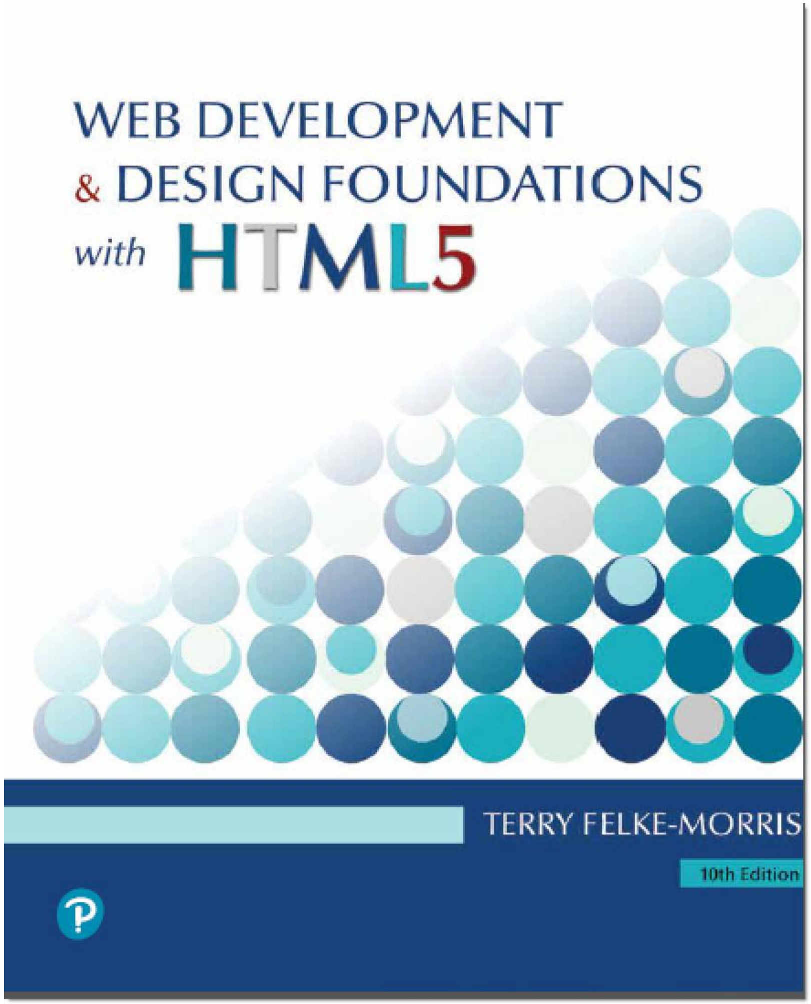
Web Development & Design Foundations with HTML5

Tenth Edition



Chapter 7

Responsive Page Layout

Learning Outcomes

- Describe CSS Flexible Box Layout
- Configure Flexbox Container and Flexbox Items
- Apply CSS Flexible Box Layout to a web-page
- Describe CSS Grid Layout
- Configure a Grid Container
- Create responsive page layouts with CSS Grid Layout
- Configure web pages for mobile display using the viewport meta tag
- Apply responsive web design techniques (CSS media queries, CSS feature queries, and flexible images
- Apply responsive image techniques

CSS Flexible Box Layout aka flexbox

Provide flexible, responsive layout
https://www.w3.org/TR/css-flexbox-1/

Best used for one dimension – a row or a column

The **display property** configures a flexbox container
display: flex;

Flex Item – a child element of the flex container

The flex-wrap property

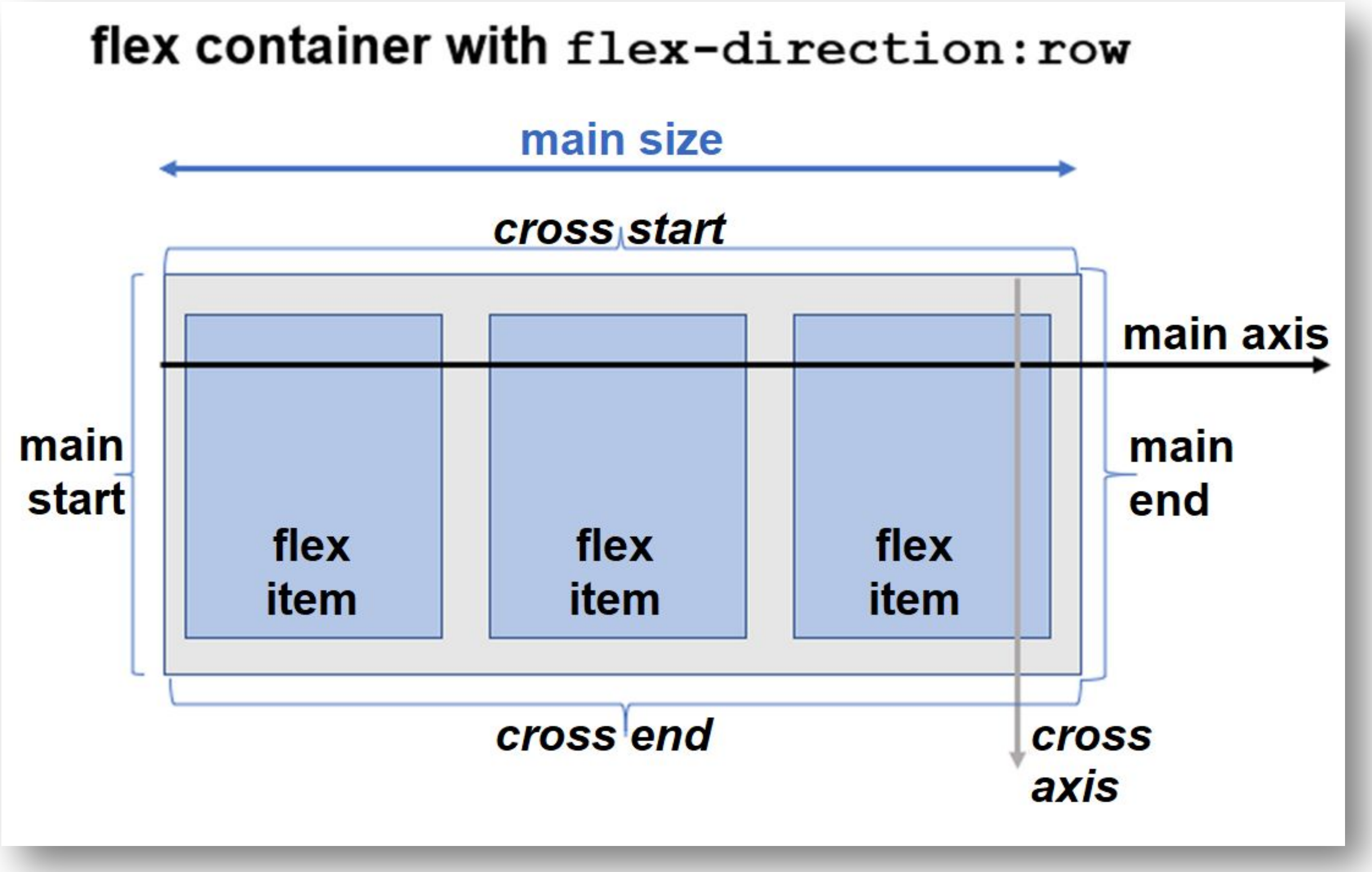
- Determines whether flex items are displayed on multiple lines
- Values are no-wrap (default), wrap, wrap-reverse

