The CSS Box Model

Every HTML element on a page is a **rectangular box** in the browser, and the **Box Model** defines how that box behaves. It's the foundation of spacing, layout, and sizing in CSS.

What is the Box Model?

The box model consists of **four layers**, from innermost to outermost:

```
|-------------------------|
|          Margin         |
|   |-----------------|   |
|   |      Border     |   |
|   |   |-----------| |   |
|   |   |  Padding  | |   |
|   |   |  |------| | |   |
|   |   |  |Content| | |  |
|   |   |  |------| | |   |
|   |   |-----------| |   |
|   |-----------------|   |
|-------------------------|
```

The Four Parts

1. Content

The actual text, image, or element inside the box.

```
width: 200px;
height: 100px;
```

2. Padding

Space **inside** the box, between content and border.

```
padding: 20px;
```

It pushes the content **inward**, increasing the total box size.

3. Border

The border around the padding and content.

```
border: 2px solid black;
```

You can control its width, style, and color.

4. Margin

Space **outside** the border. Used to create distance between elements.

```
margin: 30px;
```

Margins do not have a background color and are completely transparent.

Example

```css
.box {
  width: 300px;
  height: 150px;
  padding: 20px;
  border: 5px solid gray;
  margin: 40px;
}
```

The **actual space** this element occupies:

- Width: `300 + 2*20 (padding) + 2*5 (border)` = **350px**
- Height: `150 + 2*20 (padding) + 2*5 (border)` = **200px**

Margin is **outside** of this box, adding extra space between elements.

Box Sizing: `content-box` vs `border-box`

By default, CSS uses `content-box`, where `width` and `height` apply **only to the content**, not padding or border.

To include padding and border **inside** the specified dimensions, use:

```css
* {
  box-sizing: border-box;
}
```

With `border-box`, the total width stays fixed, and padding/border are adjusted **inside** the box.

Visual Example

```css
.card {
  width: 400px;
  padding: 20px;
  border: 10px solid black;
  box-sizing: border-box;
}
```

In this case, the **total width remains 400px**, including padding and border.

Summary

- The box model controls **how elements take up space**.
- Understand how content, padding, border, and margin interact.
- Use `box-sizing: border-box` to make layout calculations easier.