CSS Grid Layout

#cssconfeu 2014

Rachel Andrew

- Web developer since 1996ish

- ex Web Standards Project member

- edgeofmyseat.com since 2001

- grabaperch.com since 2009

- http://rachelandrew.co.uk

- http://twitter.com/rachelandrew

CSS Grid Layout

- First Public Draft April 2011

- Proposal developed by Microsoft

- Early implementation in IE10

- Spec has moved on. Is now very different to the IE10 implementation.

- Latest Editors Draft 29 August 2014

- Implementation in Chrome (Experimental)

Line based positioning with CSS3 Grid Layout.

```
<h1 class="title">...</h1>
<article class="wrapper">
   <nav class="mainnav">  </nav>
   <h2 class="subhead">   </h2>
   <div class="content">

      ...
   </div>
   <blockquote class="quote">

      ...
   </blockquote>
</article>
```

Extracts from "Our Cats, by Harrison Weir"

Usefulness of cats

In our urban and suburban houses what should we do without cats? In our sitting or bedrooms, our libraries, in our kitchens and storerooms, our farms, barns, and rickyards, in our docks, our granaries, our ships, and our wharves, in our corn markets, meat markets, and other places too numerous to mention, how useful they are! In our ships, however, the rats oft set them at defiance; still they are of great service.

How wonderfully patient is the cat when watching for rats or mice, awaiting their egress from their place of refuge or that which is their home! How well Shakespeare in Pericles, Act iii., describes this keen attention of the cat to its natural pursuit!

The cat, with eyne of burning coal, Now crouches from (before) the mouse's hole.

A slight rustle, and the fugitive comes forth; a quick, sharp, resolute motion, and the cat has proved its usefulness. Let any one have a plague of rats and mice, as I once had, and let them be delivered therefrom by cats, as I was, and they will have a lasting and kind regard for them.

A friend not long since informed me that a cat at Stone's Distillery was seen to catch two rats at one time, a fore foot on each. All the cats kept at this establishment, and there are several, are of the red tabby colour, and therefore most likely all males.

I am credibly informed of a still more extraordinary feat of a cat in catching mice, that of a red tabby cat which on being taken into a granary at Sevenoaks where there were a number of mice, dashed in among a retreating group, and secured four, one with each paw and two in her mouth.

At the office of The Morning Advertiser, I am informed by my old friend Mr. Charles Williams, they boast of a race of cats bred there for nearly half a century. In colour these are mostly tortoiseshell, and some are very handsome.

The Government, mindful also of their utility, pay certain sums, which are regularly passed through the accounts quarterly, for the purpose of providing and keeping cats in our public offices, dockyards, stores, shipping, etc., thereby proving, if proof were wanting, their acknowledged worth.

In Vienna four cats are employed by the town magistrates to catch mice on the premises of the municipality. A regular allowance is voted for their keep, and, after a limited period of active service, they are placed on the "retired list," with a comfortable pension.

There are also a number of cats in the service of the United States Post Office. These cats are distributed over the different offices to protect the bags from being eaten by rats and mice, and the cost of providing for them is duly inscribed in the accounts. When a birth takes place, the local postmaster informs the district superintendent of the fact, and obtains an addition to his rations.

Let any one have a plague of rats and mice, as I once had, and let them be delivered therefrom by cats,

Grid Layout gives us new values for the display property.

To start using grid, define a grid on the container.

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

Declare the columns with grid-template-columns.

The rows with grid-template-rows.

```css
.wrapper {
  display: grid;
  grid-template-columns: 200px 40px auto 40px 200px;
  grid-template-rows: auto;
}
```

Grid lines can be explict or implicit

- Explicit grid lines are those that you specify and give sizing information to

- Implicit lines are created when you place something into a row or column you have not specified with grid-template-rows or grid-template-columns

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grid-column-start is the line before the content.

grid-column-end the line after.

grid-row-start is the line above the content.

grid-row-end the line below.

```
.content {
  grid-column-start: 3;
  grid-column-end: 4;
  grid-row-start: 2;
  grid-row-end: 3;
}
```

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Dropping the other items into place on the grid.

```css
.mainnav {
    grid-column-start: 1;
    grid-column-end: 2;
    grid-row-start: 2;
    grid-row-end: 3;
}
.subhead {
    grid-row-start: 1;
    grid-row-end:2;
    grid-column-start: 3;
    grid-column-end: 4;
}
.quote {
    grid-column-start: 5;
    grid-column-end: 6;
    grid-row-start: 2;
    grid-row-end: 3;
}
```

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For columns start is the line before the column, end the line after.

