Day 1: Introduction to CSS and Basic Selectors

Lesson Objective:

By the end of this lesson, learners should be able to:

- Understand what CSS is and how it works.
- Apply CSS to HTML in different ways (inline, internal, external).
- Use basic CSS selectors (element, class, ID).
- Understand the CSS Box Model and apply it to style elements.
- Use different CSS measurement units.

Lesson Outline:

1. Introduction to CSS
2. Applying CSS to HTML
3. Basic CSS Selectors
4. The CSS Box Model
5. CSS Measurements
6. Practice Project

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1. Introduction to CSS

CSS (Cascading Style Sheets) is a stylesheet language used to control the appearance of HTML elements on a web page. With CSS, we can control the layout, colors, fonts, spacing, and much more.

- **Why CSS?**
  HTML defines the structure, but CSS makes your website look great! It separates content from presentation, allowing for a clean, consistent design.

Example:

```
<h1>This is HTML</h1>
<p>HTML is for content, but CSS controls the design.</p>
```

- Without CSS, everything looks plain. Let's add some style using CSS.

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2. Applying CSS to HTML

There are three ways to apply CSS to an HTML document:

1. **Inline CSS:** Applying CSS directly to an element using the `style` attribute.
2. **Internal CSS:** Placing CSS inside a `<style>` tag within the `<head>` section of the HTML file.
3. **External CSS:** Using an external stylesheet linked to the HTML file.

Example of Each:

- **Inline CSS:**

```
<h1 style="color: green;">Hello World!</h1>
```

- **Internal CSS:**

```
<!DOCTYPE html>
<html lang="en">
<head>
    <style>
        h1 {
            color: green;
        }
    </style>
</head>
<body>
    <h1>Hello World!</h1>
</body>
</html>
```

- **External CSS (recommended):**
    - First, create a `styles.css` file with the following content:

```
h1 {
    color: green;
}
```

-

- Then, link it to your HTML:

```
<link rel="stylesheet" href="styles.css">
```

- **Activity:** Create an HTML file and try applying styles using all three methods. See how each method affects the structure of your code.

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3. Basic CSS Selectors

CSS selectors are used to select the HTML elements you want to style. Here are the basic types:

- **Element Selector:** Targets all instances of a specific element (e.g., `<h1>`, `<p>`).

```
p {
    color: blue;
}
```

- **Class Selector:** Targets elements with a specific class attribute.

```
<p class="highlight">This is highlighted text.</p>


.highlight {
    color: yellow;
    font-weight: bold;
}
```

- **ID Selector:** Targets a single element with a unique ID.

```
<h1 id="main-heading">Welcome!</h1>
```

```
#main-heading {
    font-size: 2rem;
    color: red;
}
```

> **Activity:** Create a simple HTML page with at least three headings and paragraphs. Use element selectors, classes, and IDs to style them with different colors, font sizes, and background colors.

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4. The CSS Box Model

Every HTML element is considered as a box in CSS. The **Box Model** consists of four parts:

- **Content:** The actual content (text, image, etc.)
- **Padding:** Space between the content and the border.
- **Border:** The line surrounding the padding (or content if padding isn't used).
- **Margin:** The space outside the border.

Visualizing the Box Model:

```
div {
    width: 200px;
    height: 100px;
    padding: 20px;
    border: 5px solid black;
    margin: 10px;
}
```

In this example:

- Content is 200px by 100px.
- Padding adds space inside the box (20px).
- The border is 5px thick.
- Margin adds space outside the box (10px).

> **Activity:** Create a box using a `<div>` element and apply padding, border, and margin. Use the browser's developer tools to inspect and visualize the box model.

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5. CSS Measurements

CSS uses different units to specify sizes (e.g., width, height, margins, padding, etc.).

- **Absolute Units:**
  - `px`: Pixels (fixed size)
- **Relative Units:**
  - `%`: Percentage of the parent element's size.
  - `em`: Relative to the font size of the parent element.
  - `rem`: Relative to the font size of the root element (`html`).
  - `vw`: Viewport width (1vw = 1% of the viewport width).
  - `vh`: Viewport height (1vh = 1% of the viewport height).

Example of Different Units:

```
div {
    width: 50%;   /* 50% of the parent element's width */
    padding: 2em; /* 2 times the font size of the parent */
    margin: 10px; /* 10 pixels of margin */
}
```

> **Activity:** Experiment with different units. Create a container that resizes dynamically with the viewport by using `%`, `vw`, and `vh`. Also, try using `em` and `rem` to set font sizes and padding.

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6. Practice Project

Let's bring everything together in a simple project.

Goal:

Create a webpage with the following elements:

- A main heading (`<h1>`) styled using an external CSS file.
- At least two paragraphs styled using class selectors.
- A box (div) that demonstrates the box model (content, padding, border, margin).
- Use a mix of units (`px`, `%`, `em`, `rem`, `vw`, `vh`) to style the elements.

Steps:

Set up the HTML file:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="stylesheet" href="styles.css">
    <title>Day 1 CSS Project</title>
</head>
<body>
    <h1 id="main-title">Learning CSS</h1>
    <p class="intro">CSS is used to style HTML documents.</p>
    <p class="intro">We can control layout, fonts, colors, and
much more.</p>
    <div class="box">This is a box model demo.</div>
</body>
</html>
```

1.

Create the `styles.css` file:

```
/* Styling the main heading */
#main-title {
    color: darkgreen;
    text-align: center;
    font-size: 3rem;
}

/* Styling the paragraphs */
.intro {
    font-size: 1.5em;
    color: darkblue;
    line-height: 1.8;
}

/* Styling the box */
.box {
    width: 50%;
```

```
    padding: 20px;
    margin: 10px auto;
    border: 5px solid black;
    background-color: lightgray;
}
```

2. **Test Your Page:** Open the HTML file in your browser and see how the CSS changes the appearance of the elements.

Review and Summary:

- CSS allows us to control how elements look on a web page.
- We learned how to apply CSS using inline, internal, and external methods.
- We explored basic CSS selectors: element, class, and ID.
- The box model is key to understanding how elements are laid out on the page.
- CSS measurements allow us to control size and layout, and there are various units to use depending on the situation.

End-of-Day Task:
Share your final project on GitHub, and compare how the styles change when using different CSS measurement units.