INFO2180 - LECTURE 3

CSS CONT'D

THE CASCADE

In CSS, all styles *Cascade* from the top of the stylesheet to the bottom. Therefore, styles can be added or overwritten as the stylesheet progresses.

```css
p {
  background: orange;
  font-size: 24px;
}
```

```css
p {
  background: green;
}
```

```
p {
    background: green;
    background: orange;
}
```

There are, however, times where the cascade doesn't play so nicely. Those times occur when different types of selectors are used and the ***specificity*** of those selectors breaks the cascade.

SPECIFICITY

EVERY SELECTOR IN CSS HAS A SPECIFICITY WEIGHT. A SELECTOR'S SPECIFICITY WEIGHT, ALONG WITH ITS PLACEMENT IN THE CASCADE, IDENTIFIES HOW ITS STYLES WILL BE RENDERED.

http://learn.shayhowe.com/html-css/getting-to-know-css/#specificity

SPECIFICITY WEIGHT

- The type/element selector has the lowest specificity weight and holds a point value of `0-0-1`.
- The class/attribute selector has a medium specificity weight and holds a point value of `0-1-0`.
- Lastly, the ID selector has a high specificity weight and holds a point value of `1-0-0`.

```
<p id="food"> ... </p>
```

```
#food {
  background: green;
}
p {
  background: orange;
}
```

#food (1-0-0) is more specific than **p (0-0-1)**.

```
<div class="hotdog">
  <p> ... </p>
  <p> ... </p>
  <p class="mustard"> ... </p>
</div>
```

```
.hotdog p {
  background: brown;
}
.hotdog p.mustard {
  background: yellow;
}
```

`.hotdog p.mustard (0-2-1)` is more specific than `.hotdog p (0-1-1)`.

COLOURS

FOUR (4) PRIMARY WAYS TO REPRESENT COLOURS

- Keywords e.g. `white`, `red`, `green`, `blue`
- Hexadecimal Notation e.g. `#FF6600`
- RGB e.g. `rgb(128, 0, 0)` or `rgba(128, 0, 0, .5)`
- HSL e.g. `hsl(0, 100%, 25%)` or `hsla(0, 100%, 25%, .36)`

KEYWORDS

```
.my-class {
  background: maroon;
}

.some-other-class {
  background: yellow;
}
```

HEXADECIMAL

```
.some-class {
  background: #800000;
}

.another-class {
  background: #fc6;
}
```

`#fc6` is short hand for `#ffcc66`

RED-GREEN-BLUE (RGB)

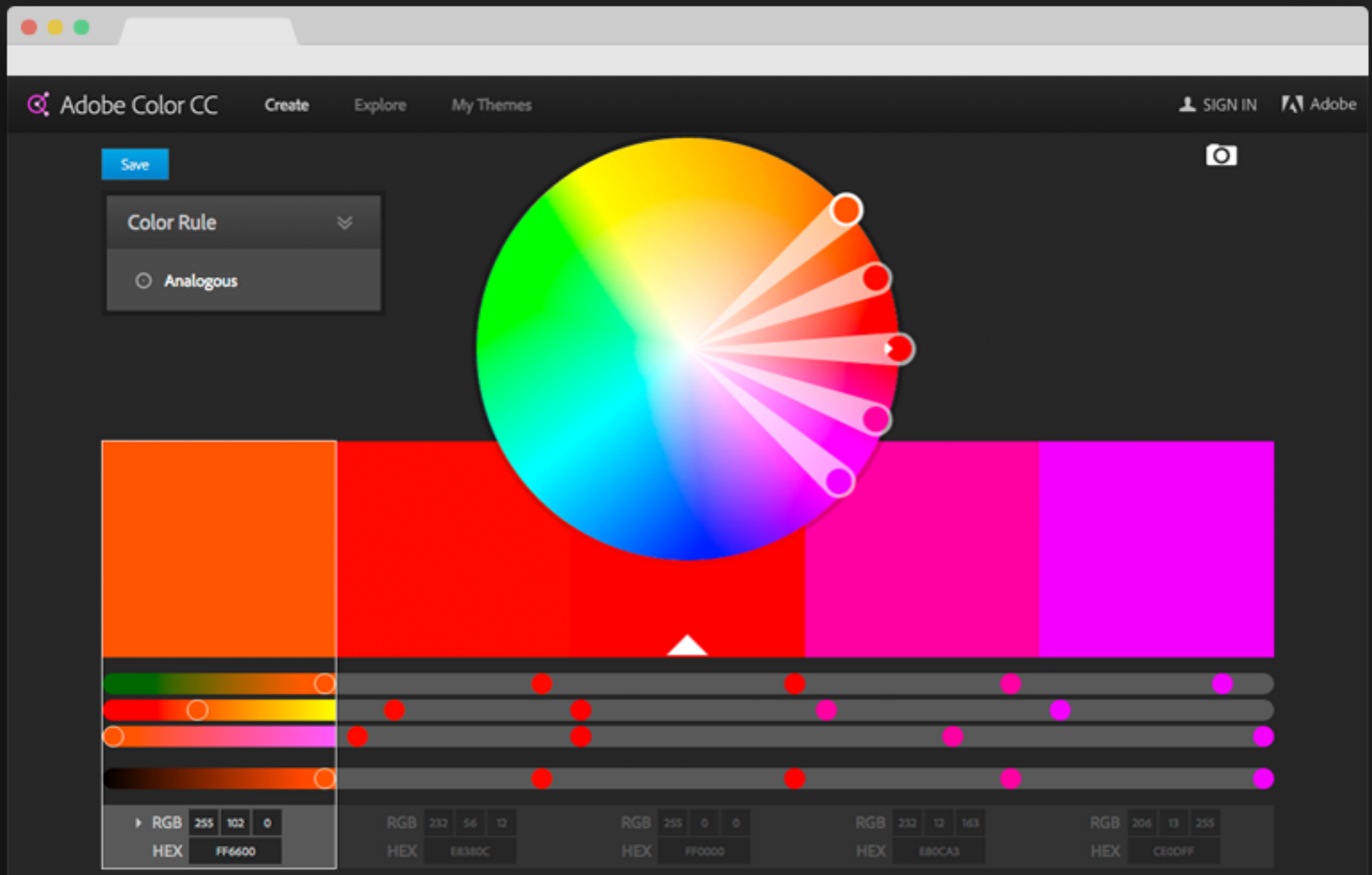
```
.task {
  background: rgb(128, 0, 0);
}
.task {
  background: rgba(128, 0, 0, .25);
}
```

