comment System</title>
</head>
<body>

  <p id="comment">This is a comment.</p>
  <button onclick="deleteComment()">Delete Comment</button>

  <script>
    function deleteComment() {
      document.getElementById("comment").remove();
    }
  </script>

</body>
</html>
```

Conclusion

Now, you fully understand **how to select and modify elements** dynamically in JavaScript!

Key Takeaways:

- ✓ **Selecting Elements:** `getElementById()`, `querySelector()`, `querySelectorAll()`
 - ✓ **Modifying Elements:** `innerText`, `innerHTML`, `style`, `createElement()`, `remove()`
 - ✓ **Real-World Use Cases:** Applied to **E-commerce, Portfolio, Blog, Weather App, Social Media, News Website**
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