Chapter 9 – The CSS Grid

The CSS grid allows the designer to lay the page, or an element on the page, into regions. These regions are logically arranged in rows and columns. The grid allows for flexibility and for truly responsive formatting. [102]

Learning Outcomes for this Chapter

Upon completion of the reading of this chapter and assignments found at the end, a student should be able to:

- apply the grid display to an element,
- add a gap between grid elements,
- create a page with nested grids,
- span multiple grid cells with a single element,
- use the new "fr" unit to divide up the unused part of a grid.

Creating a Simple Grid

To create a grid layout on an element you must first change the display to grid, using the `display: grid;` style. In the example the grid was placed on the body element, but it may be placed on virtually any element. Once the element has been told to display as a grid, the columns and optionally the rows need to be defined.

In the CSS below we are only defining the columns, by using the `grid-template-columns: dimensions;` style. [103] There are three dimensions, representing the three columns. The first you see that I have defined three columns by placing three dimensions. The first column has a fixed dimension and the second and third column are of a special grid unit of `fr` or fraction. The width of a fractional column is the total unallocated width times this fraction divided by the total of the fractions. There are a total of three fractions so the second column is 1/3 of the unallocated space and the second one is 2/3 of the remaining space. [104]

The `grid-gap: rowgap columngap;` style is also applied and adds spacing between the columns and rows. If you only specify one dimension it will be applied to both the columns and

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102 https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Grid_Layout
103 https://developer.mozilla.org/en-US/docs/Web/CSS/grid-template-columns
104 https://mozilladevelopers.github.io/playground/css-grid/04-fr-unit/

rows. [105]

The last new CSS style in this example is **grid-column: start / end;** which tells the grid layout to place an element in a specific column or columns. The first column is number 1 and the last column is one more than the column you want to fill. You can see the **<header>...</header>** is defined with a **grid-column: 1/4;** that tells the grid to spread the header across columns 1, 2, and 3. [106]

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="utf-8">
        <title>Simple Grid Layout</title>
        <link href="grid0.css" rel="stylesheet" type="text/css">
    </head>
    <body>
        <header>
            <h1>Simple 3 Column Grid Layout</h1>
        </header>
        <div>div 1</div>
        <div>div 2</div>
        <img src="greenguy.png" alt="smile">
        <div> div 3</div>
        <p>This grid element contains a paragraph of text.  This paragraph
        will wrap and fill the grid.</p>
        <article>
            <p>Another paragraph of text in a grid element. If you wanted
            multiple paragraphs of text in a single cell then they would
            need to be contained in an article or some other flow
            element.</p>
            <p>Second sentence in the article, in a cell. Remember that a
            paragraph can not be inside another paragraph.</p>
        </article>
        <footer>
            <small>Demo of Grid Layout</small>
        </footer>
    </body>
</html>
```

```
/* grid0.css - simple grid layout */

body {
    display: grid;
```

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105 https://developer.mozilla.org/en-US/docs/Web/CSS/gap
106 https://developer.mozilla.org/en-US/docs/Web/CSS/grid-column