For rows start is the line above, and end the row below.

```css
.content {
  grid-column-start: 3;
  grid-column-end: 4;
  grid-row-start: 2;
  grid-row-end: 3;
}
```
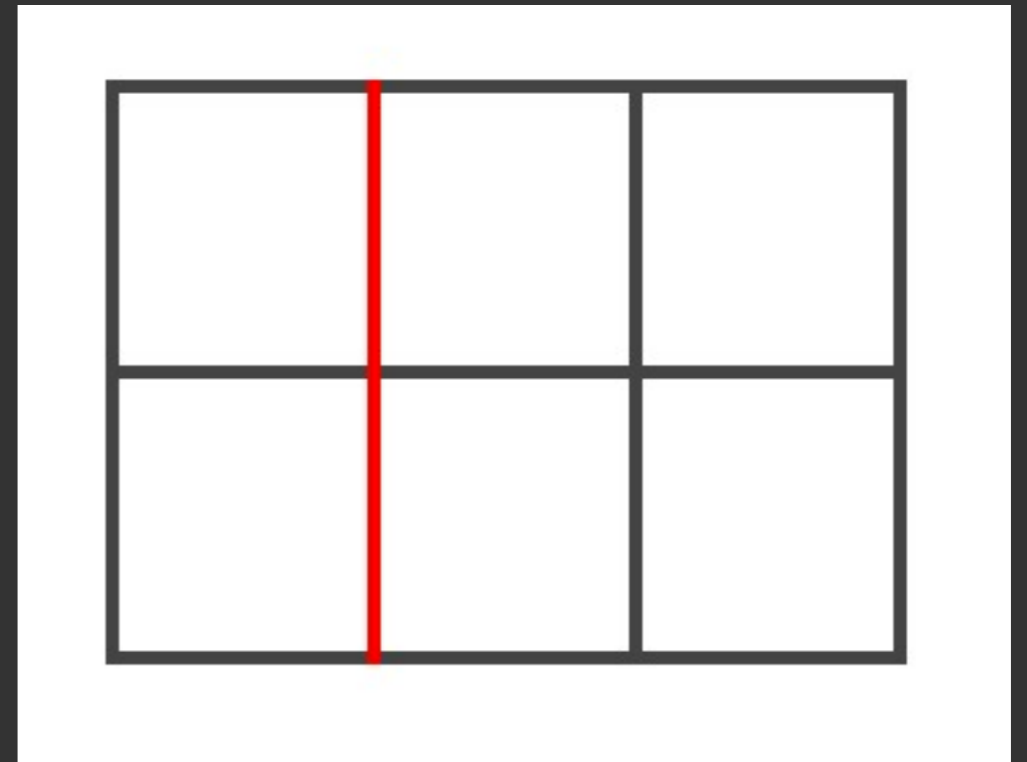
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Grid Lines

Can be horizontal or vertical. Referred to by number, or by name.
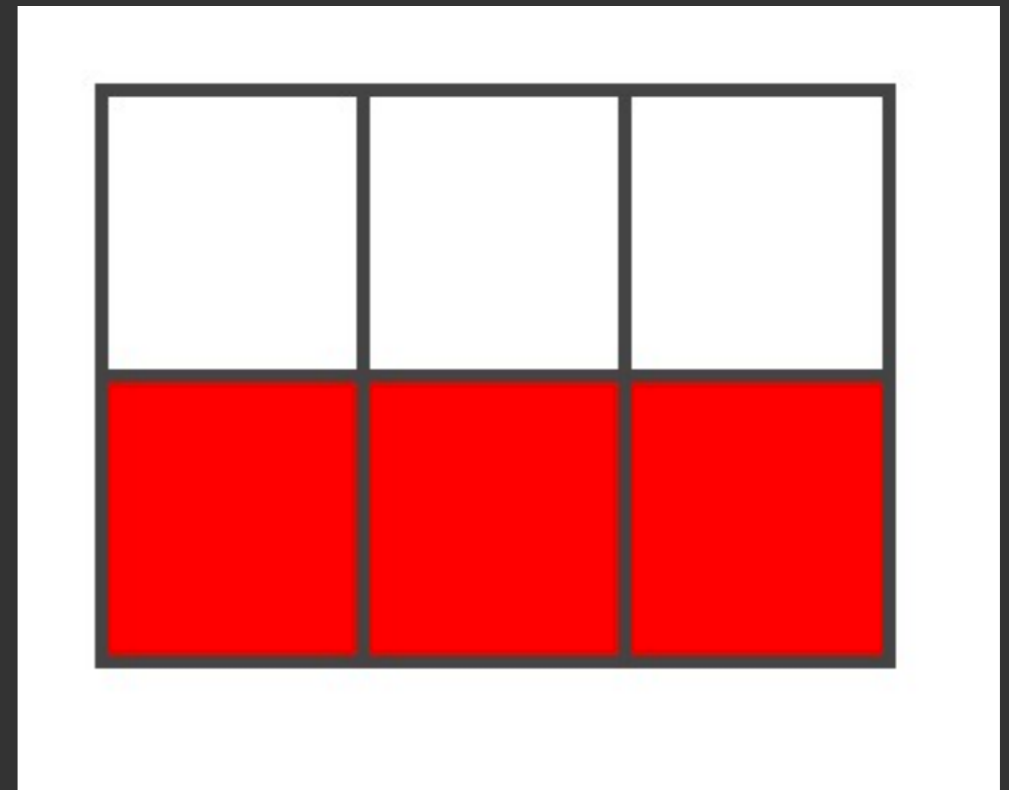
The highlighted line in this image is column line 2.

