

CSS



```
body {  
  font: x-small  
  background: #  
  color: black;  
  margin: 0;  
  padding: 0;
```

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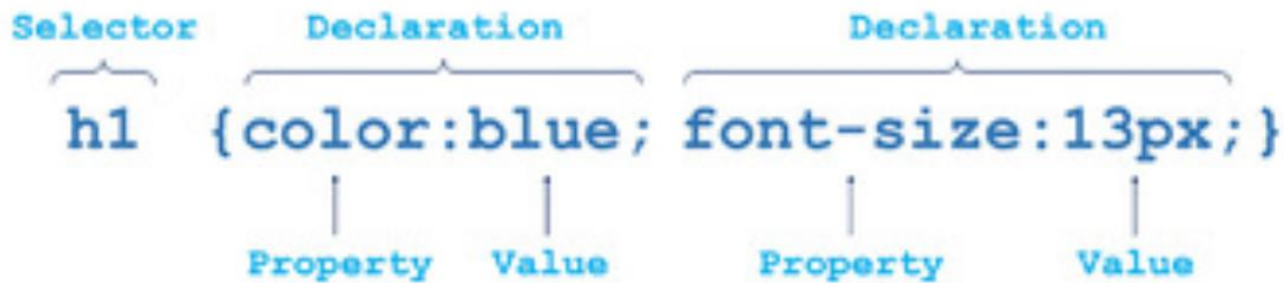
CSS Syntax

CSS – Cascading Style Sheets

- CSS is used to control the **style** and **layout** of web pages
- Allows **separating** web page content from its design and visual appearance
- Used in conjunction with HTML
 - **HTML** is used for describing the **content** of a web page, **CSS** is used for describing its **presentation**

Style Sheets Syntax

- Stylesheets consist of **rules**. Each rule has **selectors** and **declarations**. A declaration specifies a **property** and its **value**.



- Selectors are separated by commas
- Declarations are separated by semicolons
- Properties and values are separated by colons
- Comment in CSS `/* comment */`

Ways to incorporate CSS in an HTML document

- **Inline** – style included as the attribute of an HTML tag:

```
<p style="color:sienna;margin-left:20px;">This is a paragraph.</p>
```

- **Internal** – CSS code is contained in the head section:

```
<head>
<style>
p {color:sienna; margin-left:20px;}
body {text-align:center;}
</style>
</head>
```

- **External** - separate .css file referenced in the HTML:

HTML source code:

```
<head>
<link rel="stylesheet" type="text/css"
href="main.css">
</head>
```

'main.css':

```
p {color:sienna;
margin-left:20px;}
body {text-align:center;}
```



- ✓ Ensure **consistent look and feel**
- ✓ Improve **reusability** and **maintainability**

Selectors: used to select elements to style on an HTML page

- **Tag Selectors**

- Apply page-wide

e.g., `p { font-family: verdana; }` applies the style to all `<p>` tags

- **Class Selectors**



- Defines a **named** style (prefix the name with dot (.))
- Can apply to any page element using the class attribute

e.g., `.redBorder {border: 1px solid red}` defines a style named redBorder

`<p class='redBorder'>Using the class attribute to apply the redBoder style to this paragrph</p>`

- **ID Selectors**



- Apply to one specific tag
- Use hash (#) followed by the tag id to select the element to be styled
- Good for linking to specific part of a page

e.g., `#errorMsg { color: red; }` apply the style to the element with id `errorMsg`

Combined Selectors

| | | |
|-------------------|---------|--|
| element, element | div, p | Selects all <div> elements and all <p> elements |
| element element | div p | Selects all <p> elements inside <div> elements |
| element > element | div > p | Selects all <p> elements where the parent is a <div> element |

e.g.,

li a {text-decoration: underline}

- This will match all <a> tags that are inside of

https://www.w3schools.com/cssref/css_selectors.asp

Attribute Selectors

| | | |
|-------------------------------|----------------------------|--|
| [attribute ^ = value] | a[href ^ = "https"] | Selects every <a> element whose href attribute value begins with "https" |
| [attribute \$ = value] | a[href \$ = ".pdf"] | Selects every <a> element whose href attribute value ends with ".pdf" |
| [attribute * = value] | a[href * = "qu"] | Selects every <a> element whose href attribute value contains "qu" |

https://www.w3schools.com/cssref/css_selectors.asp

Pseudo-classes

- Pseudo-classes to define **element state**

- `:link, :hover, :visited, :active`

a:hover { **color: red;** } -> Style link on mouse over

`:link` pseudo-class selects anchors tags that were not visited

- Pseudo-elements to **insert content** around the selected element

p::before { **content: "«";** }

Insert « before the content of each <p> element

p::after { **content: "»";** }

Insert » after the content of each <p> element

Structural Pseudo-classes






| | | |
|-----------------------------|-----------------------------|--|
| :first-child | tr:first-child | First row of an HTML table |
| :last-child | tr:last-child | Last row of an HTML table |
| :nth-child(<i>n</i>) | tr:nth-child(2) | Second row of an HTML table |
| :nth-last-child(<i>n</i>) | tr:nth-last-child(2) | Second row of an HTML table, counting from the last row |
| nth-child(odd) | tr:nth-child(odd) | Every odd row of an HTML table |
| nth-child(even) | tr:nth-child(even) | Every even row of an HTML table |

<https://www.w3schools.com/cssref/trysel.asp>

Selectors Summary

- A style consists of a selector, followed by property/value pairs
- Selectors:
 - Tag Selectors
 - Class Selectors
 - ID Selectors
 - Combined Selectors
 - Attribute selectors
 - Pseudo-elements
 - Structural pseudo-classes

Examples

- ▼ 2.selectors
 -  1.Attribute Selectors.html
 -  2.Structural Selectors (empty).html
 -  3.Structural Selectors (first-of-type).html
 -  4.Structural Selectors (nth-child).html
 -  5.Pseudo-classes.html

Basic styles

Text-related CSS Properties

- **color** – specifies the color of the text
- **font-size** – size of font: `xx-small`, `x-small`, `small`, `medium`, `large`, `x-large`, `xx-large`... or numeric value
- **font-family** – comma separated font names
 - Example: `verdana`, `sans-serif`, ...
 - The browser loads the first one that is available
- **font-weight** can be `normal`, `bold`....

