

ARCH A4988

# Coding for Spatial Practices

Layout and Grids

# Learning Objectives

# Learning Objectives

1. Describe what a wireframe is and its role in the development process.
2. Define the flexbox module
3. Contrast flex container and flex items
4. Describe the grid system

# Agenda

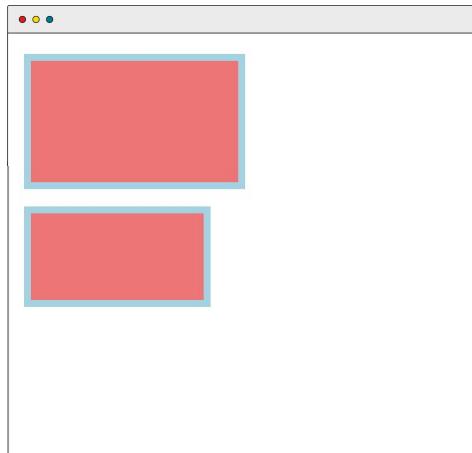
1. Review ( box-sizing )
2. The Basics
3. Assignment
4. Project 02

# box-sizing

The CSS **box-sizing** property is used to adjust or control the size of any element that accepts a **width** or **height**. It specifies how to calculate the total width and height of that element.

# box-sizing

The CSS **box-sizing** property is used to adjust or control the size of any element that accepts a **width** or **height**. It specifies how to calculate the total width and height of that element.



```
<div class="box one"></div>
<div class="box two"></div>
```

**.box .one**

Total width:  $200\text{px} + (2 * 20\text{px}) + (2 * 8\text{px}) = 256\text{px}$

Total height:  $100\text{px} + (2 * 20\text{px}) + (2 * 8\text{px}) = 156\text{px}$

```
.box {
  width: 200px;
  height: 100px;
  border: 8px solid lightblue;
  background: lightcoral;
  margin-bottom: 20px;
}

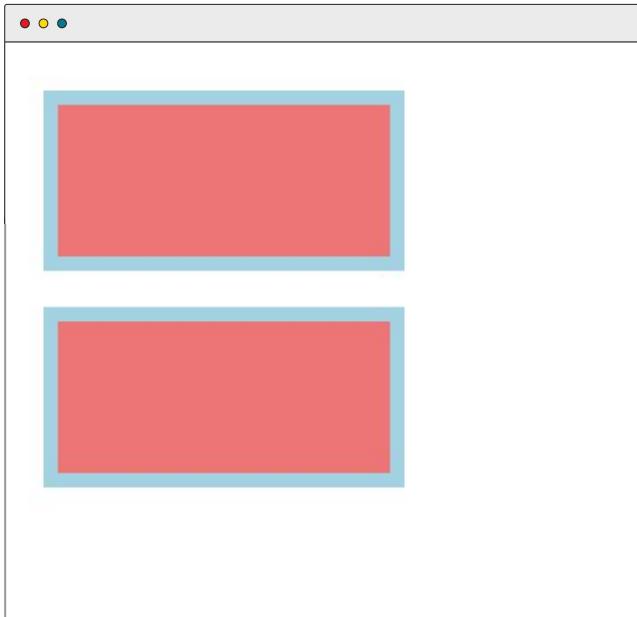
.one {
  padding: 20px;
}
```

## box-sizing

When you set the **box-sizing** property to **border-box**, it tells the browser to account for any **border** and **padding** assigned to the element's **width** and **height**.

That means, if you set an element's width to **200 pixels**, that 200 pixels will include any border or padding you add, and the content box will shrink to absorb that extra width.

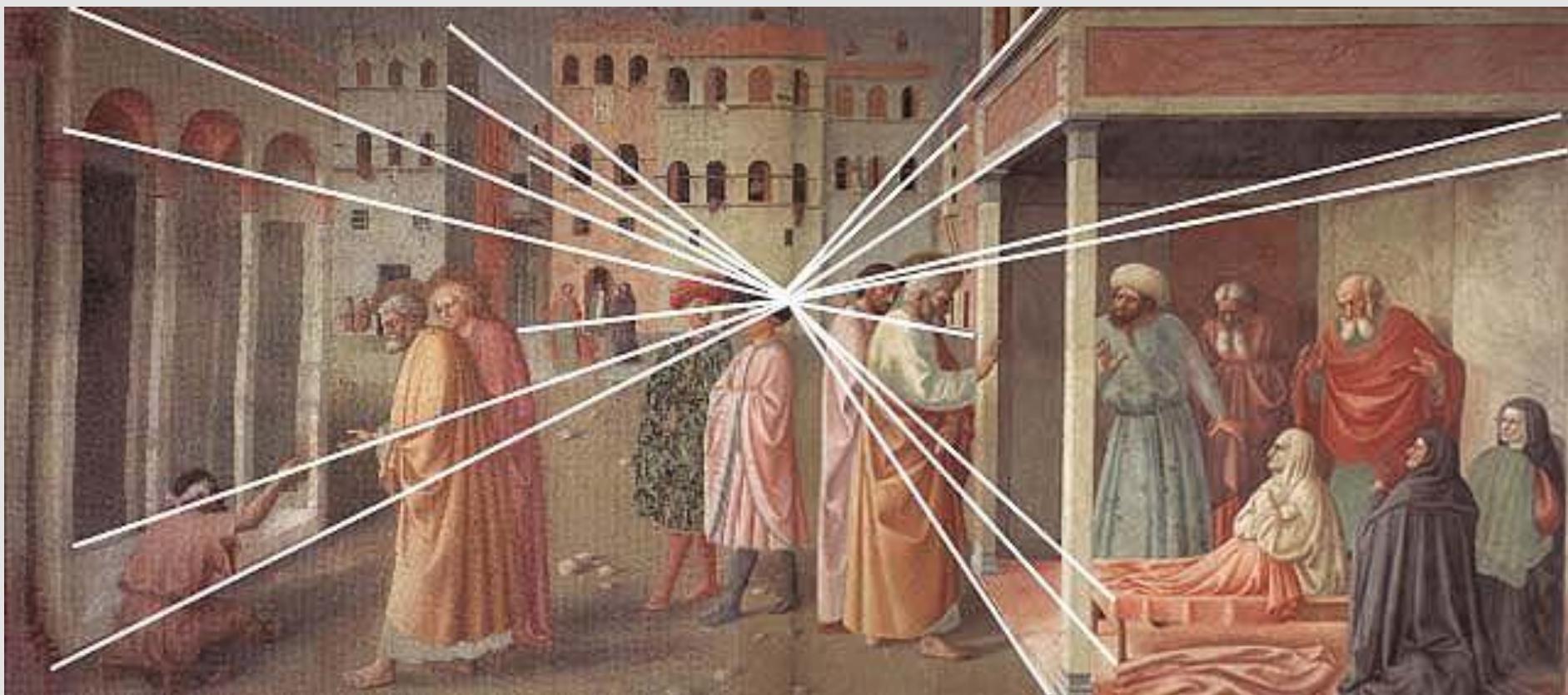
# box-sizing



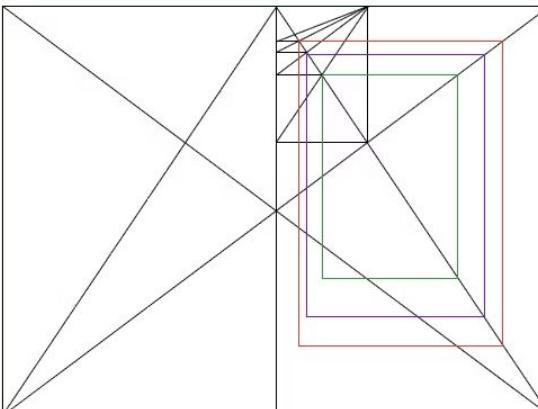
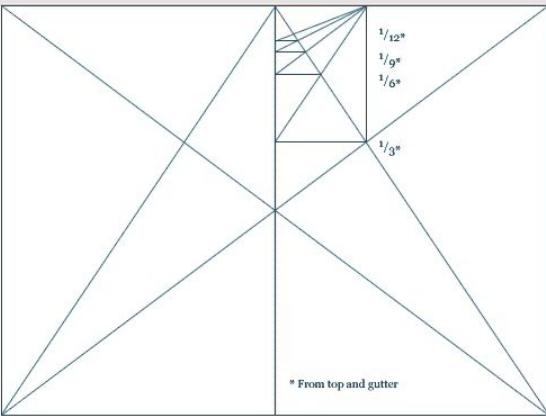
```
.box {  
    width: 200px;  
    height: 100px;  
    border: 8px solid lightblue;  
    background: lightcoral;  
    margin-bottom: 20px;  
}  
  
.one {  
    padding: 20px;  
    box-sizing: border-box;  
}  
  
.two {  
    box-sizing: border-box;  
}
```

# The Basics

# The Grid Before Graphic Design

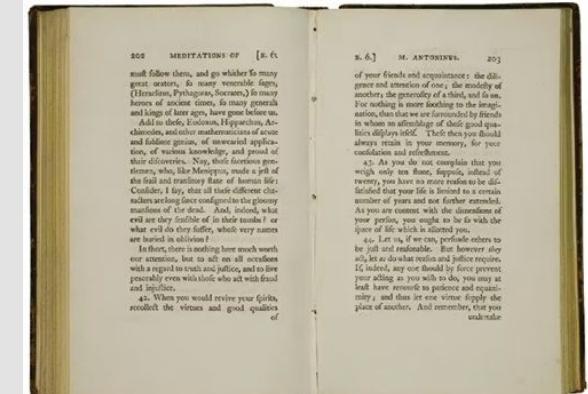
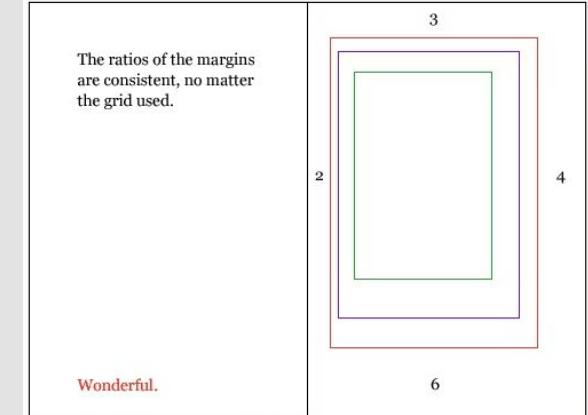


# The Grid Before Graphic Design



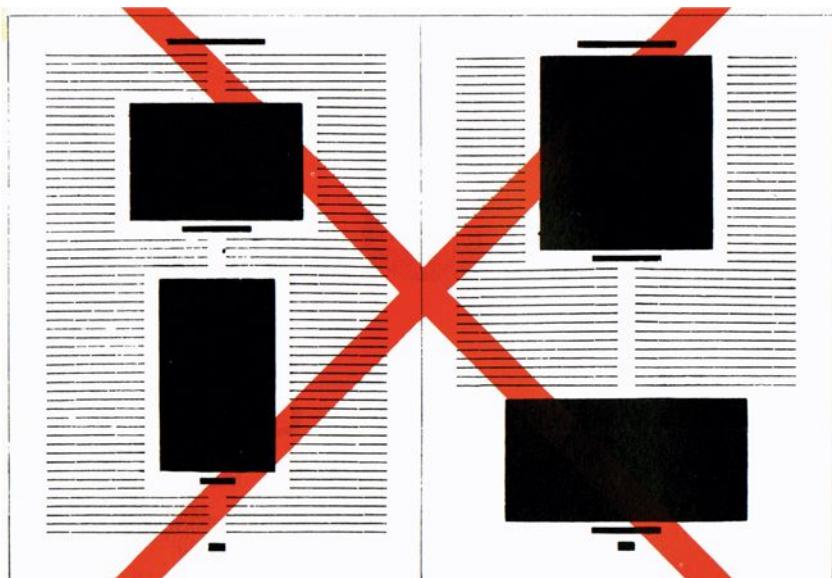
The ratios of the margins  
are consistent, no matter  
the grid used.

Wonderful.

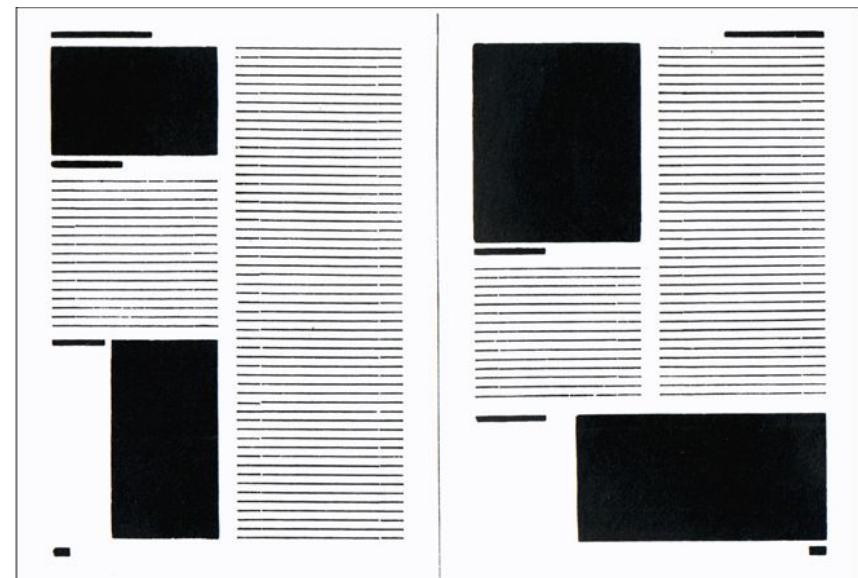


# The Modern Grid

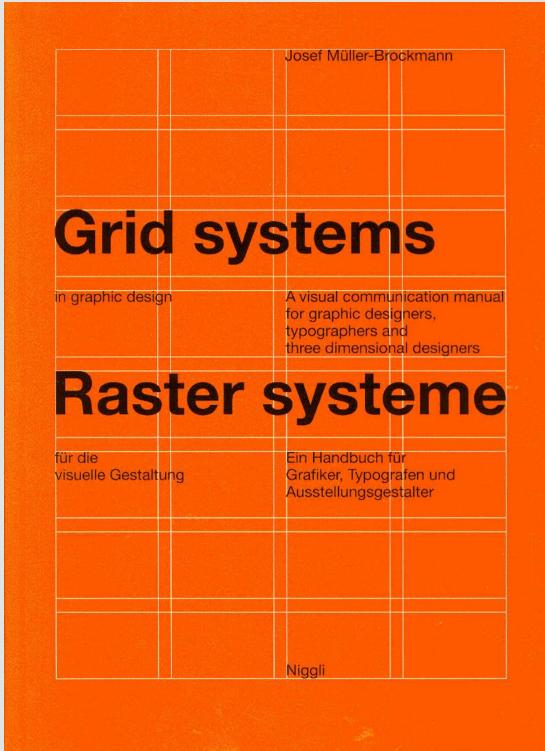
Then:



