

**CSS**



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

# Table of Contents

1. CSS Syntax
2. Basic styles
3. Margin, Border and Padding
4. **Layout using Grid**
5. Layout using Flexbox
6. Responsive Web Design (RWD)

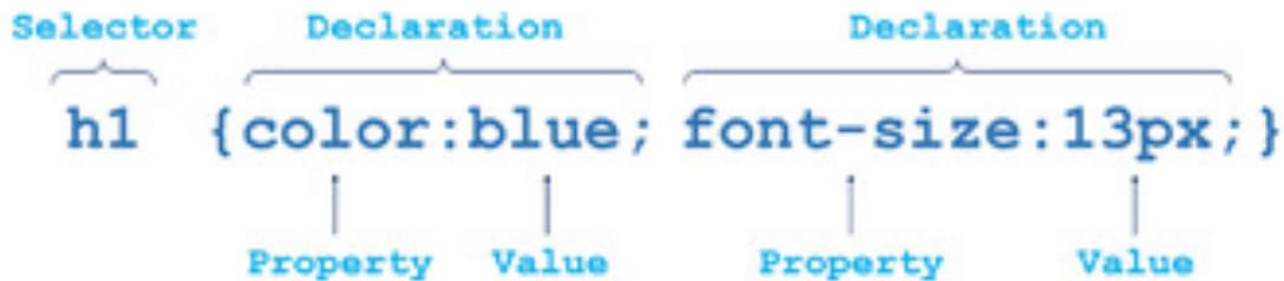
# CSS Syntax

# 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 <li>

[https://www.w3schools.com/cssref/css\\_selectors.asp](https://www.w3schools.com/cssref/css_selectors.asp)



# Attribute Selectors

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

[https://www.w3schools.com/cssref/css\\_selectors.asp](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	<b>tr:first-child</b>	First row of an HTML table
:last-child	<b>tr:last-child</b>	Last row of an HTML table
:nth-child( <i>n</i> )	<b>tr:nth-child(2)</b>	Second row of an HTML table
:nth-last-child( <i>n</i> )	<b>tr:nth-last-child(2)</b>	Second row of an HTML table, counting from the last row
nth-child(odd)	<b>tr:nth-child(odd)</b>	Every odd row of an HTML table
nth-child(even)	<b>tr:nth-child(even)</b>	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`....

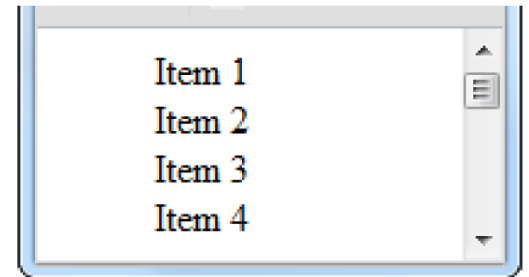
# Text-related CSS Properties (2)

- **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 `<ul>`: `circle`, `square`,...
  - Values for `<ol>`: `upper-roman`, `lower-alpha`
  - Values for both: `none`

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



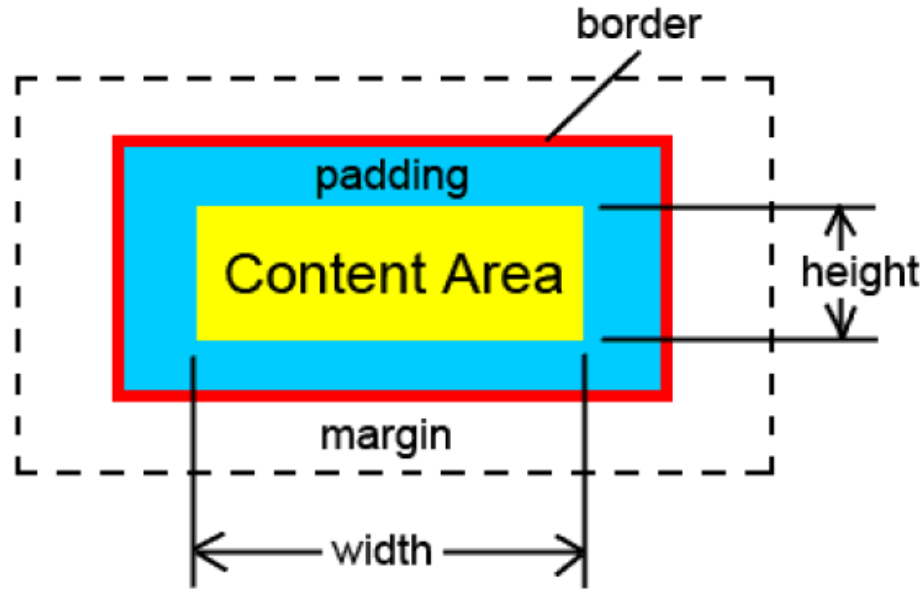


# Practice ...

- Use the W3Schools try-it-yourself editor to try styling each of these properties
- Background  
[http://www.w3schools.com/css/css\\_background.asp](http://www.w3schools.com/css/css_background.asp)
- Text  
[http://www.w3schools.com/css/css\\_text.asp](http://www.w3schools.com/css/css_text.asp)
- Fonts  
[http://www.w3schools.com/css/css\\_font.asp](http://www.w3schools.com/css/css_font.asp)
- Lists  
[https://www.w3schools.com/css/css\\_list.asp](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:

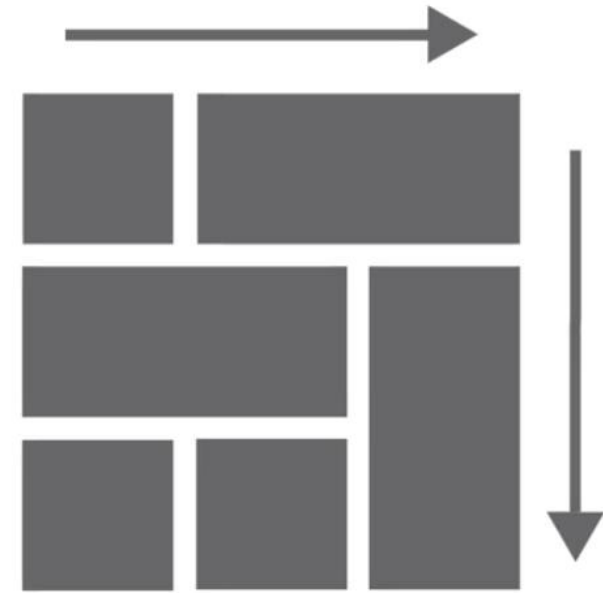
**border:** 1px solid red;