HUE-SATURATION-LIGHTNESS (HSL)

```
.task {
  background: hsl(0, 100%, 25%);
}
.count {
  background: hsla(60, 100%, 50%, .25);
}
```

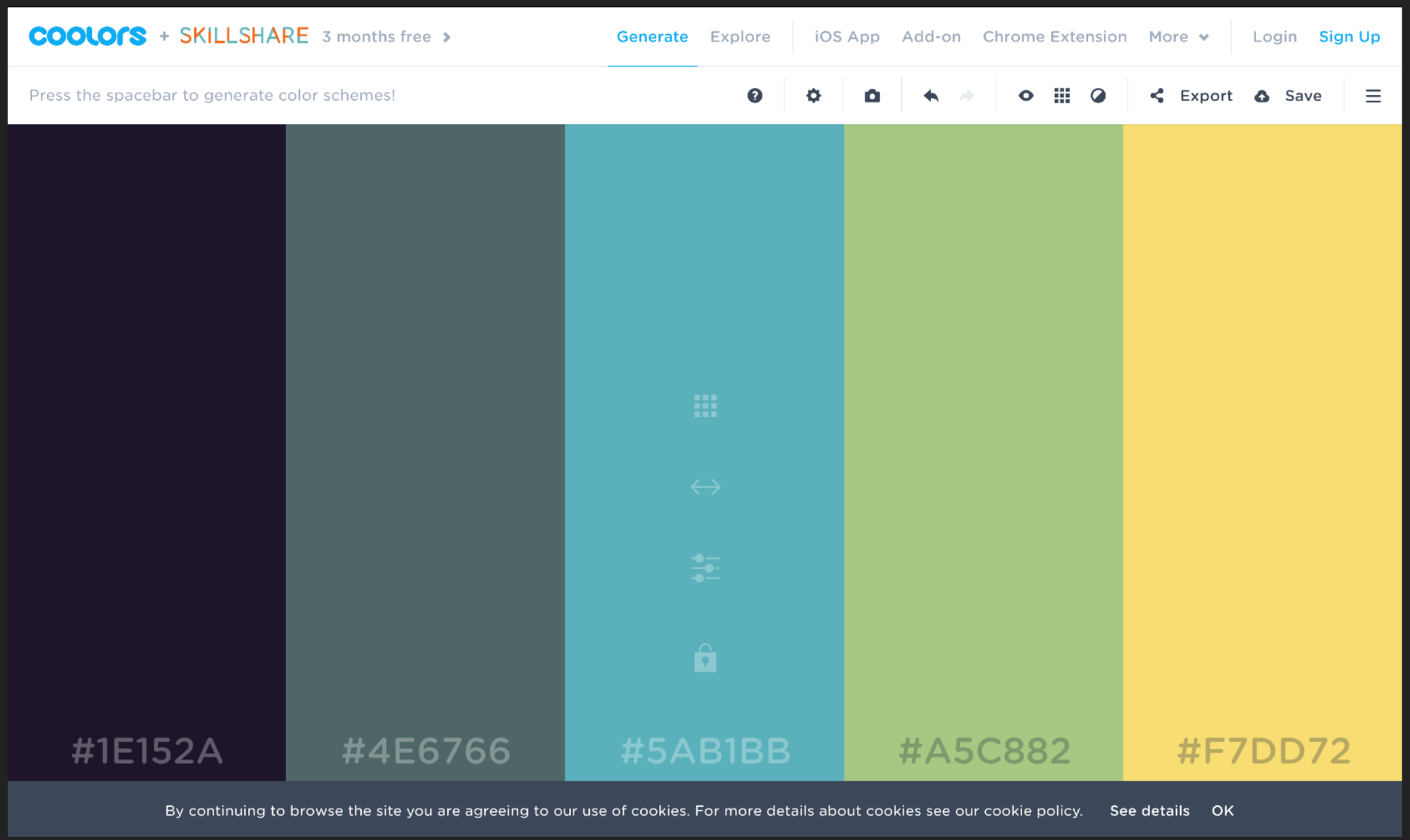
Adobe Color CC

https://color.adobe.com/



Coolors

https://coolors.co/app



LENGTHS

LENGTHS

- Pixels
- Percentages
- Em

These are the most popular, but there are others.

EXAMPLE USING PIXELS

```
p {
  font-size: 14px;
}
```

The pixel is equal to 1/96th of an inch; thus there are 96 pixels in an inch.

EXAMPLE WITH PERCENTAGES

```
div {
    width: 50%;
}
```

This **`div`** will be 50% of its parent element.

EXAMPLE WITH EM

```
.banner {
  font-size: 14px;
  width: 5em;
}
```

The width will be 5 times its font-size. 5 x 14 = 70px

When a font size is not explicitly stated for an element, the em unit will be relative to the font size of the closest parent element with a stated font size.

THE BOX MODEL

EVERY ELEMENT ON A PAGE IS A RECTANGULAR BOX AND MAY HAVE WIDTH, HEIGHT, PADDING, BORDERS, AND MARGINS.

http://learn.shayhowe.com/html-css/opening-the-box-model/

BOX MODEL EXAMPLE

BOX MODEL EXAMPLE

Total width = `margin-right` + `border-right` + `padding-right` + `width` + `padding-left` + `border-left` + `margin-left`