Now:



# The Modern Grid

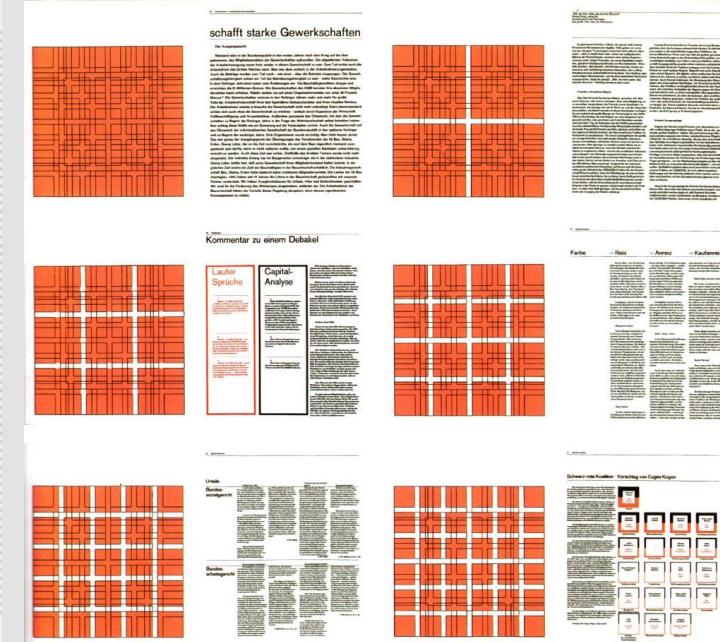
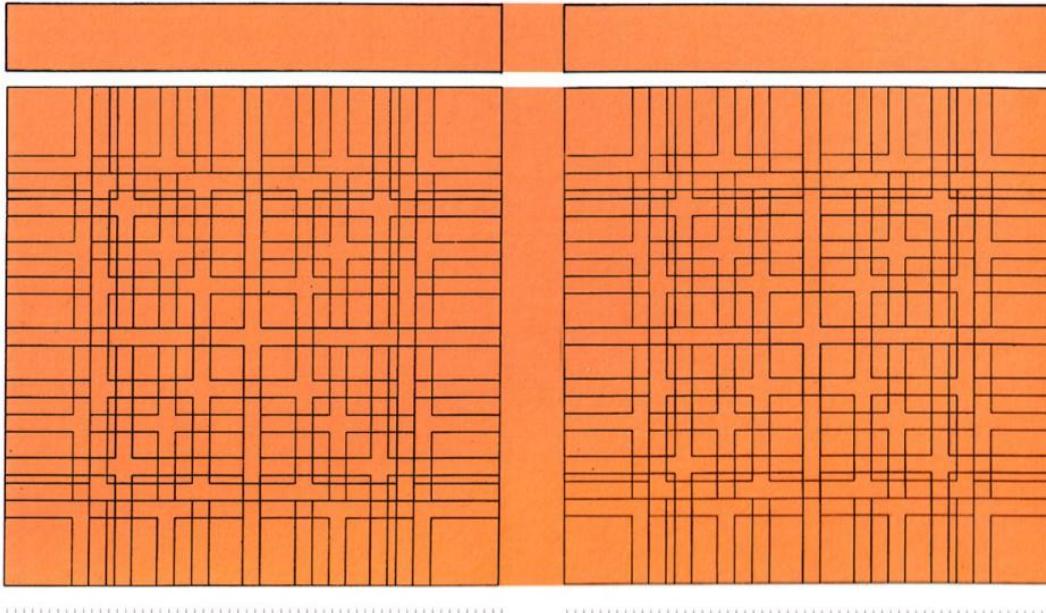


# The Modern Grid

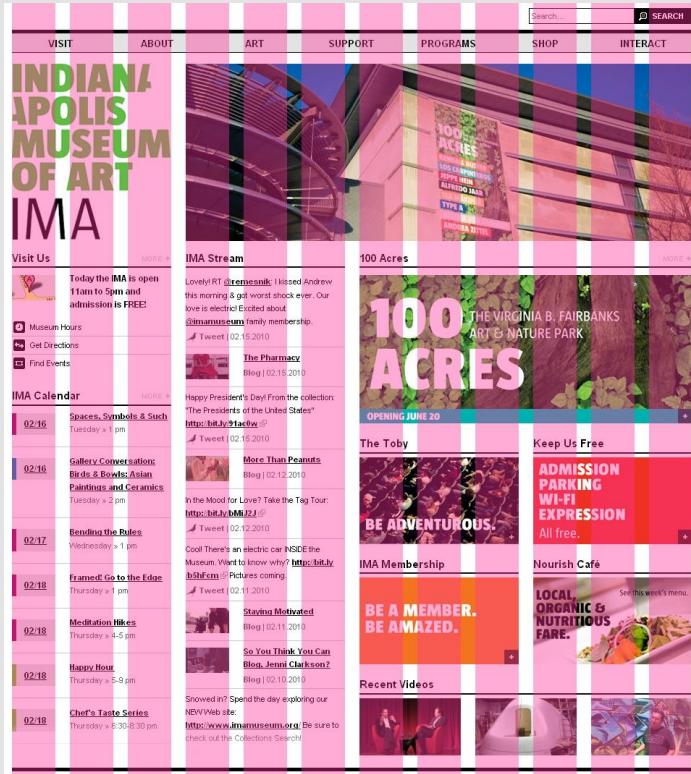
**German typographer Jan Tschichold made grid layouts inspired by the Bauhaus**

Section A	Section B	Section C
<p><b>Lorum Ipsum!</b></p> <p>dolor sit amet</p> <p>Consectetur adipisciing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupiditat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.</p>	<p><b>Lorum Ipsum!</b></p> <p>dolor sit amet</p> <p>Consectetur adipisciing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupiditat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.</p>	<p><b>Lorum Ipsum!</b></p> <p>dolor sit amet</p> <p>Consectetur adipisciing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupiditat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.</p>

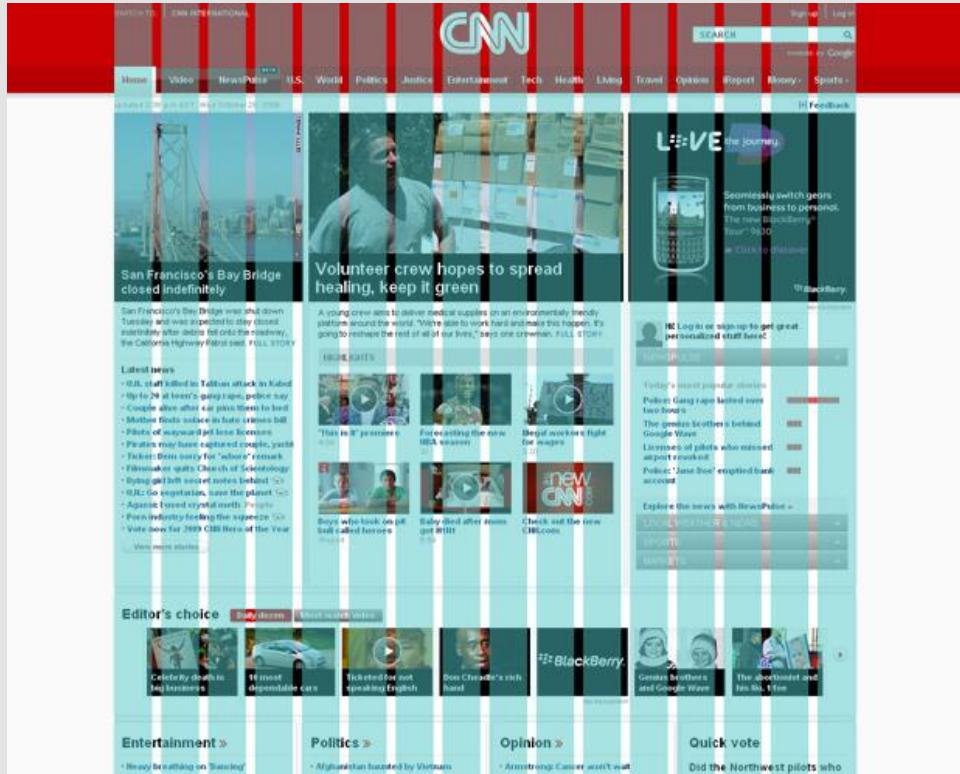
# Karl Gerstner's Flexible Grid



# Grid Layout



The Indiana Museum of Art (IMA) website features a grid-based layout with a pink header and footer. The main navigation bar at the top includes links for VISIT, ABOUT, ART, SUPPORT, PROGRAMS, SHOP, and INTERACT. Below the header, there's a large image of the museum building with a search bar overlaid. The main content area is organized into several columns and rows. On the left, there's a sidebar for 'Visit Us' with links to Museum Hours, Get Directions, and Find Events. Below that is the 'IMA Calendar' section. The central part of the page has a large banner for '100 Acres' followed by various news items, programs like 'The Toby' and 'Keep Us Free', and membership information. The footer contains a 'Recent Videos' section and a 'Search' bar.



The CNN website uses a grid layout with a red header and footer. The top navigation bar includes links for Home, Video, NewsFeed, U.S., World, Politics, Justice, Entertainment, Tech, Health, Living, Travel, Opinion, Report, Money, Sports, and Feedback. The main content area is divided into several columns. A prominent image of the San Francisco Bay Bridge is shown with a caption about it being closed indefinitely. To the right, there's a 'Volunteer crew hopes to spread healing, keep it green' article. Further right, there's a section for the new BlackBerry Bold 9900. The bottom of the page features a 'Latest news' section with various headlines, a 'Hiring carts' section with video thumbnails, and sections for 'Editor's choice', 'Entertainment', 'Politics', 'Opinion', and 'Quick vote'.

# Variety & Consistency

## Ways to add consistency

- Each web page uses the same grid
- Limit the typographic palette
- Standardize graphic elements such as icons, image dimensions or proportions etc.

## Ways to add variety

- Vary placement
- Color changes
- Contrast: color, size, shape, pacing of the text, etc.

# Variety & Consistency

Objects in the layout have an implied movement



PHOTOGRAPH  
horizontal movement



PHOTOGRAPH  
vertical movement

Phasellus rhoncus  
pretium ex, non  
porta libero lacinia  
sit amet. Donec quis  
lacinia arcu. Lorem  
ipsum dolor sit  
amet, or consectetur  
soil et adipiscing  
elit. Phasellus  
rhoncus pretium ex,  
non porta libero  
lacinia sit amet.  
Donec quis lacinia  
cucina apollo arcu.

BODY COPY  
vertical movement

Lorem ipsum dolor sit  
amet, consectetur  
adipiscing elit. Phasellus  
rhoncus pretium ex, non  
porta libero lacinia sit  
amet.

BODY COPY  
horizontal movement

# Variety & Consistency

Horizontal movement can also be controlled based on the image or justification of the text.



PHOTOGRAPH  
horizontal movement, right to  
left, right bias

*“Lorem ipsum dolor sit amet, consectetur  
elit. Phasellus rhoncus pretium ex, non  
porta libero lacinia sit amet.”*

BLOCKQUOTE  
horizontal movement, left  
to right, right bias



# Variety & Consistency

## Whitespace

You don't need to fill every inch of the page.

Give your elements room to breath – sometimes what's not there is more powerful than what is there.

JAC  
INA  
BOX

Jac in a Box is the studio of  
Jacinta Elizabeth Lippold  
(or Jac, if you prefer)

Since its inception in 2007, Jac in a Box has developed a diverse and interesting client base, collaborated with a medley of talented

No time to host? Become a Host Help Sign Up Log In

Airbnb Book unique homes and experience a city like a local.

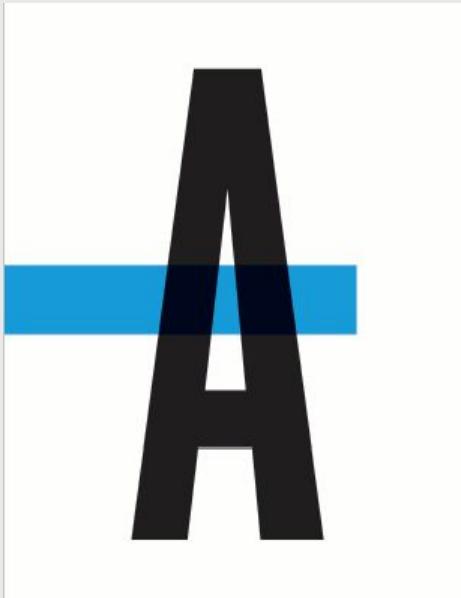
Where Anywhere When Anytime Guests 1 guest ▾ Search

FOR YOU HOMES EXPERIENCES PLACES

Just booked

# Variety & Consistency

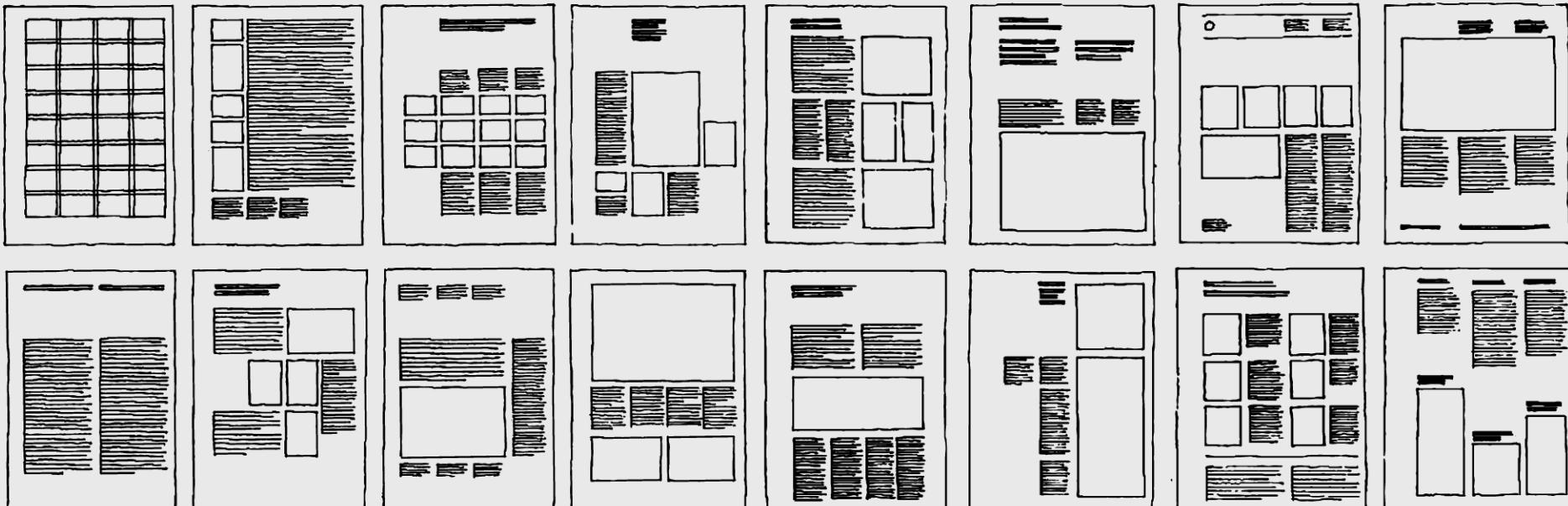
## Contrast: size and directional



A is vertical, bar is horizontal and size contrast

# Hierarchy & Structure

## Conceptual Grouping



# Hierarchy & Structure

## Content Types

Structure within a chunk of content: The typographic organization of repeating groups of text. In order to structure your typography, we can begin to identify what categories of content are there.