CSS Flexible Box Layout aka flexbox

The flex-direction property

- Configures the flow direction
- Values are row (default), column, row-reverse, and column-reverse

Diagram of a Flex Container



Horizontal flow direction

Diagram of a Flex Container

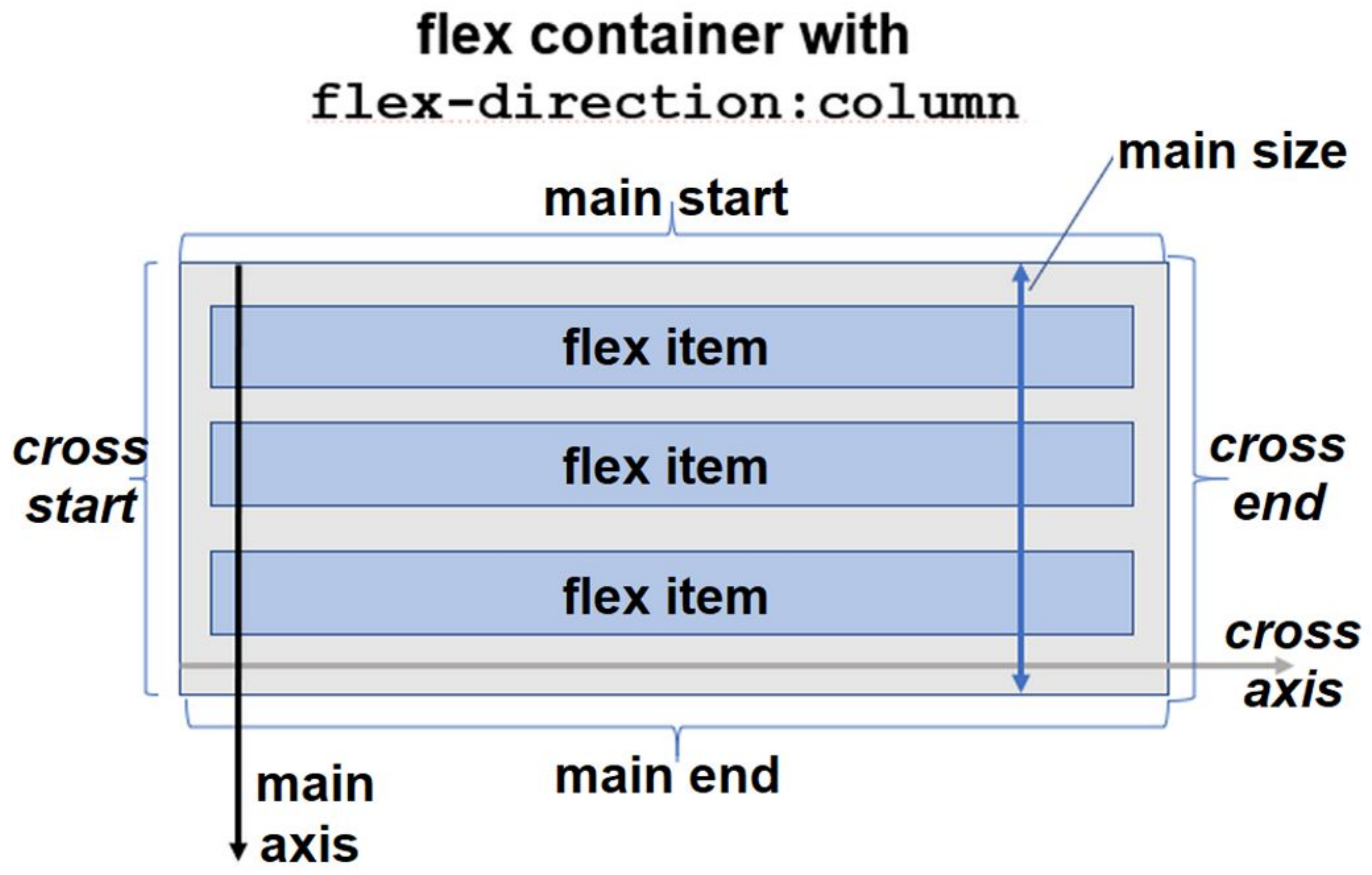
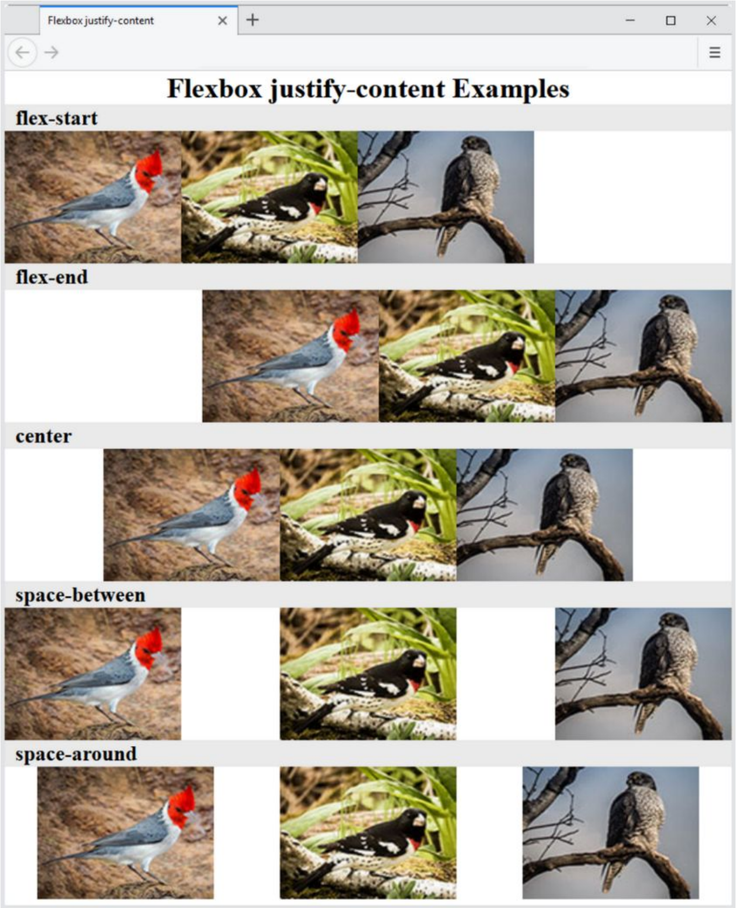


Figure 7.4 Vertical flow direction

The justify-content Property

Configures how the extra space along the main axis should be displayed



Flexbox justify-content Examples

flex-start

flex-end

center

space-between

space-around

The justify-content property

More flexbox Properties

The align-items Property

- Configures how the browser displays extra space along the cross-axis

The flex-flow Property

- Shorthand to configure flex-direction and flex-wrap properties

The order Property

- Causes the browser to display flex items in different order than they are coded
- Warning – this could be an accessibility issue