- 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>
```



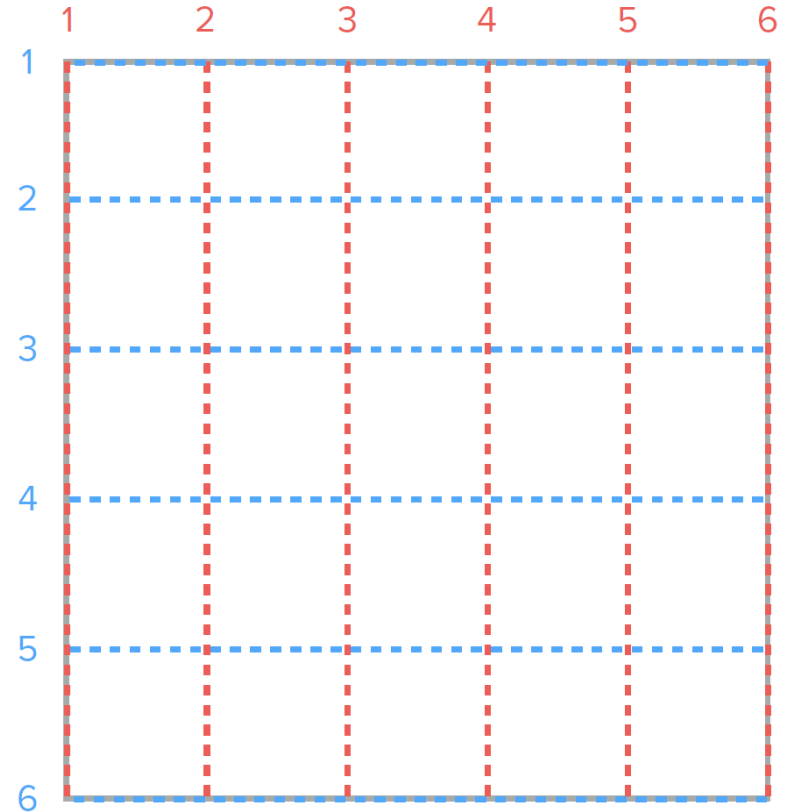
# Grid item

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

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

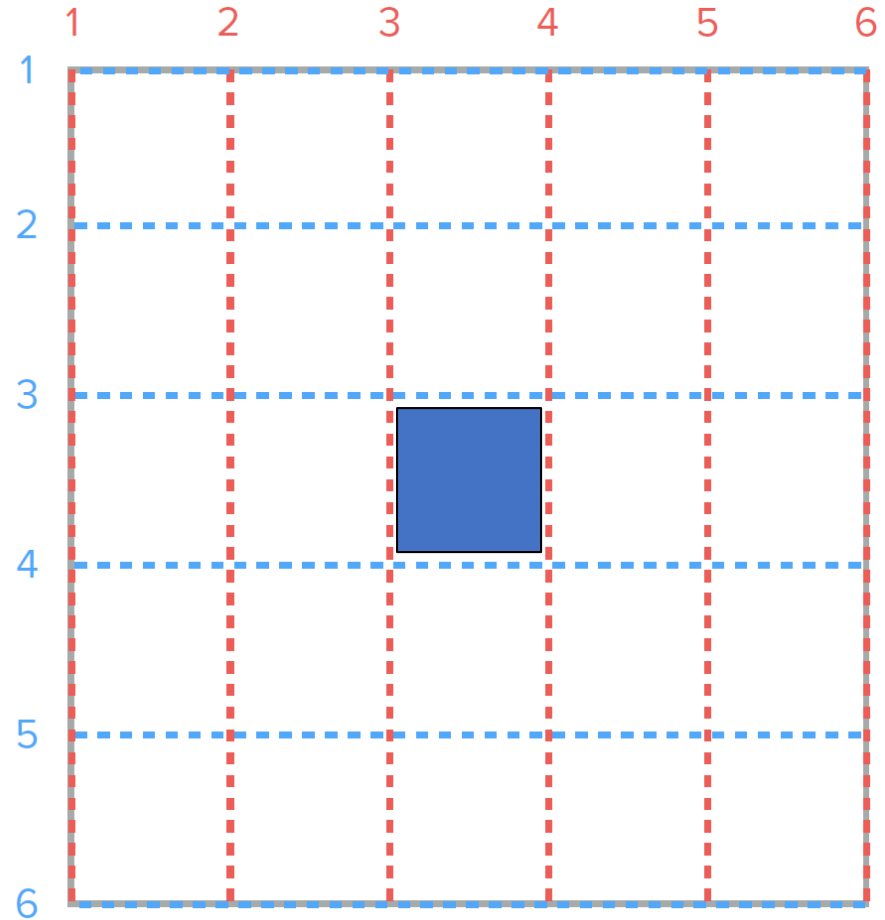
# Grid line

- 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