# Hierarchy & Structure

Can you recognize this pattern?



PRIVATE ROOM · 1 BED

**Light and cozy room on  
the top floor**

\$54 per night

★★★★★ 47



## KANE: NEXT 50 GOALS WILL BE QUICKER

It took the 23-year-old just 90 Premier League appearances to reach the landmark and he hopes to double his tally at a much faster rate

ENGLISH FOOTBALL 08:23

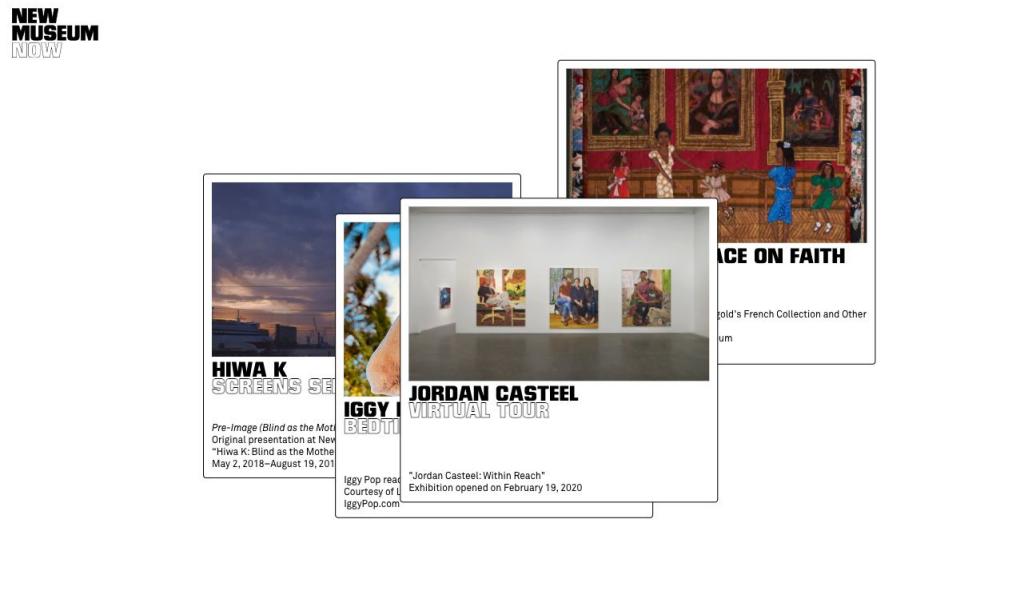
SUBTITLE HERE  
**Title cras mattis  
consectetur purus**

Description sed nulla.

An abstracted Display Pattern that could apply to a  
product Listing or a newspaper Article

# Hierarchy & Structure

Can you recognize this pattern?



SUBTITLE HERE

**Title** *cras mattis  
consectetur purus*

Description sed nulla.

or an exhibition Event

# Hierarchy & Structure

## Content Patterns are different from Display Patterns

A Content Pattern describes the types of elements within and can be rendered in multiple forms.

A Display Pattern describes a specific rendering and can be applied to multiple types of Content patterns.

Large



Small

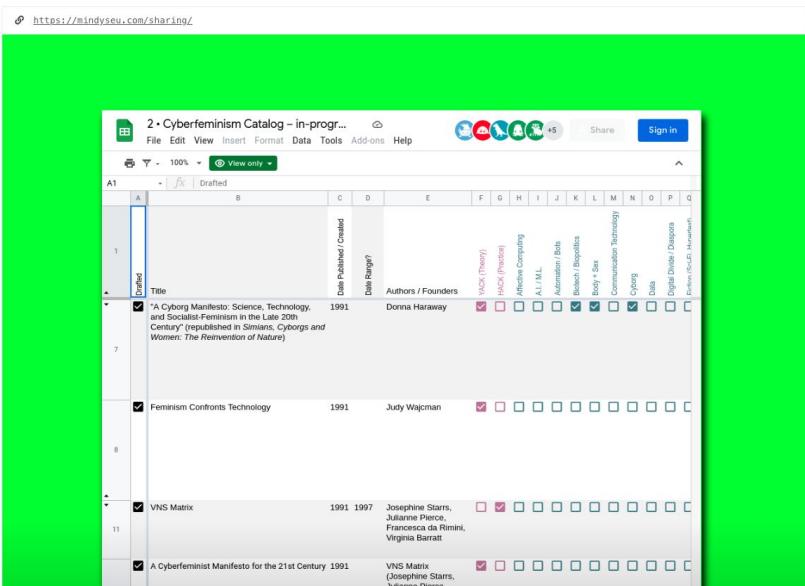


## Content Patterns are different from Display Patterns

With an abstract Display pattern, you can choose multiple kinds of Content patterns to visualize.

1. Identify the type of content (Content pattern).
2. Choose visual option (Display pattern) to render said content.

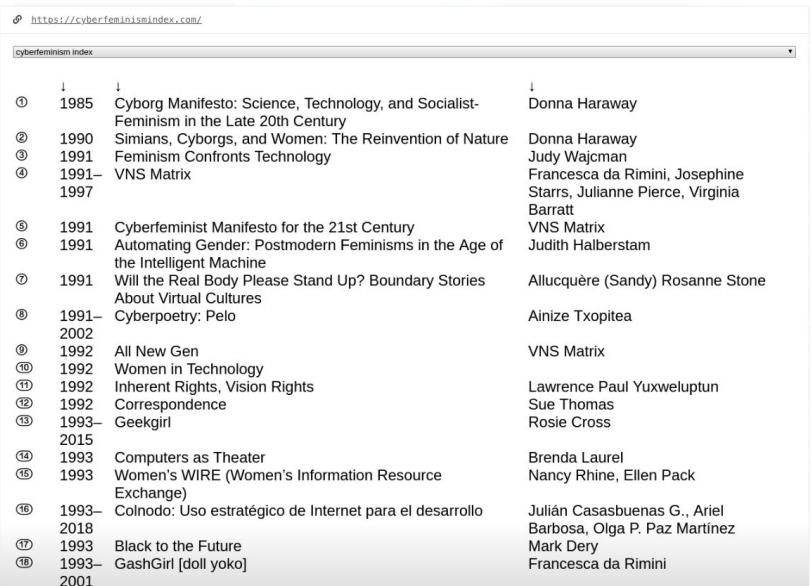
# Hierarchy & Structure



The screenshot shows a Google Sheets document with a hierarchical structure of feminist works. The columns include Title, Date Published / Created, Authors / Founders, and various thematic categories like Postmodern Feminism, Feminist Confronts Technology, VNS Matrix, Cyberfeminist Manifesto, and others.

Title	Date Published / Created	Authors / Founders	Postmodern Feminism	Feminist Confronts Technology	VNS Matrix	Cyberfeminist Manifesto	Others
"Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late 20th Century" (republished in Simians, Cyborgs and Women: The Reinvention of Nature)	1991	Donna Haraway	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feminist Confronts Technology	1991	Judy Wajcman	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VNS Matrix	1991 1997	Josephine Starrs, Julianne Pierce, Francesca da Rimini, Virginia Barratt	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A Cyberfeminist Manifesto for the 21st Century	1991	VNS Matrix (Josephine Starrs, Julianne Pierce)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**cyberfeminismindex.com**



The website lists entries from 1985 to 2018, each with a brief description and author(s). The entries are:

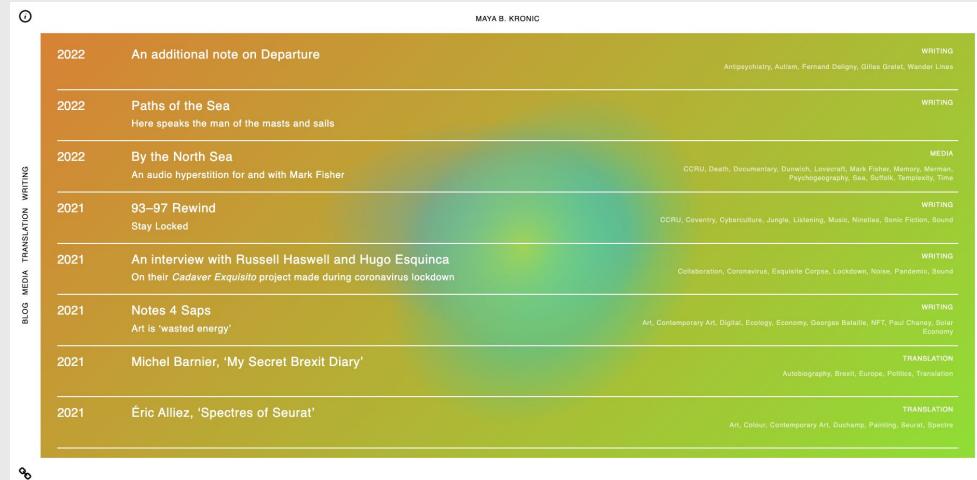
- ① 1985 Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late 20th Century by Donna Haraway
- ② 1990 Simians, Cyborgs, and Women: The Reinvention of Nature by Judy Wajcman
- ③ 1991 Feminism Confronts Technology by Francesca da Rimini, Josephine Starrs, Julianne Pierce, Virginia Barratt
- ④ 1991– VNS Matrix by VNS Matrix
- ⑤ 1991 Cyberfeminist Manifesto for the 21st Century by Judith Halberstam
- ⑥ 1991 Automating Gender: Postmodern Feminisms in the Age of the Intelligent Machine by Allucquère (Sandy) Rosanne Stone
- ⑦ 1991 Will the Real Body Please Stand Up? Boundary Stories About Virtual Cultures by Ainize Txopitea
- ⑧ 1991– Cyberpoetry: Pelo by VNS Matrix
- ⑨ 1992 All New Gen by Lawrence Paul Yuxweluptun
- ⑩ 1992 Women in Technology by Sue Thomas
- ⑪ 1992 Inherent Rights, Vision Rights by Rosie Cross
- ⑫ 1992 Correspondence by Brenda Laurel
- ⑬ 1993 Geekgirl by Nancy Rhine, Ellen Pack
- ⑭ 1993 Computers as Theater by Julián Casasbuenas G., Ariel Barbosa, Olga P. Paz Martínez
- ⑮ 1993 Women's WIRE (Women's Information Resource Exchange) by Mark Dery
- ⑯ 1993– Colnodo: Uso estratégico de Internet para el desarrollo by Francesca da Rimini
- ⑰ 1993 Black to the Future by GashGirl [doll yoko]
- ⑱ 1993– 2018

# Hierarchy & Structure

<https://www.geckelermichels.com/>

Name	Category	Client	Year
NASHI	accessory	Karimoku New Std	2021
CX8 & SX12	electronics	Hoffmann	2021
SW	lighting	ewo	2020
TRAS	furniture	Prototype	2020
BOARDSTORY	lecture	FH Potsdam	2020
PILON	furniture	Echtstahl	2019
BIAS LOUNGE	furniture	Crassevig	2019
TAIL	accessory	Sancal	2019
ICONS	accessory	Sancal	2019
SPECTRUM	furniture	Karimoku New Std	2019
PATCH	accessory	ZUCCa	2019
DS-760	furniture	de Sede	2019
DS-840	furniture	de Sede	2019
PICK-UP	furniture	Prototype	2018
MONUMENTAL	lecture	Ecol	2019

<https://www.geckelermichels.com/>



<http://readthis.wtf/>

# Hierarchy & Structure

[About](#) [Index](#) [Articles](#) [Log](#) [Downloads](#)

[PhD Thesis: Extending Horizons](#)



[Contact](#)

[Submit](#)

[Press Etc.](#)

## POST— DIGITAL PUBLISHING ARCHIVE

### LATEST WORKS ADDED

Title	Printing out the Internet
Author	Kenneth Goldsmith



Experimental  
Publishing  
Informed By  
Digital  
Technology

Title	FedEx Glass Works
Author	Walead Beshty



Subscribe

[Facebook](#) [Twitter](#) [RSS](#)

Title	Blank on Demand
Author	Giulia Ciliberto, Silvio Lorusso



# Hierarchy & Structure

↑

SEARCH ...  
AND/OR FILTER →

- COMMERCIAL
- CULTURAL
- EDUCATIONAL
- HERITAGE
- INFRASTRUCTURE

- INTERIOR DESIGN
- LATEST
- MASTERPLANNING
- PUBLIC
- RESIDENTIAL

- RETAIL
- SPORTS
- URBAN DESIGN

NEWS  
PEOPLE



1010  
LA  
TROBE  
STREET,  
DIGITAL  
HARBOUR

This administration building is part of ARM's new headquarters for Melbourne's technology-based community. It is aimed at start-up and research businesses in the IT industry.

ADELAIDE  
FESTIVAL  
PLAZA  
PRECINCT  
MASTERPLAN

This massive masterplanning project repairs one of Adelaide's most important, yet flawed, urban places.



ALBURY  
LIBRARY/MUSEUM

This building houses the Albury region's library, museum, community centre and arts space.



AMBIENT  
APARTMENTS

Ambient is the smallest building in its proposed development. It is part of a significant inter-Melbourne multi-residential development undertaken by the Living Common Consortium.

AUSTRALIAN  
INSTITUTE  
OF  
ABORIGINAL  
AND  
TORRES  
STRAIT  
ISLANDER  
STUDIES

This is Australia's leading centre for the research of our early Australian peoples.



BARAK  
BUILDING

This is the distinguished face of William Barak, the Wurundjeri prophet (Elder of the Wurundjeri clan). From our apartment tower, his portrait overviews Melbourne's Stanton Street area.

ABOUT  
AWARDS

BLACKTOWN  
EXERCISE  
SPORTS  
AND  
TECHNOLOGY  
HUB

Sydney's City of Blacktown has an amazing amount of truly inspirational sporting venues.



CAULFIELD  
VILLAGE

We have masterplanned and designed this new community from scratch.