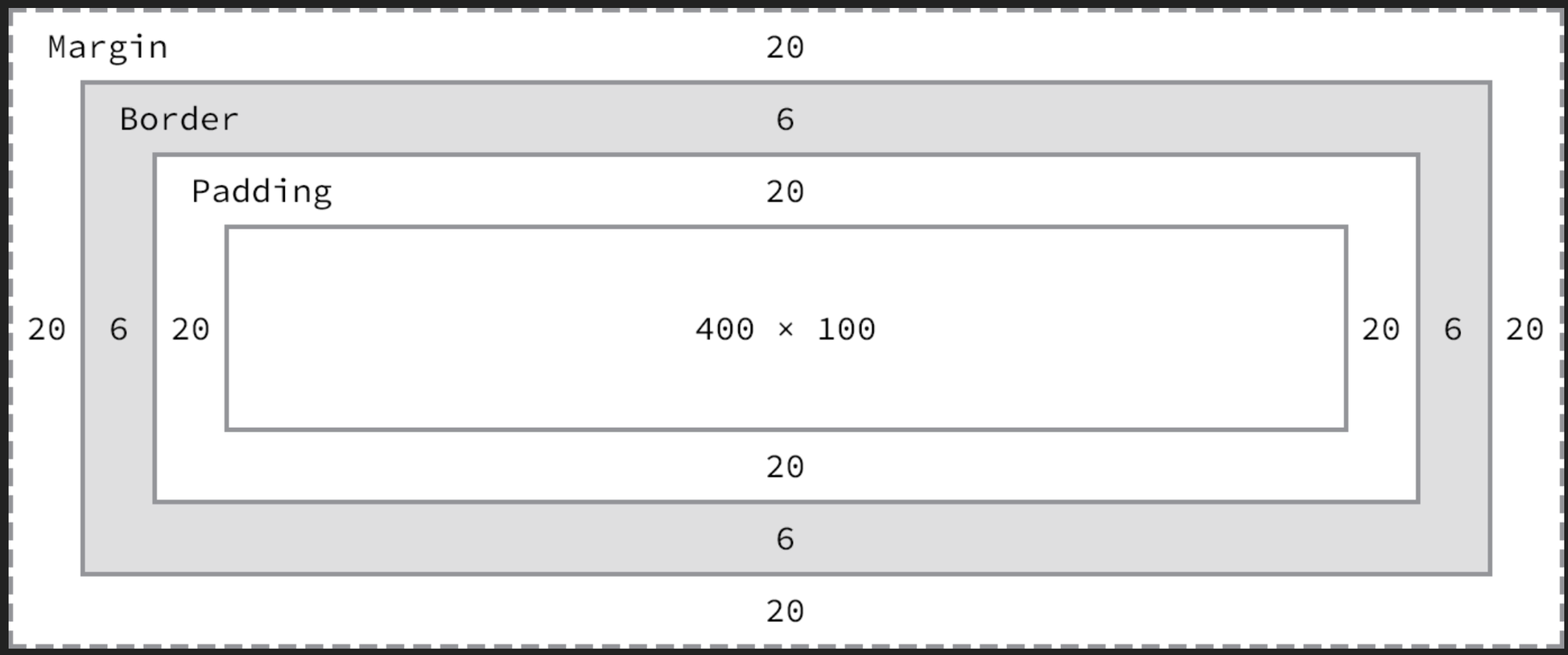
BOX MODEL EXAMPLE

Total height = `margin-top` + `border-top` + `padding-top` + `height` + `padding-bottom` + `border-bottom` + `margin-bottom`

BOX MODEL EXAMPLE

```
div {
  border: 6px solid #949599;
  height: 100px;
  margin: 20px;
  padding: 20px;
  width: 400px;
}
```

BOX MODEL EXAMPLE



So what is the total height and width of this box?

BOX MODEL EXAMPLE

Width: `492px = 20px + 6px + 20px + 400px + 20px + 6px + 20px`

Height: `192px = 20px + 6px + 20px + 100px + 20px + 6px + 20px`

MARGIN AND PADDING

- Margin - allows us to set the amount of space that surrounds an element. (ie. outside an elements border)
- Padding - allows us to set the amount of space inside an elements border (ie. between the border and the content).
- Some browsers apply default margins and/or padding on elements.

MARGIN AND PADDING DECLARATIONS

```
div {
  margin: 20px;
  padding: 5px;
}
```

All sides share same length

```
div {
  margin: 10px 20px;
  padding: 5px 10px;
}
```

Top/Bottom, Left/Right

```
div {
  margin: 10px 20px 0 15px;
  padding: 5px 10px 0 15px;
}
```

Top, Right, Bottom, Left

BORDERS

- Borders fall between the margin and padding.
- Borders require 3 properties - **`width`**, **`style`** and **`color`**.
- Examples of the most common styles are **`solid`**, **`double`**, **`dashed`**, **`dotted`** and **`none`**.

BORDER DECLARATION

```
div {
  border: 6px solid #949599;
}
```

You can also set individual borders, e.g. **`border-right`**, **`border-left`**, **`border-top`**, **`border-bottom`**.

Or properties like **`border-top-width`**, **`border-top-style`**, **`border-top-color`**.

BORDER RADIUS

- This enables rounded corners for an element.

EXAMPLE BORDER RADIUS

```
div {
  border-radius: 5px;
}
```

A single value will round all four corners of an element equally

EXAMPLE OF BORDER RADIUS

```
div {
  border-top-right-radius: 5px;
}
```

You can also use `border-top-left-radius`, `border-bottom-right-radius`, `border-bottom-left-radius`

BOX SIZING

- The `box-sizing` CSS property allows us to change the way the box model is calculated.
- It allows us to include the padding and border in an element's width and height values.
- Allowed values are `content-box` and `border-box`.
- `padding-box` used to be a part of the spec but was recently removed.
- `content-box` is the default.


border-box
padding-box
content-box

EXAMPLE OF BOX SIZING

```
div {
    -webkit-box-sizing: border-box;
       -moz-box-sizing: border-box;
            box-sizing: border-box;
}
```

What are those hyphens and letters before the property?

VENDOR PREFIXES

- As CSS3 was being introduced, browsers gradually began to support the new properties and values proposed as part of the specification.
- They were able to make these available to developers before the spec was finalized using vendor prefixes.
- As the CSS3 spec becomes finalized vendor prefixes will become less relevant.