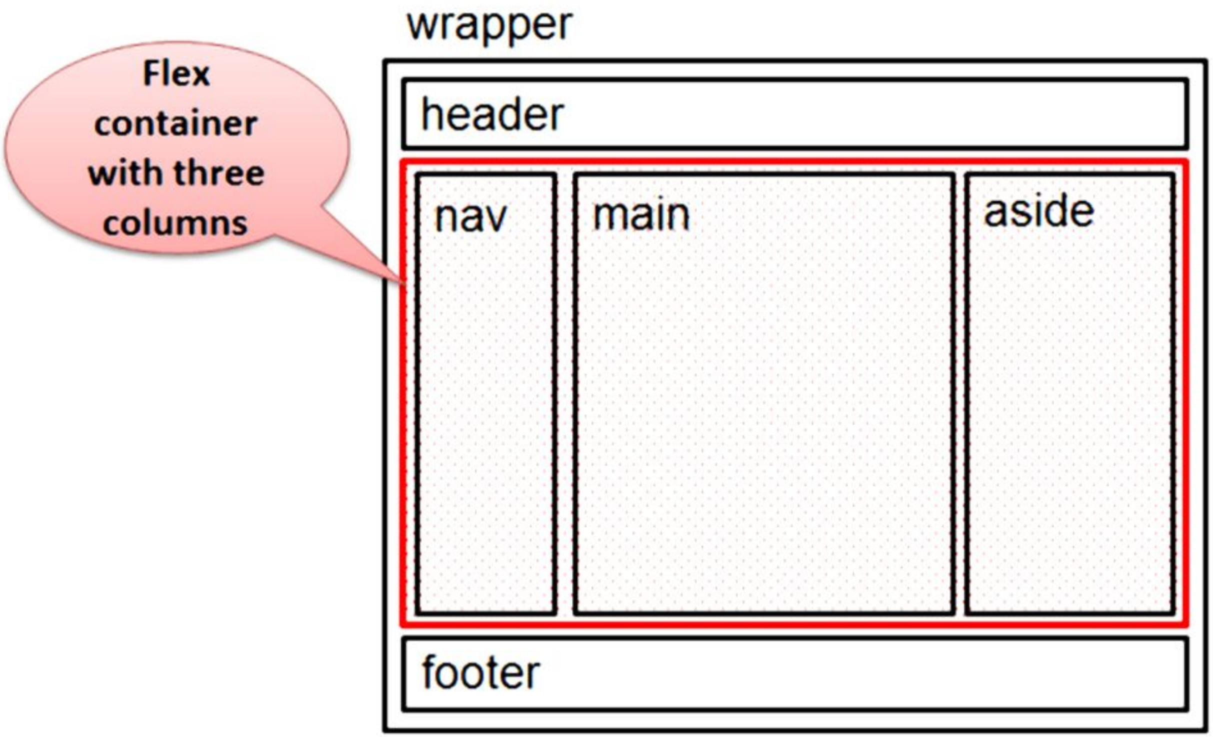
Configure Flex Items

By default flex items are flexible in size and allocated the same amount of space in the flex container

The flex property

- Customizes the size of each flex item
- Indicated the flex grow factor
- Indicates the flex shrink factor
- Can be used to indicate a proportional flexible item

Three-column page layout with the flex container indicated



```
nav   { flex: 1; }
main { flex: 7; }
aside { flex: 2; }
```

CSS Grid Layout

Purpose: Configure a two-dimensional grid-based layout The grid can be fixed in dimension or flexible and responsive.

https://www.w3.org/TR/css-grid-1/

The display property

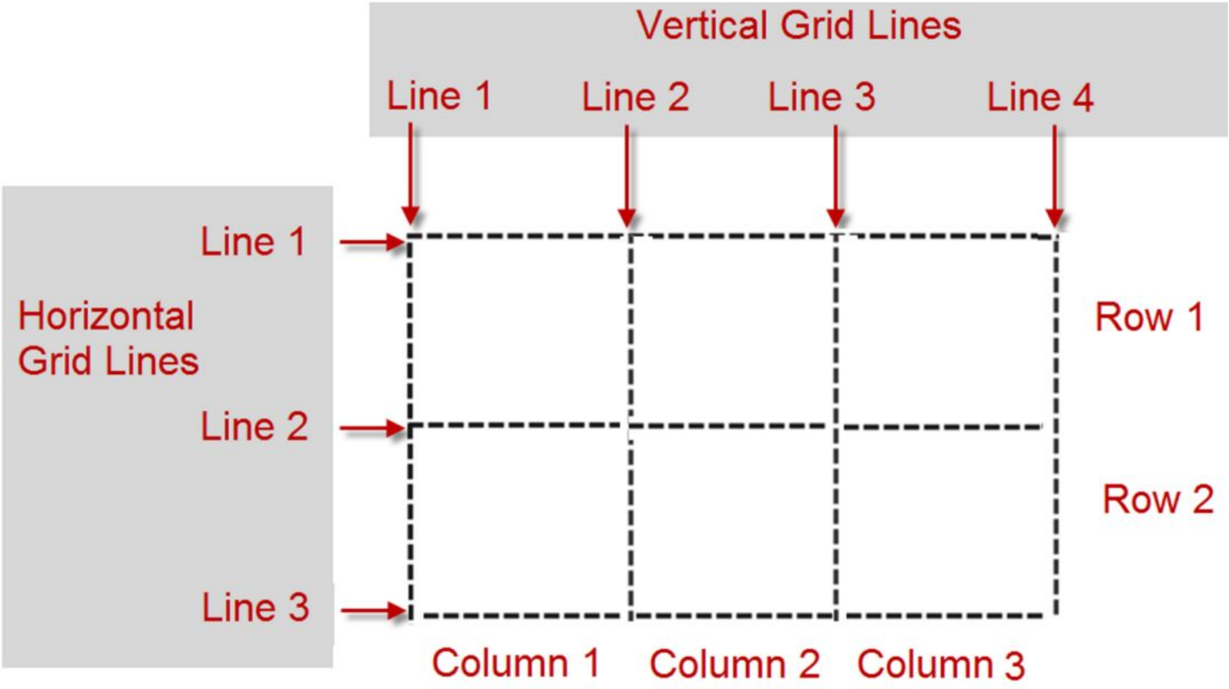
Configures a grid container display: grid;