ELIZABETH  
QUAY

Elizabeth Quay is a waterfront precinct built on land reclaimed from the Swan River. It focuses on a 700m landscaped promenade surrounding a newly formed lake, which was created by excavating the land that joined it to the shore.

FIRBANK  
GRAMMAR

ARM has completed projects on both campuses of this Melbourne independent school. We have delivered two historic buildings that have inspired our new design for children's technology-based learning spaces.



GEELONG  
ARTS  
CENTRE  
REDEVELOPMENT

ARM is designing the project's third and largest stage, known as the Little Malop Street Redevelopment.



GEELONG  
LIBRARY  
AND  
HERITAGE  
CENTRE

This is a busy community gathering place and technoculture resource for residents of one of Australia's fastest growing regional cities.

PROJECTS  
CONTACT



GREATER  
CURTIN  
UNIVERSITY  
DEVELOPMENT  
GUIDELINES

This project involves innovative thinking about planning philosophies for universities. Sustainable green commercial and residential space to the Curtin University Campus.

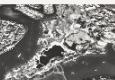


HAMER  
HALL  
REDEVELOPMENT

Hamer Hall is Melbourne's main concert hall. It will be transformed into the home of the Melbourne Symphony Orchestra and the Melbourne venue for visiting orchestras and other acoustic and amplified music.

HOME  
OF  
THE  
ARTS  
MASTERPLAN

HOTA (Home of the Arts) is a mammoth masterplan for the arts and cultural precinct to be built over 10 years. It occupies 17 hectares at Epsom.



HOTA  
BRIDGE

This bridge spans the Gold Coast's Nerang River, connecting HOTA to Surfers Paradise via Chevron HOTA.



HOTA  
GALLERY

This newly completed contemporary gallery is the anchor of the Gold Coast's extensive collection of art and cultural artifacts. It will host local and international exhibitions.



HOTA  
OUTDOOR  
STAGE

This is a super-versatile arts and culture venue - a black-box theatre and an amphitheatre. It features a 1,000-seat tiered space for 5,000. Its landscape and architecture are tailored to Gold Coast weather.

ARCHITECTURE



INNOVATION  
BUILDING



JOONDALUP  
PERFORMING  
ARTS  
CENTRE



KANE  
CONSTRUCTIONS



LAUNCH  
DANENONG





# Hierarchy & Structure

BELOW  
THE SURFACE



2005 —



NZD1.00027KST002 H:4 0:45



NZD1.00620MTL039 0:39



NZD1.00610MIX022  
LxWxH:101x34x20



NZD1.00444KST001 0:25



NZD1.00323KST001  
LxWxH:134x54x32



NZD1.00042MTL014 0:25



NZD1.00042MTL035 0:21



NZD1.00007KST003 LxW:85x54



NZD1.00087KST002 LxW:85x54



NZD1.00542KST007  
LxWxH:46x41x6



NZD1.00068KST001 L:78 0:44



NZD1.00042MTL016 0:23



# Hierarchy & Structure

🔗 <https://quarantinestories.today/>

What do you see from your window? Tell your story

Quarantine Stories is a collaborative platform that collects stories of isolation as a result of home-quarantining in efforts to reduce the effects of COVID-19

00147 Stories

Eindhoven 3 months ago  
**NINGLI**  
I recorded such a nice view during the quarantine!  
7 ❤ Share

Stories near me

Norwegian Sea  
Norway  
Sweden  
Finland  
Estonia  
Latvia  
Lithuania  
Baltic Sea  
United Kingdom  
Ireland  
North Sea  
Denmark  
Poland  
Belarus  
Ukraine  
Czechia  
Hungary  
Moldova  
Romania  
Greece  
Bulgaria  
Portugal  
Spain  
France  
Italy  
Croatia  
Austria  
Slovenia  
Serbia  
Montenegro  
Bosnia and Herzegovina  
Tunisia  
Mediterranean Sea  
Lebanon

Basel 5 months ago  
**Ana**  
@wiewaersmalmit  
In Basel, Switzerland we were never on complete lockdown. Always being able to go outside to buy food or take a walk by sticking to the rules: keeping 2m distance to each other, max. allowed crowds of 5 people,

# Hierarchy & Structure

## ART

All listings in Chelsea, Manhattan, New York on Tue 15th Oct 24 showing Current

Get the app

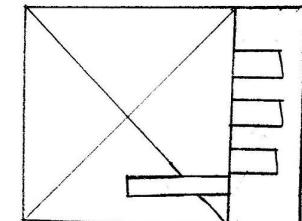
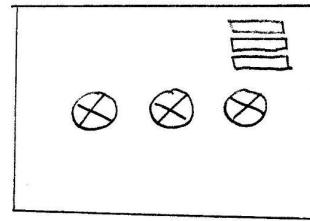
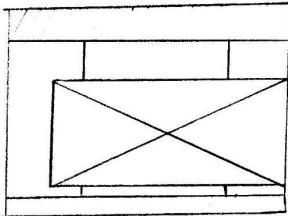
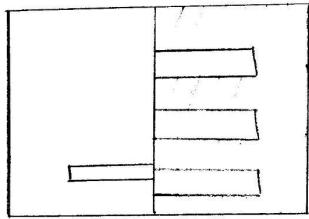
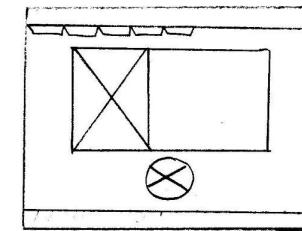
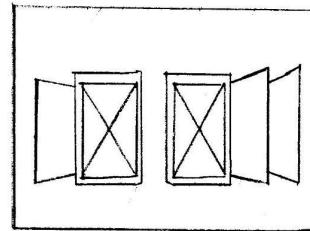
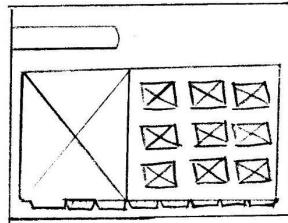
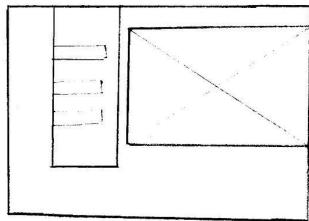
Search Menu Log in

EXHIBITION  
Stan Douglas: The Enemy of All Mankind  
12 Sep 2024 - 26 Oct 2024  
David Zwirner | 519, 525 & 533 West 19th Street, New York, United States

EXHIBITION  
South African Artists in New York  
01 Oct 2024 - 09 Nov 2024

# Wireframes

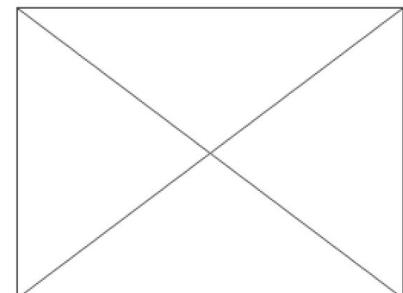
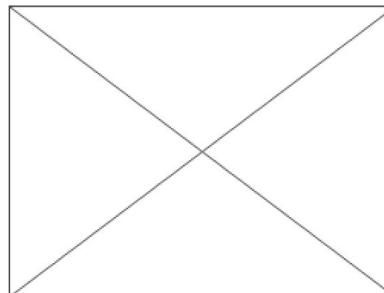
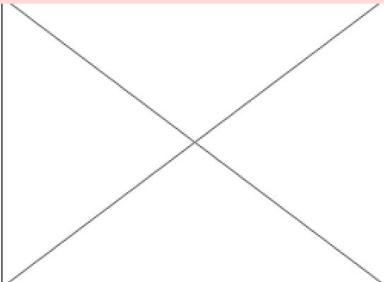
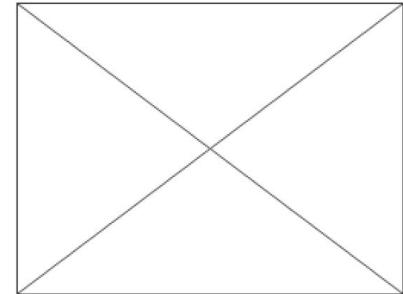
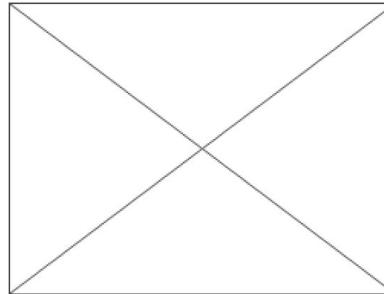
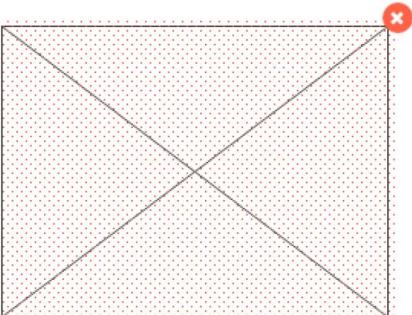
## Thumbnail Sketches



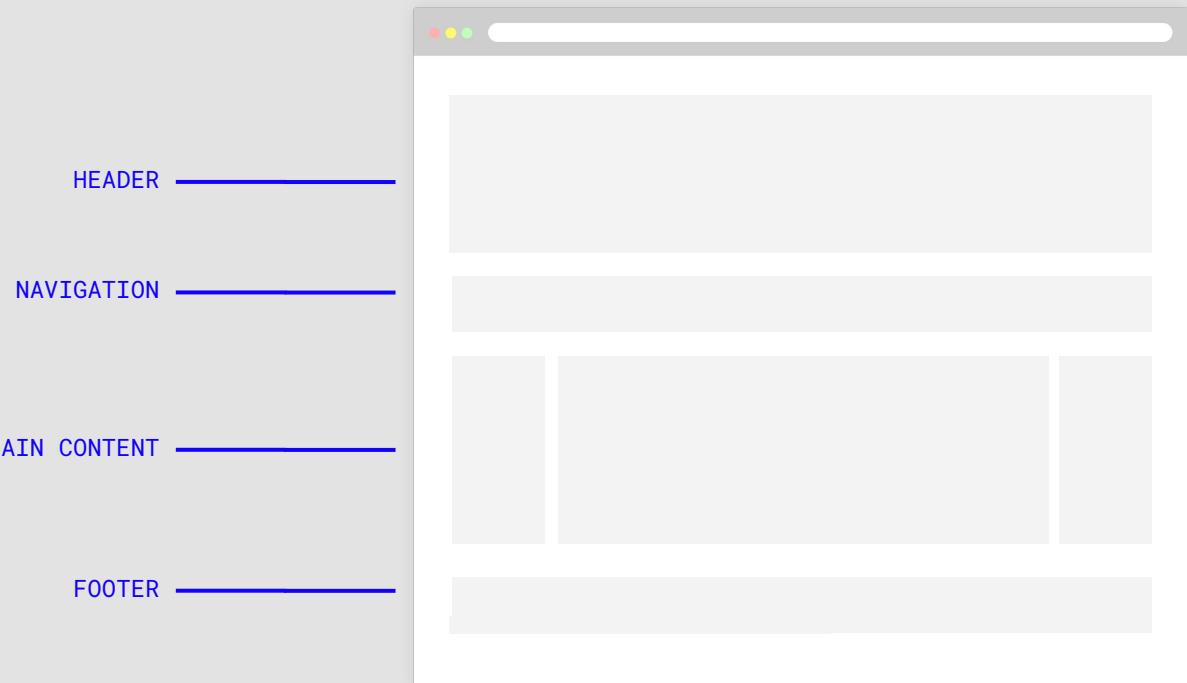
# Wireframes

## Wireframes

### PROJECTS



# Website Layout



# Flexbox

# Flexbox Demo

1 2 3 4 5 6

# Flexbox

## **display: flex**

Flexbox is a popular method for creating “flexible” columns of containers. By declaring **display: flex** on a container element, child elements could be made to shrink or expand according to specified properties.

# Flexbox

## Parent (Container)

Flex **containers** are the objects that contain the children (like this bounce house).

The parent element won't flex, but it will tell its children to be flexible!



# Flexbox

## Children (Items)

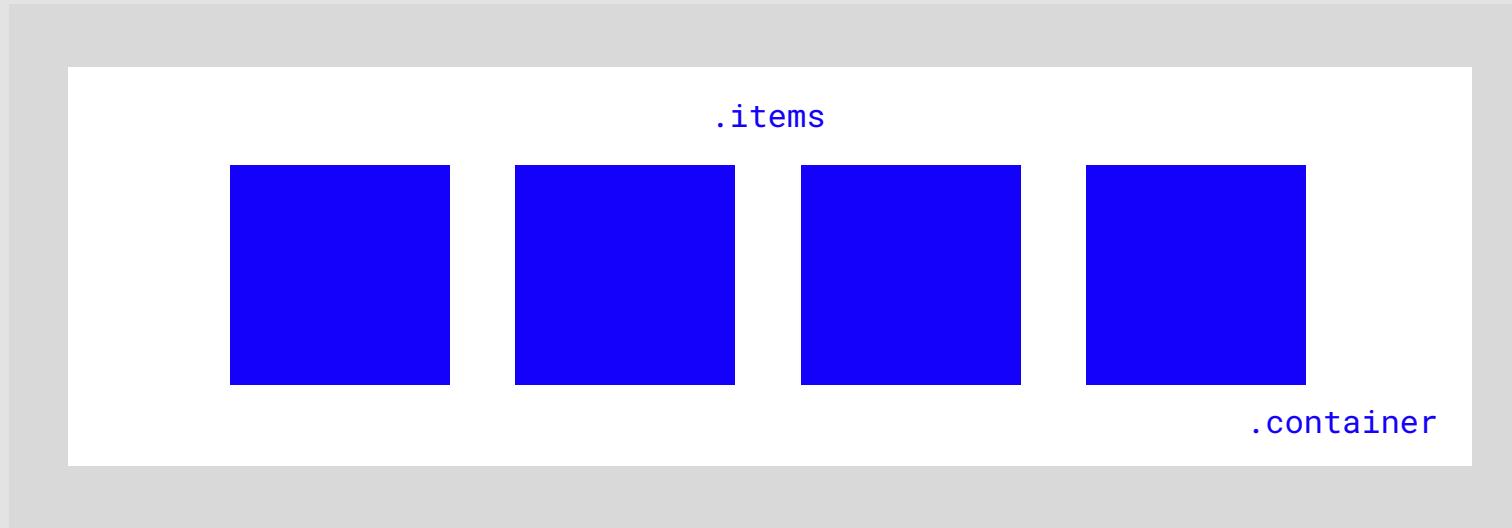
Flex **items** are the children that go inside the parent container.



# How to Flexbox

- Apply `display: flex;` to the parent flex container.
- The main axis is horizontal by default and controlled by **justify-content**.
- The cross axis is controlled by the **align-items** property of the parent.
- Direct children automatically fall into place.

