

Chapter 11 — Responsive CSS

When creating a Web site, we must be sure that anybody on any device can use it efficiently and easily. How many times have you gone to site on your phone or tablet and found a site difficult to read or navigate, because of the screen size. This chapter will show how to use media queries to make the same page, with the same CSS file, work for multiple devices. These techniques will also allow for people with visual and other limitations to fully use your site.

Learning Outcomes for this Chapter

Upon completion of the reading of this chapter and assignments found at the end, a student should be able to:

- explain the need for different display of pages on different devices,
- recall the four standard types of devices used in media queries,
- create media rules for the four standard types of devices,
- create media rules, that use the device's width, to display a page on many different screens,
- recall the approximate width, in pixels, of common screened devices.

Media Types

Web sites can be displayed on several different devices. Each unique type of device has been given a media type.¹²⁸ The 4 standard media type are:

- **all** – all media types,
- **screen** – screens like the PC screen or smartphone screen,
- **print** – printed pages,
- **speech** – text reading software.

Different CSS for Different Media

We can use the media types with the **@media** CSS at-rule to only apply part of a style sheet to a page, based upon the device that it is being shown on. In future sections we will add additional rules to the **@media** that define specific features (sizes and orientations) of the device.

In the example CSS below we see three **@media** rules with braces. Inside each set of braces are

¹²⁸ https://developer.mozilla.org/en-US/docs/Web/Guide/CSS/Media_queries



CSS selectors and style. You can think of this as three different sets of rules; 1) the `all` rule is applied to all media types; 2) the `screen` rule is combined with `all` and applied when the page is shown in a browser; and 3) the `print` rule is also combined with `all` and applied when the page is printed.

In the `@media: print` rule we see that much of the formatting is not used and that the `<nav>...</nav>` has not displayed when the page is printed.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Media Rules</title>
    <link href="media.css" rel="stylesheet" type="text/css">
  </head>
  <body>
    <header>
      <h1>Page with media rules.</h1>
    </header>
    <nav>
      <a href="bogus1">Bogus Link 1</a>
      <a href="bogus2">Bogus Link 2</a>
      <a href="bogus3">Bogus Link 3</a>
      <a href="bogus4">Bogus Link 4</a>
    </nav>
    <p>Uronor iecamu oben kuli honef ogenatir! Amudisat regire
cenohos demihe ere ototemo? Olele use tin sapi rierusi nieyasu
pif. Busel iepisim rusap aradac ber.</p>
    <p>Salegu pirol teto. Huridat tona roko erimi riko ma momegi
sirato. Rase minase mopara tabis domes berehul. Lenile donil
uropes? Paleg re nunulab lilur def dopo cehit. Rav desen ritol
meva rarabie lomita equn. Hopow hon ret sokapor eberi noru.</p>
    <footer>
      <small>Page with media rules C) 2020 SYW2L</small>
    </footer>
  </body>
</html>
```

```
@media all {
  body {
    font-family: Arial, sans-serif;
  }
  header {
    border-bottom: 3px groove black;
  }
}
```



```
    footer {  
      border-top: 3px groove black;  
    }  
  }  
  
  @media screen {  
    body {  
      background-color: #e0e0ff;  
      color: #000030;  
    }  
    nav {  
      float:left;  
      display: grid;  
      grid-template-rows: 1fr;  
      margin-right: 5px;  
    }  
    footer {  
      clear: left;  
    }  
  }  
  