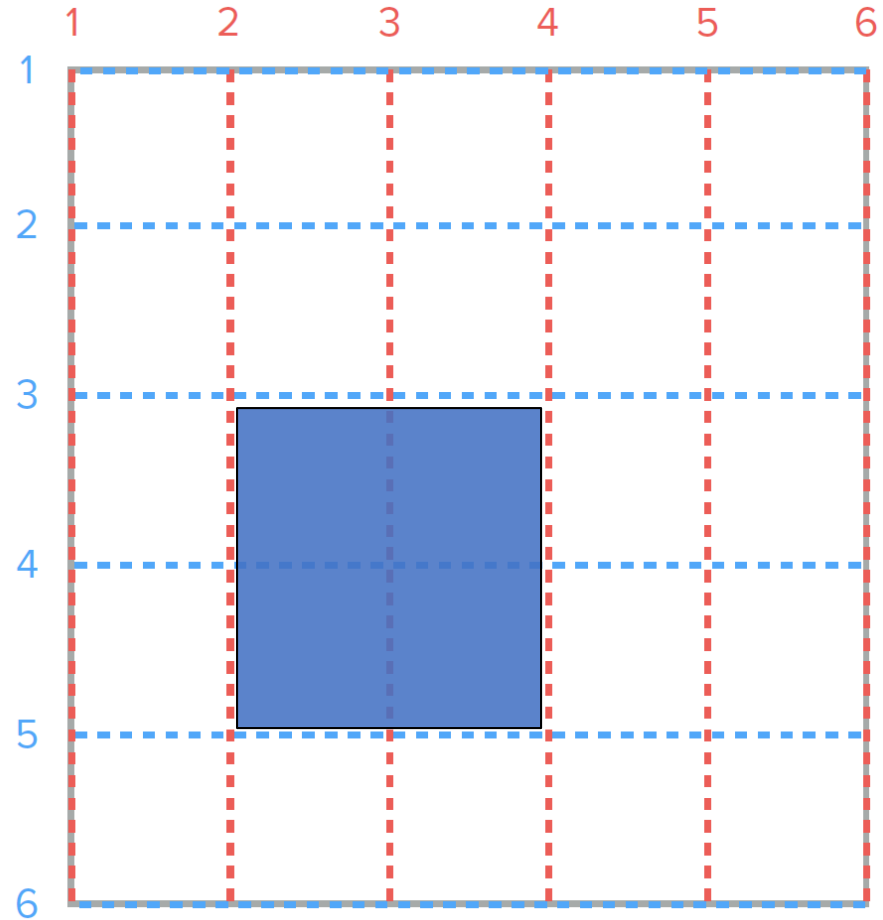
# Grid *cell*

- 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

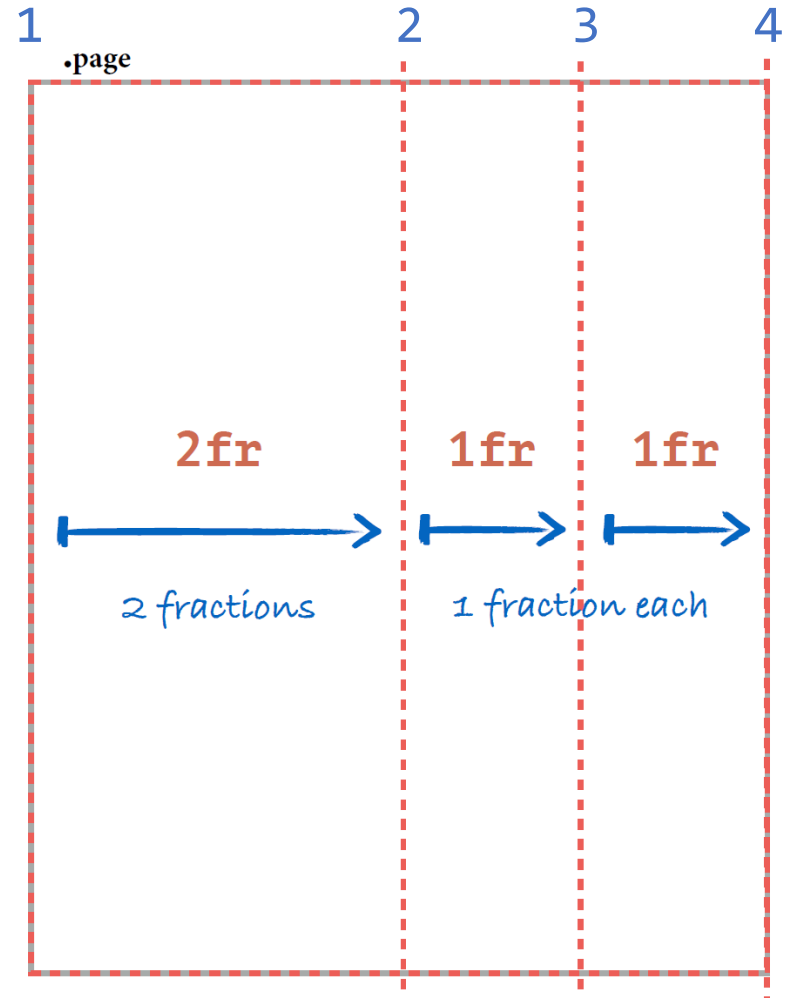


# Grid columns

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

---

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



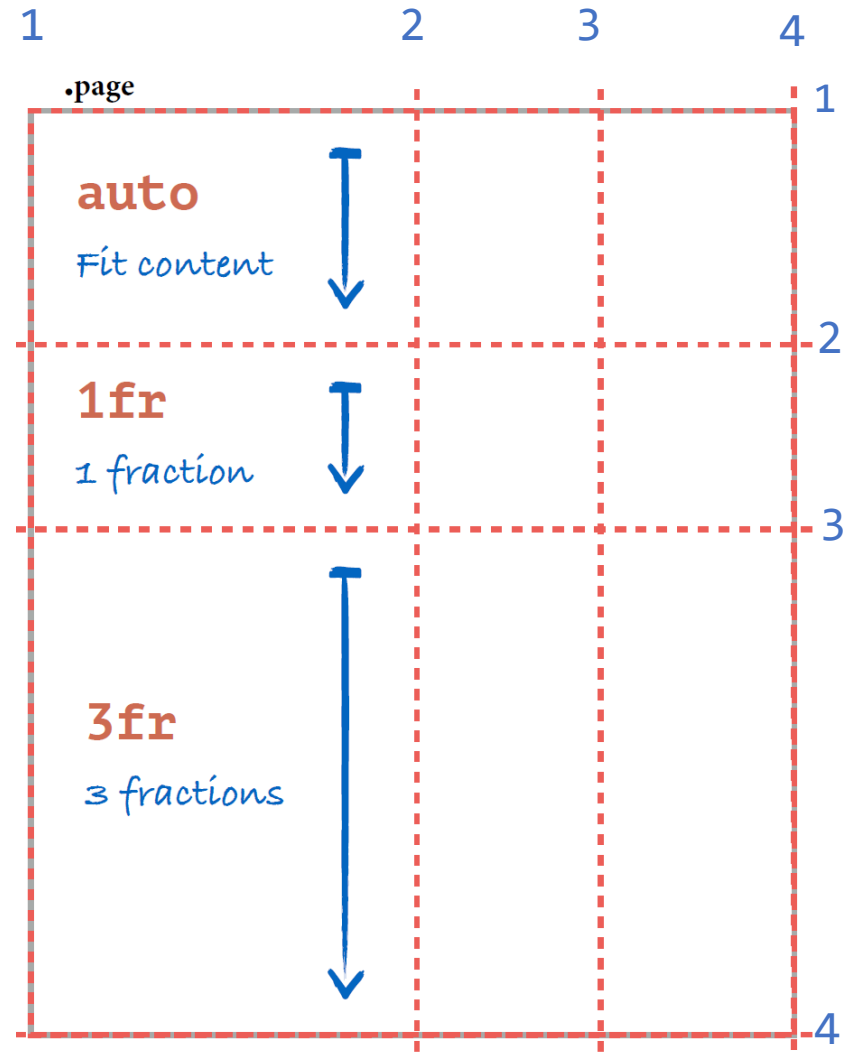
# Grid rows

`grid-template-rows:`