CSS Grid Layout

Grid Item – a child element of the grid container

Grid Terms

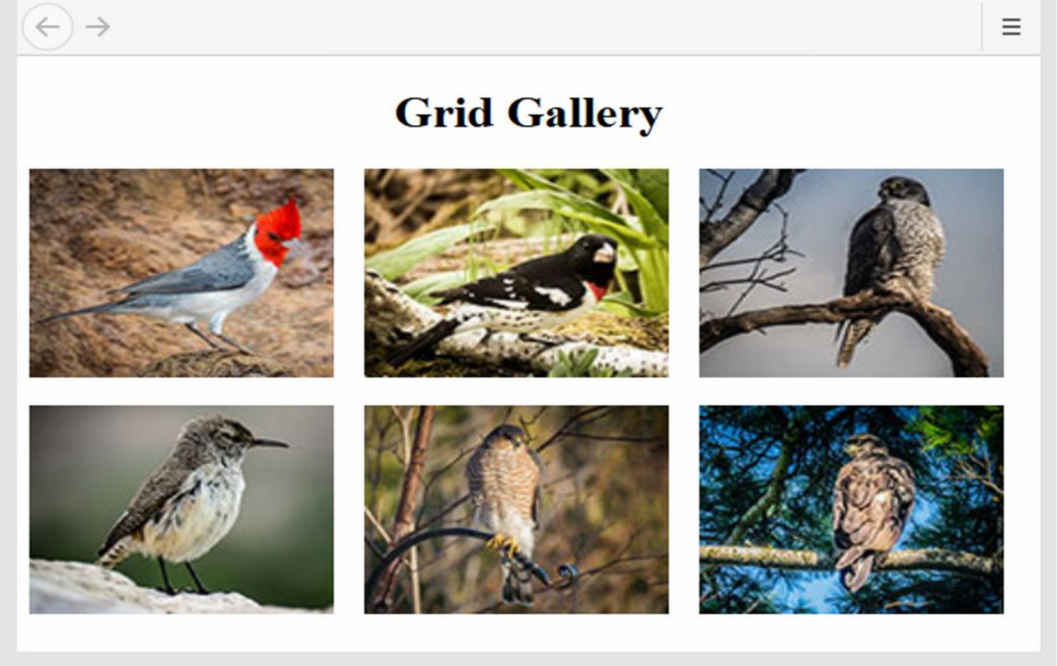
- Grid line
- Grid row
- Grid column
- Grid track
- Grid gap



Configure Grid Columns and Grid Rows

The grid-template-columns property
The grid-template-rows property

```
#gallery { display: grid;
    grid-template-columns: 220px 220px 220px;
    grid-template-rows: 170px 170px; }
```



Grid Gallery

Configure Grid Items

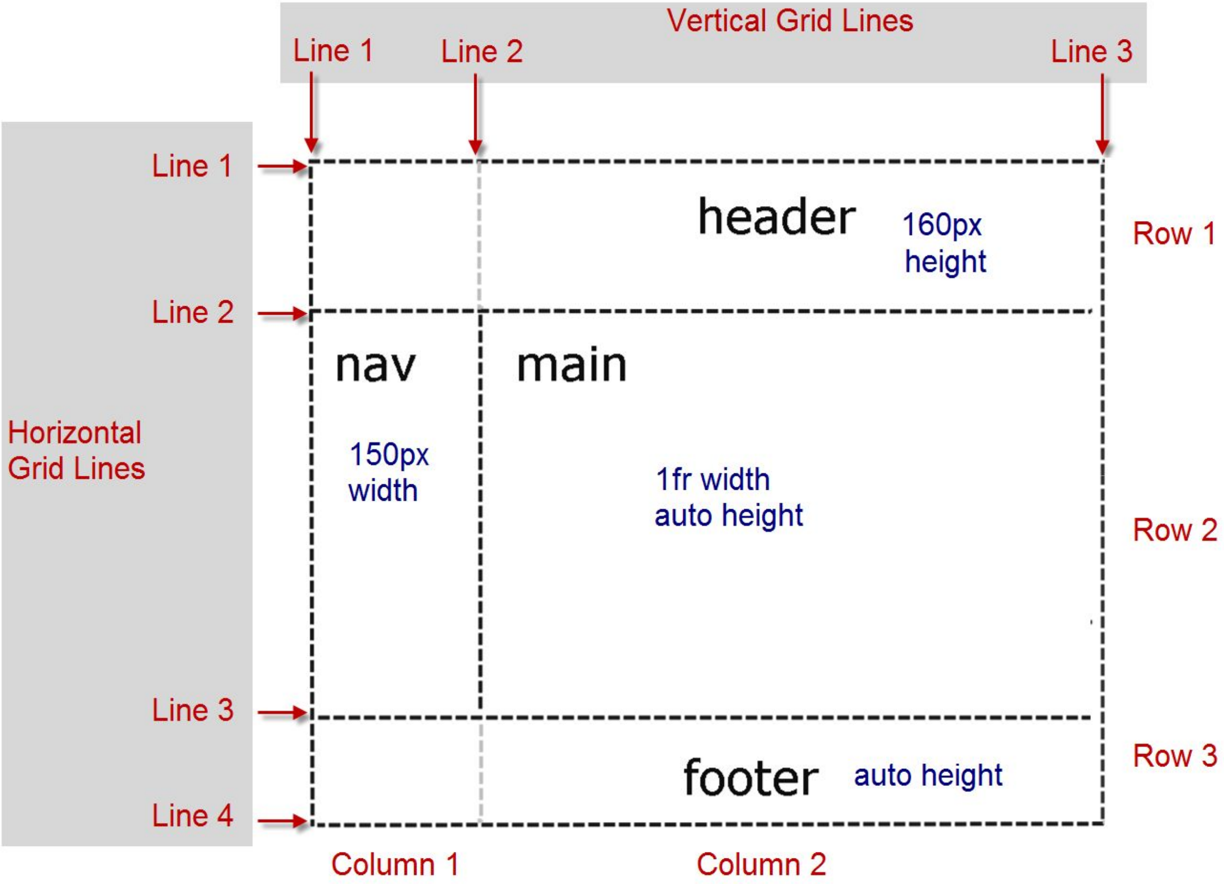
The grid-row property

- configures the area in rows that is reserved for the item in the grid

The grid-column property

- configures the area in columns that is reserved for the item in the grid

Two-column CSS Grid Layout

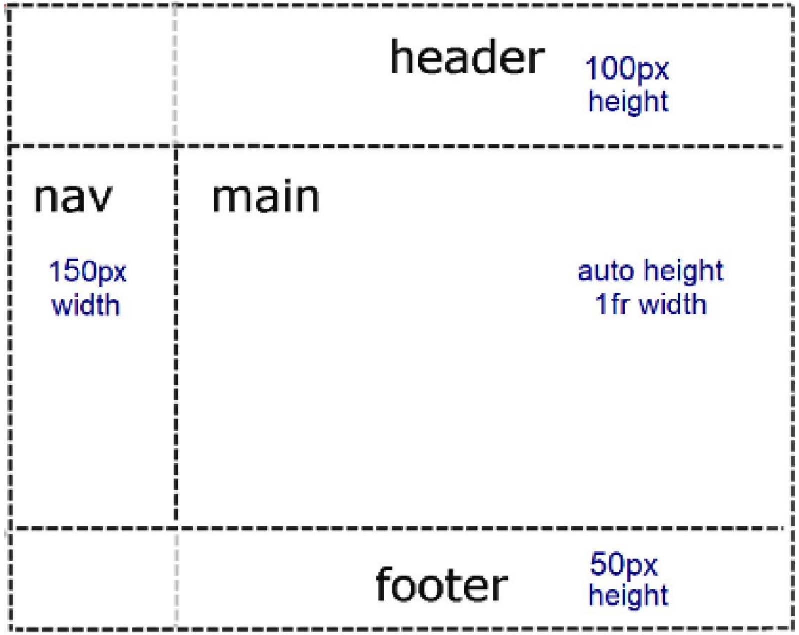


```
header { grid-row: 1 / 2; grid-column: 1 / 3; }
nav    { grid-row: 2 / 3; grid-column: 1 / 2; }
main   { grid-row: 2 / 3; grid-column: 2 / 3; }
footer { grid-row: 3 / 4; grid-column: 1 / 3; }
```

