CSS Grid Layout

Learning Objectives

- using CSS Grid to layout Webpages
- positioning elements in Grid cells
- aligning cells in a Grid

CSS Grid Layout

With CSS Grid Layout, you can position HTML elements in a grid structure, reposition individual elements, stretch items across multiple cells and much more. It's a very powerful layout tool.

Working with CSS Grid Layout contains two major parts:

1. Defining the layout on a container element
2. Positioning the children on the grid cells

Grid container

Just like CSS flexbox, the display mode is defined on a container element that contains all the elements to be positioned as direct children in the grid.

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

The grid is defined by the number and size of it's rows and columns. By default, the grid consists of one column. The properties for defining the columns and rows are grid-template-columns and grid-template-rows. With the gap property you can define a space between the grid cells.

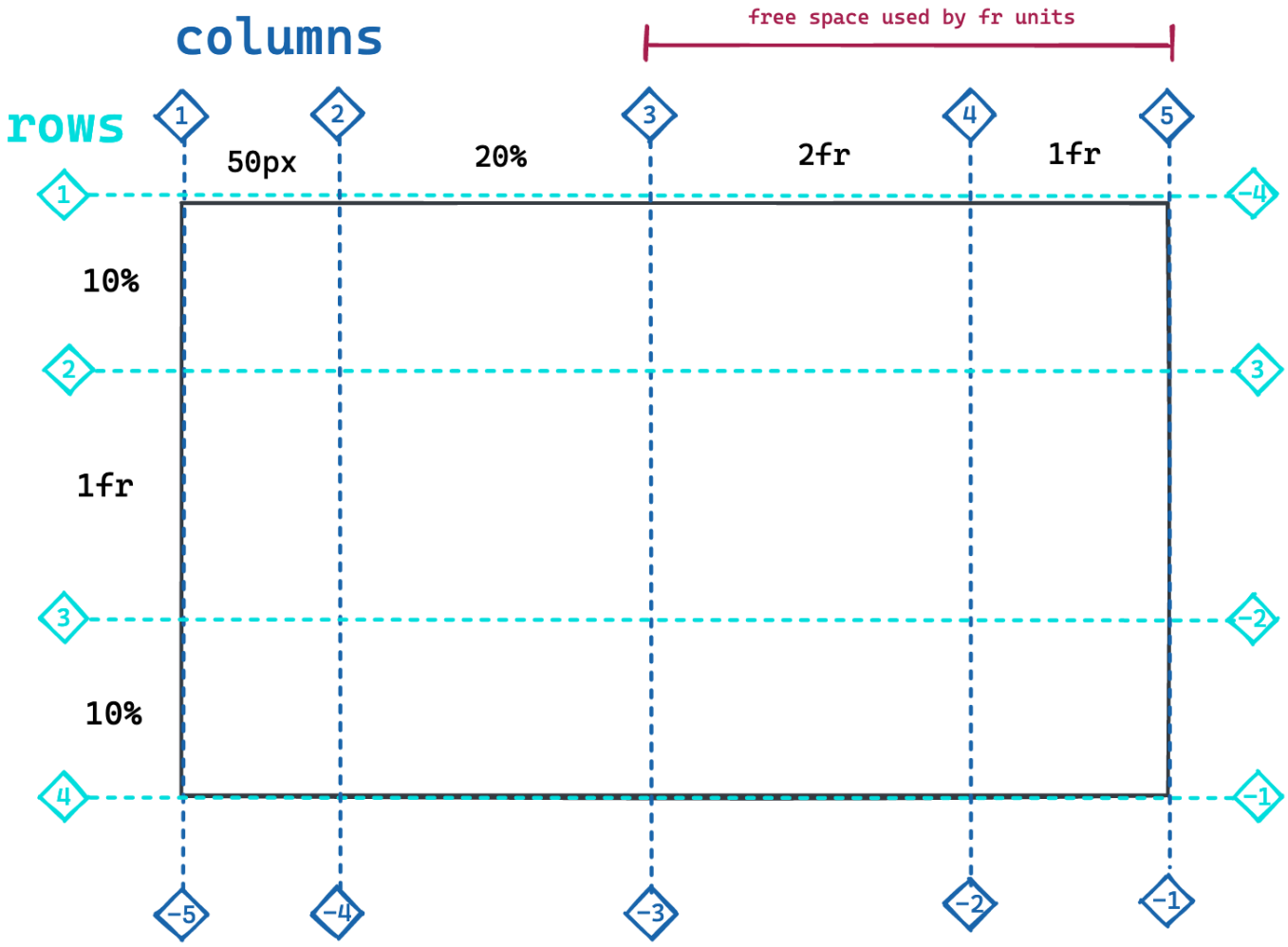
`fr` Unit

The grid layout has the fraction unit `fr` as a special sizing unit (next to `px`, `rem` or `%`)

1. It splits the remaining space in a grid into equally sized fractions. The number of these parts is determined by the total amount of fraction units distributed in the row/column template.
2. The individual rows / columns take up the assigned number of fractions.