Grid Track

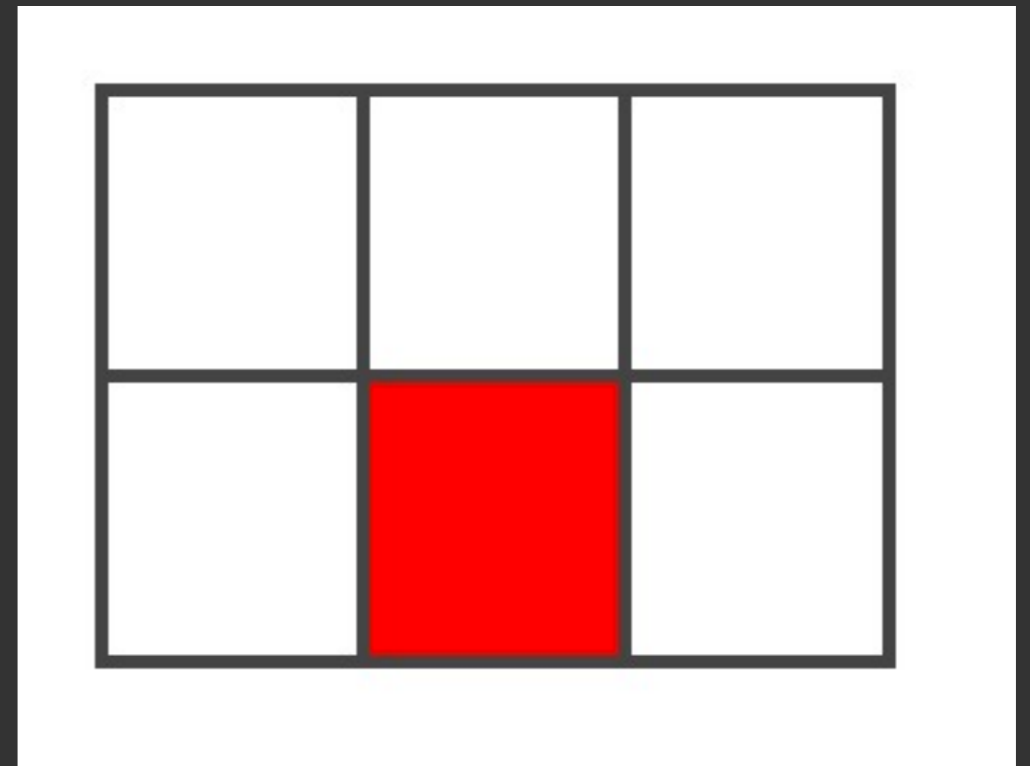The space between two Grid Lines, either horizontal or vertical.

The highlighted Grid Track in this image is between row lines 2 and 3.