`auto 1fr 3fr;`

---

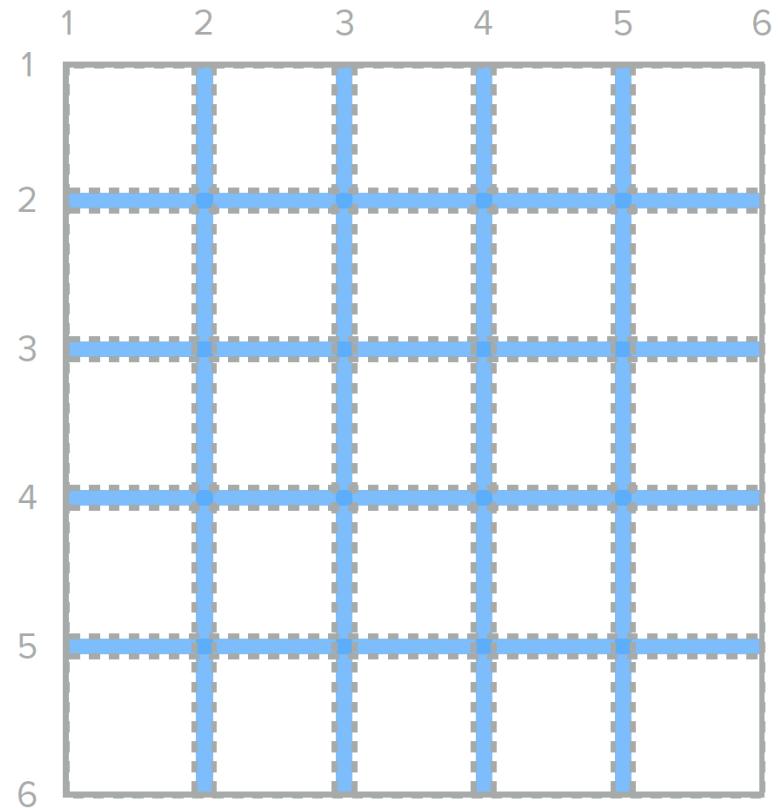
Draws grid lines. Takes list of length values (em, px, %, **fr**, etc.) denoting the distance between each line.



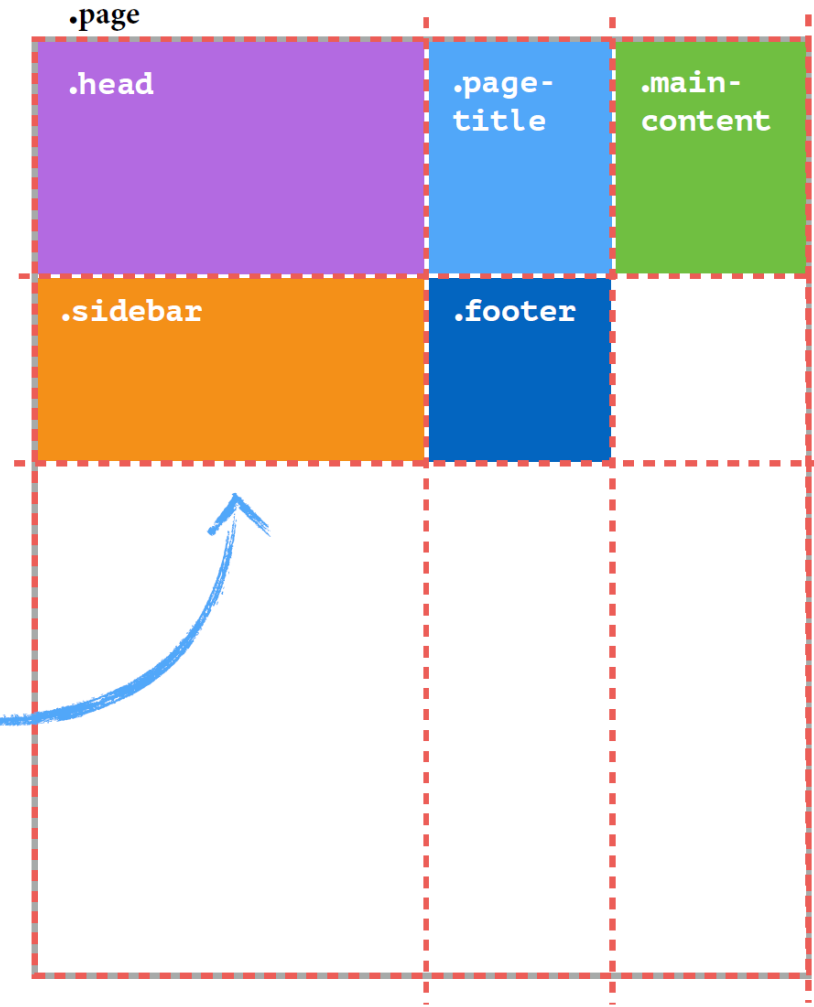
# Grid gap

- 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.





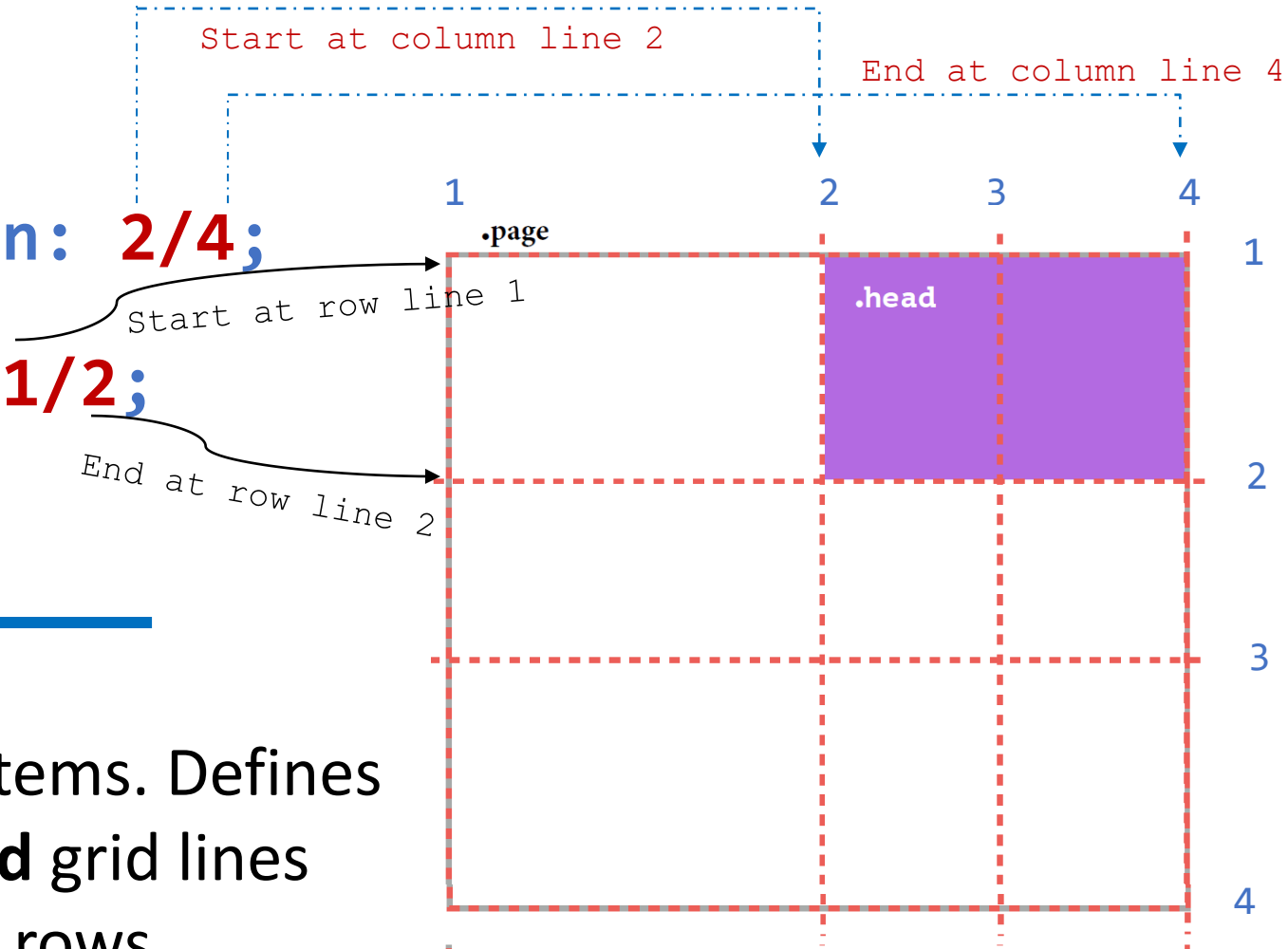
# Items placement in Grid