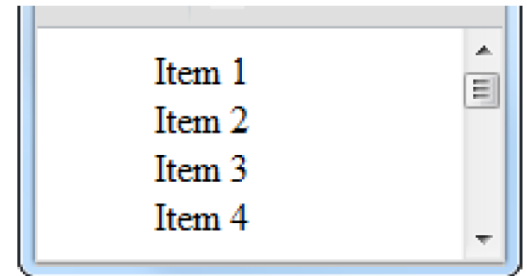
Text-related CSS Properties (2)

- **font-style** – styles the font
 - Values: **normal**, **italic**, **oblique**
- **text-decoration** – decorates the text
 - Values: **none**, **underline**, **line-through**...
- **text-align** – defines the alignment
 - Values: **left**, **right**, **center**, **justify**

Styles for Lists

- List properties are used to define the look and feel of the list items
 - Values for ``: `circle`, `square`,...
 - Values for ``: `upper-roman`, `lower-alpha`
 - Values for both: `none`

```
ul  
{  
    list-style-type:none;  
}
```

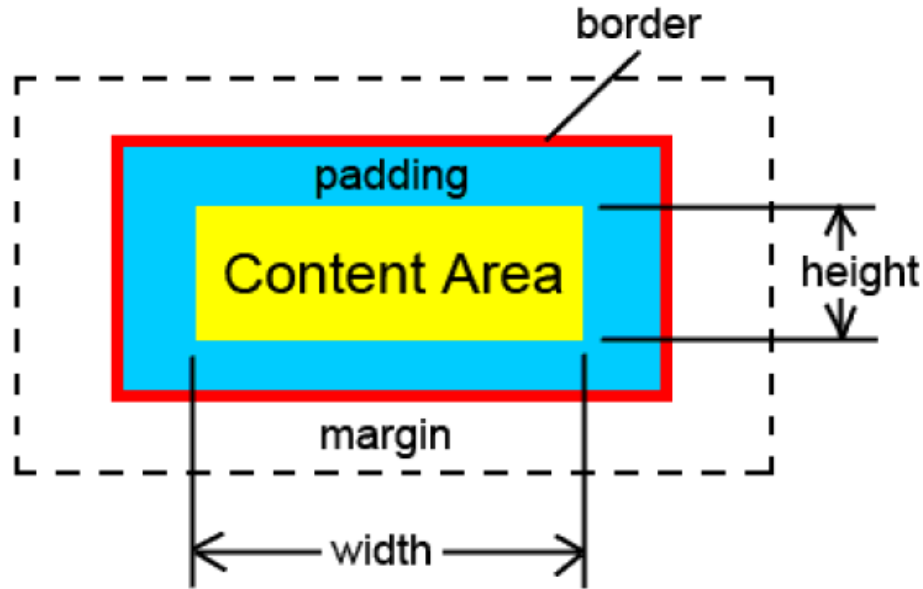


Practice ...

- Use the W3Schools try-it-yourself editor to try styling each of these properties
- Background
http://www.w3schools.com/css/css_background.asp
- Text
http://www.w3schools.com/css/css_text.asp
- Fonts
http://www.w3schools.com/css/css_font.asp
- Lists
https://www.w3schools.com/css/css_list.asp

Margin, Border and Padding

Box Model



- Each tag is a box and its properties can be styled:
 - **Margin** –the space that separates the boxes
 - **Border** –the line around each edge of the box
 - **Padding** –the space between the border and the contents

Margin and Padding

- Margin and padding define the spacing around the element
 - Numerical value, e.g. 10px
 - Can be defined for each of the four sides separately: **margin-top**, **padding-left**, ... or using short rules:
- **margin: 5px;**
 - Sets all four sides to have margin of 5 px;
- **margin: 10px 20px;**
 - top and bottom to 10px, left and right to 20px;
- **margin: 1px 3px 5px 7px;**
 - top, right, bottom, left (clockwise from top)
- Same for padding

Borders

- Border style:

`border-width: 1px;`

`border-color: red;`

`border-style: solid;`

- **border-width:** `thin`, `medium`, `thick` or numerical value
- **border-color:** `color alias` or `RGB value`
- **border-style:** `none`, `dotted`, `dashed`, `solid`, `double`, ...

- Shorthand rule for setting border properties:

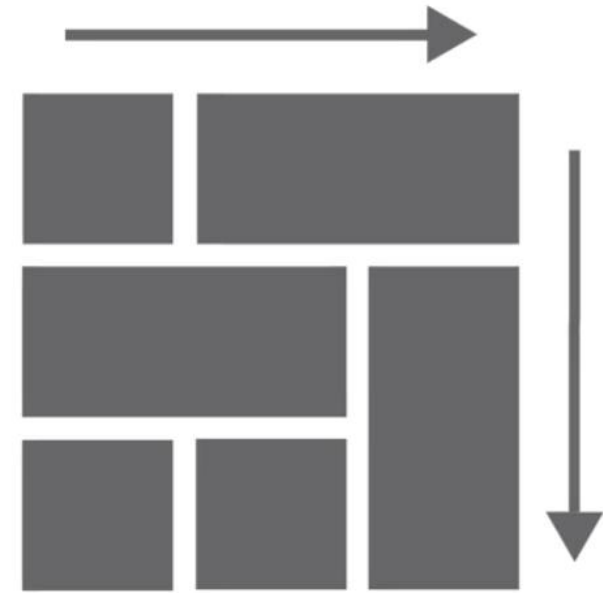
`border: 1px solid red;`

- Can specify different borders for the sides using:
`border-top`, `border-left`, `border-right`, `border-bottom`

Layout using Grid

CSS Grid

- CSS Grid is a **two-dimensional layout** system to design the page layout
- Two Steps to use CSS Grid:
 1. Define a grid
 2. Place items within the grid



CSS Grid
TWO DIMENSIONS

Watch and practice @

<https://mozilladevelopers.github.io/playground/css-grid>

Grid container

- Grid **container** is defined by setting the *display* property of the container element to *grid*

- CSS:

```
.page {  
    display: grid;  
}
```

This creates a grid container

```
.page  
<div class="page">  
  <header class="page-header">  
  </header>  
  
  <main class="main-content">  
  </main>  
  
  <aside class="sidebar">  
  </aside>  
  
  <footer class="footer">  
  </footer>  
</div>
```

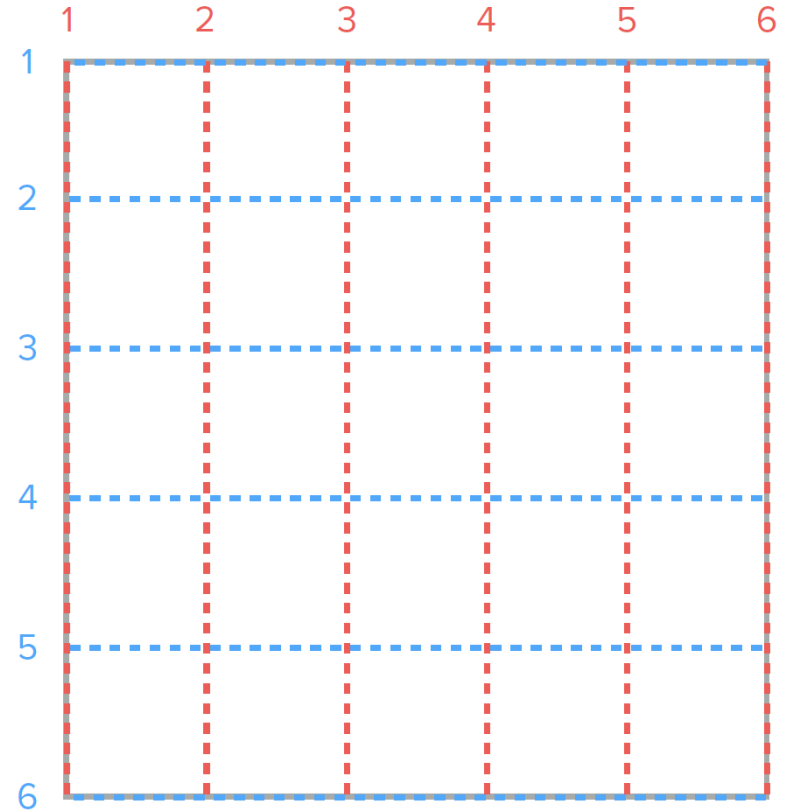

Grid item

- Grid item = *Element that is a direct descendant of the grid container*

```
<div class="page">  
  <header class="head">  
  </header>  
  <main class="main-content">  
  </main>  
  <aside class="sidebar">  
  </aside>  
  <footer class="footer">  
  </footer>  
</div>
```