Grid Cell

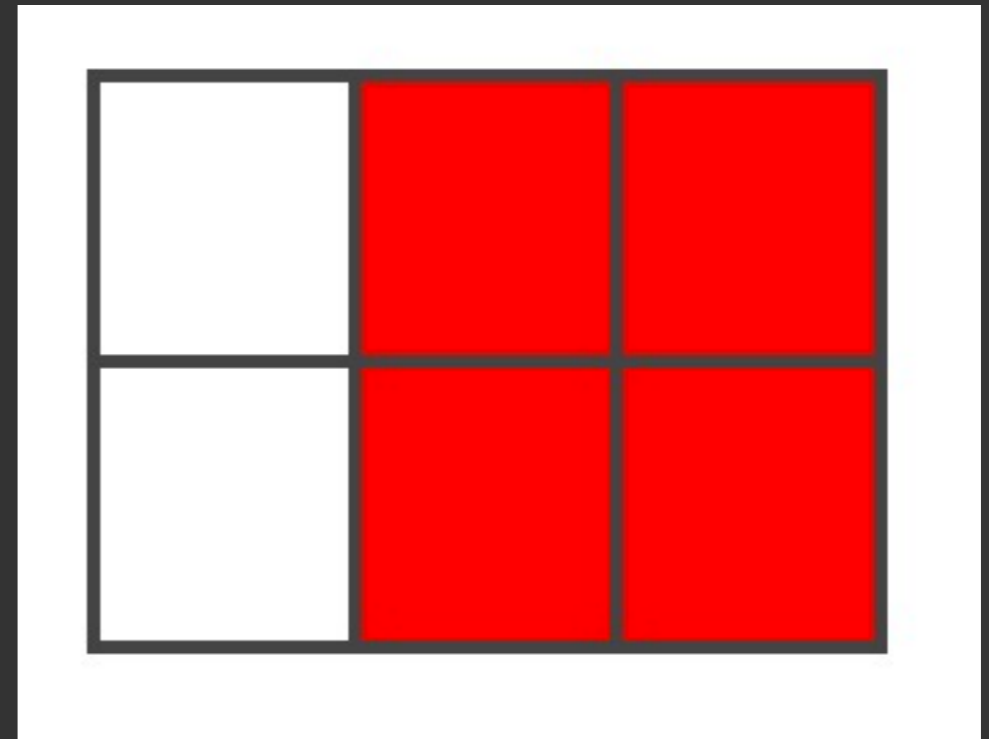The space between 4 Grid Lines.

The highlighted Grid Cell in this image is between row lines 2 and 3 and column lines 2 and 3.

Grid Area

Any area on the Grid bound by four grid lines.

The highlighted Grid Area in this image is between row lines 1 and 3 and column lines 2 and 4.

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Adding a footer
to the bottom of
my design.

```css
.mainfooter {
  grid-column-start: 1;
  grid-column-end: 6;
  grid-row-start: 3;
  grid-row-end: 4;
}
```

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This layout brought to you by the CSS Grid Layout Module.

Shorthand Syntax

The grid-row and grid-column properties allow you to declare the start and end values separated by a / character.

```
.content {
    grid-column: 3 / 4;
    grid-row: 2 / 3;
}
```

The grid-area
property lets us
set all 4 values at
once. The order
of the values is:

- grid-row-start
- grid-column-start
- grid-row-end
- grid-column-end

```
.content {
  grid-area: 2 / 3 / 3 / 4;
}
```

Grid line placement properties.

```
.content {
  grid-column-start: 3;
  grid-column-end: 4;
  grid-row-start: 2;
  grid-row-end: 3;
}

.mainnav {
  grid-column-start: 1;
  grid-column-end: 2;
  grid-row-start: 2;
  grid-row-end: 3;
}

.subhead {
  grid-column-start: 3;
  grid-column-end: 4;
  grid-row-start: 1;
  grid-row-end:2;
}

.quote {
  grid-column-start: 5;
  grid-column-end: 6;
  grid-row-start: 2;
  grid-row-end: 3;
}
```

Grid line placement properties.

```css
.content {
  grid-column: 3 / 4;
  grid-row: 2 / 3;
}

.mainnav {
  grid-column: 1 / 2;
  grid-row: 2 / 3;
}

.subhead {
  grid-column: 3 / 4;
  grid-row: 1 / 2;
}

.quote {
  grid-column: 5 / 6;
  grid-row: 2 / 3;
}
```

Grid line placement properties.

```css
.content { grid-area: 2 / 3 / 3 / 4; }

.mainnav { grid-area: 2 / 1 / 3 / 2; }

.subhead { grid-area: 1 / 3 / 2 / 4; }

.quote { grid-area: 2 / 5 / 3 / 6; }
```

Redefining the grid

The source order
of our html
elements is:

- mainnav
- subhead
- content
- quote

```
<article class="wrapper">

    <nav class="mainnav"></nav>

    <h2 class="subhead"></h2>

    <div class="content"></div>

    <blockquote class="quote">
    </blockquote>

</article>
```

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Declare the grid at the 460 pixel breakpoint.

```css
@media only screen and (min-width:
460px) {
    .wrapper {
        display: grid;
        grid-template-columns: auto ;
        grid-template-rows: auto ;
    }
}
```

Within the media queries for that breakpoint, position the elements on the grid.