```
.head {
```

```
  grid-column: 2/4;
```

```
  grid-row: 1/2;
```

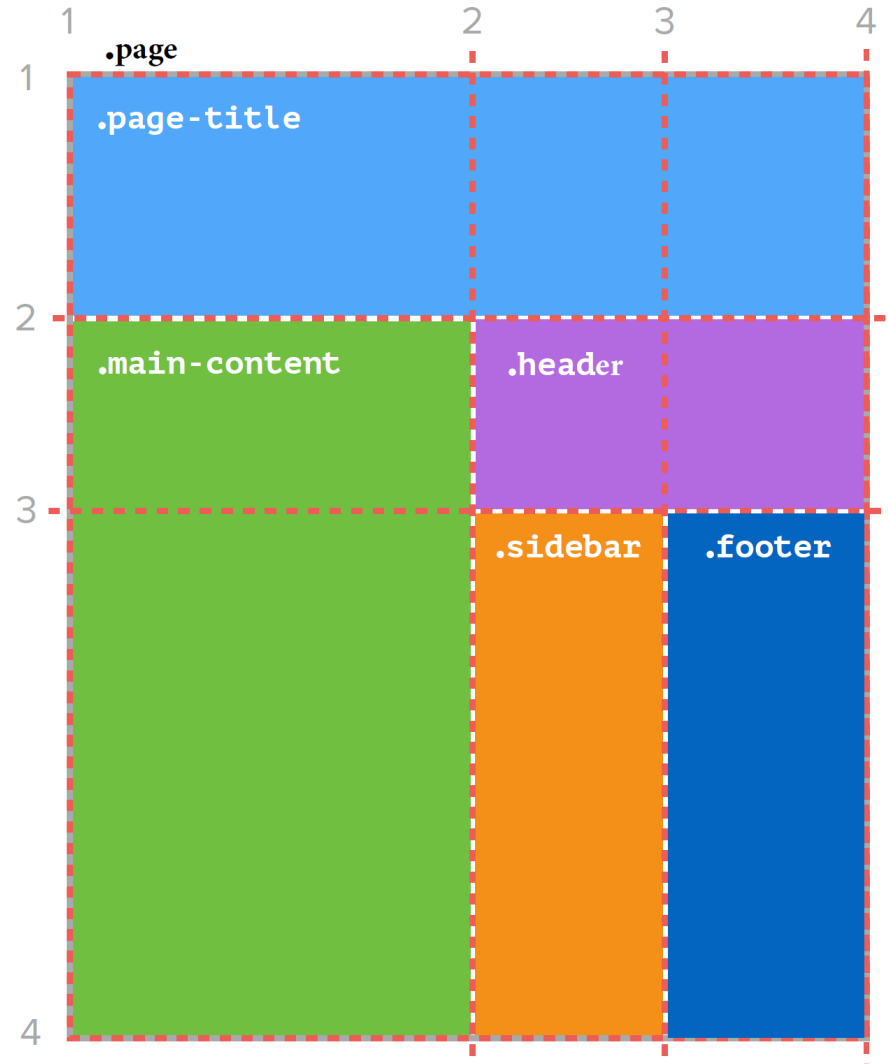
```
}
```



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;  
}  
.header {  
  grid-column: 2/4;  
  grid-row: 2/3;  
}  
.page-title {  
  grid-column: 1/4;  
  grid-row: 1/2;  
}  
.main-content {  
  grid-column: 1/2;  
  grid-row: 2/4;  
}  
/* etc etc */
```