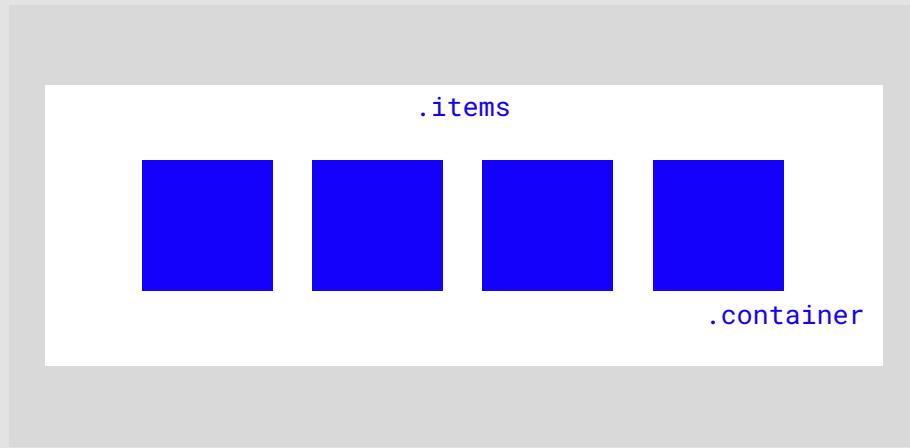
# How to Flexbox



# How to Flexbox

Easy to start, harder to use well.

```
.container {  
  display: flex;  
  justify-content: center;  
  align-items: center;  
}  
  
.item {  
  background-color: blue;  
  height: 100px;  
  width: 100px;  
}
```

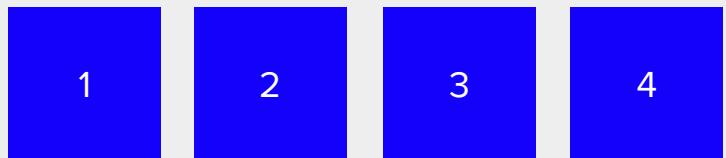


# Parent Properties

# flex-direction

You can also do layouts in a row. This is the default, and flexbox will cram every child into this single row.

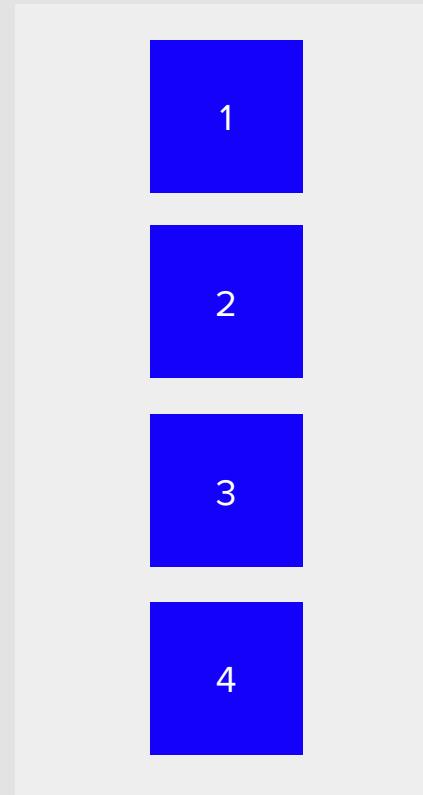
**flex-direction: row;**



# flex-direction

Think about orientation — flexbox layouts are inherently vertical or horizontal.

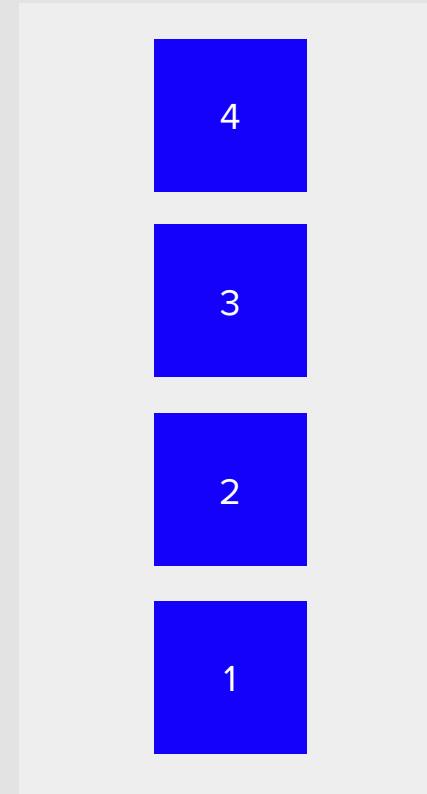
**flex-direction: column;**



# flex-direction

You can easily flip the display order without reordering your HTML!

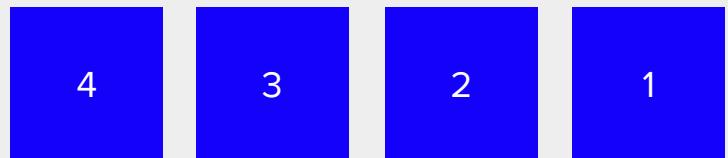
**flex-direction: column-reverse;**



# flex-direction

You can flip rows, too! This is very advantageous for users accustomed to right-to-left languages.

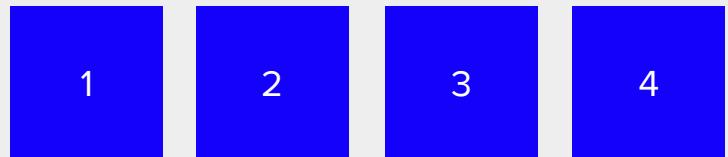
**flex-direction: row-reverse;**



# flex-wrap

By default, all boxes are stuffed into one row.

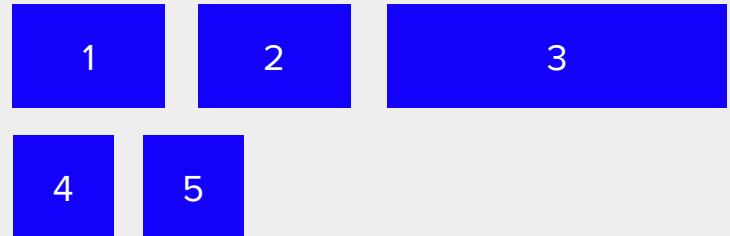
`flex-wrap: nowrap;`



# flex-wrap

But you can make them pop out into additional rows as needed.

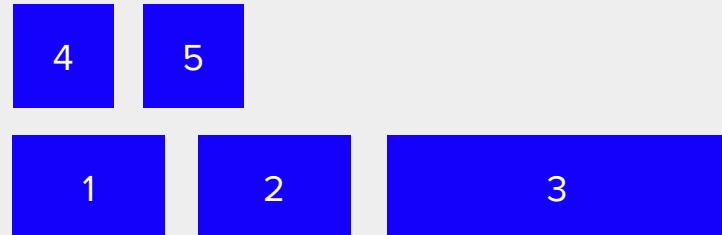
`flex-wrap: wrap;`



# flex-wrap

They can display right to left and bottom to top as well.

`flex-wrap: wrap-reverse;`



# justify-content

This controls how boxes are spaced in flexbox rows/columns.

**flex-start** pushes everything toward the start direction.

**justify-content: flex-start;**



# **justify-content**

Centering is easy! Note, however, that auto margins don't work in flex land.

Either go flex all the way or don't go flex at all.

**justify-content: center;**



# justify-content

Push everything to the end direction  
with **flex-end**.

This is similar to `text-align: right;`  
but for layouts!

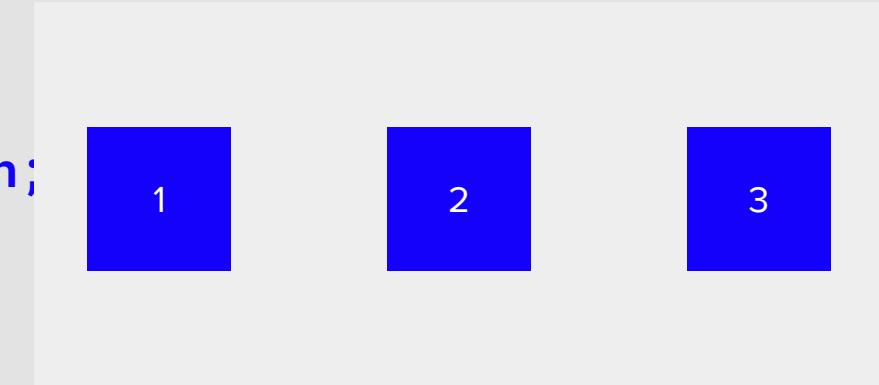
**justify-content: flex-end;**



# justify-content

Push stuff as far apart as possible using:

**justify-content: space-between;**



# **justify-content**

Center with respect to total row/column width, leaving equal spacing between each item.

**justify-content:**  
**space-around;**



# align-items

Center children items vertically.

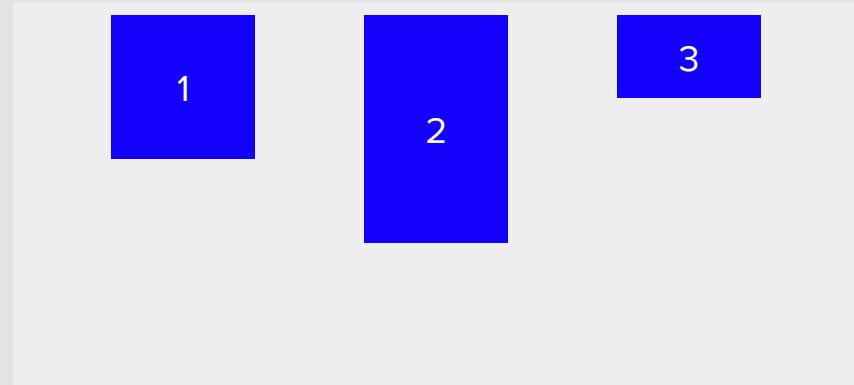
**align-items: center;**



# align-items

Align children with the top of the box,  
even if they have different heights.

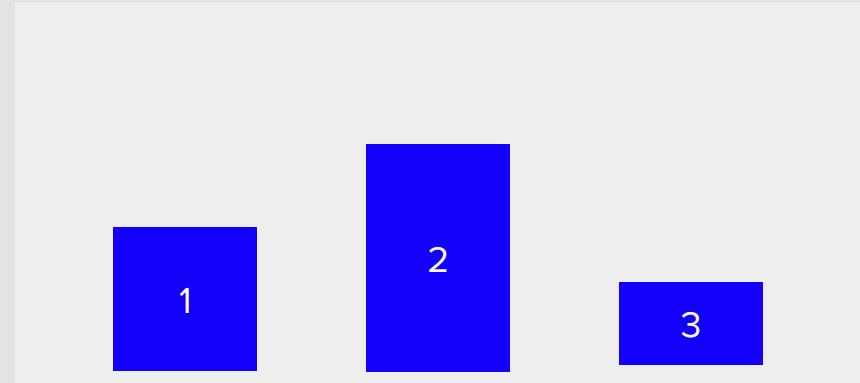
**align-items: flex-start;**



# align-items

Bottom align children, even if they have different heights.

**align-items: flex-end;**

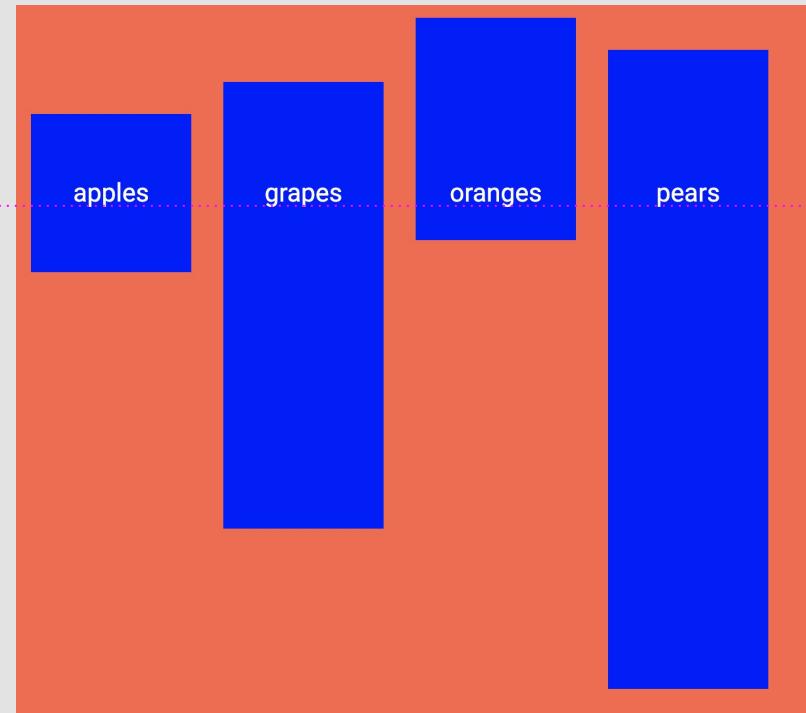


# align-items

Align children by the middle baseline of the text in the child.

**Note:** The orange line is for demonstration only — you won't see this IRL.

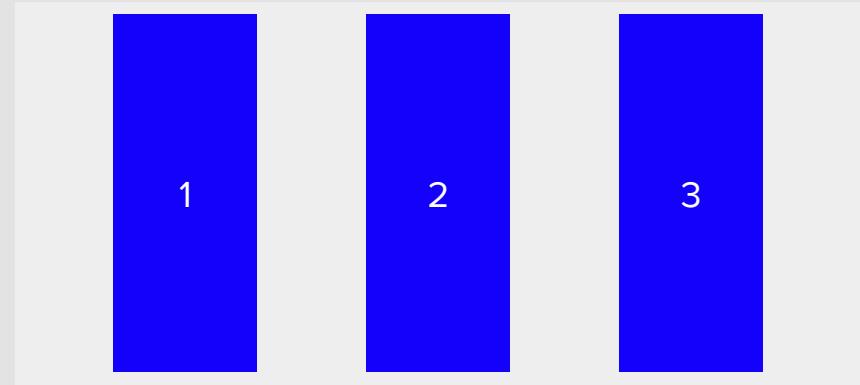
**align-items: baseline;**



# align-items

Stretch children to fill the container.

`align-content: stretch;`



# Children Properties

# order

Change the order in which children render within a row.

```
order: 3;
```

```
order: 1;
```

```
order: 2;
```



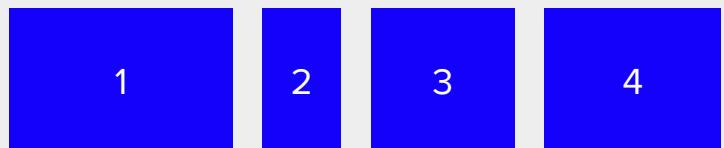
# flex-grow

Control the rate at which individual children grow in width across viewports.