LAYOUTS AND POSITIONING

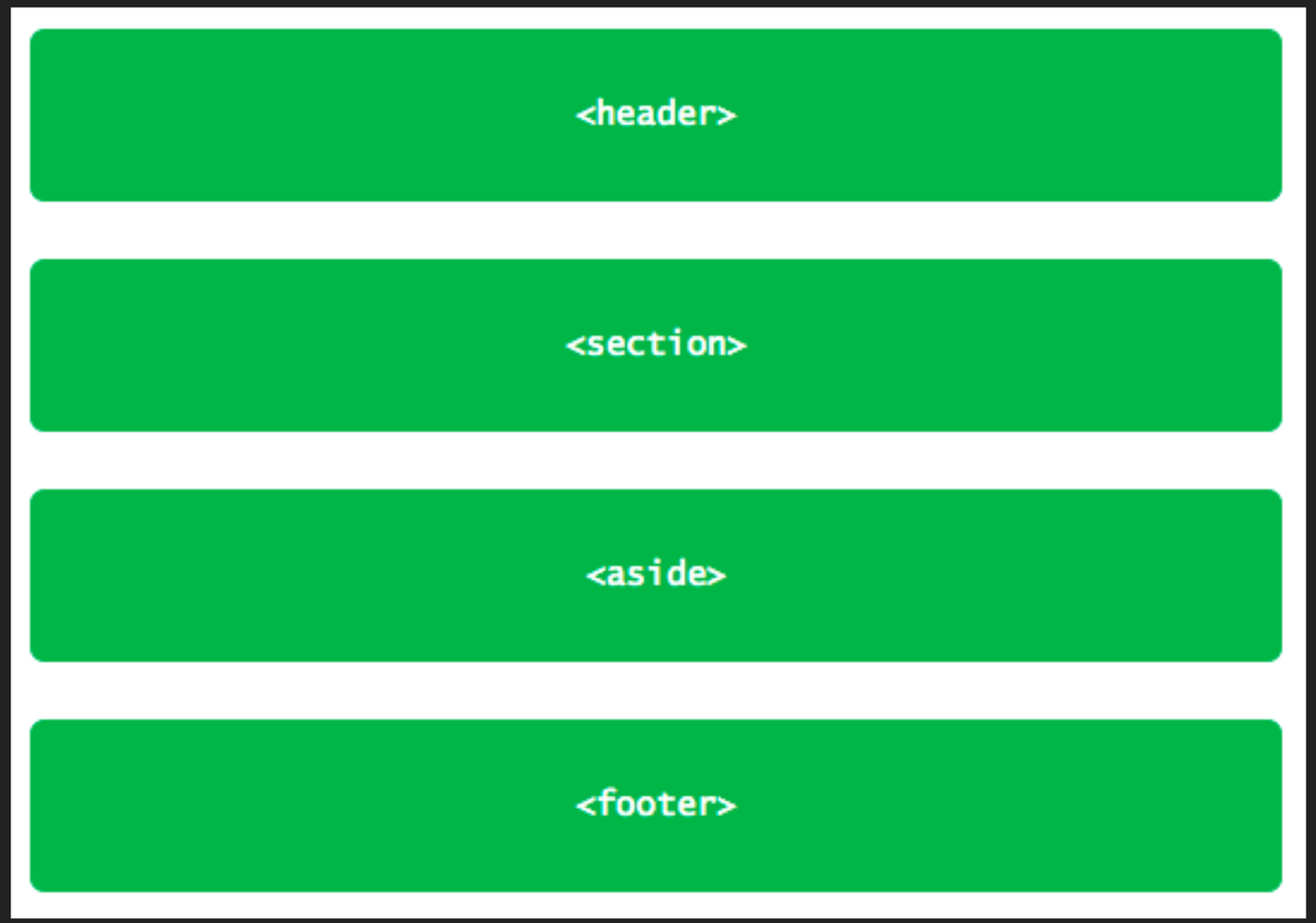
WAYS TO POSITION ELEMENTS

- Floats
- Uniquely Positioning Elements
- Relative Positioning
- Absolute Positioning

NORMAL FLOW

```
<header> ... </header>
<section> ... </section>
<aside> ... </aside>
<footer> ... </footer>
```

NORMAL FLOW



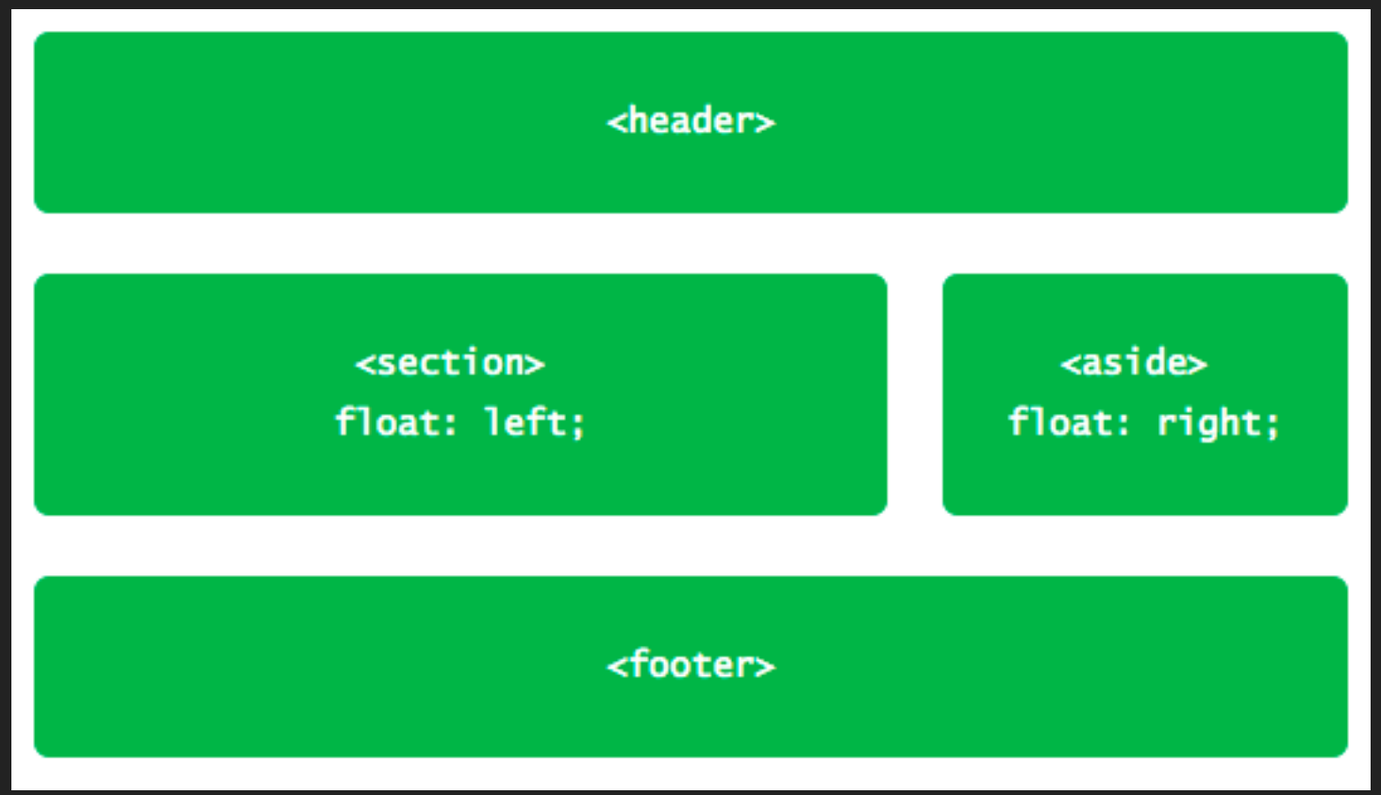
FLOATS

- Allows us to take an element, remove it from the normal flow of a page, and position it to the left or right of its parent element.
- The `float` property accepts a few values, the two most popular ones are `left` and `right`.
- An example could be floating an `<img>` element to the side so that paragraphs of text wrap around it.
- You can also float multiple elements to create a layout.