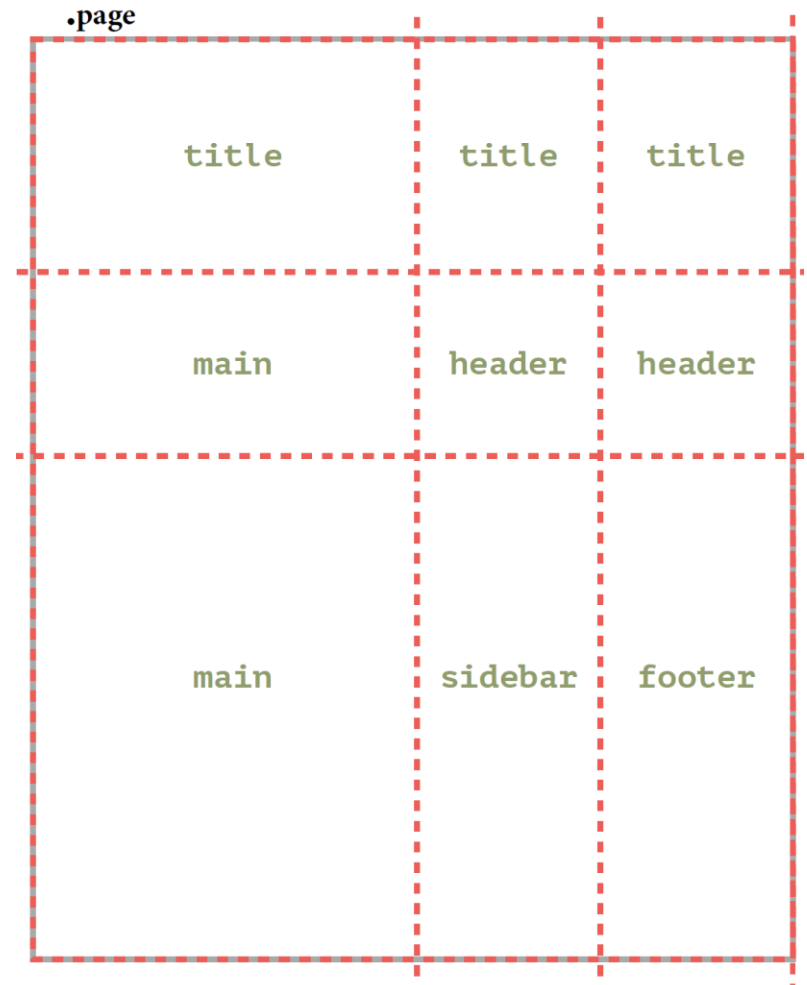


Ok, but remembering what lines to target seems tricky... especially when the site is responsive