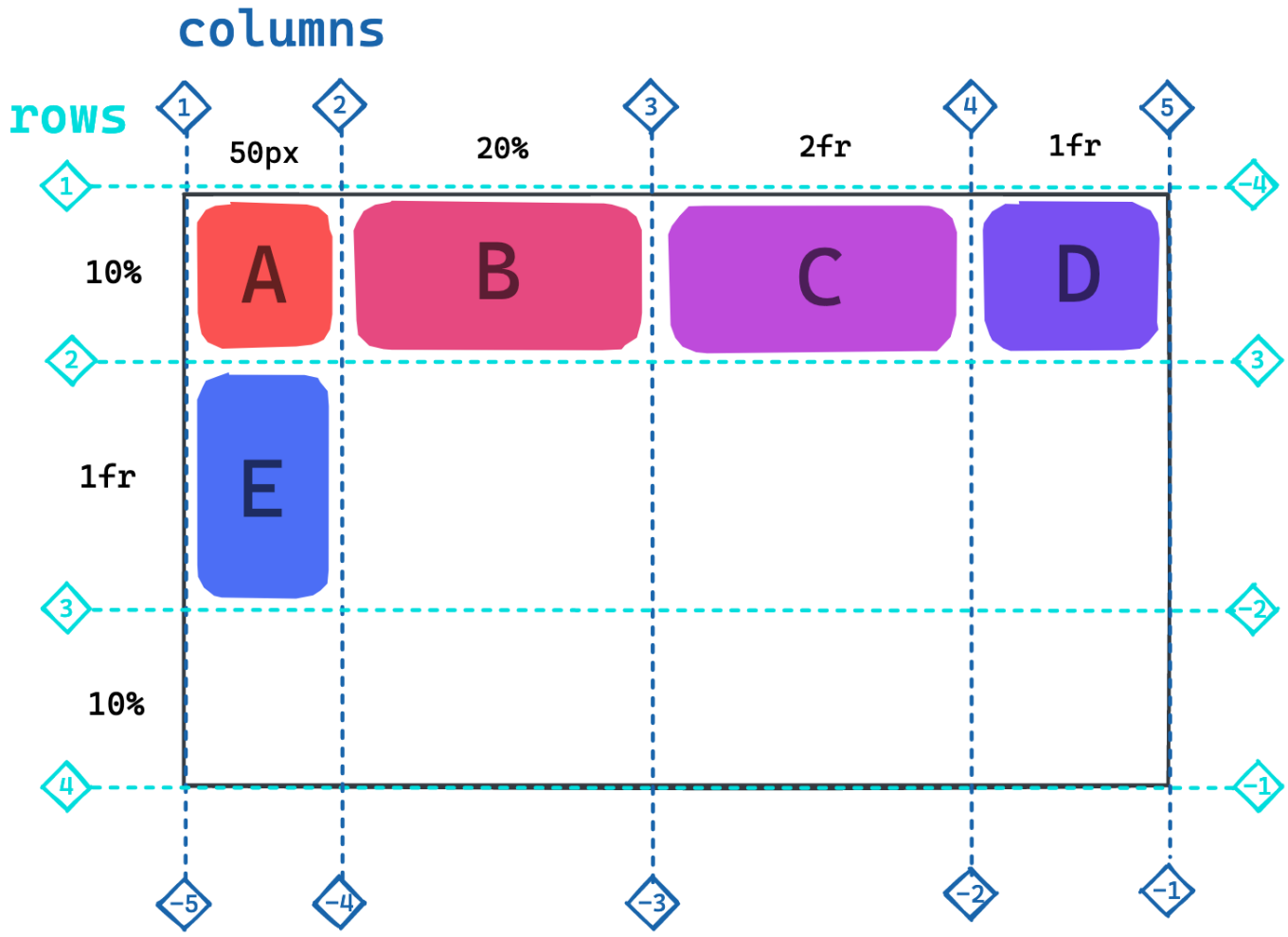
In the following picture, the last two columns are sized with fraction units. The first of them has twice the width of the second one.

```
grid-template-columns: 50px 20% 2fr 1fr;
grid-template-rows: 10% 1fr 10%;
```



Element Positioning

After the grid is set up on the container element, its children are placed inside the grid cells from left to right, top to bottom. By default, the elements are stretched such that they take up all the available cell space.