FLOATS

```
section {
  float: left;
  margin: 0 1.5%;
  width: 63%;
}
aside {
  float: right;
  margin: 0 1.5%;
  width: 30%;
}
```

FLOATS



CLEARING FLOATS

- Sometimes if you are not careful when using floats, you can end up with elements unnecessarily wrapping around a floated element or filling in the available space since it is no longer in the normal flow.

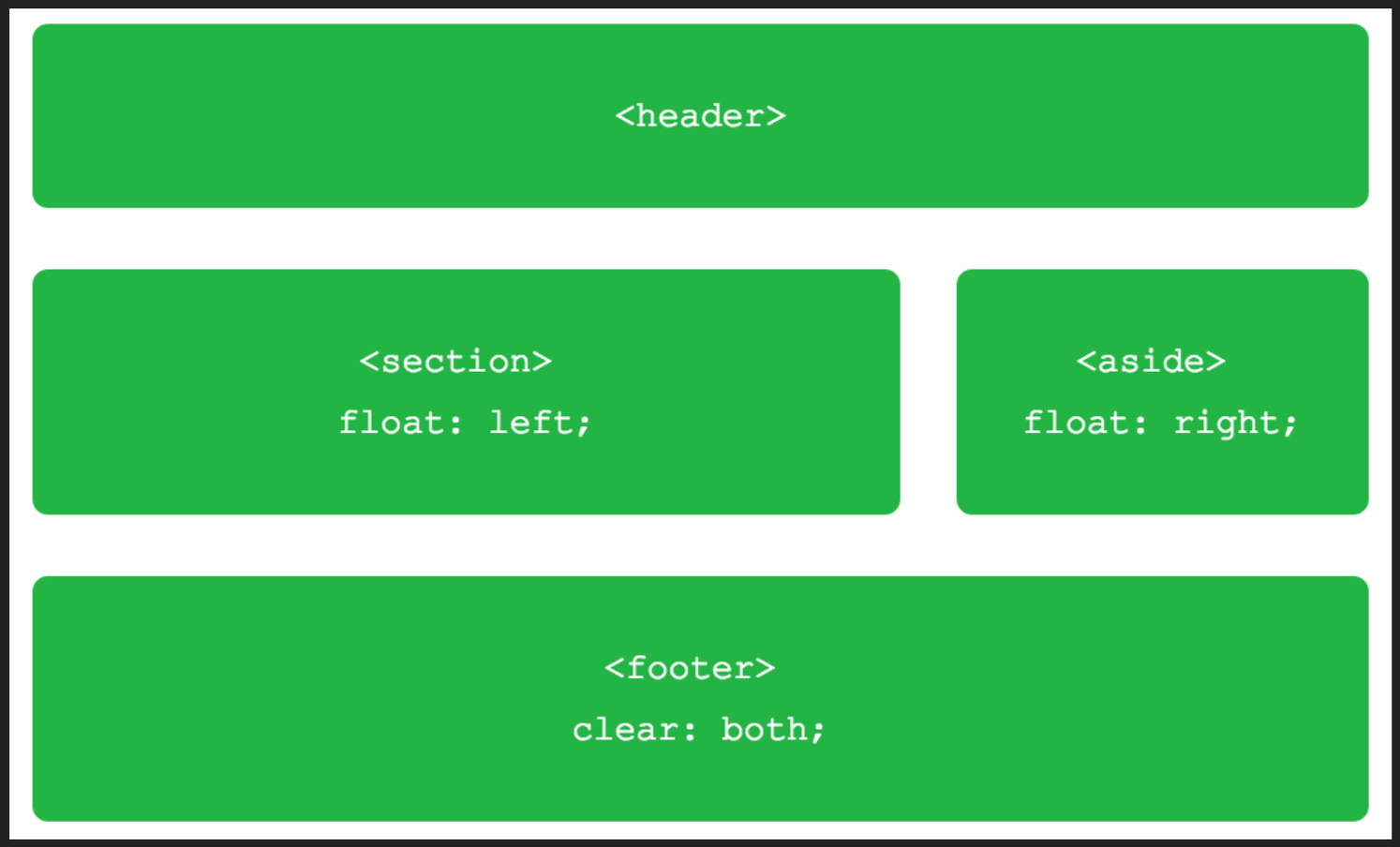
CLEARING FLOATS

- To prevent content from wrapping around floated elements, we need to clear, or contain, those floats and return the page to its normal flow.
- We can do this by using the `clear` property.
- This property accepts a few different values: the most commonly used values being `left`, `right`, and `both`.
- The `left` value will clear left floats, while the `right` value will clear right floats. The `both` value, however, will clear both left and right floats and is often the most ideal value.

CLEARING FLOATS

- So using our previous example. We can apply the following:

```
footer {
  clear: both;
}
```



UNIQUELY POSITIONING ELEMENTS

- There are times we need to precisely position an element. In cases like this we use the **`position`** property.
- The default position is **`static`** (normal flow), however, this value can be overwritten with **`relative`**, **`absolute`** or **`fixed`**.
- These work along with the box offset properties **`top`**, **`right`**, **`bottom`** and **`left`**.

RELATIVE POSITIONING

- Allows us to move an element, but keep it in the normal flow of a page, thus preventing other elements from flowing around it or taking up the space it once held.

EXAMPLE OF RELATIVE POSITIONING

```
<div> ... </div>
<div class="offset"> ... </div>
<div> ... </div>
```

```
div {
  height: 100px;
  width: 100px;
}
.offset {
  left: 20px;
  position: relative;
  top: 20px;
}
```

EXAMPLE OF RELATIVE POSITIONING

ABSOLUTE POSITIONING

- Similar to the `relative` value for the `position` property, with the exception that the element will not appear in the normal flow of the document and the space it occupied will not be preserved.
- It is also moved in relation to its closest relatively positioned element.