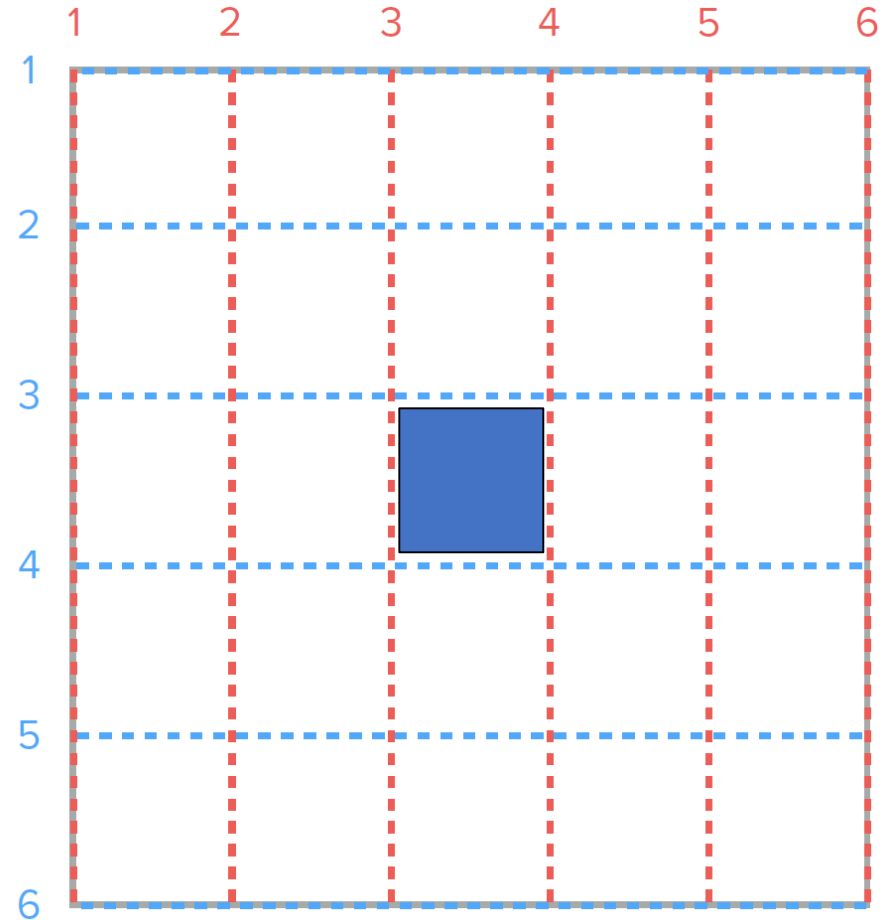
Grid line

- Horizontal (**row**) or vertical (**column**) line separating the grid into sections
- Grid lines are referenced by numbers, starting and ending with the outer borders of the grid