Configure Grid Areas

- grid-area Property

```
header { grid-area: header; }
nav { grid-area: nav; }
main { grid-area: main; }
footer { grid-area: footer; }
```



A grid wireframe

Configure Grid Areas

- grid-template-areas Property

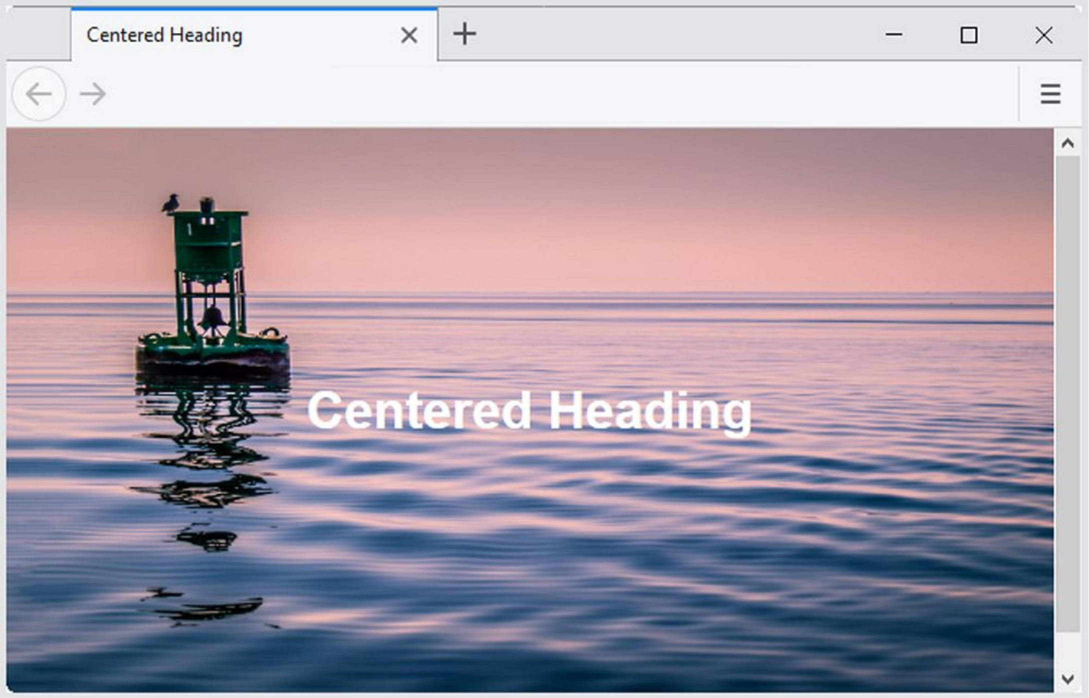
```
#wrapper { display: grid;
    grid-template-columns: 150px 1fr;
    grid-template-rows: 100px auto 50px;
    grid-template-areas:
        "header header"
        "nav main"
        "footer footer"; }
```

https://www.w3.org/TR/css-grid-1/#grid-template-areas-property

Checkpoint (1 of 2)

1. Which CSS property is used to identify a CSS selector as a grid or flexbox container?
2. The CSS justify-content property used in flexbox layout is quite versatile.
3. Which CSS property can be used to indicate the location and dimensions of named grid areas?

Center with Flexbox



```
header { display: flex;
    min-height: 100vh;
    justify-content: center;
    align-items: center;
    background-color: #227093;
    background-image: url(lake.jpg);
    background-size: 100% 100%;
    background-repeat: no-repeat;  }
```

Progressive Enhancement with Grid

CSS Feature Query

- A feature query is a conditional that can be used to test for support of a CSS property, and if support is found, apply the specified style rules.

```
@supports ( display: grid) {
…. grid styles go here …
}
```

Progressive Enhancement Strategy

- Configure web page layout with normal flow or float for browsers and devices that do not support grid
- Configure a feature query with grid layout for modern browsers

Viewport Meta Tag (1 of 2)

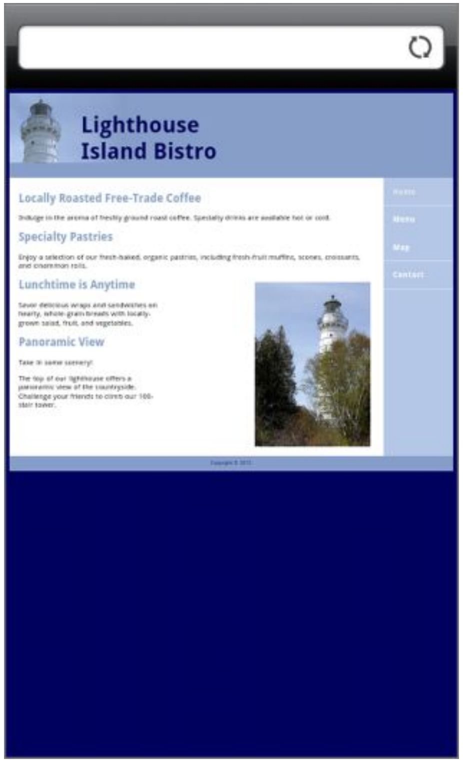
Default action for most mobile devices is to zoom out and scale the web page

Viewport Meta Tag

- Created as an Apple extension to configure display on mobile devices
- Configures width and initial scale of browser viewport

```
<meta name="viewport" content="width=device-width,
initial-scale=1.0">
```

Viewport Meta Tag (2 of 2)



Lighthouse Island Bistro

Locally Roasted Free-Trade Coffee

Indulge in the aroma of freshly ground roast coffee. Specialty drinks are available hot or cold.

Specialty Pastries

Enjoy a selection of our fresh-baked, organic pastries, including fresh-fruit muffins, scones, croissants, and cinnamon rolls.

Lunchtime is Anytime

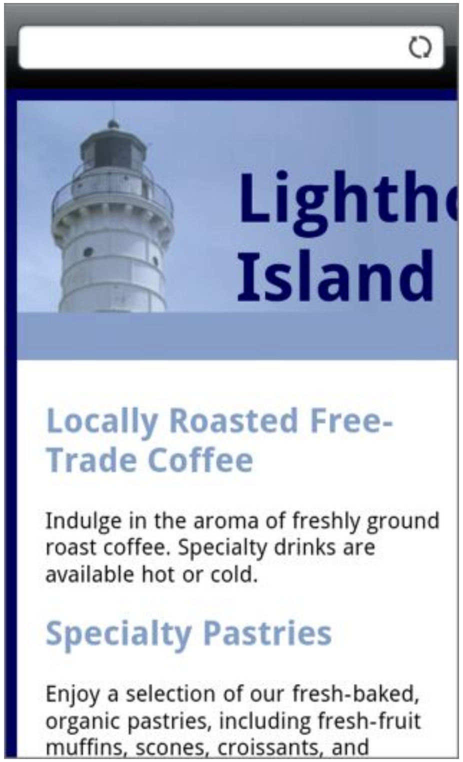
Savor delicious wraps and sandwiches on hearty, whole-grain breads with locally-grown salad, fruit, and vegetables.

