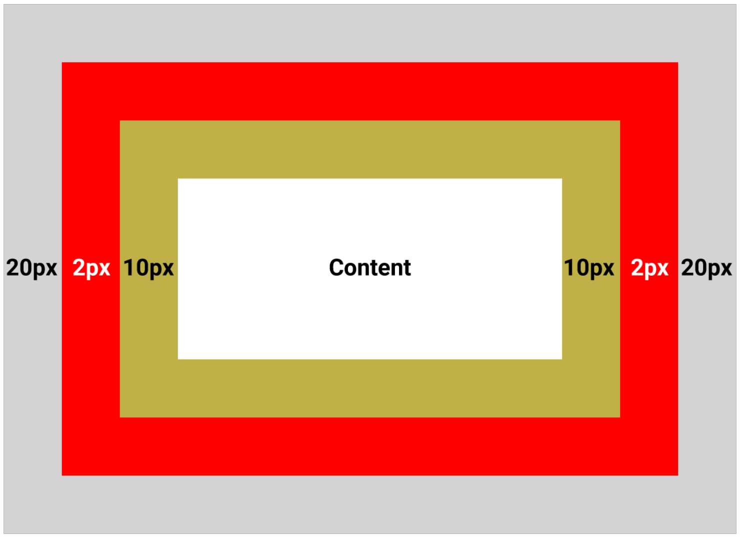
Changing the CSS Box Model to the Border-Box model

In contrast to the CSS box model, the **border-box** model says that to determine the total width of an element, you simply add together the value of the CSS width property plus the margin. In other words, border and padding are bundled together in a single value in the width and height.

```
article {
  width: 500px;
  border: 2px solid red;
  padding: 10px;
  margin: 20px;
}
```



The overall width for this element is:

$$500\text{px} + 20\text{px} + 20\text{px} = 540\text{px wide}$$

Why is this distinction important? The border-box model is especially helpful to responsive design, because now layouts may depend on just the width and margin properties. If borders or padding are added after the fact, it won't affect the overall layout of the web page — and that's a great thing!

Adding the CSS Border-Box Property

To add the border-box property, use the following CSS syntax:

```
html {
  box-sizing: border-box;
}
*, *:before, *:after {
  box-sizing: inherit;
}
```

If you are interested, this code syntax is described in more depth by Paul Irish.

To the <html> element, the root of the HTML document, we assign the box-sizing property with a value of border-box. However, box-sizing is not an **inherited property** — meaning it would need to be declared on every element in the HTML document if we wanted to use border-box throughout the document.

That's what happens in the second declaration. The * character is the **universal selector**. This is selecting absolutely everything in our document. *:before and *:after are **pseudo-elements** that indicate that anything that comes before or after the selector should also be included.

Therefore, this code syntax says:

- For the html element, set the box model to the border-box model.
- For everything in the universe, and everything before and after it, inherit the box sizing model from the html tag.

Example:

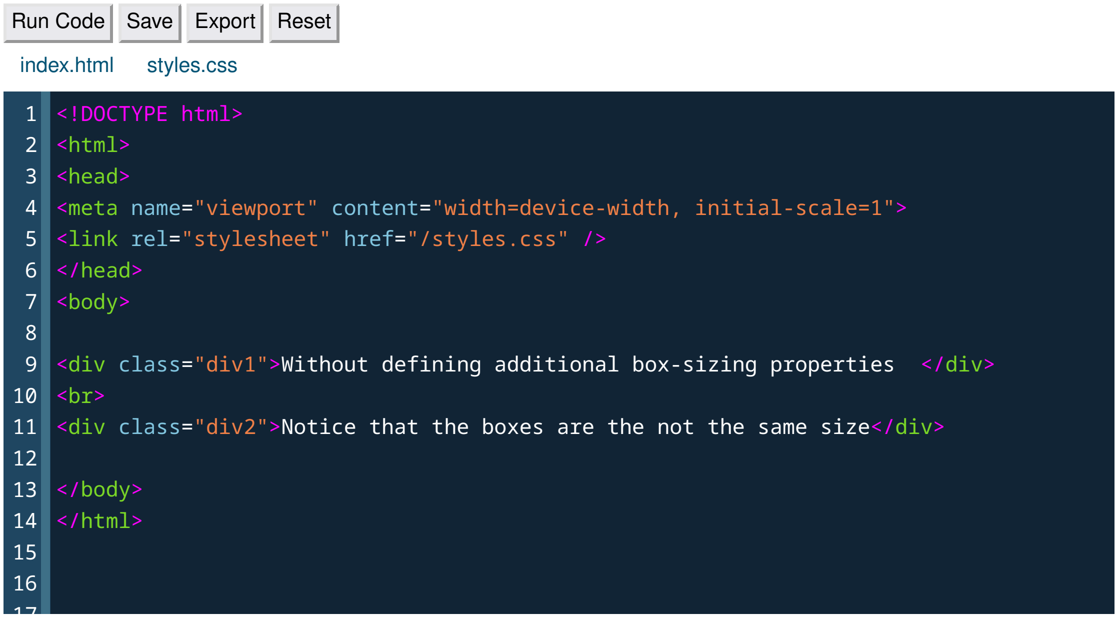
Let's take a look at an example that illustrates the difference in how content on a webpage displays with the default box-sizing, and after adding the box-sizing: border-box; property.