```
        grid-template-columns: 50px 1fr 2fr;
        grid-gap: 5px 10px;
}
header {
        border: 3px solid blue;
        grid-column: 1/4;
}
article {
        border: 2px solid red;
}
div {
        border: 2px solid black;
}
p {
        background-color: yellow;
}
footer {
        border: 3px solid green;
        grid-column: 1/4;
}
```
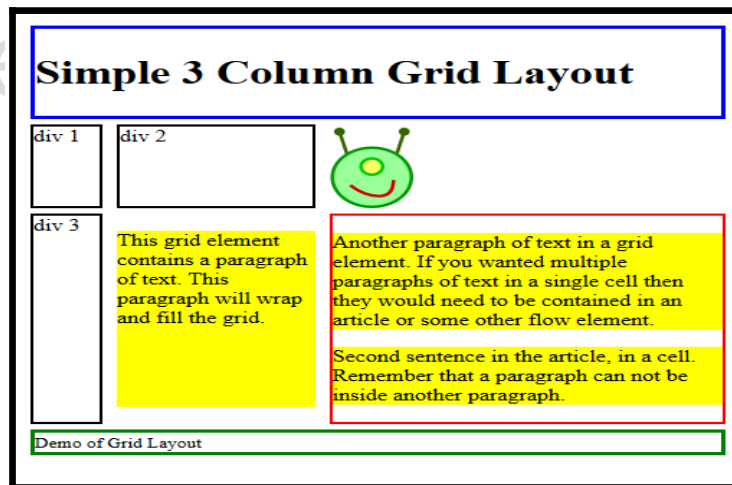

Illustration 28: Simple 2 Column Grid Layout

Defining Rows

In the first example you saw that we defined a grid of columns and then had elements that spanned multiple columns. We can also define rows of a grid and give them heights. This is done

with the **`grid-template-rows: dimensions;`** style. [107] It was said earlier, that a grid may be applied to elements other than the **`<body>..</body>`**. In the following example there are actually three grids: 1) the **`<body>..</body>`** is divided into three rows with heights defined, 2) the **`<header>..</header>`** is divided into two columns, and 3) the **`<main>...</main>`** is also divided into two columns (but differently than the header).

Illustration 29: Layout of the Three Grids

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="utf-8">
        <title>title</title>
        <link href="grid1.css" rel="stylesheet" type="text/css">
    </head>
    <body>
        <header>
            <h1>My Page with Lots of Grids</h1>
            <img src="greenguy.png" alt="logo">
        </header>
        <main>
            <div>1</div>
            <div>2</div>
            <div>3</div>
            <div>4</div>
            <div>5</div>
            <div>6</div>
```
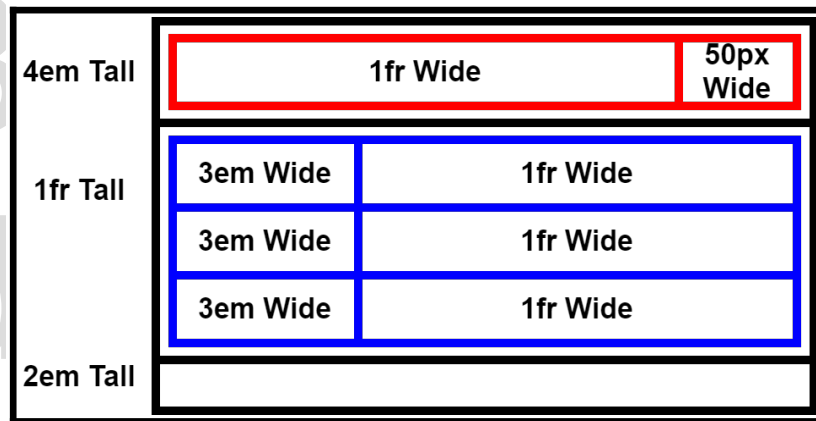
---

107   https://developer.mozilla.org/en-US/docs/Web/CSS/grid-template-rows

```
            </main>
        <footer>
            <small>&copy; 2020 The SYW2L Project
            <a href="http://www.syw2l.org"> http://www.syw2l.org
            </a></small>
        </footer>
    </body>
</html>
```

```css
body {
    display: grid;
    grid-template-rows: 4em 1fr 2em;
    gap: 5px;
}
main {
    display: grid;
    grid-template-columns: 3em 1fr;
}
header {
    display: grid;
    grid-template-columns: 1fr 50px;
    background-color: #ffc0c0;
    border-bottom: 3px groove #800000;
}
div {
    border: 1px solid black;
}
footer {
    background-color: #c0c0ff;
    border-top: 3px groove #000080;
}
```
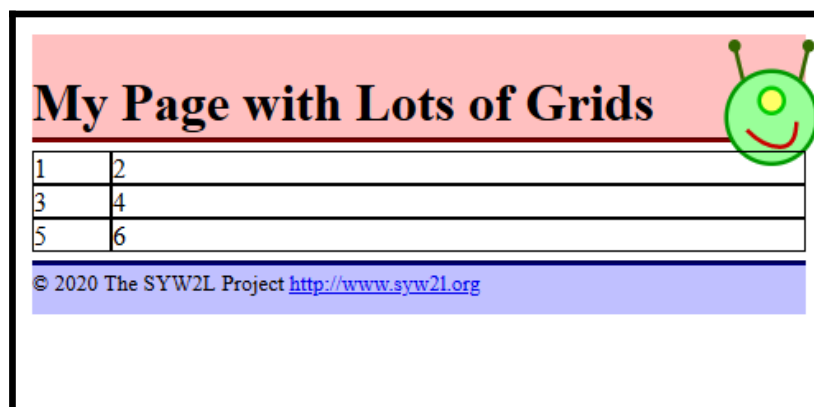

Illustration 30: Second Grid Example - Multiple Grids

Vocabulary

- columns
- fraction
- grid

- rows
- template

Exercises

Word Search

```
          p f i c t l c w r
          l r p t r t a s l
          c a l r m s r t r
          r c a c p r c r t
          i t l g l o s i w
          d i s r a w o m o
          u o o i t s l s a
          a n s d e s r l m
          g s c o l u m n s
columns, fraction, grid, rows, trmplate
```

Problems