**CSS: Box Model & Essential Layout**

**1. Key Definitions**

* **Box Model:** Fundamental concept describing how every HTML element is a box made of content, padding, border, and margin[[1]](#fn1)[[2]](#fn2).
* **Content:** Where your text or images appear.
* **Padding:** Space inside the box, between content and border.
* **Border:** Line surrounding the padding and content.
* **Margin:** Space outside the border, separating elements.

**2. Diagram: The CSS Box Model**

| Margin | ← Space outside the element  
| ┌────────────┐  
| | Border |   
| | ┌────────┐ |  
| | |Padding | |  
| | |┌──────┐| |  
| | ||Content|| |  
| | |└──────┘| |  
| | └────────┘ |  
| └────────────┘

**Memory Tip:**  
Remember: Content → Padding → Border → Margin (inside-out)[[2]](#fn2).

**3. Box Model Example**

.box {  
 width: 200px;  
 padding: 10px;  
 border: 5px solid #333;  
 margin: 20px;  
}

* Total box width: 200px (content) + 2\*10px (padding) + 2\*5px (border) = 230px
* Margin adds space outside the box[[2]](#fn2).

**4. Height & Width**

* **height/width:** Set content area size.
* Units: pixels (px), percent (%), em/rem, auto[[3]](#fn3)[[4]](#fn4).
* **Example**:

div { width: 50%; height: 120px; }

* **Tip:** Padding and border add to size unless using box-sizing: border-box[[3]](#fn3).

**5. Border Property**

**Formula:**

border: width style color;

* **Styles:** solid, dotted, dashed, double, groove, ridge, inset, outset, none[[5]](#fn5)[[6]](#fn6).
* **Example:**

p { border: 2px dashed red; }

**Memory Tip:**  
Use border shorthand for cleaner code: border: 1px solid black;[[6]](#fn6).

**6. Border Radius**

* **border-radius:** Rounds corners of elements.
* Can apply one to four values for each corner[[7]](#fn7).
* **Example:**

div { border-radius: 10px 20px 30px 40px; }

* 50% makes perfect circles if width and height are equal.

**7. Padding Property**

* **Padding**: Space *inside* the border.
* Can set all sides at once or each individually[[8]](#fn8)[[9]](#fn9).
* **Formulas:**
  + padding: 20px; (all sides)
  + padding: 10px 5px 15px 20px; (top, right, bottom, left)
* **Tip:** No negative values allowed[[9]](#fn9).

**8. Margin Property**

* **Margin**: Space *outside* the border, separates elements[[10]](#fn10)[[11]](#fn11).
* Set with margin shorthand or individual sides.
* **Syntax:**
  + margin: 20px; (all sides)
  + margin-top: 10px; margin-left: 5px;
* Can be negative (pulls elements closer)[[11]](#fn11).

**9. Display Property**

Defines how elements are rendered and flow in the layout[[12]](#fn12)[[13]](#fn13).

|  |  |
| --- | --- |
| Value | Description |
| block | Break onto new line, full width. (div, p) |
| inline | In line, only as wide as content. (span, a) |
| inline-block | Like inline, but you can set width/height. |
| none | Hidden from layout. |
| flex, grid | Advanced, for layouts/columns/rows, not beginner. |

* **Syntax:** display: block;[[12]](#fn12)[[13]](#fn13)

**10. Inline-Block**

* Combines inline and block: elements stay inline but accept width/height[[14]](#fn14)[[15]](#fn15).
* **Useful For:** Buttons or nav items side by side.
* **Example:**

.btn { display: inline-block; width: 100px; }

**11. Relative Units (%, em, rem)**

* **%:** Relative to parent’s value.
* **em:** Relative to *current* element’s font-size.
* **rem:** Relative to *root* (html) font-size.

**Example:**

div { width: 80%; font-size: 2em; padding: 1rem; }

**Tip:** Prefer rem for consistency, % for responsive sizing.

**12. Memory Tips & Key Points**

* **Box Order:** Content → Padding → Border → Margin.
* Default sizing: width/height applies to content box. Use box-sizing: border-box; so width includes padding/border[[2]](#fn2).
* Use shorthand properties for cleaner code: margin, padding, border[[9]](#fn9)[[11]](#fn11).
* Use %, em, rem for responsive and scalable layouts.
* Try changing each property in a live code editor to see effects!

**Essential Quick Reference Table**

|  |  |  |
| --- | --- | --- |
| Property | Purpose | Example Code |
| width, height | Sets element size | div { width: 100px; } |
| border | Adds line around box | p { border: 1px solid; } |
| border-radius | Rounds box corners | div { border-radius: 10px; } |
| padding | Space inside border | .menu { padding: 10px; } |
| margin | Space outside border | h2 { margin-top: 20px; } |
| display | Controls element layout | span { display: block; } |
| inline-block | Inline + width/height | li { display: inline-block;} |
| %, em, rem | Responsive sizing units | p { font-size: 2rem; } |

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