**flex-grow: 2;**

**flex-grow: 0.5;**

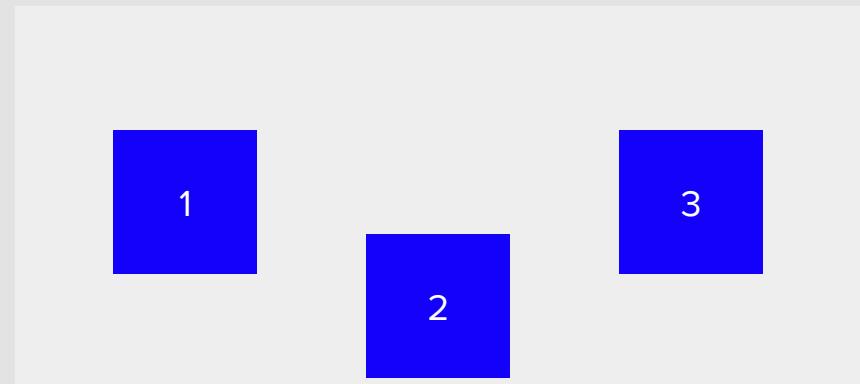
**flex-grow: 1;**



# align-self

This works like **align-items** but for an individual child, so you can override the flex containers' align-items property on a per-item basis.

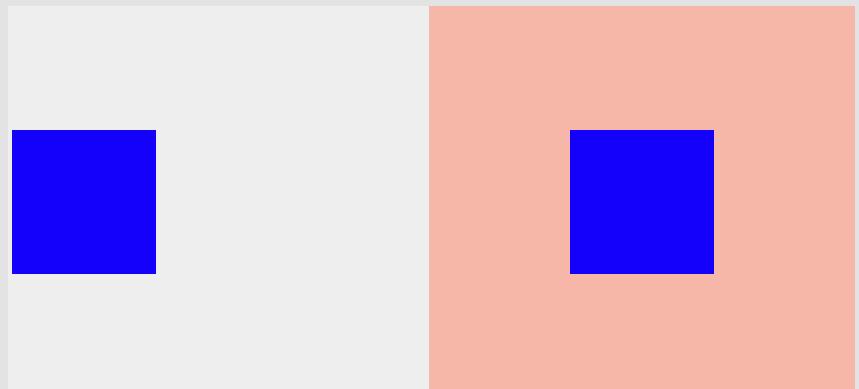
**align-self: flex-end;**



# Can You Flex within Flex?

You can nest a flex container inside of a flex container — no problem.

Flex container properties only adjust their direct children, so you may need several layers of flexing to drill down to further descendant elements!





Guided Walk-Through:

# Navigation Bar with Flexbox

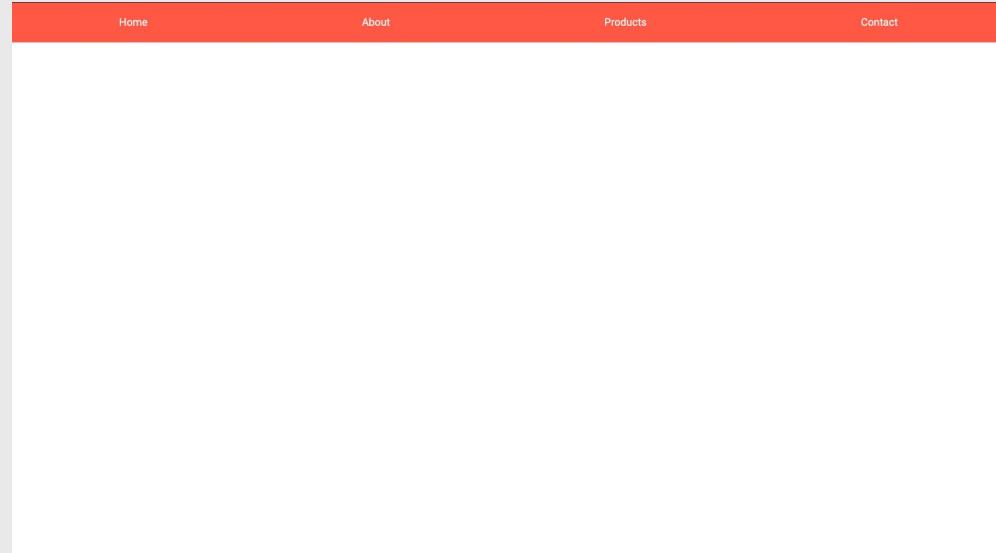
20 minutes



In this exercise, we'll build a navigation bar using flex properties. Look closely at the example image for spacing details.

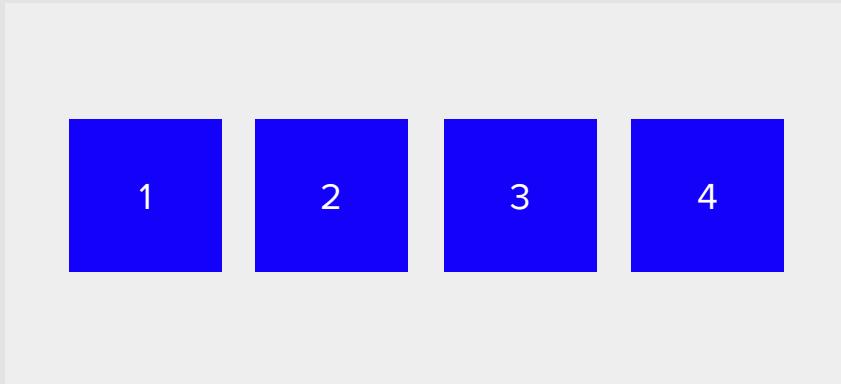
Instructions:

Go to the **starter\_code\_week\_06** folder and complete the **nav\_bar\_flexbox** exercise.



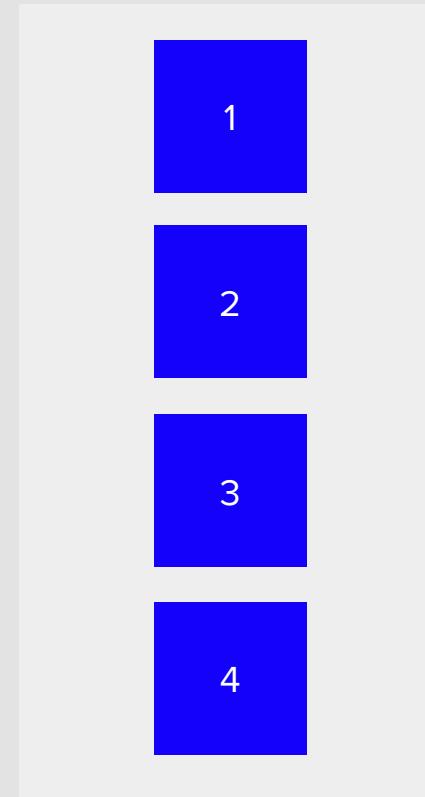
# Flexbox vs CSS Grid

Flexbox can be a row ... `flex-direction: row;`



# Flexbox vs CSS Grid

Flexbox can be a column ... `flex-direction: column;`



**But flexbox can't be both!**

# CSS Grid

# CSS Grid Demo



```
<!DOCTYPE html>
<html lang="en">
  <head> ... </head>
  <body>
    <div class="grid-container">
      <article> ... </article>
      <article> ... </article>
    </div>
  </body>
</html>
```

Elements Console Sources Network Performance > |

Styles Computed Layout Event Listeners DOM Breakpoints Properties >

Filter :<div>.grid-container

```
.grid-container {
}
```

grid-container {

```
  display: grid;
  grid-template-columns: repeat(8, minmax(110px, 1fr));
  grid-auto-rows: 1fr;
  grid-gap: 2em;
  align-items: start;
  padding: 2em;
}
```

styles.css:12

# What is a Grid?

Imagine spreadsheets:  
Columns and rows into which  
you can lay content.

Grids ensure that elements  
will line up smoothly across  
the page.


# What is a Grid?

## CSS Grid

CSS Grid is a two-dimensional layout that you can use for creating responsive layouts on the web.

# Why Use CSS Grid?

## Structure

Grids are a simple way to apply layout to a webpage. A better layout improves the user experience.

Grids help avoid stressful CSS debugging by starting out on the right foot.

# Why Use CSS Grid?

## Reusability

Grids make the layout process easier because of reusable, semantically-named "utility classes" (i.e., a library of CSS class selectors).

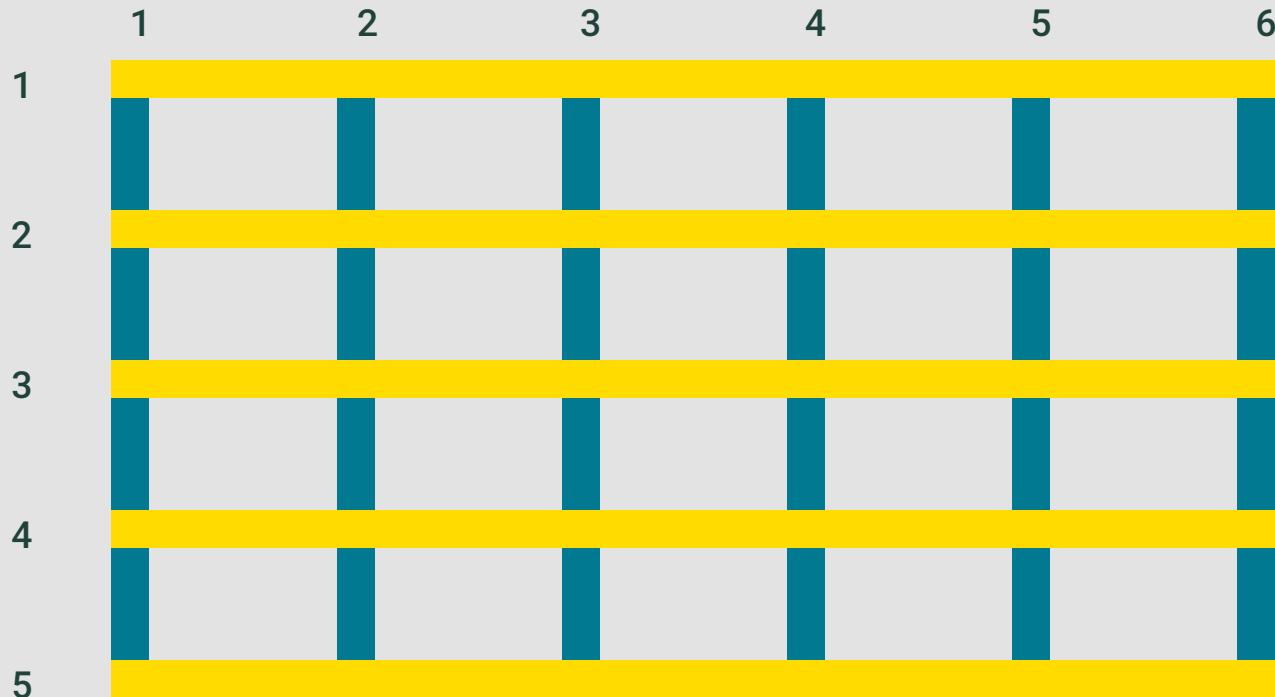
Grids aren't limited to a particular project. We can apply them to pretty much everything we do.

Grids are highly customizable. You can really make them your own.

# Basic Components of CSS Grid?

## Grid Line

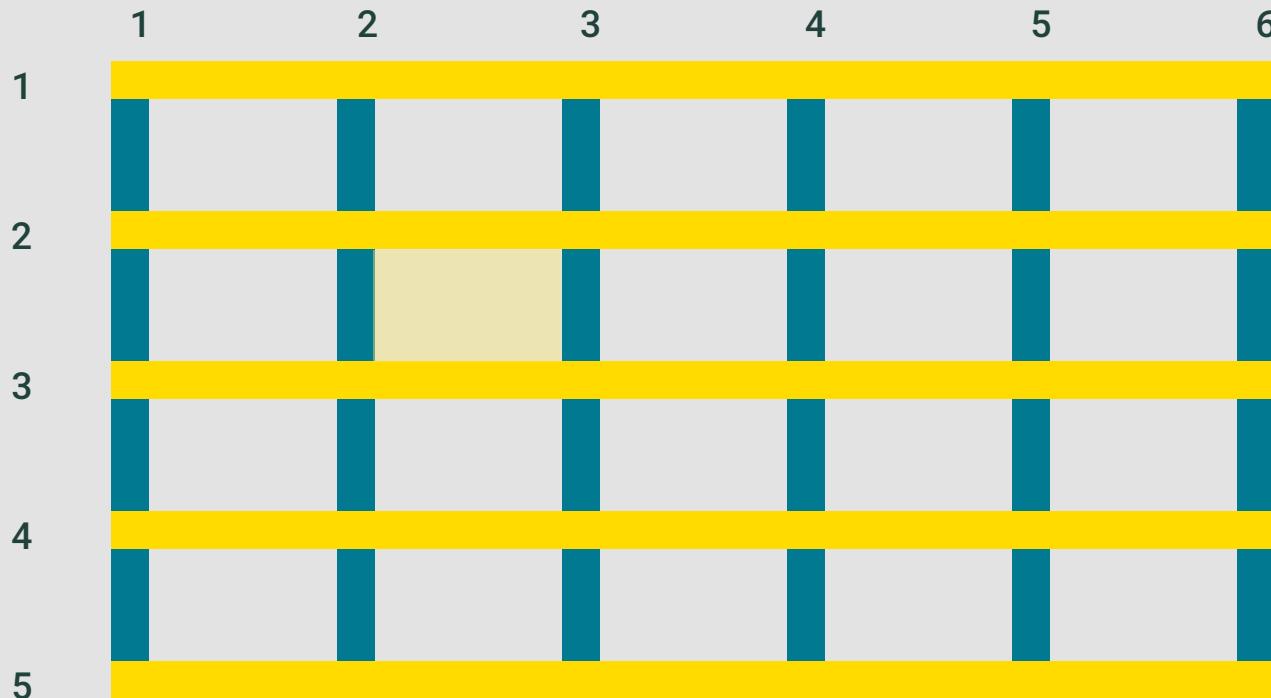
Referenced by number, starting and ending with the outer edges of the grid container, so the left and top edges are counted as 1.



# Basic Components of CSS Grid?

## Grid Cell

The space between two adjacent horizontal and vertical lines where a grid column and grid row intersect.