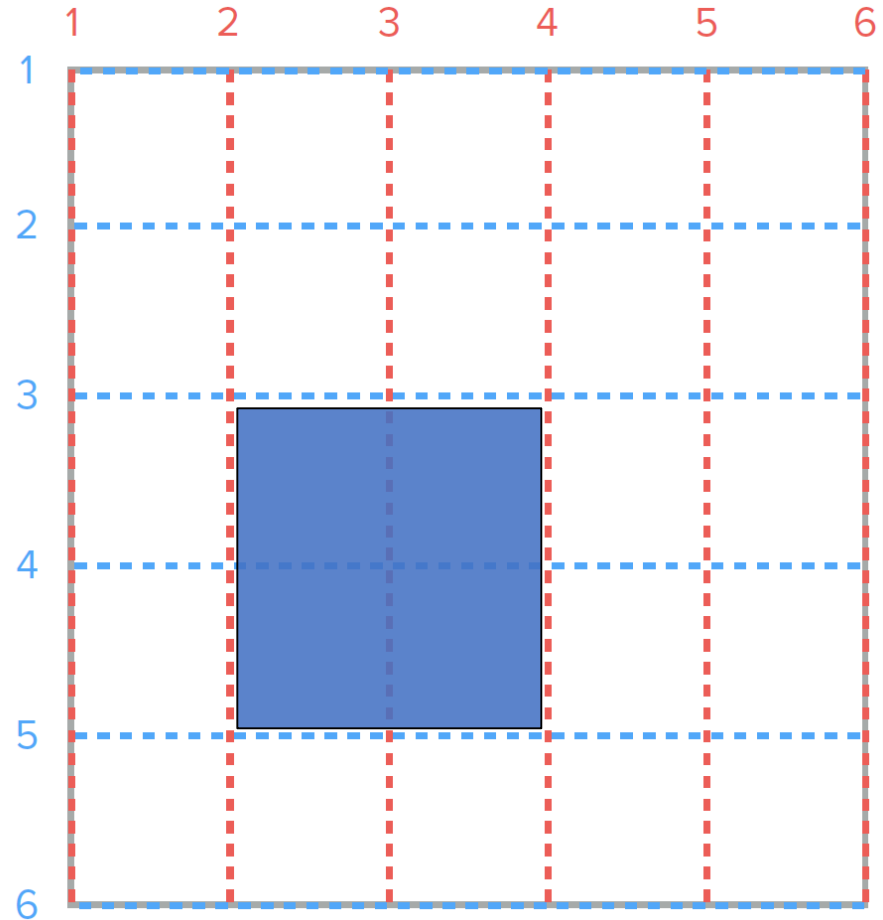
Grid *cell*

- The *intersection* between a grid row and a grid column



Grid *area*

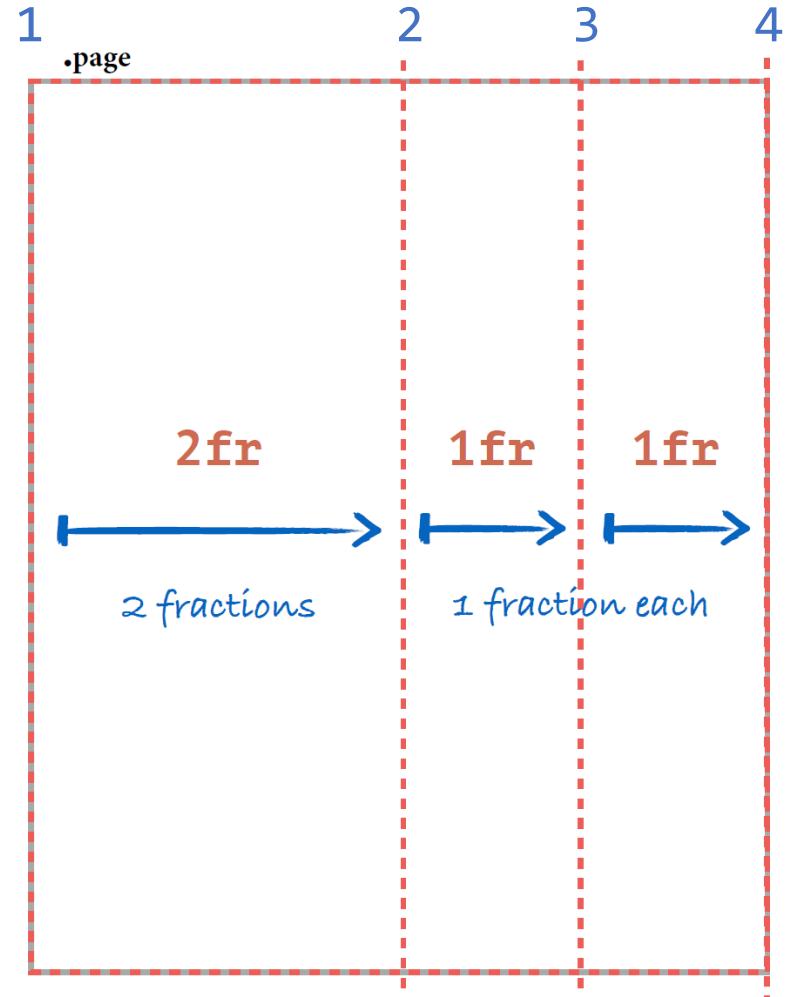
- *Rectangular area* between four specified grid lines
- Grid areas can cover one or more cells
- E.g., blue area between row lines 3 and 5 and column lines 2 and 4



Grid columns

`grid-template-columns:`
2fr 1fr 1fr;

Draws grid lines. Takes list of length values (em, px, %, **fr**, etc.) denoting the distance between each line.

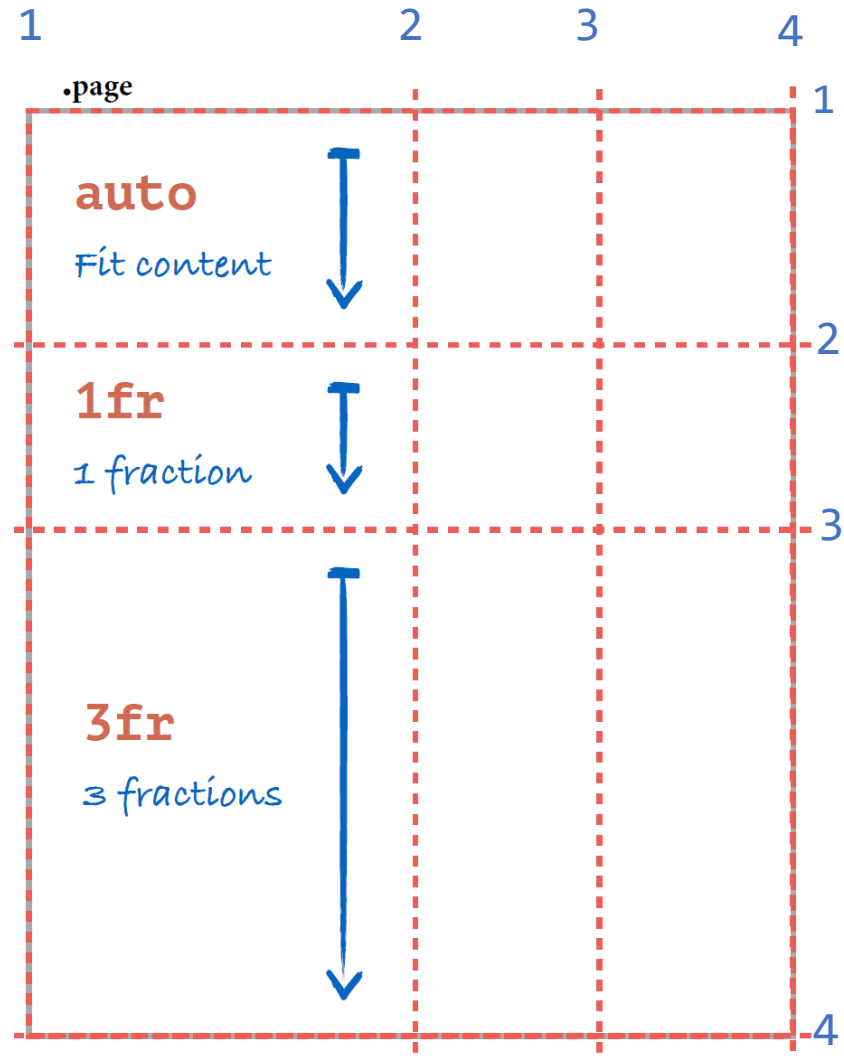


Grid rows

`grid-template-rows:`

`auto 1fr 3fr;`

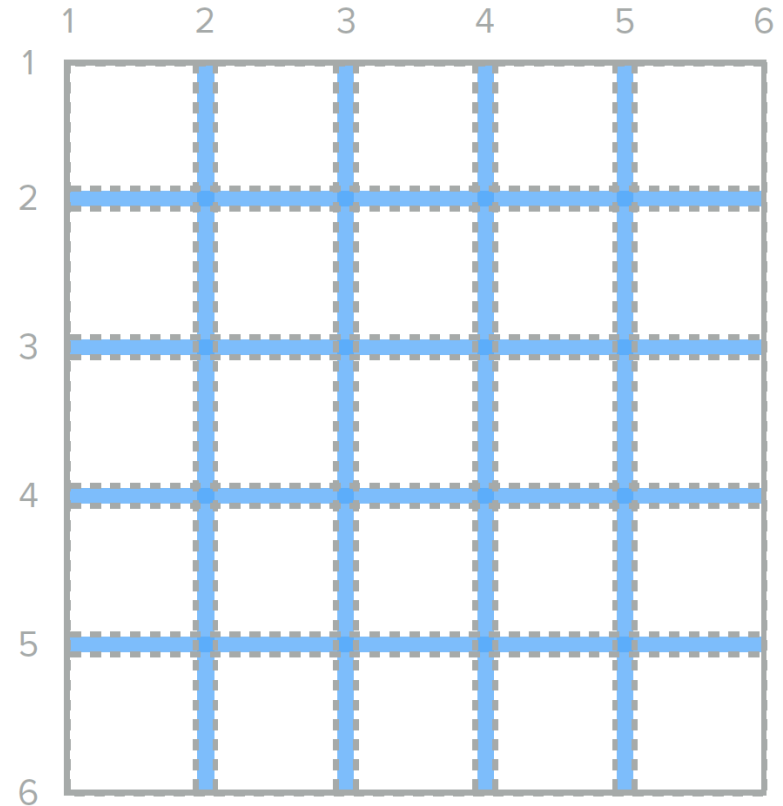
Draws grid lines. Takes list of length values (em, px, %, **fr**, etc.) denoting the distance between each line.