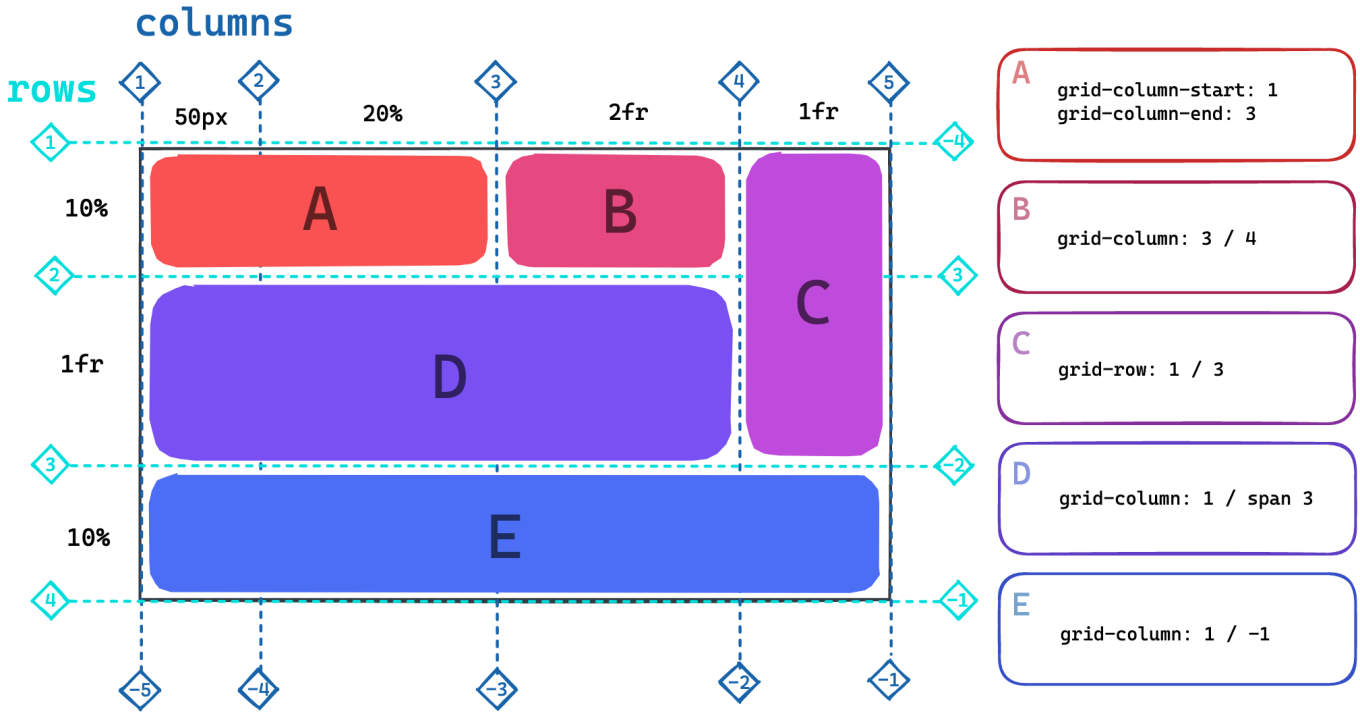


You can change an element's positioning by using the the CSS properties grid-column, grid-rows or grid-area, which combines the former into a single CSS shorthand property. Elements can also be stretched over multiple cells.

Each element can be positioned on the columns and rows by using these values:

1. **Column / row index** (see picture above).
2. Negative **index**. Indexing the lines from the other side.
3. The `span` value. Defines how many cells the item should stretch across.

Here is an example:



> ! Positioning properties are set on the child elements, not on the container!

grid-template-areas

A completely different approach to position elements inside a grid is to use `grid-template-areas`.

- First the template cells are grouped into named areas. Every created cell is assigned an **area name**. Cells with the same name are grouped together to one area. This is done on the container element:

```
grid-template-areas:
  "a a b c"
  "d d d c"
  "e e e e";
```

- Then the grid elements are assigned to one of these areas with the `grid-area` property:

```
.element-a {
    grid-area: a;
}
.element-b {
    grid-area: b;
}
...
```

This will result in the same layout as shown above.

> ! Make sure that the named areas are geometrically possible in the defined grid, otherwise your grid won't work.

Column and Row Alignment

The combined size of the grid columns/rows you defined might be less than a given height/width of the grid container. In this case you can distribute the columns or rows inside the grid container.

Property	Effect
justify-content	Sets the alignment of the `columns`.
align-content	Sets the alignment of the `rows`.
place-content	Sets the alignment of the `rows` and `columns`.

Cell Alignment

The position of the elements *inside* their cells can be specified on the grid container.

Property	Effect
justify-items	Sets the `horizontal` alignment.
align-items	Sets the `vertical` alignment.
place-items	Sets the `vertical` and `horizontal` alignment.

Resources

- Complete Guide to CSS Grid