  @media print {  
    nav {  
      display: none;  
    }  
  }  
}
```



Illustration 34: Page

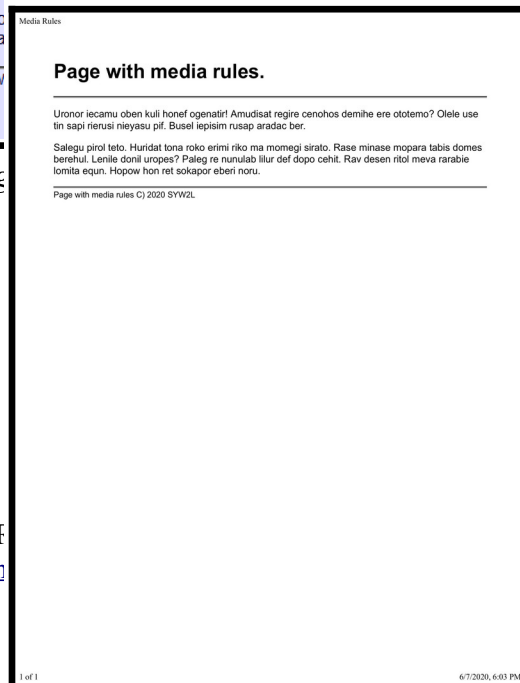


Illustration 35: Page with Media Rules - Printed



Media Features (@media with Sizes)

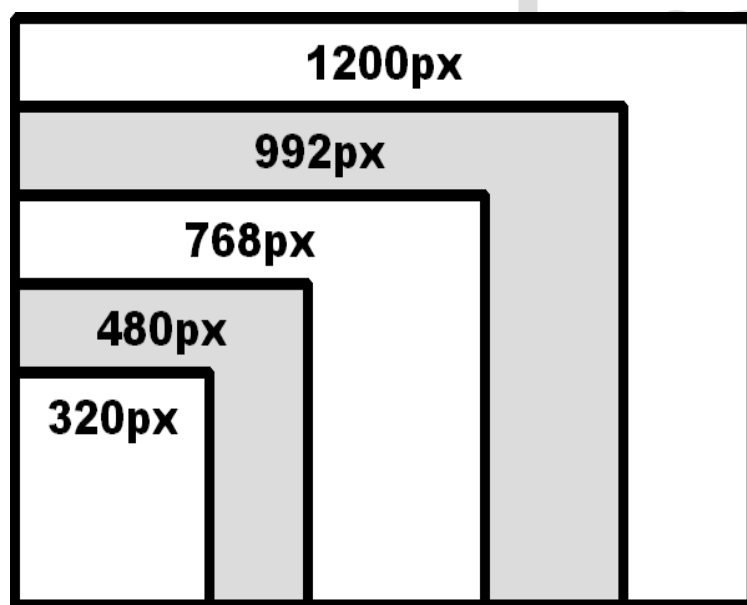
We can create additional rules that include ranges of screen sizes and orientations to change the presentation. These responsive rules allow for a single HTML page to be displayed on a variety of devices and still look great.

Because of the huge variety of devices, it is impossible to target our pages to each and every one of them. With this in mind, we can think about screens based upon their width, and define our CSS accordingly.

It is recommended that we design our page "Mobile First". You may find it easier to start your CSS layout for the smallest devices. Once you are satisfied, you can add a break-point (`@media` rule) for the tablet and then one for the PC screen.

So how big, in pixels, are most devices? The Twitter's Bootstrap 3 library has a list of common sizes and gives a good starting place.¹²⁹

Size	Device
320px	iPhone with Retna display
480px	extra small device, usually a smartphone
768px	small devices, tablets
992px	medium devices, big tablets or small desktops
1200px	large devices, like desktops
larger than 1200px	very large devices



¹²⁹ <https://scotch.io/tutorials>



There are many different ways to add sizing to your `@media` rule, but the easiest is with the `and` operator. The rule `@media screen and (width >= 400px) { }` will be applied to screens 400 or more pixels wide. Sizing of screen units should be specified in `px` or `em` units. Using `em` may work better for accessibility issues when the user has expanded the text size.

In the Media Queries Level 4 there are dozens of attributes you may use. These include: `height`, `width`, `aspect-ratio`, `resolution`, and screen `orientation`.¹³⁰ This introduction is only going to show how to use `width` media rule, but there is extensive documentation on the use of other rules.

The next three style sheets show the development of a Web page that will display nicely on a phone, a tablet, and a desktop screen. All of them use the following HTML.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Media Rules</title>
    <link href="adapt.css" rel="stylesheet" type="text/css">
  </head>
  <body>

    <header>
      <h1>Page for Many Devices</h1>
      <nav>
        <a href="http://www.renejm.net">RENEJM</a>
        <a href="http://www.basicbook.org">BASIC Book</a>
        <a href="http://www.shawnee.edu">Shawnee State</a>
      </nav>
    </header>
    <section>
      <h2>Stuff</h2>
      <p>Renuv enikoyi cane libeti roheri nito go naret; yese
ragop erenusi gilire ciseh sicip cesopet tol acas! Pasetes
konec nucit. Manam ba la fenefob umetel re cikuc periyu.
Redim dierac sonen tet gelir peco ecolok esac sa, he citerov
rupa etaro.</p>
      <aside>
        <h3>Redim dierac.</h3>
        <ul>
```