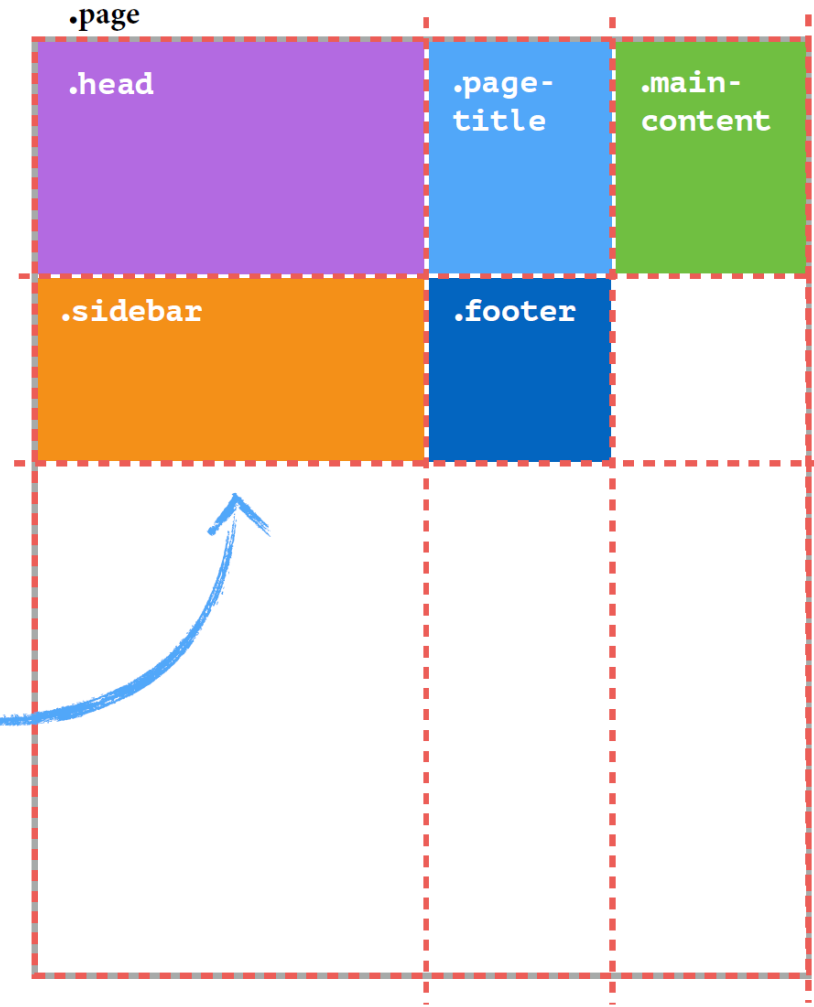
Grid gap

- Empty space between grid tracks (shown in **blue**)
- Commonly called *gutters*

```
.page {  
    display: grid;  
    grid-gap: 10px;  
}
```



Grid items automatically populate grid from top left to bottom right based on HTML source order.



Items placement in Grid

```
.footer {
```

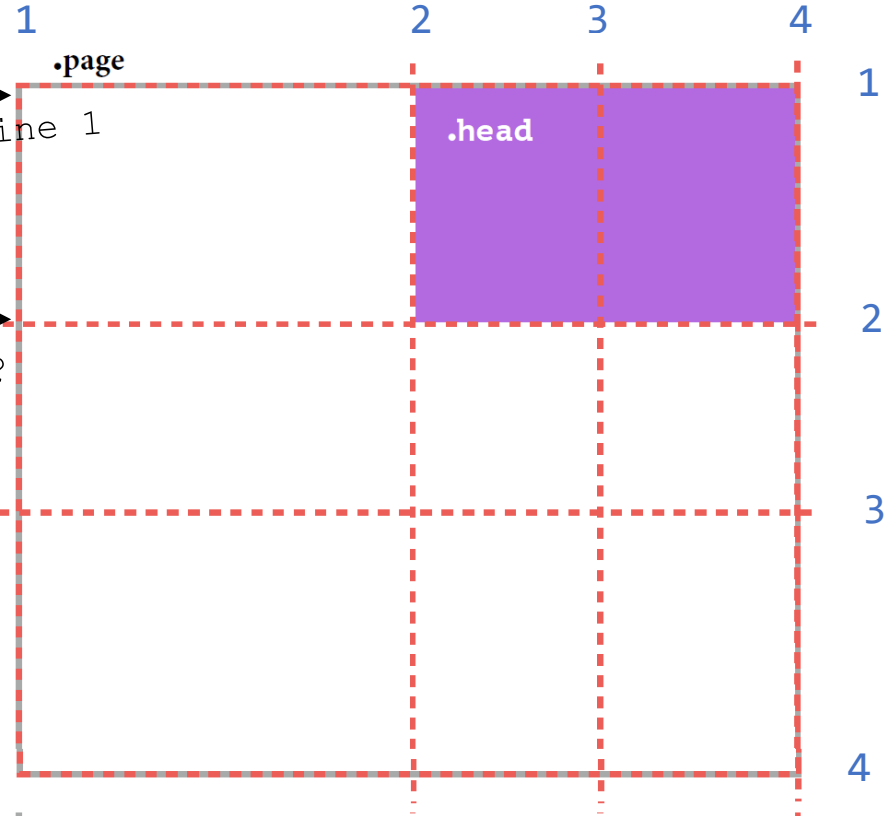
```
  grid-column: 1/4;
```

```
  grid-row: 3/4;
```

```
}
```

Start at column line 2

End at column line 4

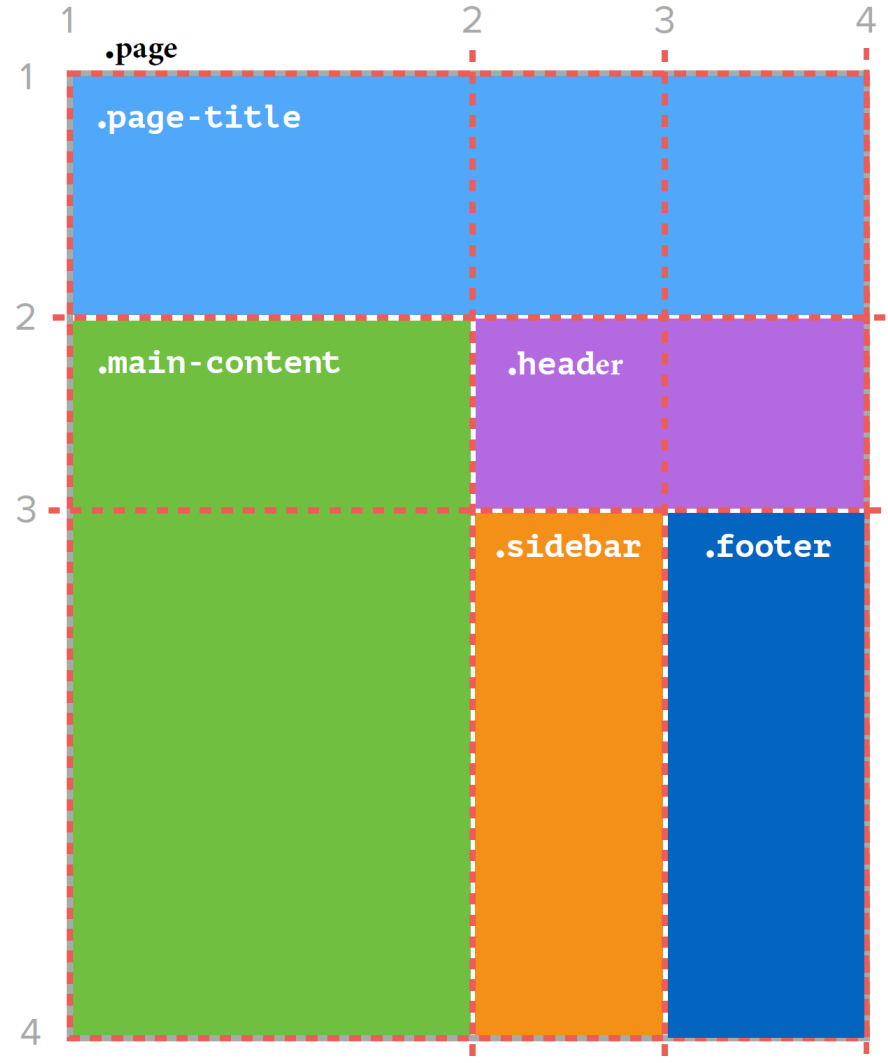


Applied to grid items. Defines the **start** and **end** grid lines for columns and rows