EXAMPLE OF ABSOLUTE POSITIONING

```
<section>
  <div class="offset"> ... </div>
</section>
```

```
section {
  position: relative;
}
.offset {
  right: 20px;
  position: absolute;
  top: 20px;
}
```

EXAMPLE OF ABSOLUTE POSITIONING

```
<section>
position: relative;
```

```
<div
class="offset">
position:
absolute;
right: 20px;
top: 20px;
```

FLEXBOX AND CSS GRIDS

FLEXBOX

- Provides tools to allow rapid creation of complex, flexible layouts that can scale better from desktop to mobile.
- You define a *Flex container* by setting `display: flex;` on an element.
- *Flex containers* (parent) will then contain *one or more Flex items* (children).

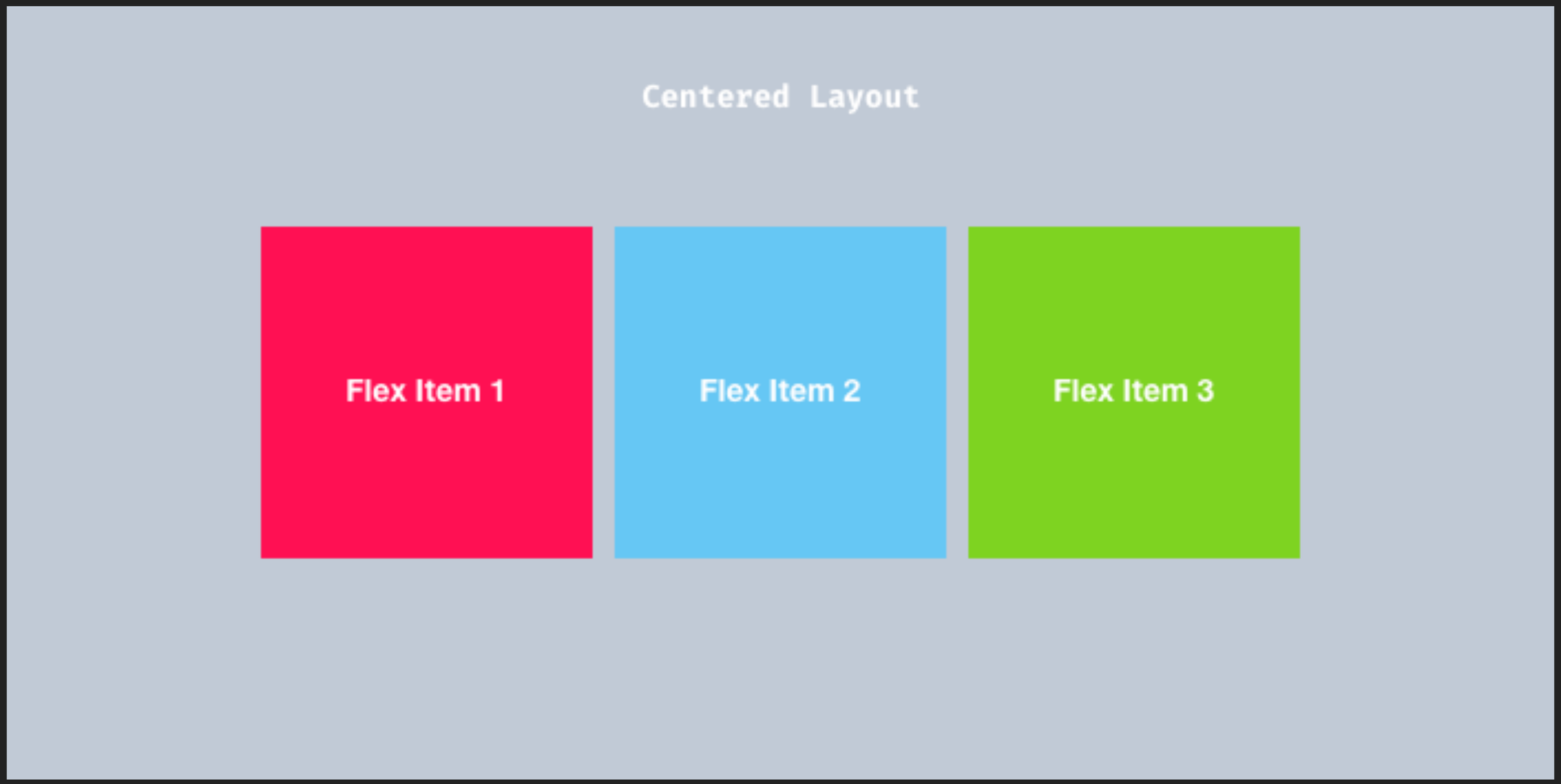
FLEXBOX

- The direction Flex items are in can be defined using the **`flex-direction`** property. They value of this property can be **`row`**, **`row-reverse`**, **`column`** or **`column-reverse`**.
- You can horizontally align these Flex items by using the **`justify-content`** property. And this property takes the values **`flex-start`**, **`flex-end`**, **`center`**, **`space-between`** or **`space-around`**.
- You can vertically align Flex items by using the **`align-items`** property. And this property takes the values **`flex-start`**, **`flex-end`**, **`center`**, **`baseline`** or **`stretch`**.

FLEXBOX

- Properties that may be used on the Flex items (children) are:
  - **`align-self`**: allows for aligning individual flex items.
  - **`flex`**: specifies the length of the flex item, relative to the rest of the flex items inside the same container. This is the shorthand for **`flex-grow`**, **`flex-shrink`** and **`flex-basis`** combined.
  - **`order`**: specifies the order of a flexible item relative to the rest of the flexible items inside the same container

EXAMPLE OF CENTERED LAYOUT WITH FLEXBOX



EXAMPLE HTML

```
<div class="flex-container">
  <div id="box1" class="flex-item">Box 1</div>
  <div id="box2" class="flex-item">Box 2</div>
  <div id="box3" class="flex-item">Box 3</div>
</div>
```

EXAMPLE CSS

```css
.flex-container {
  display: flex;
  justify-content: center;
  align-items: center;
}
```

EXAMPLE OF EVENLY DISTRIBUTED FLEXBOX ITEMS

```
justify-content: space-between;
```

EXAMPLE HTML

```
<div class="flex-container">
  <div id="box1" class="flex-item">Box 1</div>
  <div id="box2" class="flex-item">Box 2</div>
  <div id="box3" class="flex-item">Box 3</div>
</div>
```

EXAMPLE CSS

```css
.flex-container {
  display: flex;
  justify-content: space-between;
  align-items: center;
}
```

And there are many more interesting layouts that can be created using a combination of flex box properties and their respective values.