# 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";  
}
```

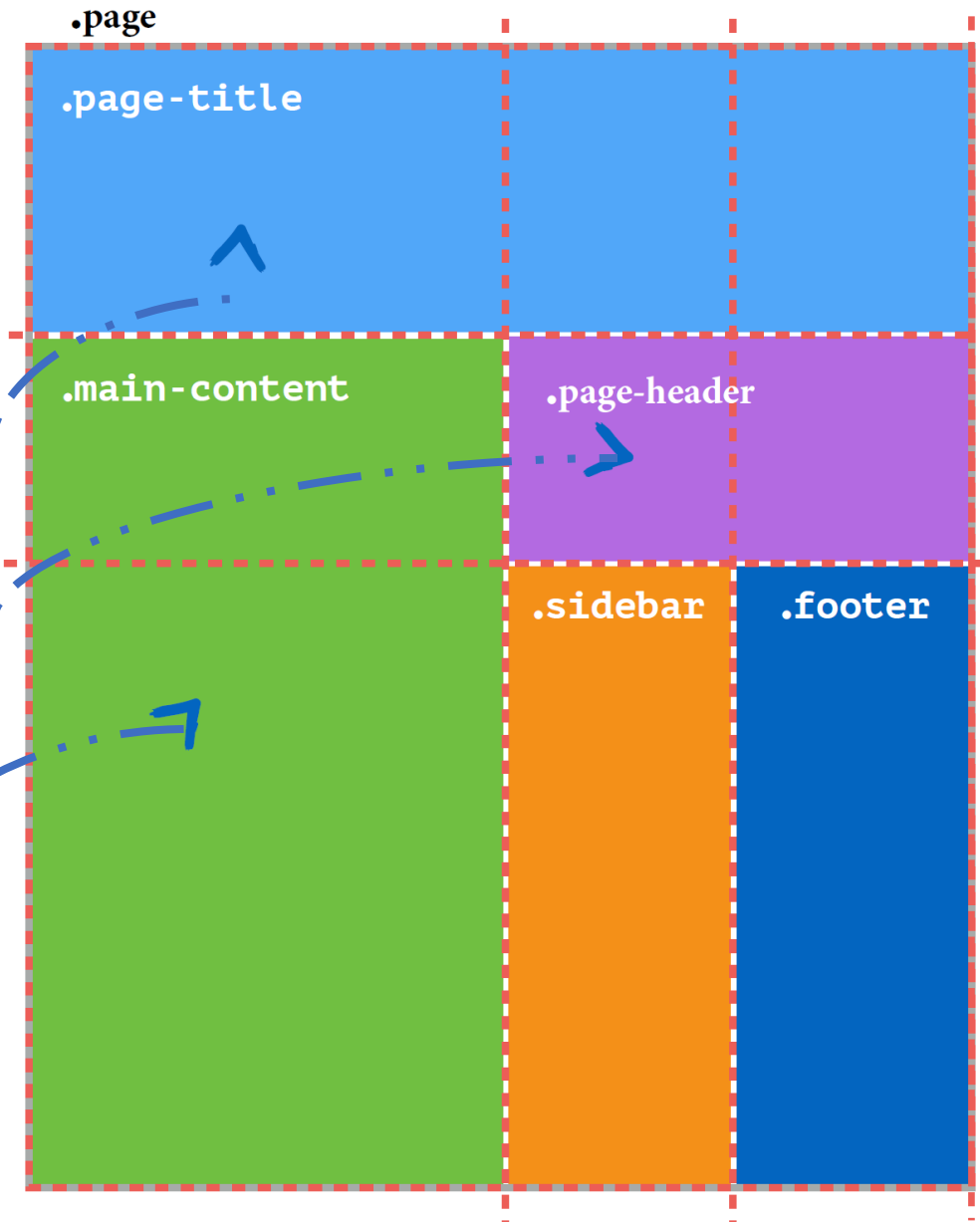
*/\* Placing items in the grid areas: \*/*

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

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

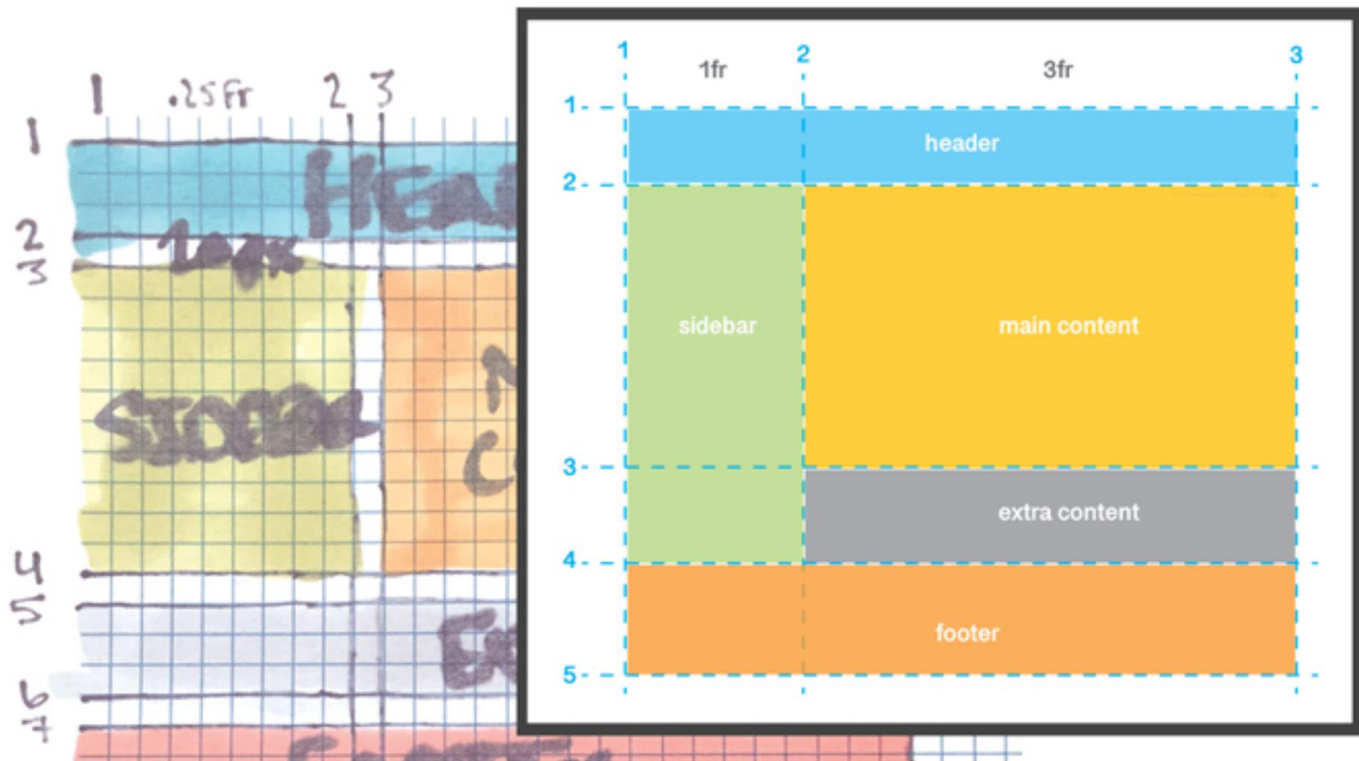
```
.main-content {  
  grid-area: main;  
}
```

*/\* 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

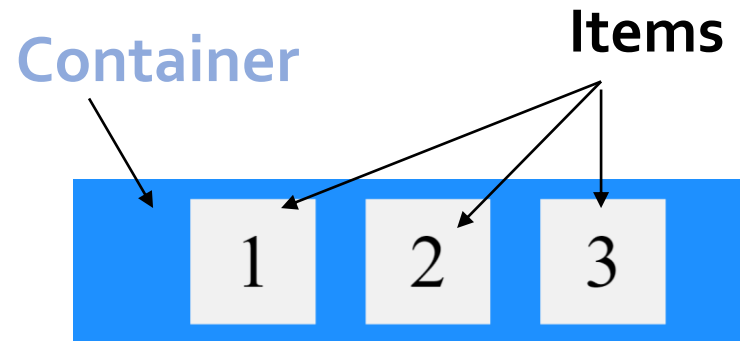


# Layout using Flexbox

# 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

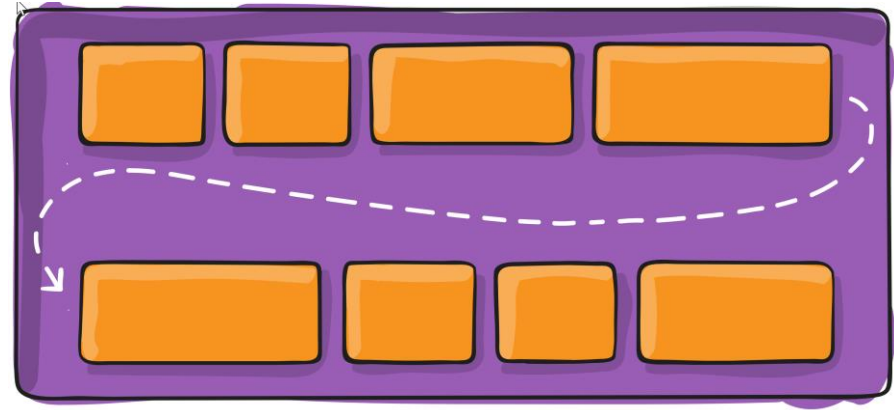
```
.flex-container {  
  display: flex;  
  justify-content: center;  
}  
  