I am using the shorthand grid-row property here to define start and end.

```css
.mainnav {
   grid-row: 1 / 2;
}

.subhead {
   grid-row: 2 / 3;
}

.quote {
   grid-row: 3 / 4;
}

.content {
   grid-row: 4 / 5;
}
```

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Redefining the grid to two columns at the 700 pixel breakpoint.

```
@media only screen and (min-width: 700px) {
    .wrapper {
        grid-template-columns: 20% 5% auto ;
        grid-template-rows: auto ;
}
```

In the two column version the nav goes into the left column. Between column lines 1 and 2.

```
.mainnav {
  grid-column: 1 / 2;
  grid-row: 2 / 3;
}

.subhead {
  grid-column: 3 / 4;
  grid-row: 1 / 2;
}

.content {
  grid-column: 3 / 4;
  grid-row: 3 / 4;
}

.quote {
  grid-column: 3 / 4;
  grid-row: 2 / 3;
}
```

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At the office of The Morning Advertiser, I am informed by my old friend Mr. Charles Williams, they boast of a race of cats bred there for nearly half a century. In colour these are mostly

Redefining the
layout as three
columns again.

```css
@media only screen and (min-width: 980px) {
    .wrapper {
    grid-template-columns: 200px 40px auto
40px 200px;
    grid-template-rows: auto ;
    max-width: 960px;
}
```

In this layout the
quote is placed
between column
lines 5 and 6.

```
.mainnav {
  grid-column: 1 / 2;
  grid-row: 2 / 3;
}
.subhead {
  grid-column: 3 / 4;
  grid-row: 1 / 2;
}
.content {
  grid-column: 3 / 4;
  grid-row: 2 / 3;
}
.quote {
  grid-column: 5 / 6;
  grid-row: 2 / 3;
}
```

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Grid Template Areas

Use the grid-area property to set up areas for the main elements outside of the media queries.

```css
.mainnav {
  grid-area: nav;
}
.subhead {
  grid-area: subhead;
}
.quote {
  grid-area: quote;
}
.content {
  grid-area: content;
}
.feature-image {
  grid-area: feature;
}
```

Give names to the areas using the grid-template-areas property.

```css
@media only screen and (min-width: 460px)
and (max-width: 700px){
    .wrapper {
      display: grid;
      width: 90%;
      grid-template-columns: auto ;
      grid-template-rows: auto ;
      grid-template-areas:
        "nav"
        "subhead"
        "quote"
        "content"
        "feature";
    }
}
```

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> The cat, with eyne of burning coal, Now crouches from (before) the mouse's hole.

A slight rustle, and the fugitive comes forth; a quick, sharp, resolute motion, and the cat has proved its usefulness. Let any one have a plague of rats and mice, as I once had, and let them be delivered therefrom by cats, as I was, and they will have a lasting and kind regard

Redefine the areas for two columns.
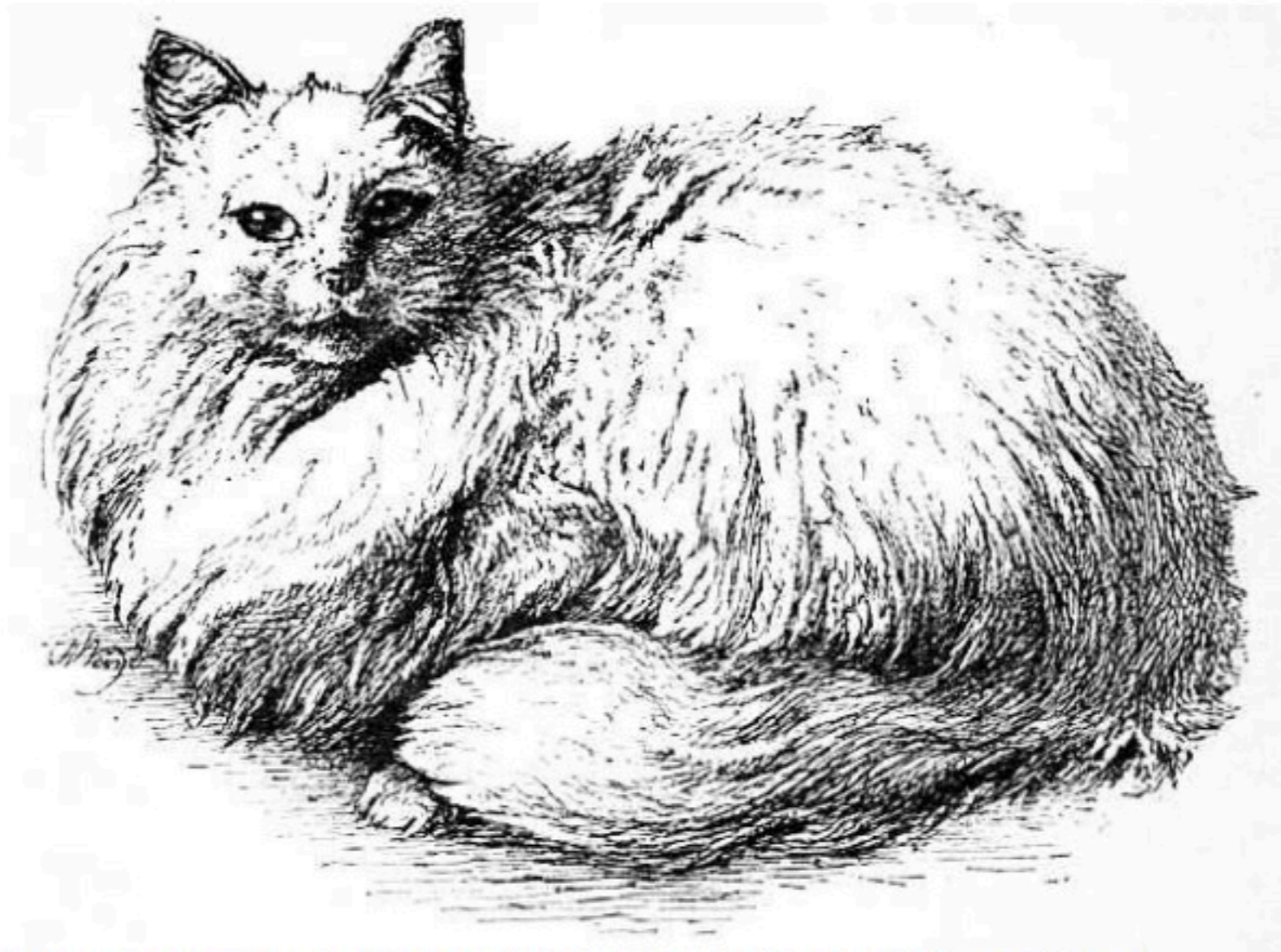
```
@media only screen and (min-width: 700px)
and (max-width: 980px){
   .wrapper {
      display:grid;
      grid-template-columns: 20% 5% auto ;
      grid-template-rows: auto ;
      grid-template-areas:
         ". . subhead"
         "nav . quote"
         "nav . feature"
         "nav . content" ;
      }
}
```