CSS GRIDS

- Designed for organizing content both into columns and rows (Two dimensions).
- The columns and rows form *Grid Tracks*.
- It allows us to create grid like structures without using tables or needing a CSS framework such as Bootstrap. And our layouts can also be redefined using CSS Media Queries to adapt to different contexts (Responsive Web Design).
- You define a Grid container (parent) by setting `display: grid;` on an element.

CSS GRIDS

- We can create a grid using the `grid-template-columns` and `grid-template-rows` properties. These properties can take multiple values with each value defining the length of the respective column or row.
- We can use the `grid-gap` property to create a gap between columns and rows. e.g. `grid-gap: 10px;`
- With these set, the direct children of the grid-container (parent) now become *grid items* and the auto-placement algorithm lays them out, one in each grid cell. Creating extra rows as needed.

CSS GRIDS

- You can also position grid items in a particular row or column or span multiple rows or columns by using the `grid-column` and `grid-row` properties. Some e.g. of values for these properties are:
  - `grid-column: 1;`
  - `grid-column: 1 / 3;`
  - `grid-column: span 3;`

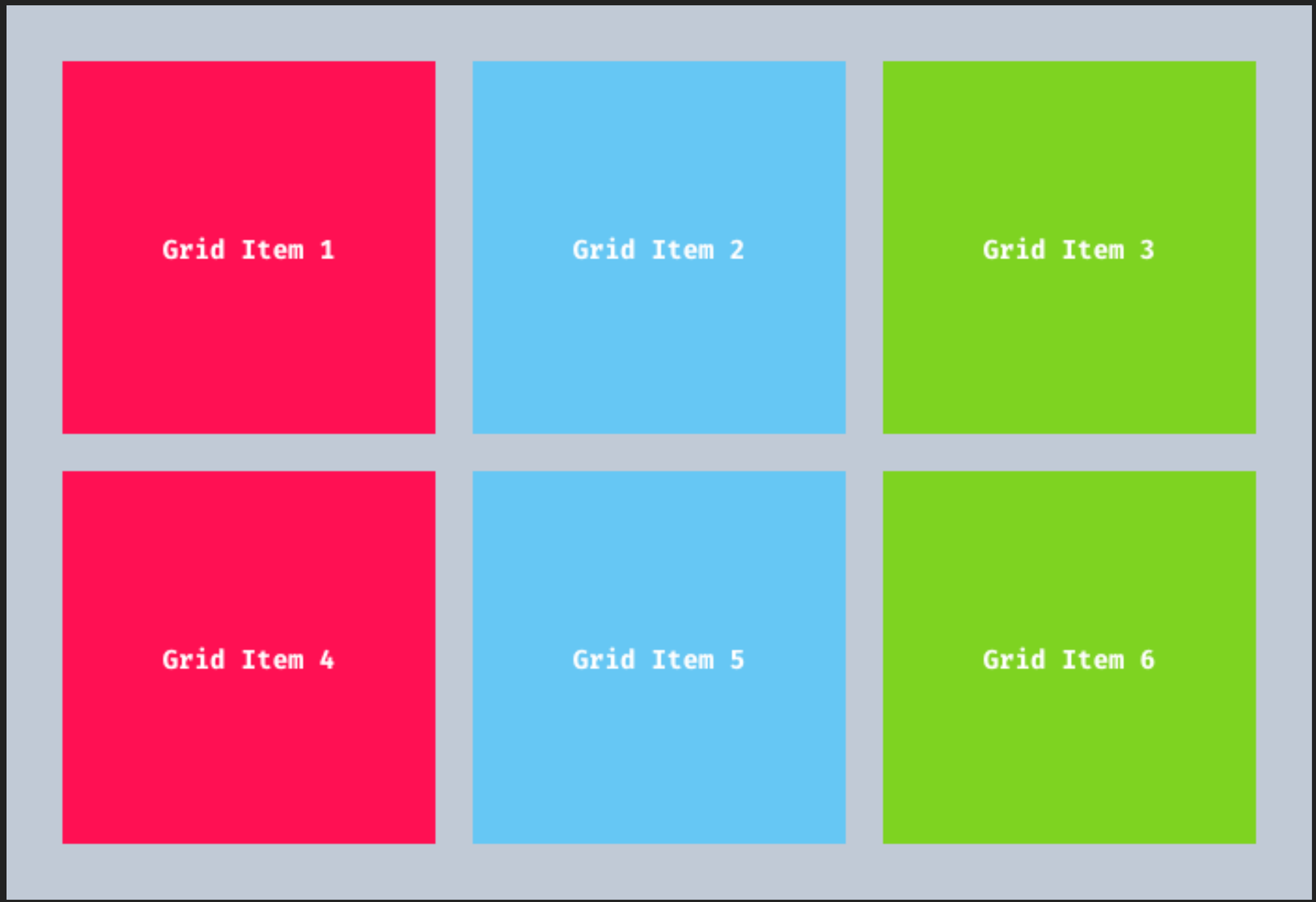
CSS GRIDS – FR UNIT

- CSS Grid introduced a new unit of length to help us create flexible grid tracks. This unit is called the `fr` unit.
- It represents a fraction of the available space in a grid container.
- e.g. You could have `grid-template-columns: 1fr 2fr 1fr;`
- You can also mix absolute sized tracks with fraction units. (e.g. `500px 1fr 2fr`)

CSS GRIDS – REPEAT()

- For large grids you can also use the `repeat()` notation to repeat all or a section of the grid.
- e.g. You could have `grid-template-columns: 1fr 1fr 1fr;`
- Using the repeat() notation we would have `grid-template-columns: repeat(3, 1fr);`