Panoramic View

Take in some scenery!

The top of our lighthouse offers a panoramic view of the countryside. Challenge your friends to climb our 100-stair tower.

Mobile display of a typical desktop web page without the viewport meta tag



Lighthth
Island

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The viewport meta tag helps with mobile displays

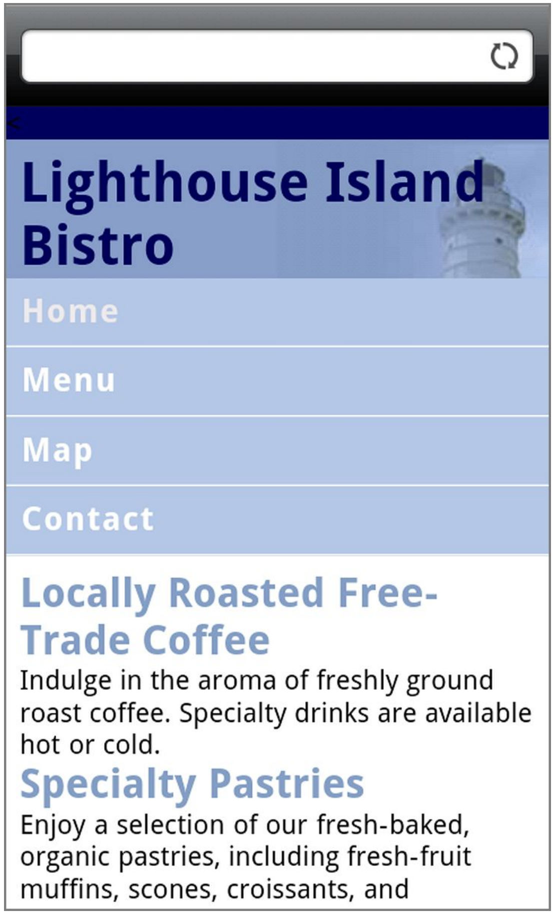
CSS Media Queries

Media Query

- Determines the capability of the mobile device, such as screen resolution and directs the browser to styles configured specifically for those capabilities

Example with link tag

```
<link href="lighthousemobile.css"
rel="stylesheet"
media="(max-device-width: 480px)">
```



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CSS media queries to configure the page for mobile display

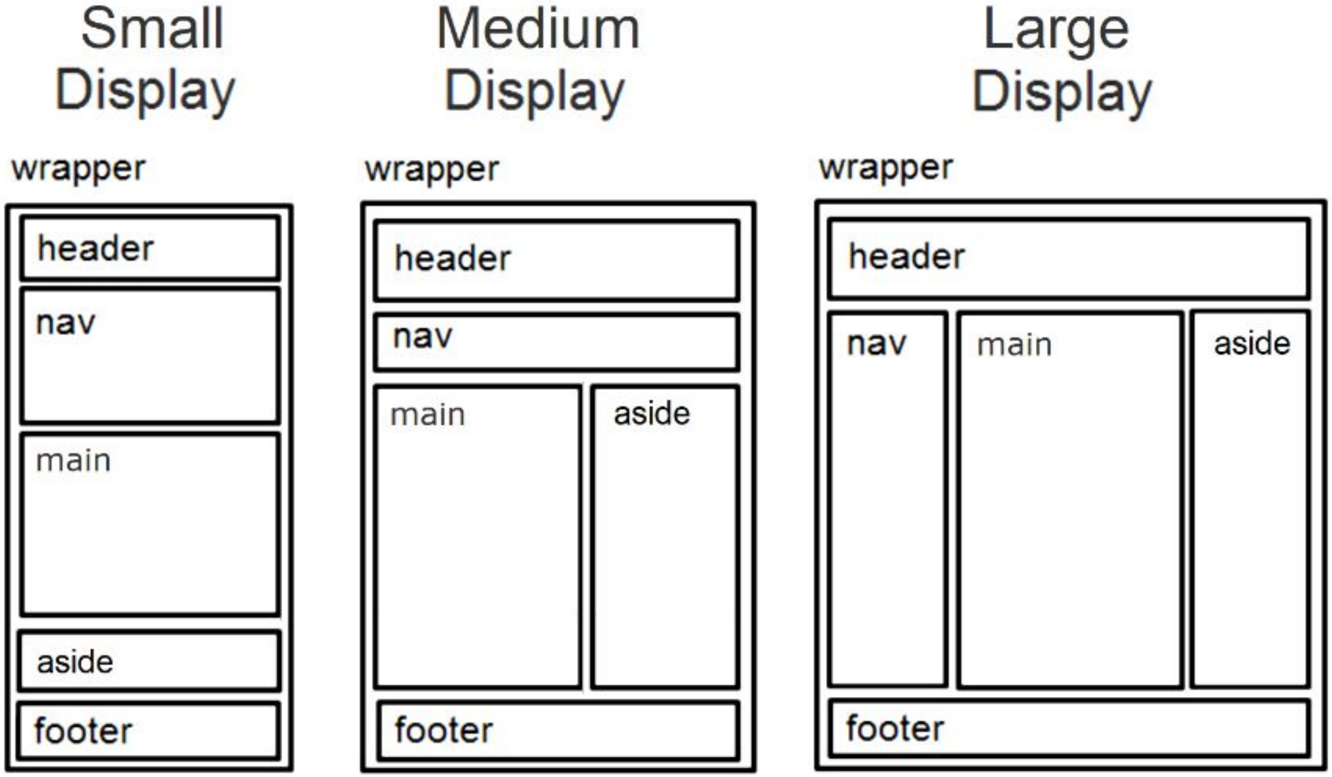
Mobile First Approach

Responsive design layout strategy (coined by Luke Wroblewski)

The Mobile First Process:

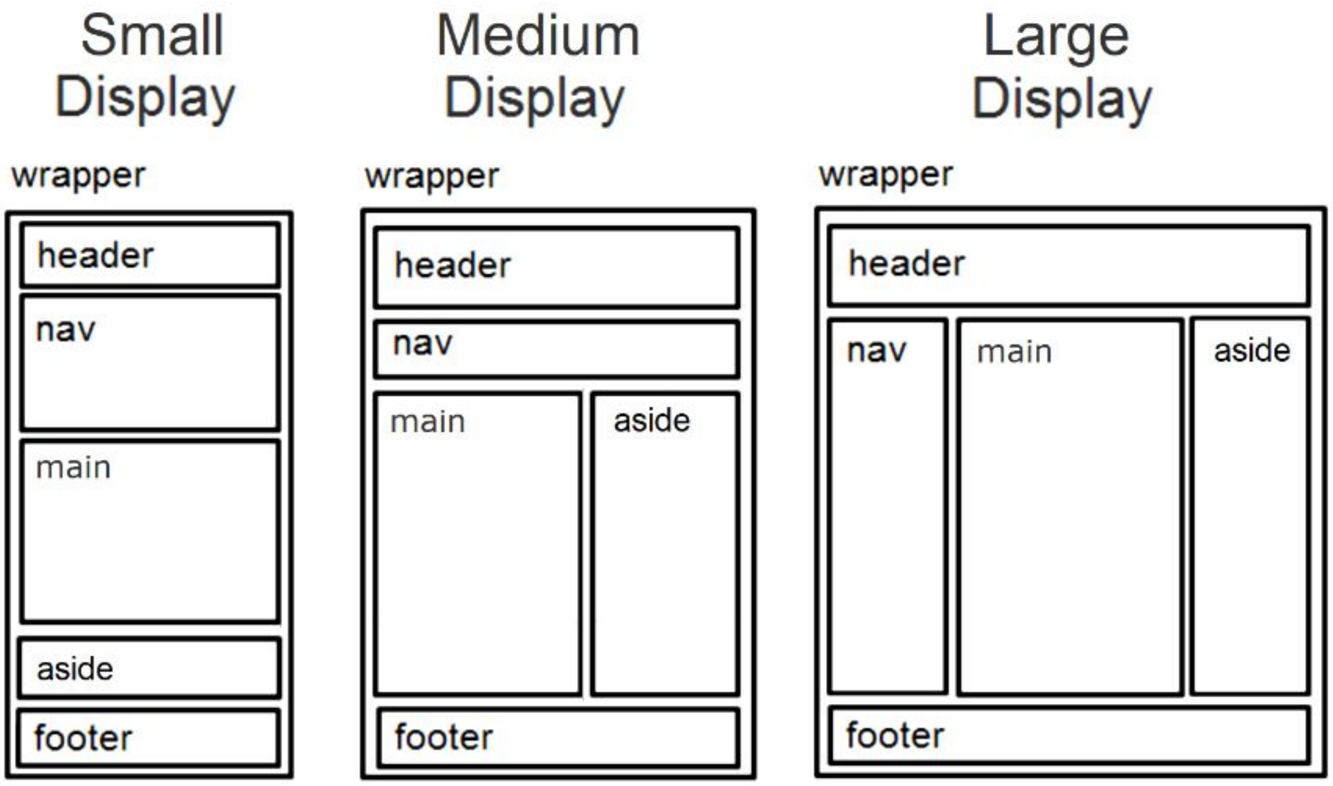
1. Configure a single-column page layout for narrow screens – smartphones!
   Test with a small browser window if needed.
2. Resize the browser viewport to be larger until the design "breaks" and needs to be reworked for a pleasing display—this is the point where you may need to code a media query.
3. Continue resizing the browser viewport to be larger until the design breaks and code additional media queries.

Responsive Layout with Media Queries



Three wireframe layouts

Responsive Grid Layout with Media Queries



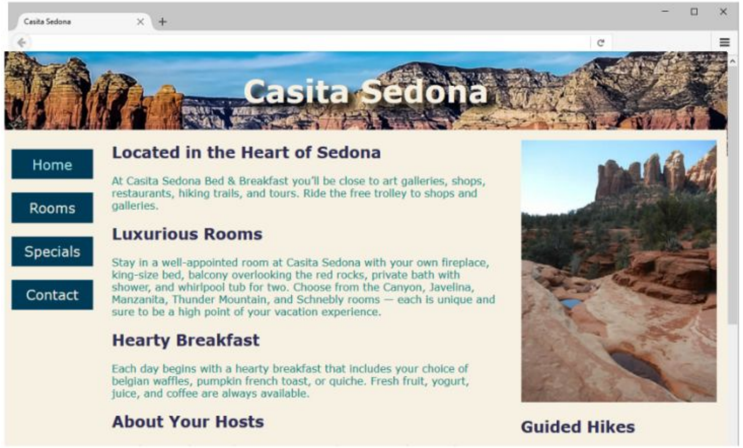
Three wireframe layouts

Flexible Images

Edit HTML: remove height and width attributes

CSS: img { max-width: 100%; height: auto; }

Desktop Browser



Located in the Heart of Sedona

At Casita Sedona Bed & Breakfast you'll be close to art galleries, shops, restaurants, hiking trails, and tours. Ride the free trolley to shops and galleries.

Luxurious Rooms

Stay in a well-appointed room at Casita Sedona with your own fireplace, king-size bed, balcony overlooking the red rocks, private bath with shower, and whirlpool tub for two. Choose from the Canyon, Javelina, Manzanita, Thunder Mountain, and Schnebly rooms — each is unique and sure to be a high point of your vacation experience.

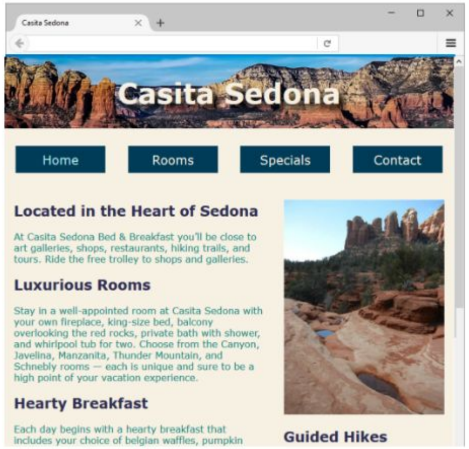
Hearty Breakfast

Each day begins with a hearty breakfast that includes your choice of belgian waffles, pumpkin french toast, or quiche. Fresh fruit, yogurt, juice, and coffee are always available.

About Your Hosts

Guided Hikes

Tablet
Display Width



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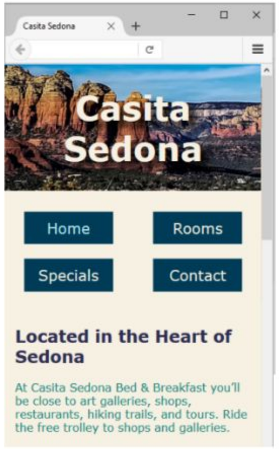
Guided Hikes