Example

```
.page {  
  display: grid;  
  grid-template-columns: 2fr 1fr 1fr;  
  grid-template-rows: auto 1fr 3fr;  
}  
  
.page-title {  
  grid-column: 1/4;  
  grid-row: 1/2;  
}  
  
.header {  
  grid-column: 2/4;  
  grid-row: 2/3;  
}  
  
.main-content {  
  grid-column: 1/2;  
  grid-row: 2/4;  
}  
/* etc etc */
```

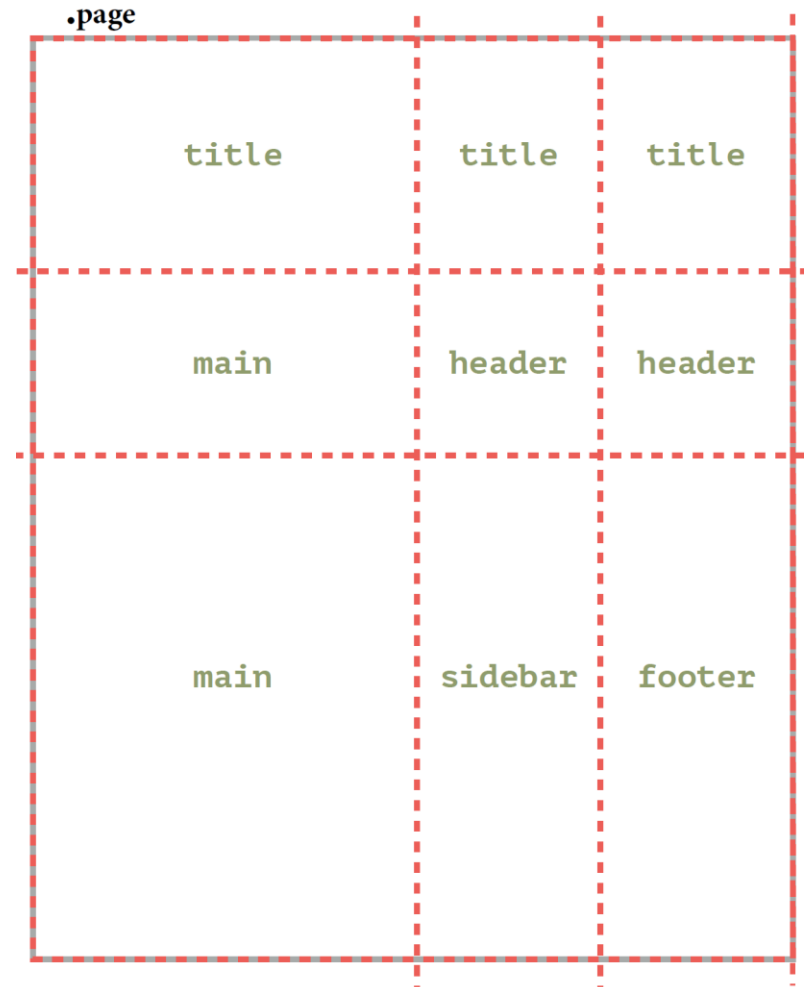
Ok, but remembering what lines to target seems tricky... especially when the site is responsive



Define grid areas

```
.page {  
  display: grid;  
  grid-template-columns: 2fr 1fr 1fr;  
  grid-template-rows: auto 1fr 3fr;  
  grid-template-areas:  
    "title title title"  
    "main header header"  
    "main sidebar footer";  
}
```

grid-template-areas
is used to define named grid areas



Placing items in the grid areas

```
.page {  
  display: grid;  
  grid-template-columns: 2fr 1fr 1fr;  
  grid-template-rows: auto 1fr 3fr;  
  grid-template-areas:  
    "title title title"  
    "main header header"  
    "main sidebar footer";  
}
```

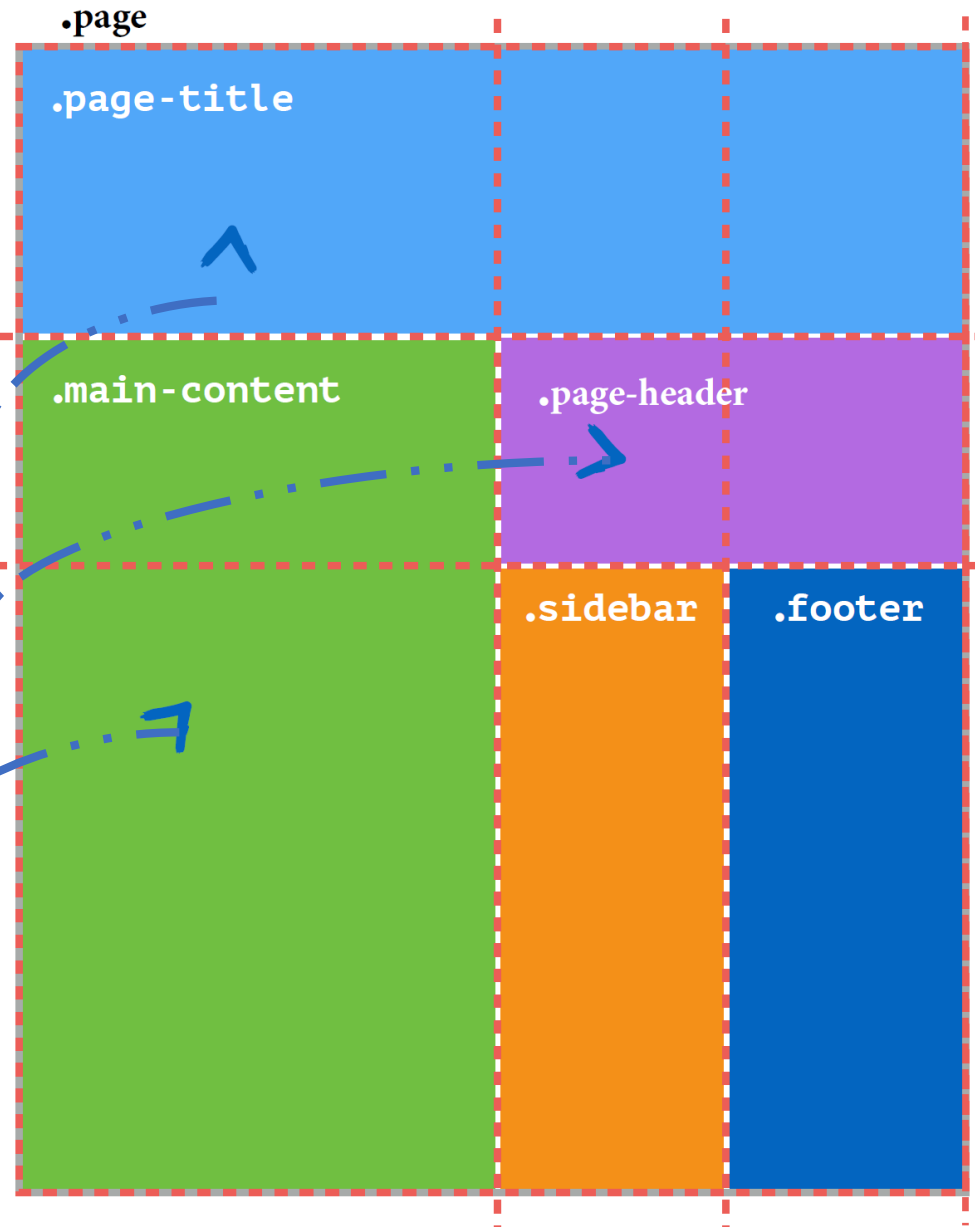
/ Placing items in the grid areas: */*

```
.page-title {  
  grid-area: title;  
}
```

```
.page-header {  
  grid-area: header;  
}
```