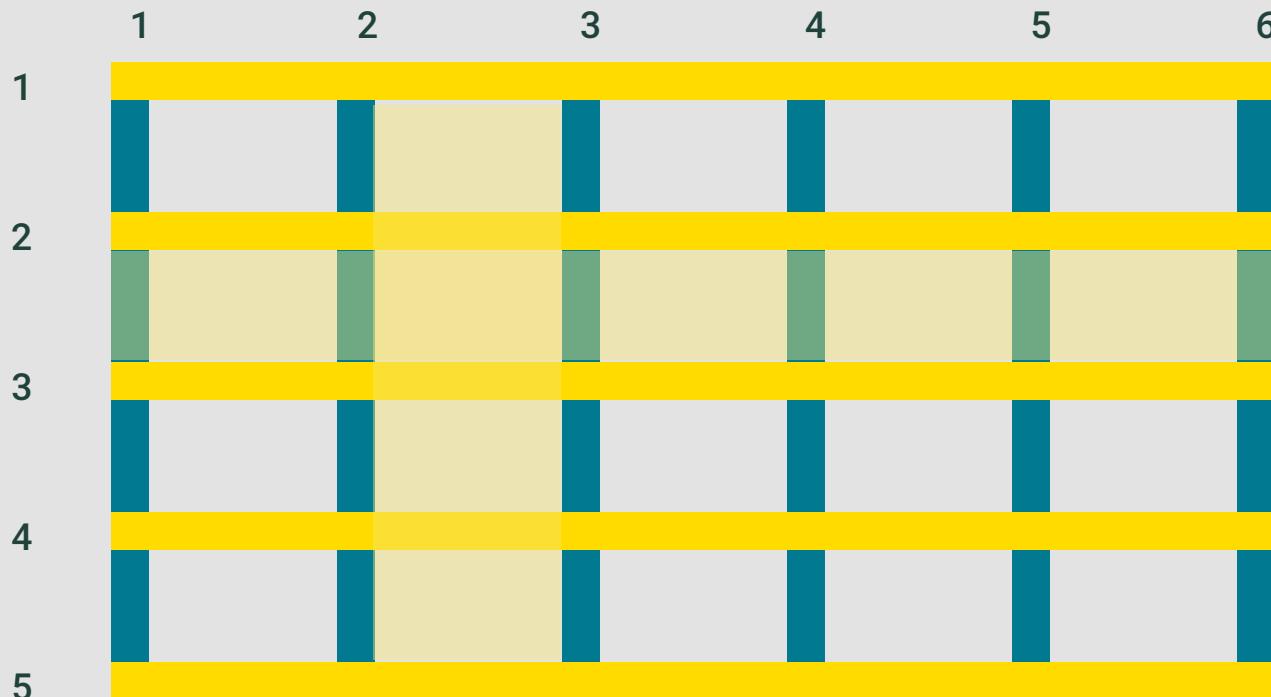
# Basic Components of CSS Grid?

## Grid Track

The space between two or more adjacent grid lines, either horizontal or vertical.

Row tracks are horizontal.

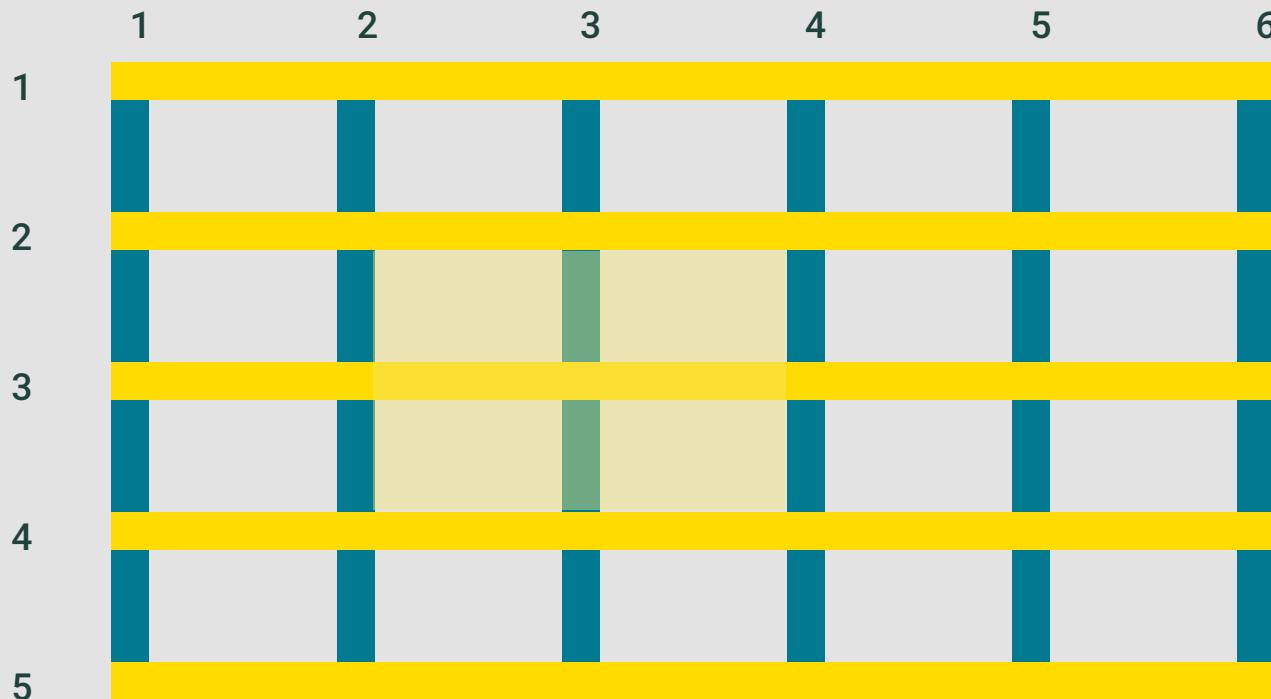
Column tracks are vertical.



# Basic Components of CSS Grid?

## Grid Area

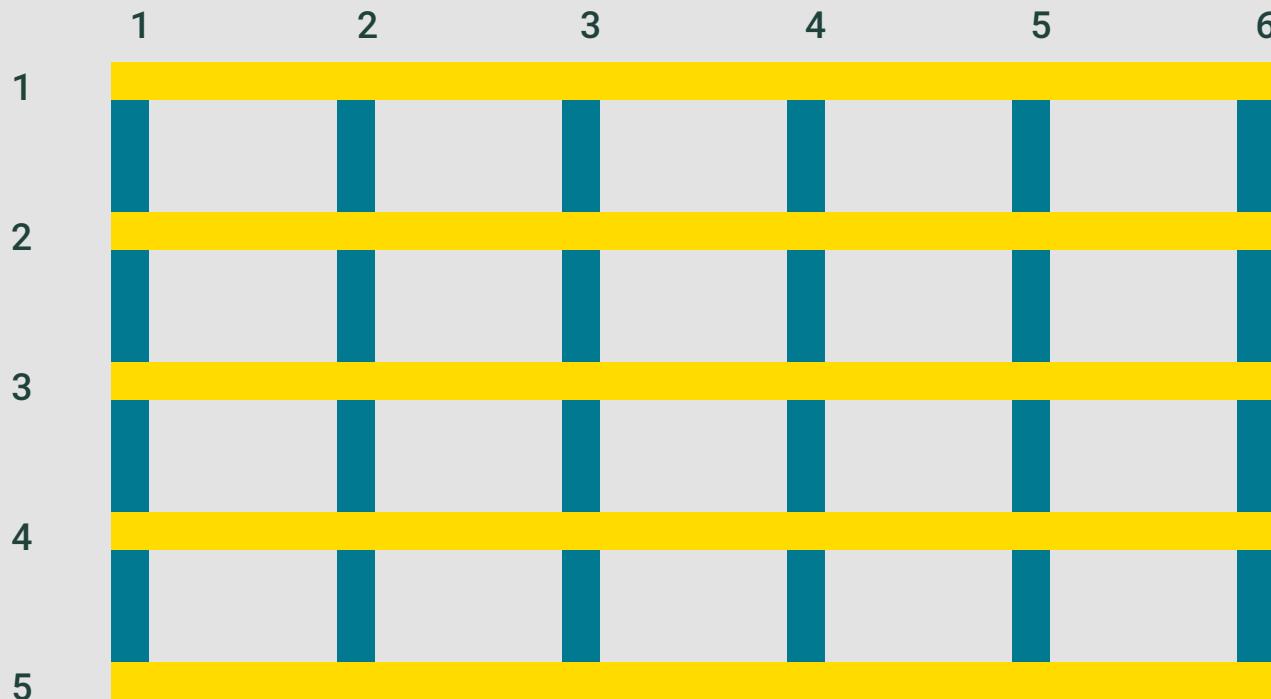
Covers one or more cells with the intent of defining an area within the grid that can be referred to when grid items are placed.



# Basic Components of CSS Grid?

## Grid Gap

`grid-gap` is the margin or padding between the cells.

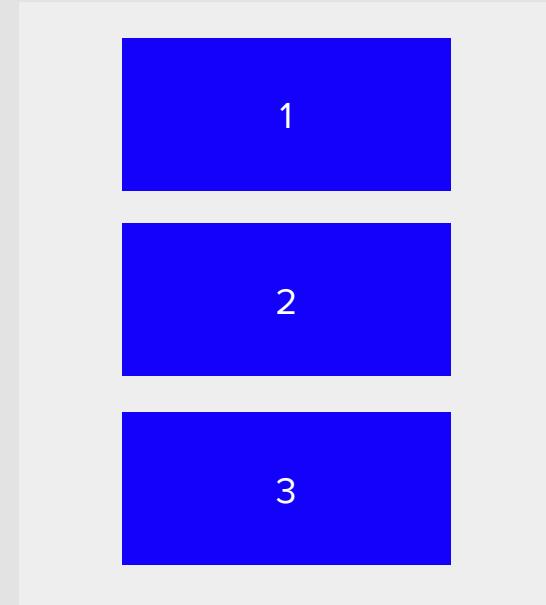


# Basic Components of CSS Grid?

## grid container

The highest-level component of a grid.  
Comprised of columns.

## `display: grid;`

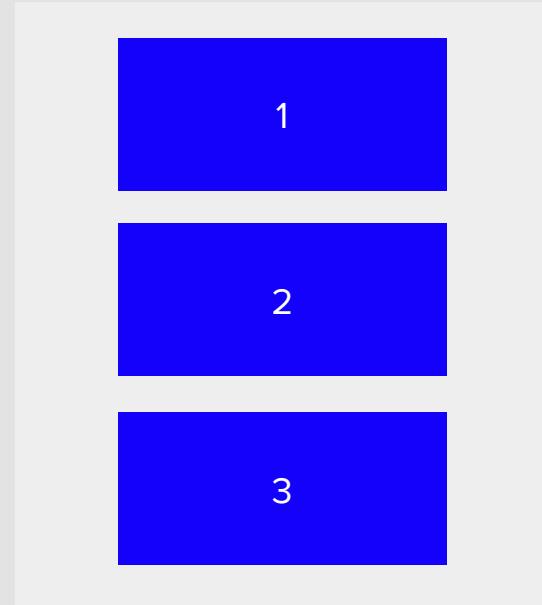


# Basic Components of CSS Grid?

## rows

The highest-level component of a grid.  
Comprised of columns.

**grid-template-rows: repeat(3, 1fr);**

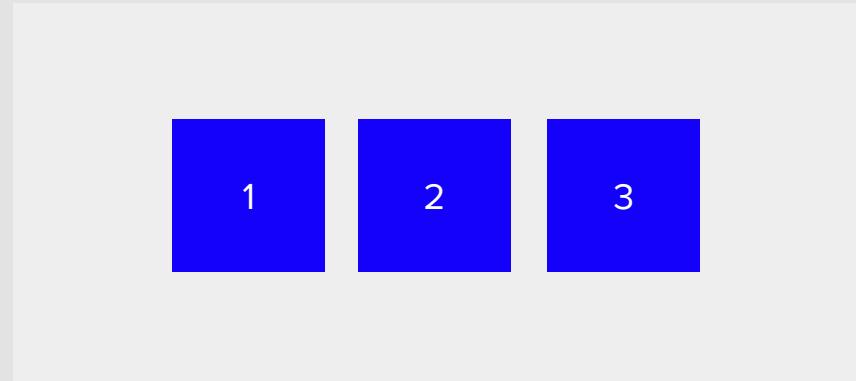


# Basic Components of CSS Grid?

## columns

Contain and separate site content.

**grid-template-columns: repeat(3, 1fr);**



# Basic Components of CSS Grid?

## gutters

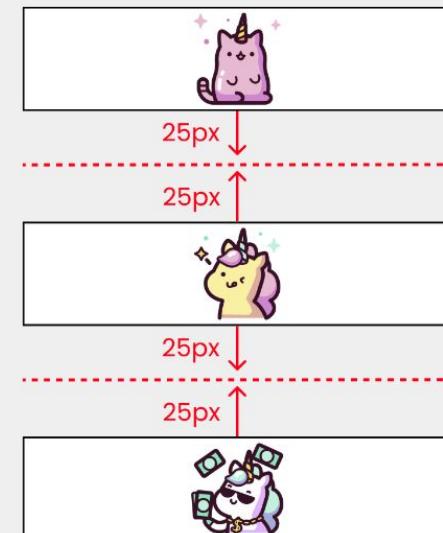
Provides spacing between our columns.  
Optional, but useful.

### column-gap: 50px



Red Dotted lines are called -> grid lines

### row-gap: 50px



Red Dotted lines are called -> grid lines

# How to Grid?

## Basics in HTML

On the parent element,  
create a class called  
**grid-container**.

```
<section class="grid-container">
  <div class="item">Item 01</div>
  <div class="item">Item 02</div>
  <div class="item">Item 03</div>
  <div class="item">Item 04</div>
</section>
```

# How to Grid?

## Basics in CSS

You'll need to use **grid-template-columns** and **grid-template-rows** on the parent to create a simple grid.

```
/* 2 column, 1 row grid */
.grid-container {
  display: grid;
  grid-template-columns: 100px 100px;
  grid-template-rows: 100px;
}
```

# How to Grid?

## Basics in CSS

```
/* 2 column, 1 row grid */
.grid-container {
  display: grid;
  grid-template-columns: 100px 100px;
  grid-template-rows: 100px;
}

.item {
  background-color: orange;
}
```

# Implicit Tracks

You can leave off **grid-template-rows** and CSS Grid will automatically make the rows (conceptually, this is called the “implicit grid”).

If we don't know how many rows our content will take, can we still define their height?

Turns out there's a property called **grid-auto-rows** for just that purpose!