EXAMPLE OF A GRID



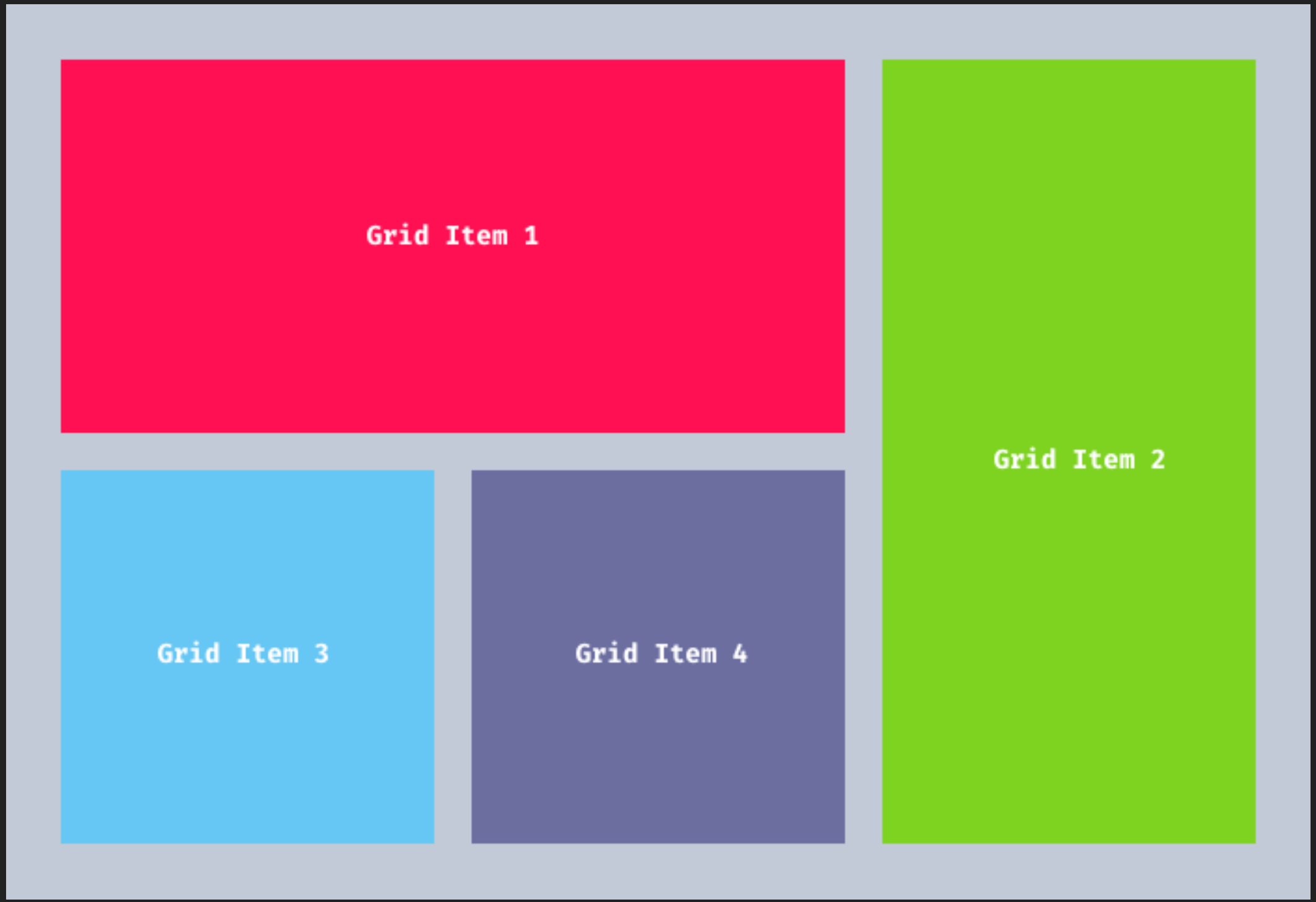
EXAMPLE HTML

```
<div class="grid-container">
  <div id="box1" class="grid-item">Box 1</div>
  <div id="box2" class="grid-item">Box 2</div>
  <div id="box3" class="grid-item">Box 3</div>
  <div id="box4" class="grid-item">Box 4</div>
  <div id="box5" class="grid-item">Box 5</div>
  <div id="box6" class="grid-item">Box 6</div>
</div>
```

EXAMPLE CSS

```css
.grid-container {
  display: grid;
  grid-template-columns: 150px 150px 150px;
  grid-template-rows: 150px 150px;
  grid-gap: 20px;
}
```

EXAMPLE OF A GRID WITH ITEMS THAT SPAN



EXAMPLE HTML

```
<div class="grid-container">
  <div id="box1" class="grid-item">Box 1</div>
  <div id="box2" class="grid-item">Box 2</div>
  <div id="box3" class="grid-item">Box 3</div>
  <div id="box4" class="grid-item">Box 4</div>
</div>
```

EXAMPLE CSS

```css
.grid-container {
  display: grid;
  grid-template-columns: 150px 150px 150px;
  grid-template-rows: 150px 150px;
  grid-gap: 20px;
}
```

EXAMPLE CSS

```css
#box1 {
  grid-column: 1 / 3;
  grid-row: 1;
}

#box2 {
  grid-column: 3;
  grid-row: 1 / 3;
}
```

```css
#box3 {
  grid-column: 1;
  grid-row: 2;
}

#box4 {
  grid-column: 2;
  grid-row: 2;
}
```

EXAMPLE CSS

```css
.grid-container {
  display: grid;
  grid-template-columns: 100px 300px 200px;
  grid-template-rows: 100px 1fr;
  grid-gap: 20px;
}
```

And there are many more interesting and complex layouts that can be created using a combination of CSS Grid properties and their respective values.

RESOURCES TO LEARN MORE

- Mozilla Developer Network https://developer.mozilla.org/en-US/
- Shay Howe - Learn HTML & CSS http://learn.shayhowe.com/html-css/
- W3 Schools - https://www.w3schools.com
- HTML Reference - http://htmlreference.io/
- The Elements of Typographic Style Applied to the Web http://webtypography.net/

RESOURCES TO LEARN MORE

- CSS Reference http://cssreference.io/
- CSS Specificity http://cssspecificity.com/
- Coolors (Colour Scheme Generator) - https://coolors.co
- Learn Layout - http://learnlayout.com/

RESOURCES TO LEARN MORE

- Flexbox - https://developer.mozilla.org/en-US/docs/Learn/CSS/CSS_layout/Flexbox
- Flexbox Froggy Game - http://flexboxfroggy.com/
- A Guide to Flexbox - https://css-tricks.com/snippets/css/a-guide-to-flexbox/
- CSS Grid Layouts - https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Grid_Layout
- Grid by Example - https://gridbyexample.com/
- CSS Grid Garden game - http://cssgridgarden.com/

ANY QUESTIONS?