<div class="flex-container">  
  <div>1</div>  
  <div>2</div>  
  <div>3</div>  
</div>
```



[https://www.w3schools.com/css/css3\\_flexbox.asp](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

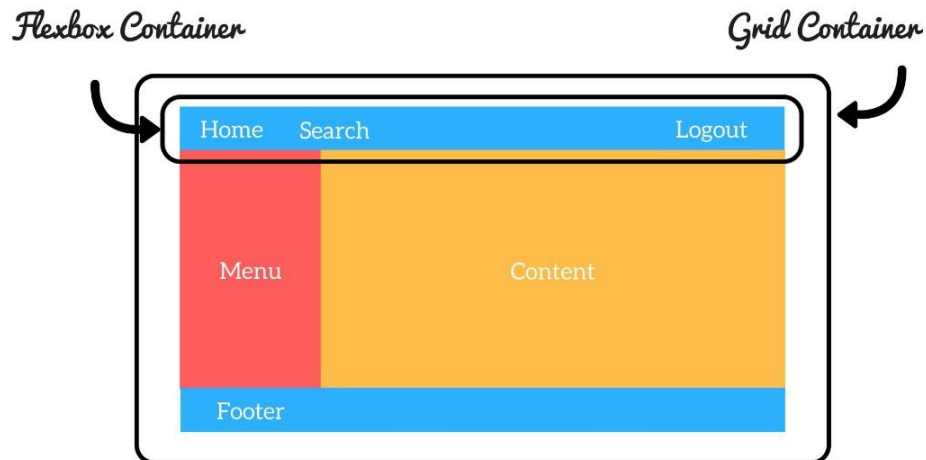


More info @ <https://css-tricks.com/snippets/css/a-guide-to-flexbox/>  
<https://rachelandrew.co.uk/css/cheatsheets/box-alignment>



# 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)



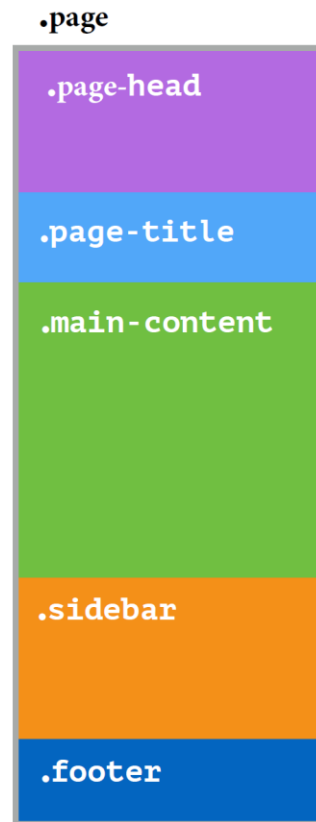
- RWD is an approach to **serve different layouts for different screen sizes**
  - **Optimize the viewing experience on range of devices:** mobile, desktop, tablet, TV...
  - Can be accomplished using CSS **media queries** and **grid/flexbox**
  - Mobile-first layouts work well on all screen widths

# Responsive page layout using grid

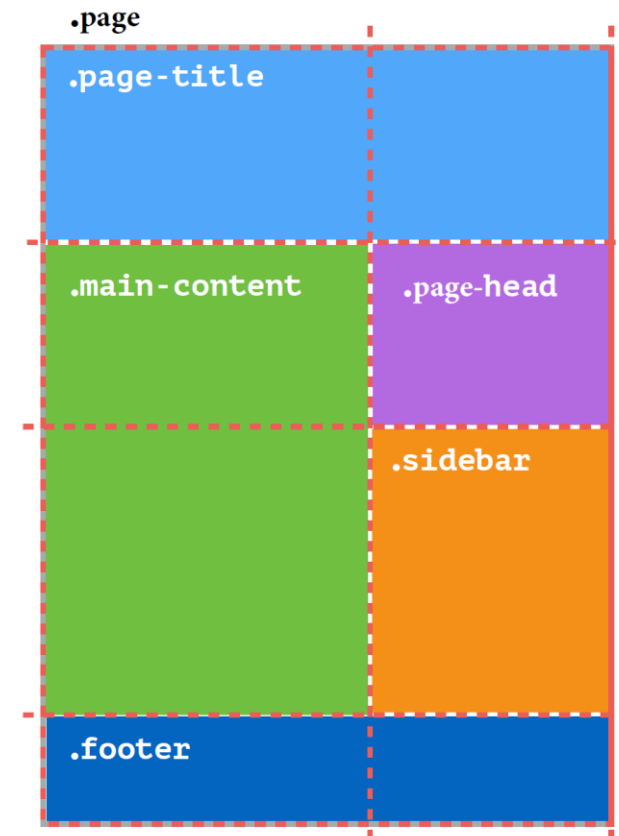
```
@media screen and (min-width: 700px) {  
  .page {  
    display: grid;  
    grid-template-columns: 2fr 1fr 1fr;  
    grid-template-rows: auto 1fr 3fr;  
    grid-template-areas: "title title"  
                        "main header"  
                        "main sidebar"  
                  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



# 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://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/>