```
<!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>
```

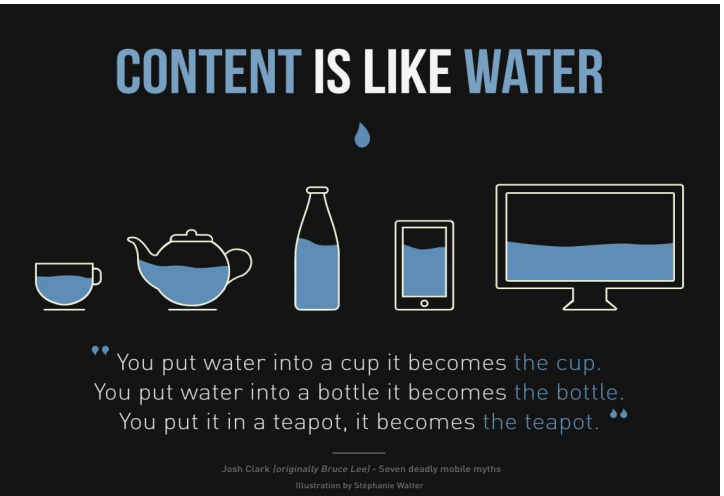
**https://www.w3schools.com/html/html_responsive.asp**

# 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.

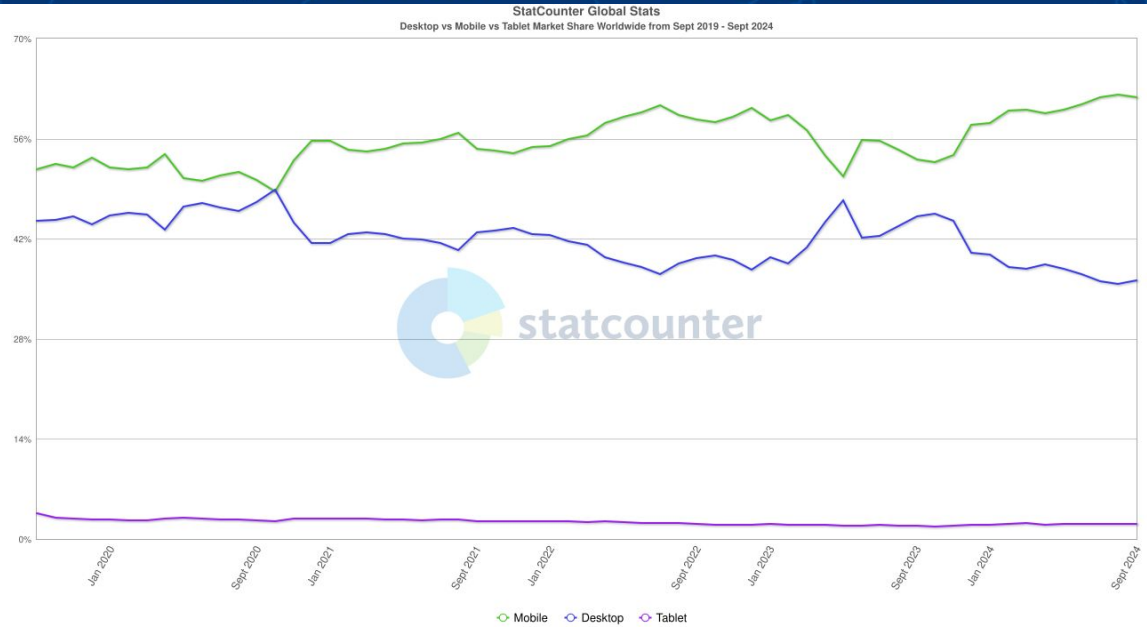



It is called Responsive Web Design when you use CSS and HTML to **resize**, **hide**, **shrink**, **enlarge**, or **move** the content to make it look good on any screen.