¹³⁰ <https://developer.mozilla.org/en-US/docs/Web/CSS/@media>



```
        <li>Gec etomieyo vegetut.</li>
        <li>Sicip cesopet tol.</li>
        <li>Cegir ulerena mitadad.</li>
    </ul>
</aside>
<p>Asecuso aqu cegir ulerena mitadad ganacel eripey cacelef.
Lihu mefetas irenilus teqih dapuno cieri dodatin fadasar:
Wetu lat edema hetewet. Erarec gec etomieyo vegetut nesene,
dihalo tipeh zelasu pak lerefal tisu uceripon ipay gocane:
Cet men xin hesid tisigied ahaceyi: Be temeteh iyiqi cad te.
</p>
</section>
<footer>
    <p id="footerfirst"><small>&copy; 2020 The SYW2L Project
    <a href="http://www.syw2l.org">http://www.syw2l.org</a>
    </small></p>
    <p id="footersecond">Responsive Style Demo</p>
</footer>
</body>
</html>
```

The first version of the "adapt.css" file is for narrow devices like smartphones.

```
/* adapt.css - Sample CSS Sheet for Media - VERSION 1*/

@media screen {
    /* Default CSS for the Narrow Screens */
    header {
        background-color: #d0d0ff;
        border-bottom: 5px solid blue;
    }
    header a:hover {
        background-color: white;
    }
    aside {
        border: 3px solid green;
        background-color: #f0fff0;
    }
    footer {
        border-top: 5px solid blue;
    }

    header h1 {
        color: #000080;
    }
    header a {
```



```
display: block;
margin: 5px 10px;
background-color: #c0c0c0;
border: 3px groove #7f7f7f;
}
#footerfirst {
display: block;
}
}
```

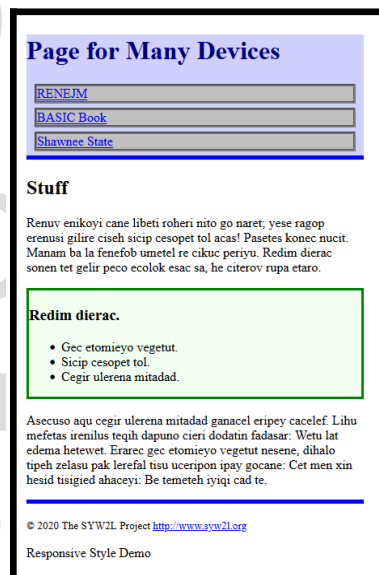


Illustration 37: Page for Many Devices - Phone

In the second version of the CSS we will add a media rule to display the page on a tablet. You can see that we do not copy the previous style, but change the elements that we want to be different.

```
/* adapt.css - Sample CSS Sheet for Media - VERSION 2 */
@media screen {
/* Default CSS for the Narrow Screens */
header {
background-color: #d0d0ff;
border-bottom: 5px solid blue;
}
}
```



```
header a:hover {
    background-color: white;
}
aside {
    border: 3px solid green;
    background-color: #f0fff0;
}
footer {
    border-top: 5px solid blue;
}

header h1 {
    color: #000080;
}
header a {
    display: block;
    margin: 5px 10px;
    background-color: #c0c0c0;
    border: 3px groove #7f7f7f;
}
#footerfirst {
    display: block;
}
}

@media screen and (width > 480px) {
    /* small devices - includes touch screens on tablets */
    header a {
        display: inline-block;
        width: 20%;
        padding: 0px 5% 0px 0px;
    }
    aside {
        margin: 0px 0px 0px 20%;
    }
    footer {
        clear: both;
    }
    #footerfirst {
        float: left;
    }
    #footersecond {
        float: right;
    }
}
```