# Implicit Tracks

```
/* 2 column, ??? row grid */
.grid-container {
  display: grid;
  grid-template-columns: 100px 100px;
}

.item {
  background-color: orange;
}
```

# grid-gap

**grid-gap** is the margin/padding of CSS Grid. If you want space between your grid items, you apply **grid-gap** to the container.

```
.grid-container {  
  display: grid;  
  grid-template-columns: 1fr 1fr 1fr 1fr;  
  grid-gap: 20px;  
}  
.item {  
  background-color: orange;  
}
```

# grid-gap

When **grid-gap** is given one value, it applies an equal amount of space between rows and columns.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

## Two-value grid-gap

```
.grid-container {  
  display: grid;  
  grid-template-columns: 100px 100px;  
  grid-gap: 25px 10px;  
}
```

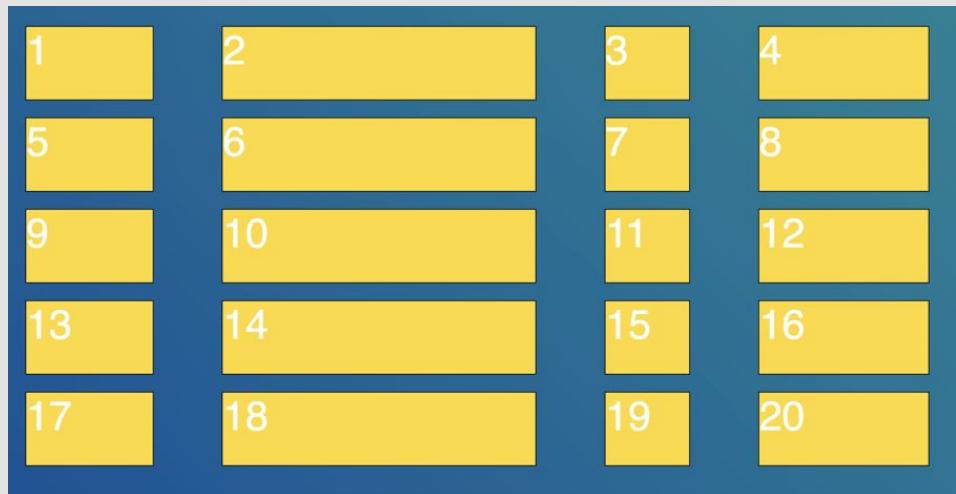
# grid-gap

Keep in mind: grid-gap can take two values, which set column and row padding (respectively).

```
.grid-container {  
  display: grid;  
  grid-template-columns: 100px 100px;  
  grid-gap: 20px 80px;  
}  
.item {  
  background-color: orange;  
}
```

# grid-gap

Note the difference when **grid-gap** is given two values:  
Different amounts of space between rows and between columns.



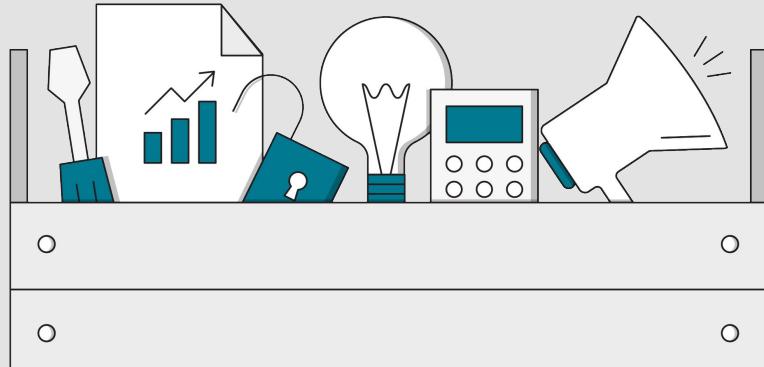
# Fractional Units

You'll The **fractional unit (fr)** is a newer unit to be used with CSS Grid (similar to percentages). It stands for fractions of a grid container, and it intelligently takes grid-gap into account.

```
.grid-container {  
  display: grid;  
  grid-template-columns: 1fr 1fr 1fr 1fr;  
  grid-gap: 20px;  
}
```

# Basics in CSS

We can feel free to mix fixed-width and variable-width units such as pixels, **fr**, and percentages. They can be used together. When used together with fixed-width units, **fr** is saying: 'Use the remainder of the space left over after the fixed-width units.'



# Parent Properties

# grid-template-rows

Use this property to define the number and width of rows.

Note: If you use fr (fraction unit) as a unit of measurement, all the boxes will be equal in size.

**grid-template-rows:**  
**repeat(3, 1fr);**

grid-template-rows : repeat(3, 1fr);



# grid-template-columns

Use this property to define the number and width of rows.

Note: The pixel values will be an exact measurement. The "auto" keyword will cover the available space.

**grid-template-columns: 200px auto 100px;**

grid-template-rows : **200px auto 100px**

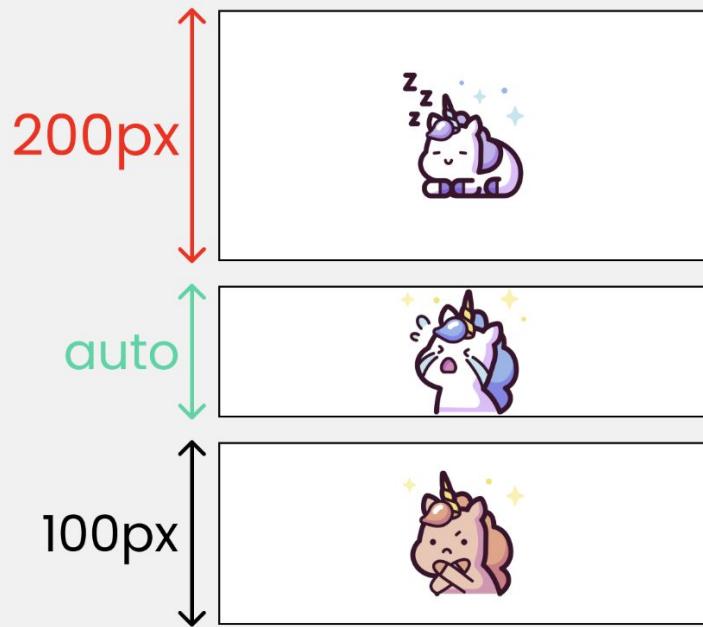


# column-gap

Specifies the size of the grid lines. You can think of it like setting the width of the gutters between the columns/rows.

**column-gap: 20px;**

grid-template-rows : 200px auto 100px

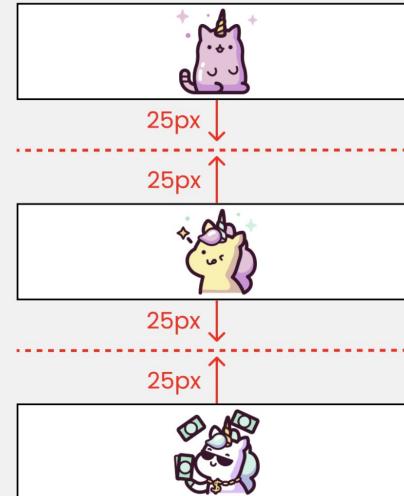


# row-gap

Specifies the size of the grid lines. You can think of it like setting the width of the gutters between the columns/rows.

**row-gap: 50px;**

**row-gap: 50px**



Red Dotted lines are called -> grid lines

# justify-items

Aligns grid items along the inline (row) axis (as opposed to align-items which aligns along the block (column) axis). This value applies to all grid items inside the container..

**justify-items: start;**

justify-items -> X Axis

Start



end



# align-items

Aligns grid items along the block (column) axis (as opposed to justify-items which aligns along the inline (row) axis). This value applies to all grid items inside the container.

**align-items: start;**

align-items → Y Axis

Start



end



center



stretch



## **grid-column-start**

Determines a grid item's location within the grid by referring to specific grid lines.

**grid-column-start: 2;**

## **grid-column-end**

Determines a grid item's location within the grid by referring to specific grid lines.

**grid-column-end: 2;**



Guided Walk-Through:

# Make a Grid with Images

20 minutes



Build a grid of the images provided in the starter code. The images are BIG! How can you solve for that?

Instructions:

Go to the **starter\_code\_week\_06** folder and complete the **css\_grid\_lab** exercise.



The Little Prince

After leaving his home planet and his beloved rose, the prince journeys around the universe, ending up on Earth.



The Fox

Although the fox asks the little prince to tame him, the fox is in some ways the more knowledgeable of the two characters, and he helps steer the prince toward what is important in life.



The Railway Switchman

The railway switchman works at the hub for the enormous trains that rush back and forth carrying dissatisfied adults from one place to the other.



# Combining Layout Tools

## Flexbox & CSS Grid

You can use CSS Grid with flexbox. They all have a role to play and a purpose in your toolkit.

- **Flexbox** works well for website navigation and big horizontal sections.
- **Grid** is a good tool for large, repetitive display patterns.

Experiment! There isn't just a single way to build layouts; experience will help you select the right tool.



# Guided Walk-Through: Flexbox & CSS Grid Lab

10 minutes



In this exercise, we'll build a web page layout that uses both flex and grid properties.

Instructions:

Go to the **starter\_code\_week\_06** folder and complete the **flexbox\_css\_grid\_lab** exercise.

## Flexbox & Grid Halloween Edition



### Bat

At evening, sitting on this terrace,  
When the sun from the west,  
beyond Pisa, beyond the mountains  
of Carrara Departs, and the world is  
taken by surprise — D H Lawrence



### Cat

I married early, and was happy to  
find in my wife a disposition not  
uncongenial with my own.  
Observing my partiality for  
domestic pets, she lost no  
opportunity of procuring those of  
the most agreeable kind. We had  
birds, gold-fish, a fine dog, rabbits,  
a small monkey, and a cat. — Edgar  
Allan Poe



### Spiderweb

The spider, dropping down from  
twig, Unfolds a plan of her  
desvise, A thin premeditated rig To  
use in rising. — E B White



### Ghost

At first you didn't know me;  
I was a shape moving rapidly,  
nervous  
at the edge of your vision. A flat,  
high voice,  
dark slash of hair across my  
cheekbone. — Cynthia Huntington



### Spider

Itsy busy spider  
Climbed up the waterspout;  
Down came the rain  
And washed the spider out; —  
Anonymous



### Pumpkin

Oh, greenly and fair in the lands of  
the sun, The vines of the gourd and  
the rich melon run, And the rock  
and the tree and the cottage enfold,  
— John Greenleaf Whittier

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# Examples

# Examples

## Untold Stories

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### Facts Against Fear

Political Campaign, 2017

In March 2017, the Netherlands was suddenly the center of the world's attention. The right-wing populist PVV (Party for Freedom) party was leading the polls in the election with proposals to close all Mosques, stop refugees and Muslim immigrants from entering the country, forbid the Quran, and leave the EU. Its popularity inspired larger moderate parties to copy its rhetoric, making anti-Islam and anti-refugee sentiments more accepted. As a concerned citizen I wanted to take action against this fearmongering.



Armed police at Amsterdam central station after the attacks in Brussels in 2016. Photo: ANP

### Maas Paradox

Exhibition, 2016

Water is both a curse and a blessing. We are dependent on it: we must drink it, it is essential for farming, but it also causes floods. *Maas Paradox* is an exhibition in which designers, artists, and residents consider the impact of climate change on the lives of people in the Meuse region.



Flood of the Meuse in Grubbenvorst, 1926. Photo: E. Bergs

The Maas (Meuse in Dutch) flows through five countries, along the residential areas of nine million people, where three different languages and twenty-two dialects are

← untold stories →

### The Politics of Design

Book, 2016



Dymaxion world map by Buckminster Fuller, 1943. Image by Ruben Pater.

You are privileged. Just reading this sentence makes you part of the 85% of the world population that is literate, the 20% that understands English, and the 40% that has access to the internet. Visual communication is not an even playing field, but is dominated by the urban regions, primarily in the Northern hemisphere. The design of visual communication is shaped by the

### The Refugee Crisis as a Design Problem

Article, 2016

We are facing a humanitarian crisis. There are 60 million displaced persons in the world,<sup>1</sup> and every ten minutes a stateless child is born.<sup>2</sup> Millions of people that have no access to water, food, housing, work, education, and are caught in legal limbo. This refugee crisis has inspired many designers to do projects about refugees, the most recent of which is the *What design can do (WDCD) Refugee Challenge*. Designers that address such complex issues as the refugee crisis have to be aware of their responsibilities, since approaching the refugee crisis as a design problem without the proper context can be problematic, even harmful. I want to examine the role of designers in the refugee crisis using the *WDCD Refugee Challenge* as an example.

### Puzzled by Espionage

Puzzles, 2014



Puzzle portrait of Edward Snowden.  
Image: Ruben Pater

### A Study into 21st Century Drone Acoustics

LP and Performance, 2014



MQ-1 Predator drone engine. Rotax 912 four-cylinder piston engine. Image: Royal Air Force

Military drones fly at high altitudes and are often invisible to the human eye, it is only the sound of their propellers that reveals their existence. A sound that permeates everything, a frightening buzzing that seems never stop. Those living under drones experience tremendous stress and anxiety from the sounds of drones. Together with

# Examples

## Wendy36



Wendy36 (Schleiermacherstraße 36, 10961 Berlin, Germany)

10/02/2016 at 5pm  
Clemens Jahn, talk and discussion.

09/30/2016 at 4pm  
AMATEUR HAIR BODY SPIRIT SALON.

09/29/2016 at 9pm  
A.C.(b)2000: Screening of Akira 1988 in Japanese with English subtitles.

09/29/2016 at 2pm  
Hanne Lippard, talk and discussion.

09/28/2016 at noon  
Matt Evans, talk and workshop on publishing.

09/27/2016 at 3pm  
Podcast afternoon.

For a period of six weeks the third year graphic design students from the Gerrit Rietveld Academie Amsterdam, together with Calla Henkel, Max Pitegoff & Emily Segal are creating, exploring, maintaining, transforming their workspace.

# Examples

## for / with / in

for / with / in

### Peter Bil'ak talks with Catherine Schmidt

*Peter Bil'ak works in the field of editorial, graphic, and type design, teaches at the Royal Academy of Arts in The Hague. Started Typotheque in 1990, Dot Dot Dot in 2000, Indian Type Foundry in 2009, and Works That Work magazine in 2012.*

cs A big thing about HTML & CSS is limiting factors. The web is a platform designed by engineers at its core. It's made great strides in the past couple years, but there's still a lot more work to do.

# Assignment

# Assignment 04

Using your new understanding of web page layout, apply a flexbox layout to *Houses or Museums?* by Lina Bo Bardi. You've already marked up the content in a previous exercise. Keep in mind webfont implementation and font properties. Experiment with conceptual grouping, whitespace, location and contrast.

# Assignment 04

Create a new folder called `/exercise_04` in your local Github repository. Create an `index.html` and a `styles.css` file. Remember to link your `.css` file with your `.html` file.

Push your local changes to the Github cloud (aka remote repository), and add the link to [the shared document](#) under the `#exercise04` tab.

