

```
<!DOCTYPE html>
<html>
<head>
  <title>CSCI 111 Web Programming and Problem Solving</title>
</head>
<body>
  <h1>Week-5-Lecture</h1>
  <h2>Responsive Web Design</h2>
  <ul>
    <li>Dr. Talgat Manglayev</li>
    <li>Dr. Irina Dolzhikova</li>
    <li>Marat Isteleyev</li>
  </ul>
</body>
</html>
```



outline

```
<h1>Responsive Web Design</h1>
```

```
<ol>
```

```
  <li>What is RWD?</li>
```

```
  <li>Main Strategies
```

```
    <ol>
```

```
      <li>Viewport</li>
```

```
      <li>Grid View</li>
```

```
      <li>Media Queries</li>
```

```
      <li>Flexible Layouts</li>
```

```
      <li>Responsive Images</li>
```

```
      <li>Relative Units</li>
```

```
    </ol>
```

```
  </li>
```

```
</ol>
```

What is Responsive Web Design

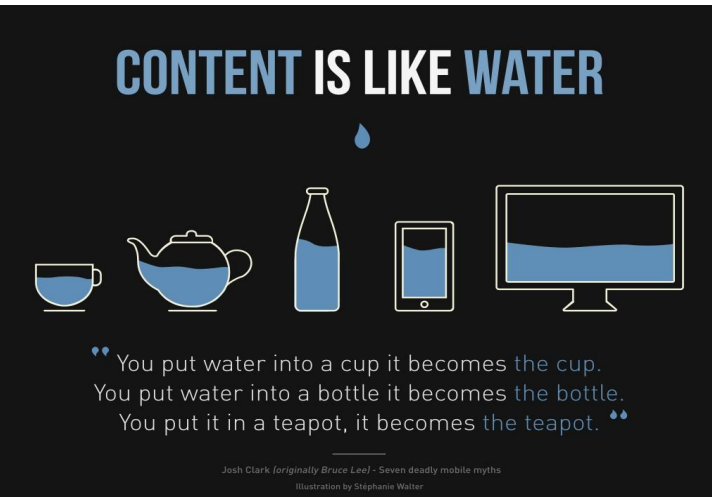


What is Responsive Web Design? “Be Water”



What is Responsive Web Design? “Be Water”

- **Responsive web design** refers to a design strategy to make websites render correctly for various devices (mobile, tablet, laptop and desktop). It uses **only** HTML and CSS.



It is called Responsive Web Design when you use CSS and HTML to **resize**, **hide**, **shrink**, **enlarge**, or **move** the content to make it look good on any screen.

Device Statistics

Mobile

62.03%

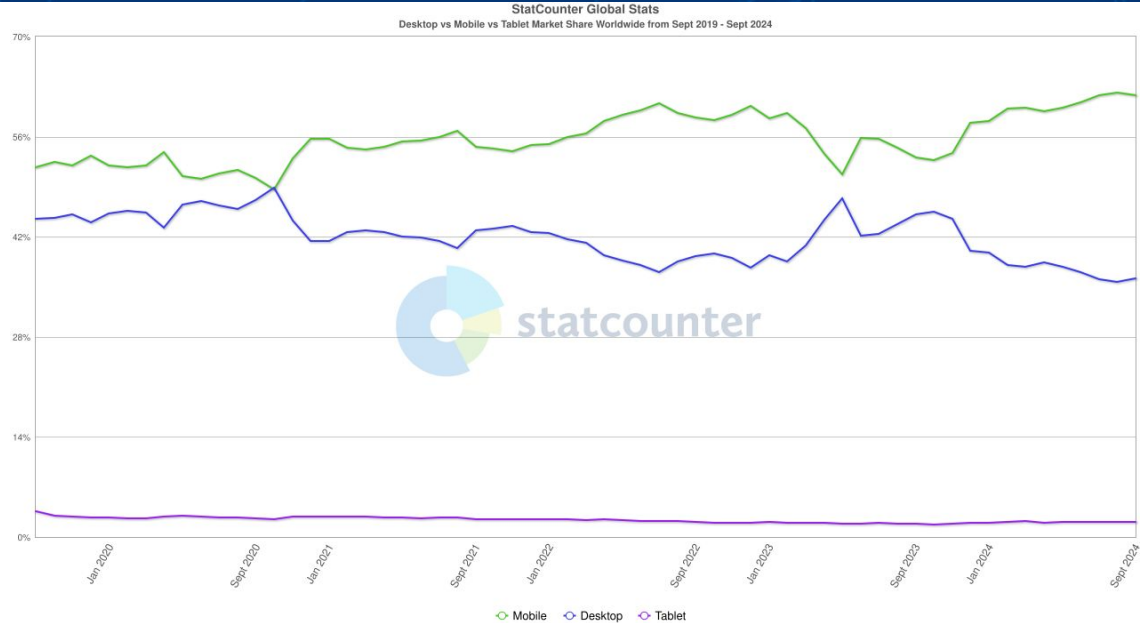
Desktop

35.84%

Tablet

2.13%

Desktop vs Mobile vs Tablet Market Share Worldwide - August 2024



<https://gs.statcounter.com/platform-market-share/desktop-mobile-tablet/worldwide/#monthly-201909-202409>

Main Strategies

- Viewport
- Grid View
- Media queries
- Flexible layouts
- Responsive images
- Relative units

Viewport

RWD strategy Viewport is added by:

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

The **viewport** is the user's visible area of a web page.