Smartphone
Display Width



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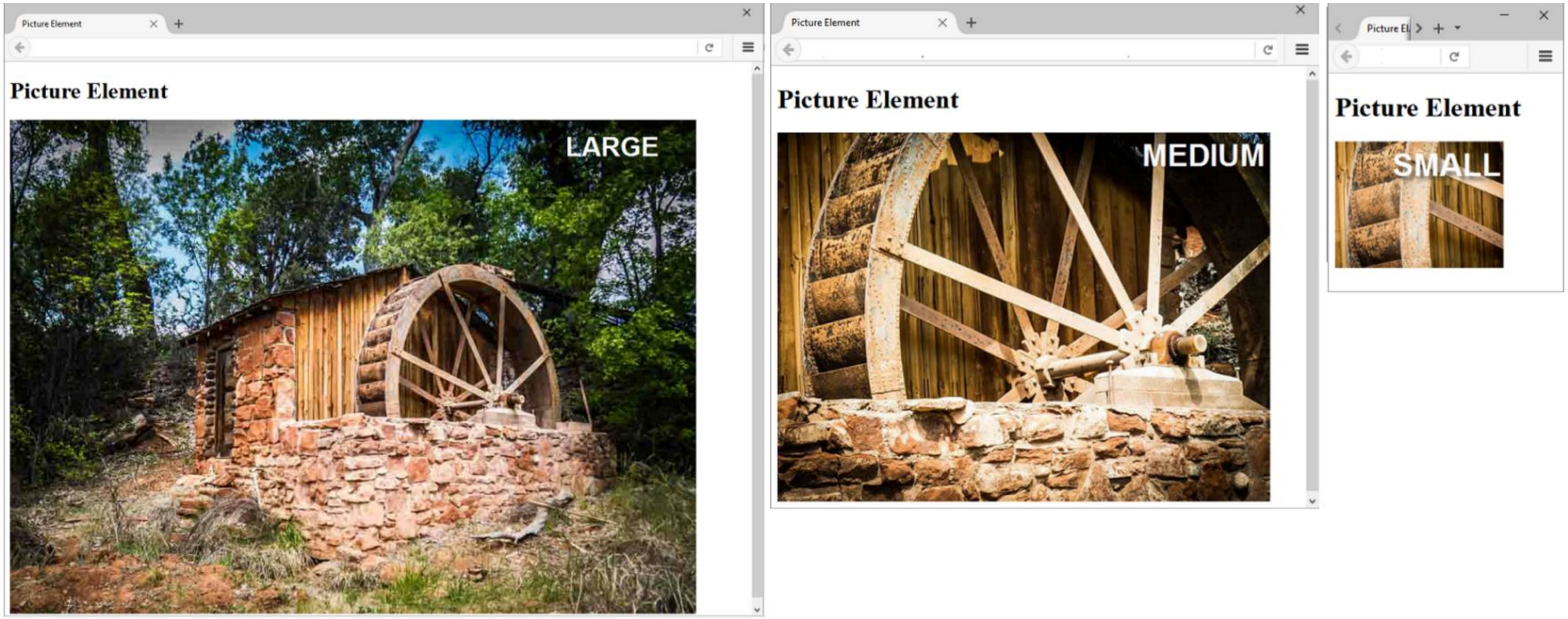
The web page demonstrates responsive web design techniques

Responsive Images HTML 5.1 Picture Element



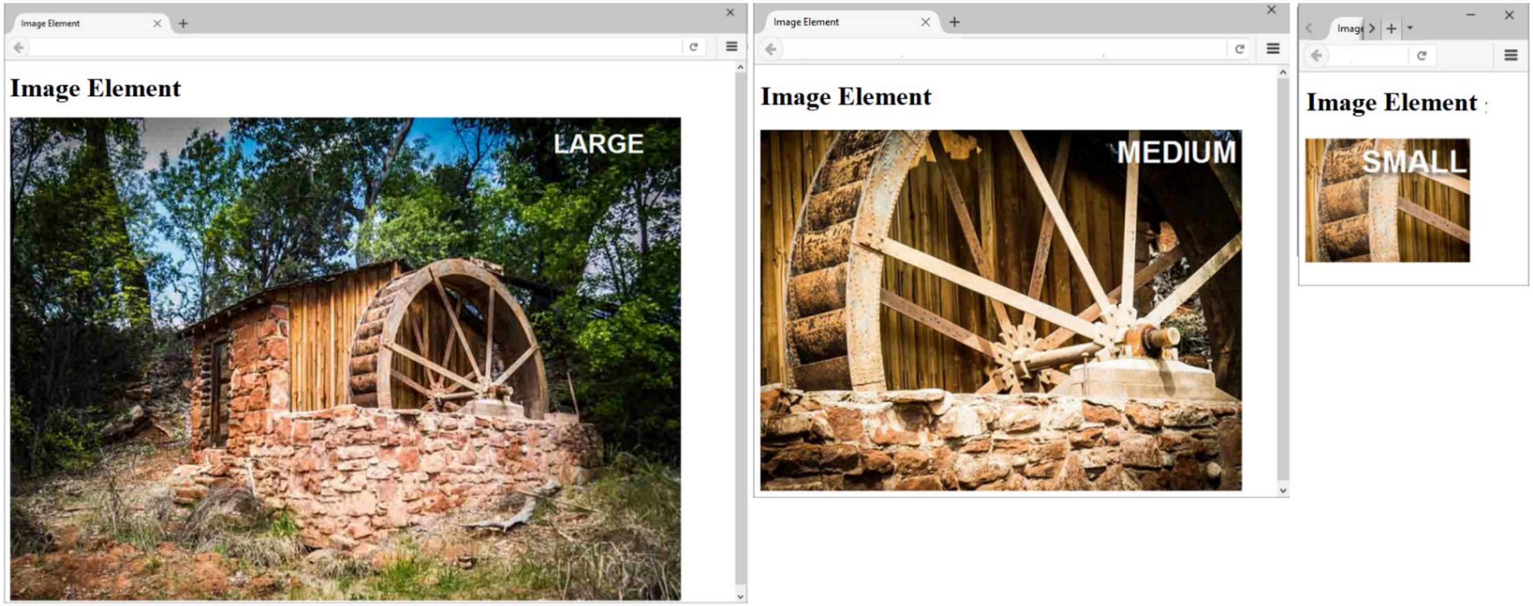
Picture Element

Picture Element

Picture Element

Responsive image with the picture element

Responsive Images HTML 5.1 sizes & srcset Attributes



Responsive image with the image element’s srcset attribute

```
<img src="fallback.jpg"
      sizes="100vw"
      srcset="large.jpg 1200w, medium.jpg 800w,
small.jpg 320w"
      alt="waterwheel">
```

Checkpoint (2 of 2)

1. What is meant by the phrase "Mobile First"?
2. Are there certain values that must be used in CSS media queries? Why or why not?
3. Describe coding techniques that will configure an image with a flexible display.

Testing Mobile Display Options

- **Test with a mobile device**
- **Test with a Desktop Browser**
- **Other Options**
  - **Opera Mobile Emulator**
    https://dev.opera.com/articles/opera-mobile-emulator/
  - **Google Chrome Dev Tools**
    https://developers.google.com/web/tools/chrome-devtools/device-mode/
  - **iPhone Emulator**
    http://www.testiphone.com

CSS Debugging Tips

- Manually check syntax errors
- Use W3C CSS Validator to check syntax errors

  http://jigsaw.w3.org/css-validator/
- Configure temporary background colors
- Configure temporary borders
- Use CSS comments to find the unexpected

  /* the browser ignores this code */
- Don't expect your pages to look exactly the same in all browsers!
- Be patient!

Summary

- This chapter introduced you to modern layout techniques which configure responsive web pages that display well on desktop browsers and mobile devices.