Notice in the CSS stylesheet in the code tool below that both <div> elements are defined with the same height (75px) and width (150px).

```
.div1 {
   width: 150px;
   height: 75px;
   border: 3px solid #2324e1;
}

.div2 {
   width: 150px;
   height: 75px;
   padding: 25px;
   border: 3px solid #24e123;
}
```

Instructions:

- Click the 'run code' button'



```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="/styles.css" />
</head>
<body>

<div class="div1">Without defining additional box-sizing properties  </div>
<br>
<div class="div2">Notice that the boxes are the not the same size</div>

</body>
</html>
```

Theme Select:

rubyblue ⌄

Notice in the browser display, that one div block is smaller than the other. Why?

As described above, by default, the CSS box module calculates the actual width of an element as follows:

width + padding + border = actual width of an element

The actual width of the first div box is:

$$3\text{px} + 150\text{px} + 3\text{px} = 156\text{px wide}$$

However, remember that by default, the padding is also added to the width of the second div element. Therefore, the actual width of the second div element is:

$$3\text{px} + 25\text{px} + 150\text{px} + 25\text{px} + 3\text{px} = 206\text{px wide}$$

This example illustrates that with the default CSS box-sizing model, when the height or width of an element is defined, the element often appears larger than its specified height or width setting because the element's border and padding are added to the actual width or height calculation.

Adding the border-box Property

Now let's add the border-box property to the CSS stylesheet in the code tool below and see how that changes our display.

Instructions:

- Cut and paste the border-box property (shown below) into the css stylesheet in the code tool below.
- Then, click the 'run code' button'

```
html {
  box-sizing: border-box;
}
*, *:before, *:after {
  box-sizing: inherit;
}
```

Run Code | Save | Export | Reset

index.html   styles.css

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="./styles.css"/>
</head>
<body>

<div class="div1">After adding the border-box property to the CSS stylesheet</div>
<br>
<div class="div2">The boxes are the same size</div>

</body>
</html>
```

Theme Select:

rubyblue

Notice that both div elements now appear as the same size. Why? Because the box-sizing property *includes* the padding and border in an element's actual height or width.

Click the tab below to see the correct CSS code Syntax.

Click for Correct CSS Code Syntax

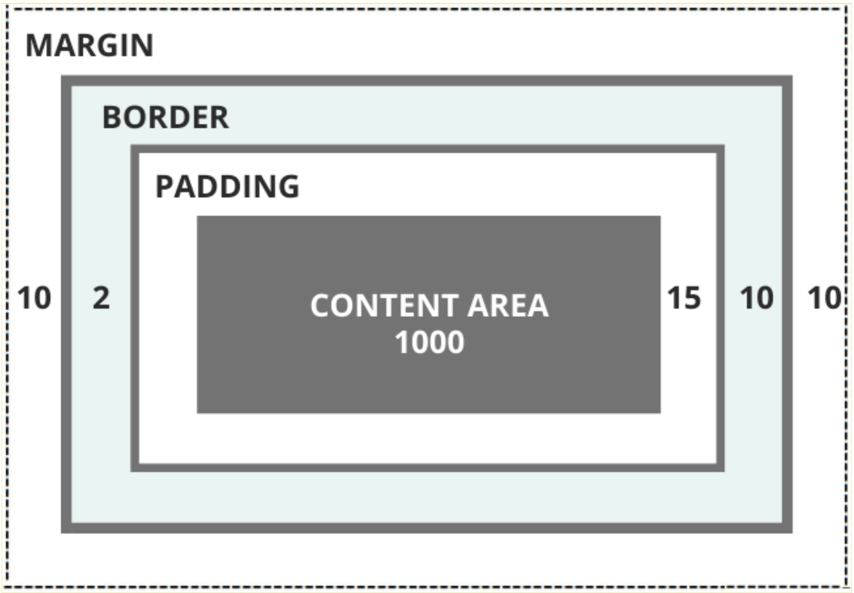
```
html {
   box-sizing: border-box;
   }
   *, *:before, *:after {
     box-sizing: inherit;
     }

  .div1 {
     width: 150px;
     height: 75px;
     border: 3px solid #2324e1;
    }

  .div2 {
     width: 150px;
     height: 75px;
     padding: 25px;
     border: 3px solid #24e123;
    }
```

Interactive Game: Calculating Width with the CSS Border-Box Model

Calculate the overall width for each element. Drag the correct width measurement to the image. Watch for feedback.

watch here for feedback

1020 px | 1030 px | 720 px | 900 px



0/4 Complete!

Reset | Print | Sound on

Review Checkpoint

To test your understanding of the content presented in this assignment, please click on the Questions icon below. If you have trouble answering any of the questions presented here, you are always free to return to this or any assignment to re-read the material.

1. True or False?

Box-sizing is an inherited property.

a. True

Incorrect. Try again.

b. False

Correct. Box-sizing is not an inherited property; it must be declared on every element it will be used for. This can be done for a whole document using universal selectors.

2. When using the border-box box sizing property, which of the following measurements is included in the height and width of the element?

a. border

Incorrect. Try again.

b. border and margin

Incorrect. Try again.

c. border and padding

Correct. By default, the height and width of the border and the padding are added to the assigned dimensions of the element. With the border-box property, the border and the padding are instead included in the assigned height and width.

d. border, margin, and padding

Incorrect. Try again.