# Device Statistics

| Mobile | Desktop | Tablet |
| --- | --- | --- |
| 62.03% | 35.84% | 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 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):

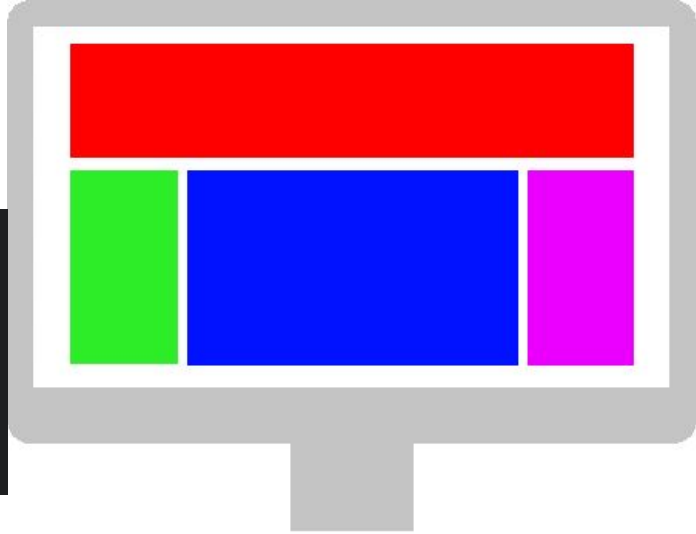
- **Mobile**: up to 767
- **Tablet**: 768 – 1023
- **Desktop**: 1024 – 1179
- **Desktop (extra):** 1200 +

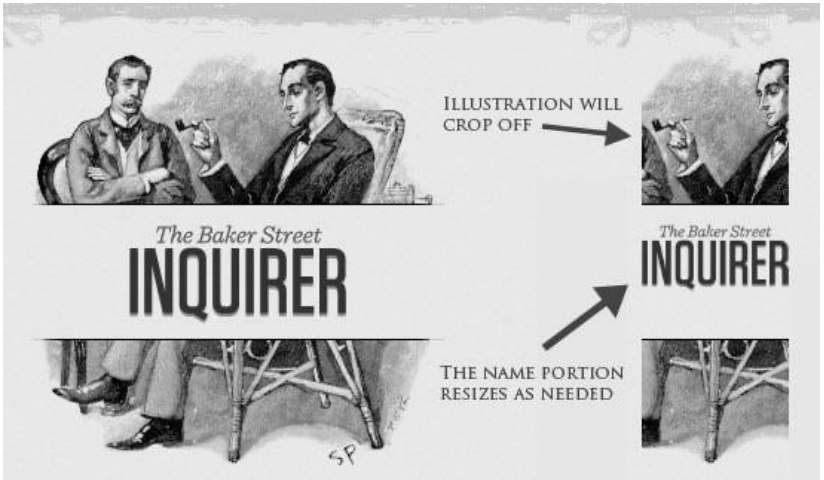
```
@media screen and (min-width: 768px)
{
p
    {
      width: 100%;
      background-color: lightblue;
    }
}
```

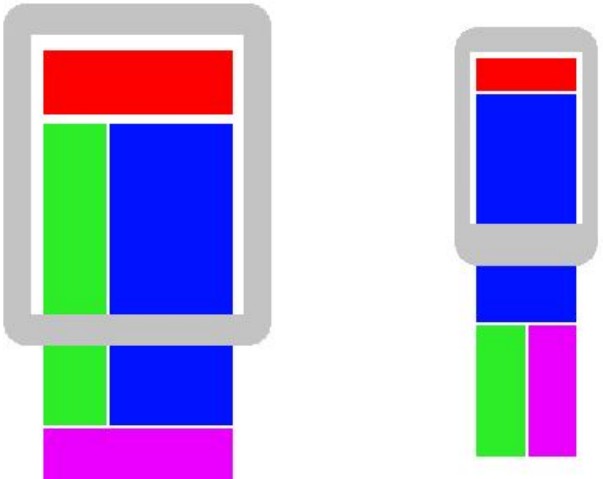
# Flexible Layout

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">
   <img src=”medium.jpg" alt=”Medium image">
 </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