Content is sized to the **viewport** and the **scaling factor** set to 1

Some key points to follow:

1. Do NOT use large fixed width elements
2. Do NOT let the content rely on a particular viewport width to render well
3. Use CSS media queries to apply different styling for small and large screens

Grid View

Many web pages are based on a **grid-view** and divided into columns:

- a responsive grid-view often has **12 columns**
- the **percentage** for one column: $100\% / 12 \text{ columns} = 8.33\%$
- the columns should be **floating** to the left and other elements **cleared**
- make **one class** for each of the 12 columns: `.col-1 {width: 8.33%;}`, etc.
- The columns should be wrapped with a **row**, where they **add up** to 12

Media Queries

Media queries are **@media** rules used to change CSS properties if some conditions are true

```
@media not|only mediatype and (mediafeature and|or|not mediafeature)  
{  
    CSS-Code;  
}
```

mediatype: all, print, **screen**, speech

mediafeature: max-width, min-width, orientation, etc.

Media Queries

Media queries use **breakpoints** (screen sizes) to decide how content needs to be rendered

Common breakpoints (in pixels):

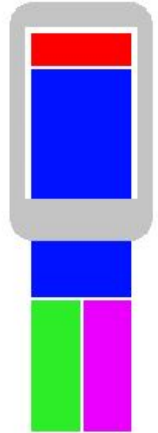
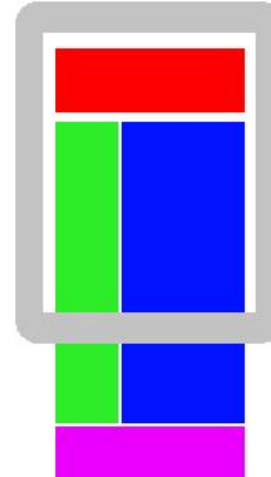
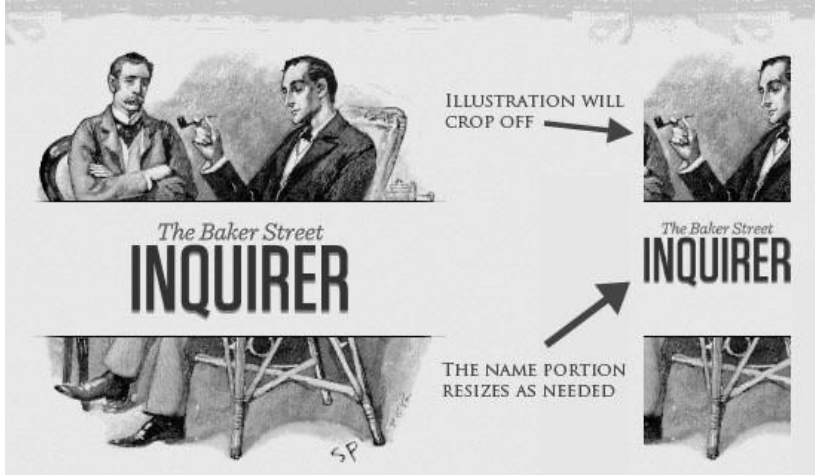
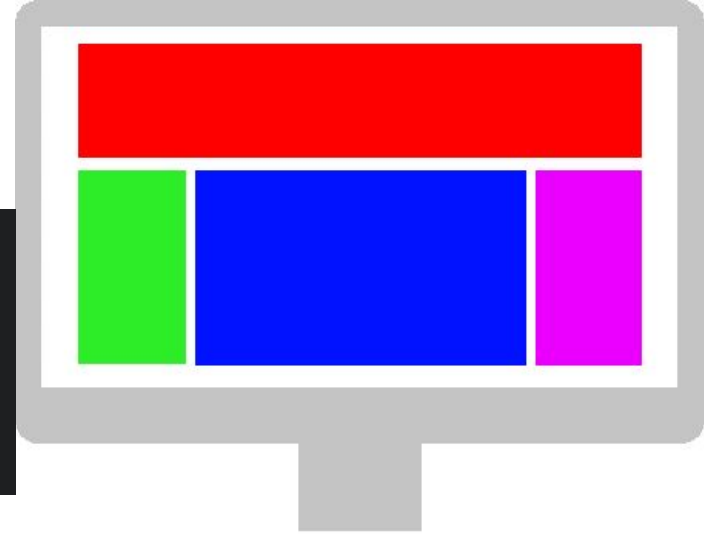
- **Mobile:** up to 767
- **Tablet:** 768 – 1023
- **Desktop:** 1024 – 1179
- **Desktop (extra):** 1200 +

```
@media screen and (min-width: 768px)
{
  p
  {
    width: 100%;
    background-color: lightblue;
  }
}
```

Flexible Layout

Website layout can be optimized for a device's screen size:

- reposition elements
- resize elements (images)
- hide or partially show elements



Responsive images

Some techniques to make images responsive:

- Set **max-width** and **height**
- Use **picture** and **srcset**
- Vectors (svg) vs Bitmap (jpg)

img

```
{  
    max-width: 100%;  
    height: auto  
}
```

<picture>

```
<source srcset="small.jpg" media="(max-width: 768px)">  
<source srcset="medium.jpg" media="(max-width: 1024px)">  
<source srcset="large.jpg">  
  
</picture>
```



Relative Units

Use relative units for width/height, font size, etc.

percentage (width: 100%)

em (font size: 1 em)

vw, vh, vmin, vmax (height: 100vh)

Summary

Content is like water, so target all types of devices (mobile, tablet, laptop, desktop)

To make your website responsive, use RWD strategies:

- Viewport
- Grid view
- Media queries
- Flexible layouts
- Responsive images
- Relative units

bonus info