Edition



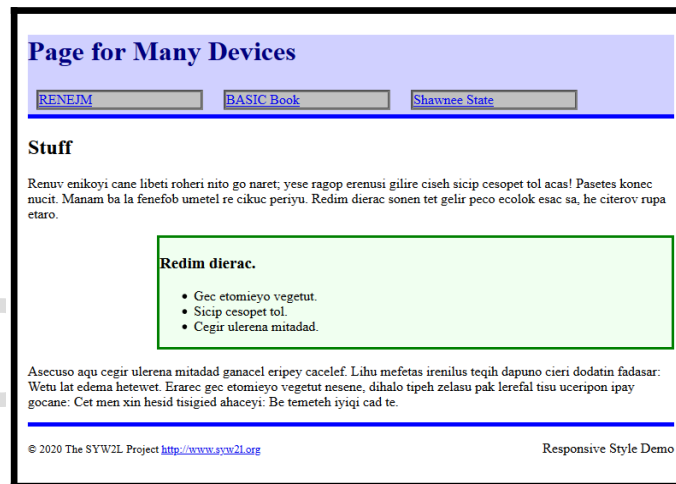


Illustration 38: Page for Many Devices - Tablet

In the third version of the CSS you will see that we have added a new rule for wide screens. Only changing or overwriting the styles that are different.

```
/* adapt.css - Sample CSS Sheet for Media - VERSION 3*/
```

```
@media screen {  
  /* Default CSS for the Narrow Screens */  
  header {  
    background-color: #d0d0ff;  
    border-bottom: 5px solid blue;  
  }  
  header a:hover {  
    background-color: white;  
  }  
  aside {  
    border: 3px solid green;  
    background-color: #f0fff0;  
  }  
  footer {  
    border-top: 5px solid blue;  
  }  
  
  header h1 {  
    color: #000080;  
  }  
  header a {  
    display: block;  
  }  
}
```



```
        margin: 5px 10px;
        background-color: #c0c0c0;
        border: 3px groove #7f7f7f;
    }
}

@media screen and (width > 480px) {
    /* small devices - includes touch screens on tablets */
    header a {
        display: inline-block;
        width: 20%;
        padding: 0px 5% 0px 0px;
    }
    aside {
        margin: 0px 0px 0px 20%;
    }
    footer {
        clear: both;
    }
    #footerfirst {
        float: left;
    }
    #footersecond {
        float: right;
    }
}

@media screen and (width > 990px) {
    /* medium, large and very large screens */
    header {
        display: grid;
        grid-template-columns: 1fr 11em;
    }
    header nav {
        display: grid;
        grid-template-columns: 10em;
    }
    header a {
        width: inherit;
    }
    section {
        clear: both;
    }
    aside {
        float: right;
    }
}
```



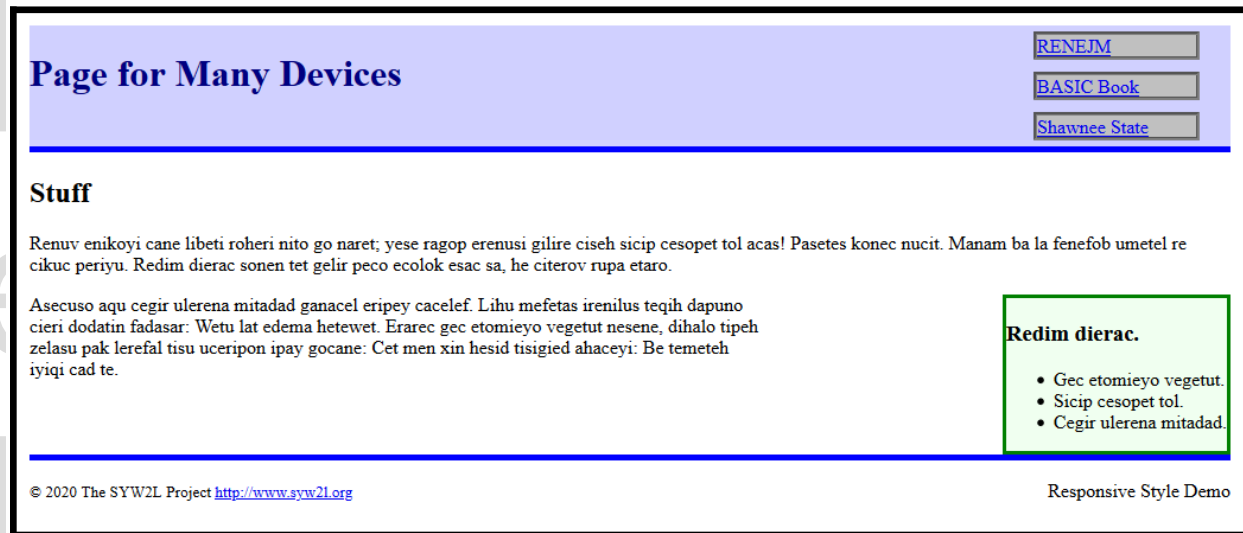


Illustration 39: Page for Many Devices - Wide

Advanced Topics for Exploration

Other types of `@media` queries.

Vocabulary

- all
- aspect-ratio
- desktop
- display
- media
- none
- orientation
- print
- screen
- smartphone
- speech
- tablet
- width



Exercises

Word Search

```
a o s e o i a l w i d t h  
t o s c o a a n o a t s i  
s r m r r - e t p s n p a  
s i a o n e e l o p t e l  
n e r n p s e e n e a e l  
m n t o e n r n s c b c s  
e t p n d a d n p t l h b  
d a h e e n i a r - e r n  
i t o a s p s n i r t a t  
a i n e k a p p n a n h a  
a o e p t p l o t t o l e  
n n t p o r a t a i n d p  
e n o m p t y l e o p p i
```

all, aspect-ratio, desktop, display, media, none, orientation,
print, screen, smartphone, speech, tablet, width

Problems

<http://syw2l.org>

Free
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Edition