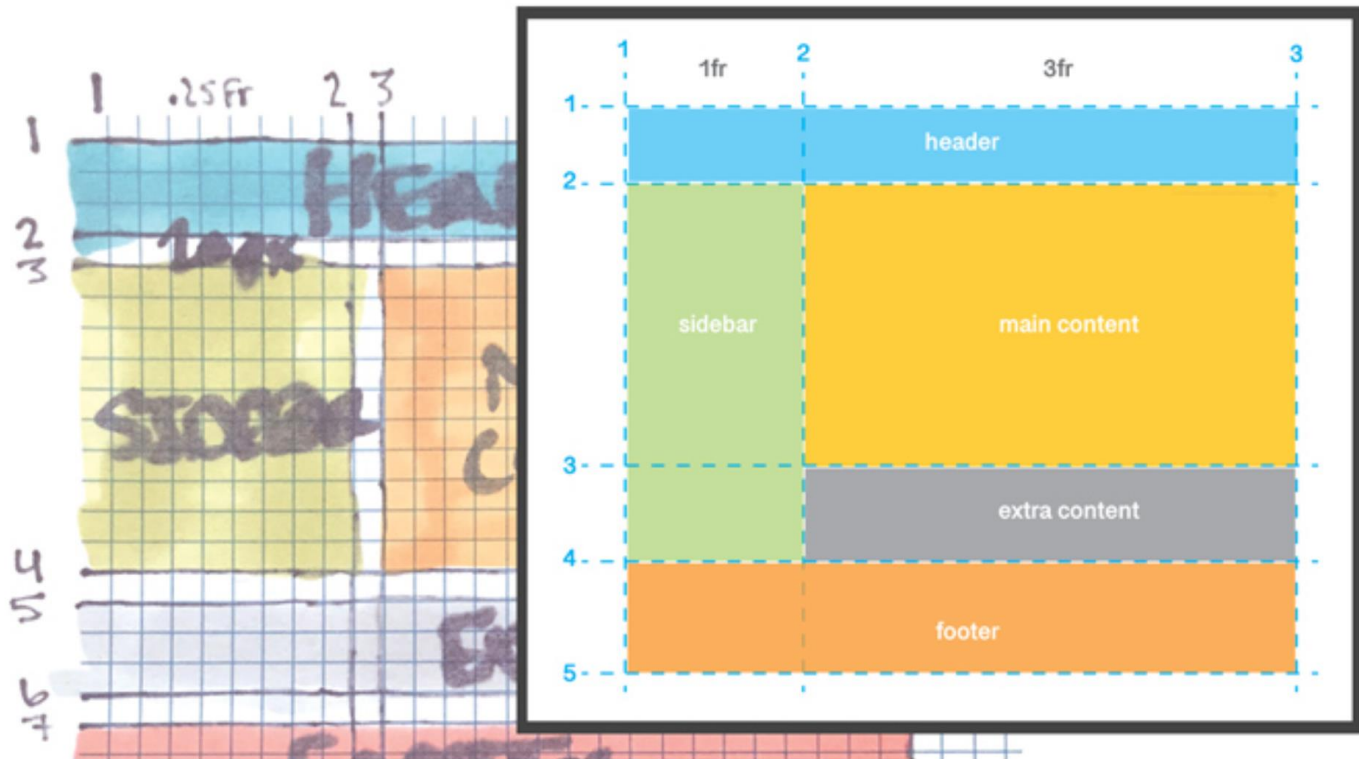
```
.main-content {  
  grid-area: main;  
}
```

/ etc etc */*



Grid areas

- Defining grid areas and using them to place elements is **best way** to design the page layout as it allow direct translation of the paper-based design to a CSS grid

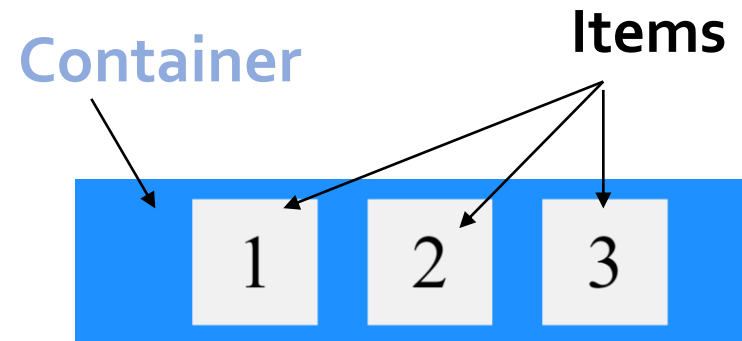


Layout using Flexbox

Flexbox

- The Flexbox provide a more efficient way to define **one-dimensional layout** and distribute space among items in a container while accommodating different screen sizes