Extracts from "Our Cats, by Harrison Weir"

Usefulness of cats

Let any one have a plague of rats and mice, as I once had, and let them be delivered therefrom by cats, as I was, and they will have a lasting and kind regard for them.

In our urban and suburban houses what should we do without cats? In our sitting or bedrooms, our libraries, in our kitchens and storerooms, our farms, barns, and rickyards, in our docks, our granaries, our ships, and our wharves, in our corn markets, meat markets, and

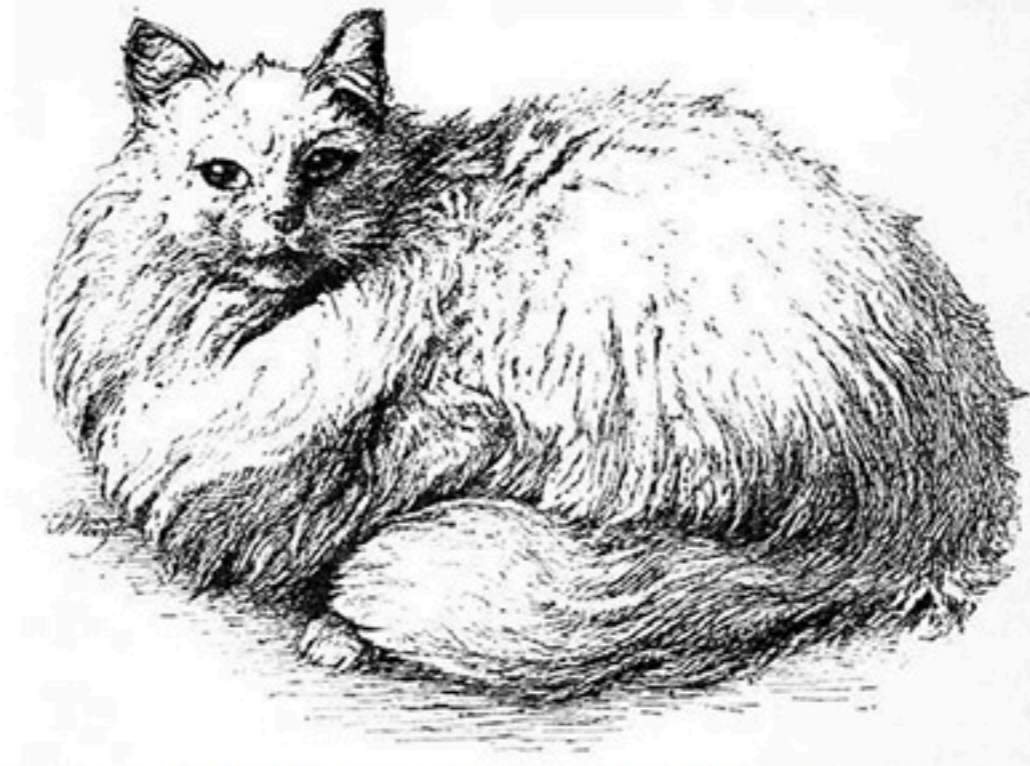Redefine the areas for three columns.

```
@media only screen and (min-width: 980px) {
    .wrapper {
      display: grid;
      grid-template-columns: 200px 40px auto
40px 200px;
      grid-template-rows: auto ;
      grid-template-areas:
          ". . subhead . ."
          "nav . feature . quote"
          "nav . content . quote";
    }
}
```

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> The cat, with eyne of burning coal, Now crouches from (before) the mouse's hole.

