

```
<!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>Talgat Manglayev</li>
    <li>Irina Dolzhikova</li>
    <li>Aigerim Yessenbayeva</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”

Design strategy to make websites render correctly for devices with various display size (mobile, tablet, laptop and desktop).

It uses **only** HTML and CSS.

## CONTENT IS LIKE WATER



“ You put water into a cup it becomes **the cup**.  
You put water into a bottle it becomes **the bottle**.  
You put it in a teapot, it becomes **the teapot**. ”

Josh Clark (originally Bruce Lee) - Seven deadly mobile myths

Illustration by Stéphanie Walter

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

62.71%

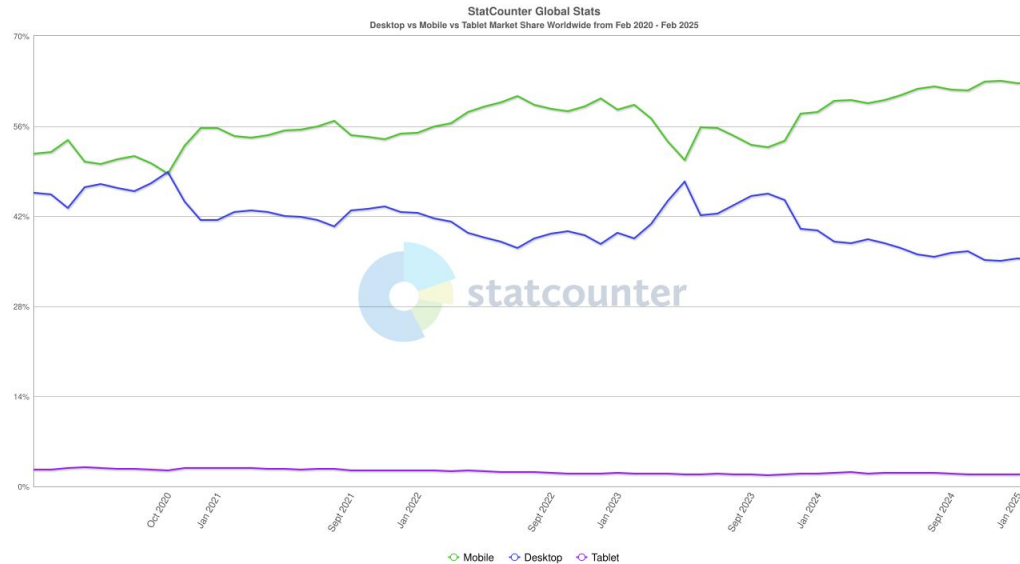
Desktop

35.4%

Tablet

1.88%

Desktop vs Mobile vs Tablet Market Share Worldwide - January 2025



<https://gs.statcounter.com/platform-market-share/desktop-mobile-tablet/worldwide/#monthly-202002-202502>

# Main Strategies

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

# Viewport

1-viewport-example.html

1-image-resize-example.html

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):

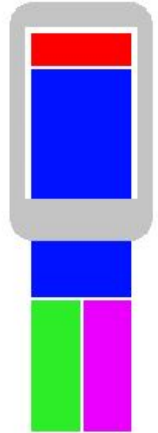
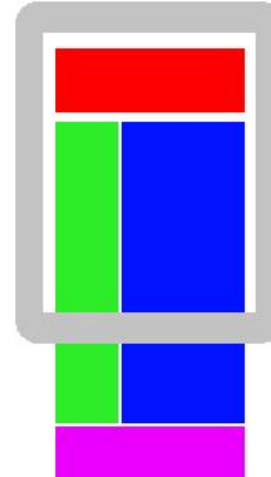
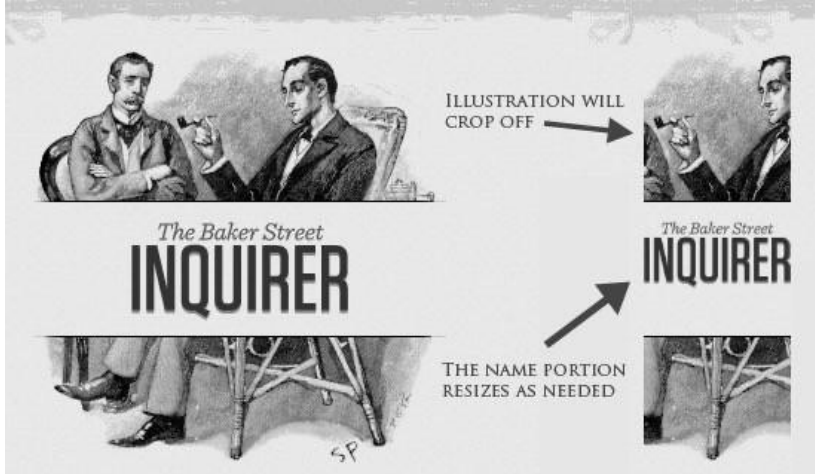
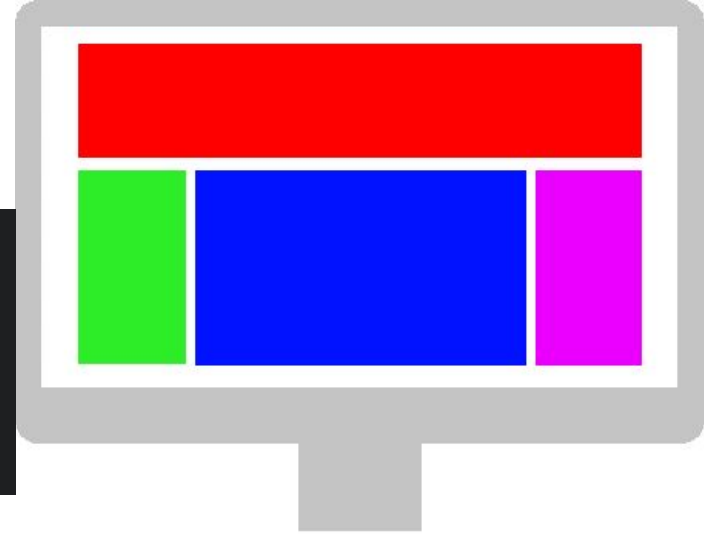
- **Mobile:** up to 767
- **Tablet:** 768 – 1023
- **Desktop:** 1024 – 1179
- **Desktop (extra):** 1200 +

```
@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%;  
}
```

**<picture>**

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

[https://www.w3schools.com/html/tryit.asp?filename=tryhtml\\_responsive\\_picture](https://www.w3schools.com/html/tryit.asp?filename=tryhtml_responsive_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

# Website templates

You can develop website layout using popular [bootstrap 3 framework](#).  
It has HTML, CSS and JavaScript.

There are lots of free ready to use [website templates](#) for desktop and for mobile devices.

You are recommended to use templates in your course project.  
But html and css code that is already in templates is not counted for grading.



**bonus info**