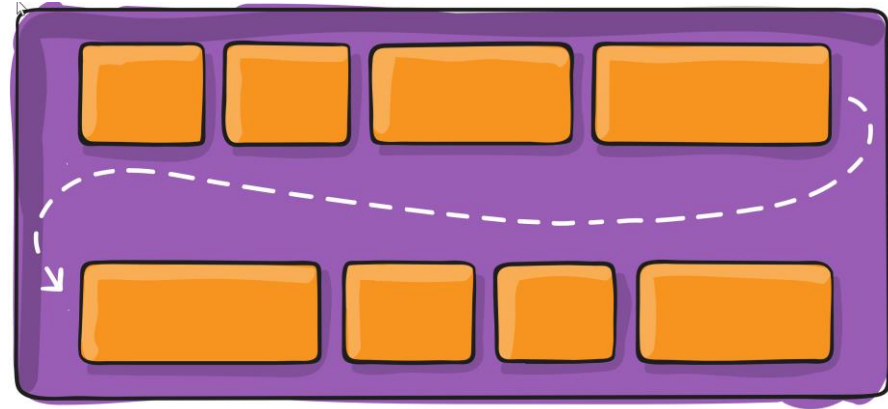
```
.flex-container {  
  display: flex;  
  justify-content: center;  
}  
  
<div class="flex-container">  
  <div>1</div>  
  <div>2</div>  
  <div>3</div>  
</div>
```



https://www.w3schools.com/css/css3_flexbox.asp

Key Properties

```
.container{  
  display: flex;  
  flex-wrap: wrap;  
  justify-content: space-around;  
}
```



justify-content

flex-start



flex-end



center



space-between



space-around



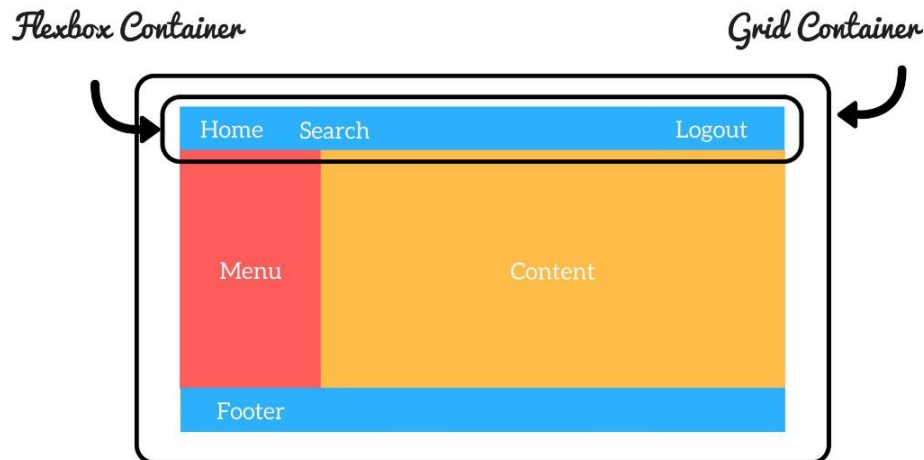
space-evenly



More info @ <https://css-tricks.com/snippets/css/a-guide-to-flexbox/>
<https://rachelandrew.co.uk/css/cheatsheets/box-alignment>

Grid vs Flexbox

- Grid Layout is a **two-dimensional** system with columns and rows, unlike flexbox which is a **one-dimensional system** (either in a column or a row).
- In practice you combine these layout models. Often you can use a Flexbox container inside a Grid container
 - Grid is often used for the overall page layout of the homepage (i.e., **larger scale** layout) while the **flexbox** is used for **small-scale** one-dimensional layouts (e.g., menu or card layout)



Responsive Web Design (RWD)



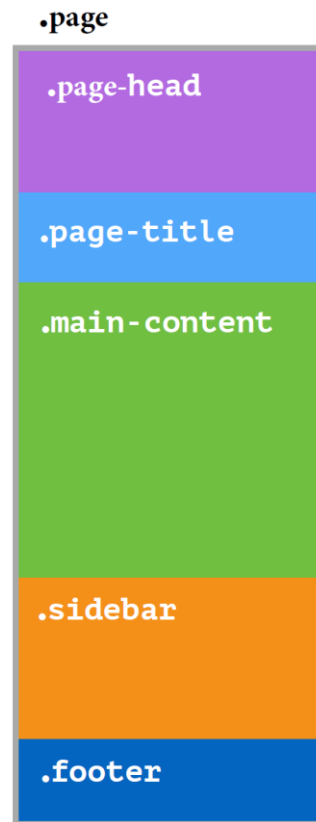
- RWD is an approach to **serve different layouts for different screen sizes**
 - **Optimize the viewing experience on range of devices:** mobile, desktop, tablet, TV...
 - Can be accomplished using CSS **media queries** and **grid/flexbox**
 - Mobile-first layouts work well on all screen widths

Responsive page layout using grid

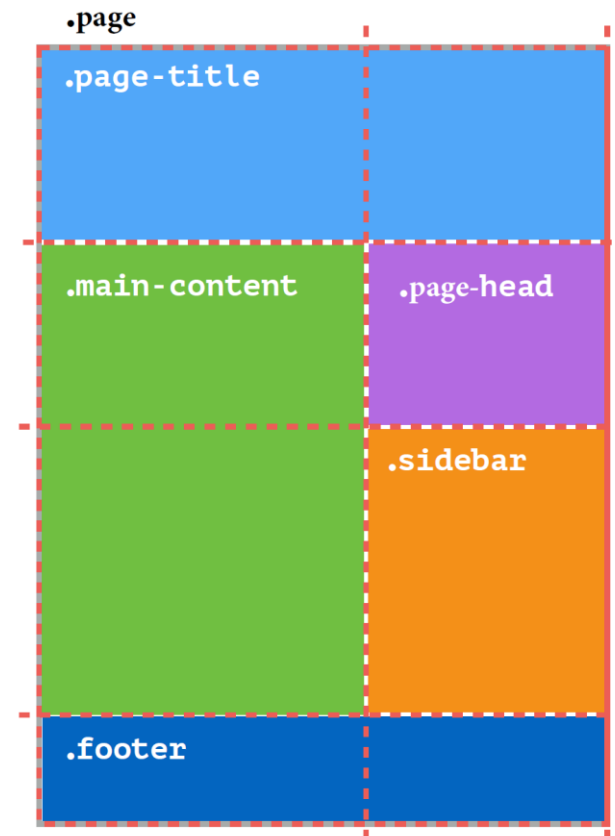
```
@media screen and (min-width: 700px) {  
  .page {  
    display: grid;  
    grid-template-columns: 2fr 1fr 1fr;  
    grid-template-rows: auto 1fr 3fr;  
    grid-template-areas: "title title"  
                        "main header"  
                        "main sidebar"  
                        "footer footer";  
  }  
}
```

- Responsive page layout using media queries and grid
- Media queries allows applying styles based on the browser screen size

No grid



Two-column grid
(when page width $\geq 700px$)



Responsive Grid

```
main {  
  display: grid;  
  grid-template-columns: repeat(auto-fit, minmax(280px, 1fr));  
}
```



Browser!

- I want you to **auto-create the grid columns** you decide how many you can fit using the auto-placement algorithm
- I want the columns to be minimum 200px and a maximum of **sharing the available space equality among the columns**



[See posted example](#)

Summary

- Use Grid any time you work with **two-dimensional** layouts to divide the page into several sections having different size and position
- Use Flexbox for **one-dimensional** layout that offers space allocation between items + the ability to alter its items' width/height (and order) to best fill the available space
- Use Media Queries and Grid layout for responsive design
- .. mastering CSS will take some time and effort   ...

References

- CSS Tutorials <http://www.w3schools.com/css/>
- Cheat sheet <https://htmlcheatsheet.com/css/>
- CSS developer guide
<https://developer.mozilla.org/en-US/docs/Web/Guide/CSS>
- Selectors <http://code.tutsplus.com/tutorials/the-30-css-selectors-you-must-memorize--net-16048>
- CSS Grid
 - https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Grid_Layout
 - <https://gridbyexample.com/learn/>
 - <https://css-tricks.com/snippets/css/complete-guide-grid/>
 - <https://mozilladevelopers.github.io/playground/css-grid/>