A slight rustle, and the fugitive comes forth; a quick, sharp, resolute motion, and the cat has proved its usefulness. Let any one have a plague of rats and mice, as I once had, and let them be delivered therefrom by cats, as I was, and they will have a lasting and kind regard for them.

A friend not long since informed me that a cat at Stone's Distillery was seen to catch two rats at one time, a fore foot on each. All the cats kept at this establishment, and there are several, are of the red tabby colour, and

Extracts from "Our Cats, by Harrison Weir"

Usefulness of cats .subhead

.feature

.quote

Let any one have a plague of rats and mice, as I once had, and let them be delivered therefrom by cats, as I was, and they will have a lasting and kind regard for them.

.content

In our urban and suburban houses what should we do without cats? In our sitting or bedrooms, our libraries, in our kitchens and storerooms, our farms, barns, and rickyards, in our docks, our granaries, our ships, and our wharves, in our corn markets, meat markets, and other places too numerous to mention, how useful they are! In our ships, however, the rats oft set them at defiance; still they are of great service.

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16 Column Grid

Naming Grid lines. Remember that the name is for the line and NOT the grid track.

```
grid-template-columns:
   (nav-start) 200px
   (nav-end) 40px
   (content-start) auto
   (content-end) 40px
   (side-start) 200px (side-end);

.content {
   grid-column: content-start / content-end;
}
```

You can use the
repeat keyword
to repeat parts of
the grid
definition.

```
grid-template-columns: repeat(4,
200px 20px);
```

The fr unit is a flexible length that represents a fraction of the available space in the grid container.

```
grid-template-columns: 5fr 1fr 10fr
1fr 5fr;
```

Creating a 16 column grid using the repeat syntax.

I am also giving my grid lines names of col, row and gutter by adding a name for that line.

```
.wrapper {
  display:grid;
  grid-template-columns: (gutter) 1fr
repeat(16, (col) 4.25fr (gutter) 1fr );
  grid-template-rows: repeat(9, (row) auto
(gutter) 20px );
}
```

We can create a
bunch of boxes ...

```html
<div class="wrapper">
   <div class="box grid1">01</div>
   <div class="box grid2">02</div>
   <div class="box grid3">03</div>
   <div class="box grid4">04</div>
   <div class="box grid5">05</div>
   <div class="box grid6">06</div>
   ...
</div>
```

... and position
them on the grid.

```
.grid1 { grid-column: col / span 1;
grid-row: row / span 1;}

.grid2 { grid-column: col 2 / span
1; grid-row: row / span 1;}

.grid27 { grid-column: col 7 / span
gutter 3; grid-row: row 3 / span
1; }

.grid32 { grid-column: col 9 / span
gutter 4; grid-row: row 4 / span
1; }
```

Flexible Grid

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

| 25 | 26 | 27 | 28 | 29 |

| 30 | 31 | 32 | 33 |

The markup for
my layout.

```
<div class="wrapper">
   <header class="header">   </header>
   <aside class="side1">   </aside>
   <article class="content">   </article>
   <aside class="side2">   </aside>
   <footer class="footer box">   </footer>
</div>
```
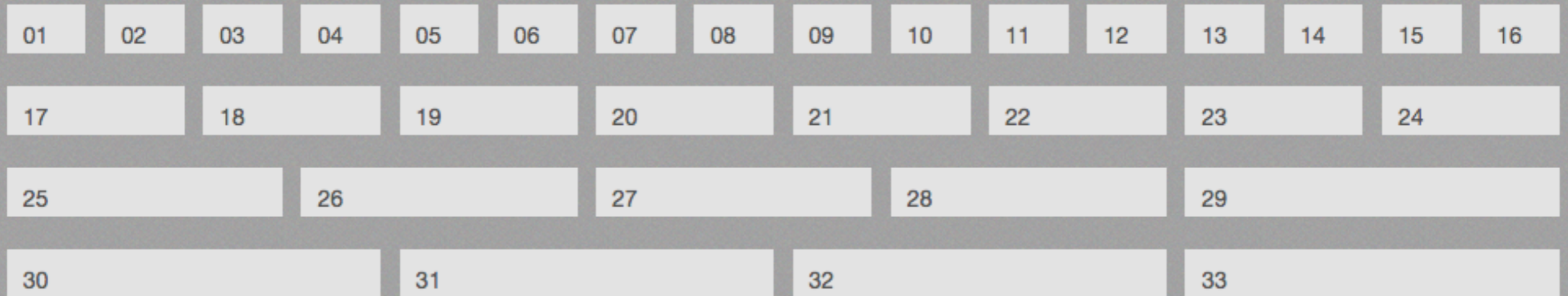
Using the span keywords to span across gutter lines.

```
.header {
  grid-column: col / span gutter 16;
  grid-row: row / span 1;
}
.side1 {
  grid-column: col / span gutter 4;
  grid-row: row 2 / span 1;
}
.content {
  grid-column: col 5 / span gutter 8;
  grid-row: row 2 / span 1;
}
.side2 {
  grid-column: col 13 / span gutter 4;
  grid-row: row 2 / span 1;
}
.footer {
  grid-column: col / span gutter 16;
  grid-row: row 3 / span 1;
}
```

span gutter 16
means span over
16 lines named
gutter.

```css
.header {
  grid-column: col / span gutter 16;
  grid-row: row / span 1;
}
.side1 {
  grid-column: col / span gutter 4;
  grid-row: row 2 / span 1;
}
.content {
  grid-column: col 5 / span gutter 8;
  grid-row: row 2 / span 1;
}
.side2 {
  grid-column: col 13 / span gutter 4;
  grid-row: row 2 / span 1;
}
.footer {
  grid-column: col / span gutter 16;
  grid-row: row 3 / span 1;
}
```

Flexible Grid

Usefulness of Cats

At the office of The Morning Advertiser, I am informed by my old friend Mr. Charles Williams, they boast of a race of cats bred there for nearly half a century. In colour these are mostly tortoiseshell, and some are very handsome.

In our urban and suburban houses what should we do without cats? In our sitting or bedrooms, our libraries, in our kitchens and storerooms, our farms, barns, and rickyards, in our docks, our granaries, our ships, and our wharves, in our corn markets, meat markets, and other places too numerous to mention, how useful they are! In our ships, however, the rats oft set them at defiance; still they are of great service.

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This layout brought to you by the CSS3 Grid Layout Module.

Flexible Grid

Usefulness of Cats

grid-column: col / span gutter 16

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Our content starts on col line 5, and spans 8 lines named gutter.

```css
.header {
  grid-column: col / span gutter 16;
  grid-row: row / span 1;
}
.side1 {
  grid-column: col / span gutter 4;
  grid-row: row 2 / span 1;
}
.content {
  grid-column: col 5 / span gutter 8;
  grid-row: row 2 / span 1;
}
.side2 {
  grid-column: col 13 / span gutter 4;
  grid-row: row 2 / span 1;
}
.footer {
  grid-column: col / span gutter 16;
  grid-row: row 3 / span 1;
}
```

Flexible Grid

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grid-column: col 5 / span gutter 8;
grid-row: row 2 / span 1;

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The **Gutter Problem** - no way to define gutters without creating an explicit Grid Track for them.

```
.wrapper {
  display:grid;
  grid-template-columns: (gutter) 1fr
repeat(16, (col) 4.25fr (gutter) 1fr );
  grid-template-rows: repeat(9, (row) auto
(gutter) 20px );
}
```

What is Grid Layout

Examples

-- Page Layouts

Other Grid Links

Problems with Grid

About

Grid by Example simple usage examples for the CSS3 Grid Layout Module

I have been writing and speaking about the CSS Grid Layout Module for some time now. In order to learn how Grid works I've put together lots of small examples, and I am publishing them here as a resource for anyone else interested in this emerging specification.

I wanted to try and demonstrate Grid in a way that broke down the spec into smaller chunks, rather than large examples that show lots of different aspects of the specification at once. I have also posted some of the examples I use in my presentation, as these are simple layouts than show a few of the properties discussed in the examples at once.

If you spot any problems, have an enhancement suggestion or would like to see a certain aspect of the module explained then feel free to either submit a pull request or just drop me a line on me@rachelandrew.co.uk. I'm also on Twitter as rachelandrew.

In addition to my examples I have linked to other resources and examples and will try and keep this listing up to date. However I would welcome any additions.

CSS3 Layout Modules, 2nd Edition

A lot of the examples here were my test examples as I researched Grid for my latest book - CSS3 Layout Modules, 2nd edition. If you are interested in modern layout for the web, take a look at the book.

http://gridbyexample.com

Thank you.

http://rachelandrew.co.uk/presentations/css-grid
@rachelandrew