Chapter 20: Length Units

Unit	Description
%	Define sizes in terms of parent objects or current object dependent on property
em	Relative to the font-size of the element (2em means 2 times the size of the current font)
rem	Relative to font-size of the root element
vw	Relative to 1% of the width of the viewport*
vh	Relative to 1% of the height of the viewport*
vmin	Relative to 1% of viewport's* smaller dimension
vmax	Relative to 1% of viewport's* larger dimension
cm	centimeters
mm	millimeters
in	inches (1in = 96px = 2.54cm)
px	pixels (1px = 1/96th of 1in)
pt	points (1pt = 1/72 of 1in)
pc	picas (1pc = 12 pt)
s	seconds (used for animations and transitions)
ms	milliseconds (used for animations and transitions)
ex	Relative to the x-height of the current font
ch	Based on the width of the zero (0) character
fr	fractional unit (used for CSS Grid Layout)

A CSS distance measurement is a number immediately followed by a length unit (px, em, pc, in, …)

CSS supports a number of length measurements units. They are absolute or relative.

Section 20.1: Creating scalable elements using rems and ems

Version ≥ 3

You can use `rem` defined by the `font-size` of your `html` tag to style elements by setting their `font-size` to a value of `rem` and use `em` inside the element to create elements that scale with your global `font-size`.

HTML:

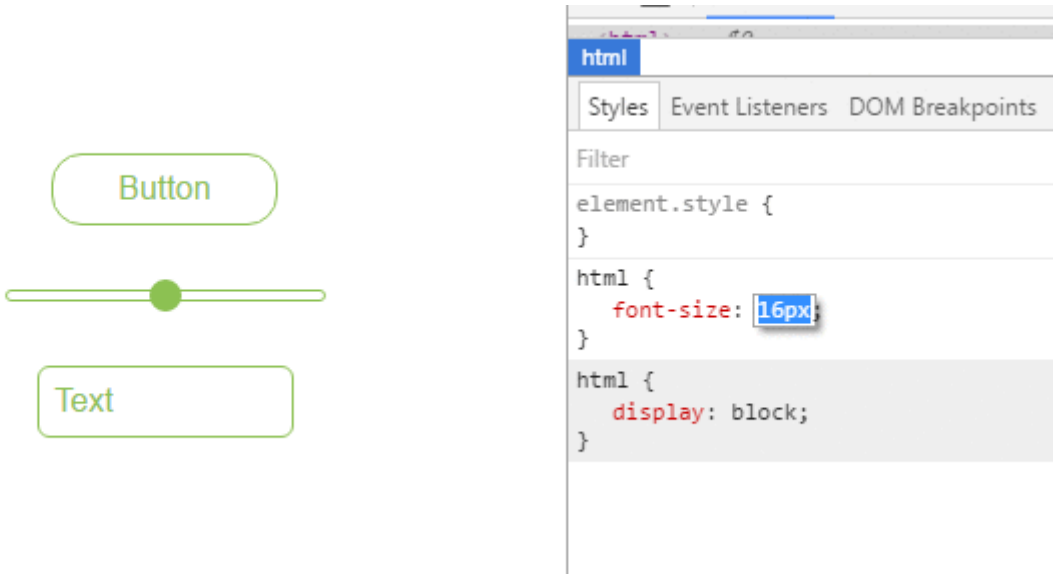
```
<input type="button" value="Button">
<input type="range">
<input type="text" value="Text">
```

Relevant CSS:

```
html {
  font-size: 16px;
}

input[type="button"] {
  font-size: 1rem;
  padding: 0.5em 2em;
}

input[type="range"] {
  font-size: 1rem;
```

```
  width: 10em;
}

input[type=text] {
  font-size: 1rem;
  padding: 0.5em;
}
```

Possible Result:



Section 20.2: Font size with rem

CSS3 introduces a few new units, including the `rem` unit, which stands for "root em". Let's look at how `rem` works.

First, let's look at the differences between `em` and `rem`.

- **em**: Relative to the font size of the parent. This causes the compounding issue
- **rem**: Relative to the font size of the root or **`<html>`** element. This means it's possible to declare a single font size for the html element and define all `rem` units to be a percentage of that.

The main issue with using `rem` for font sizing is that the values are somewhat difficult to use. Here is an example of some common font sizes expressed in `rem` units, assuming that the base size is 16px :

- 10px = 0.625rem
- 12px = 0.75rem
- 14px = 0.875rem
- 16px = 1rem (base)
- 18px = 1.125rem
- 20px = 1.25rem
- 24px = 1.5rem
- 30px = 1.875rem
- 32px = 2rem

CODE:

Version ≥ 3

```
html {
  font-size: 16px;
}
```

```
h1 {
  font-size: 2rem;          /* 32px */
}

p {
  font-size: 1rem;          /* 16px */
}

li {
  font-size: 1.5em;         /* 24px */
}
```

Section 20.3: vmin and vmax

- **vmin**: Relative to 1 percent of the viewport's smaller dimension
- **vmax**: Relative to 1 percent of the viewport's larger dimension

In other words, 1 `vmin` is equal to the smaller of *1 vh* and *1 vw*

1 `vmax` is equal to the larger of *1 vh* and *1 vw*

Note: `vmax` is not supported in:

- any version of Internet Explorer
- Safari before version 6.1

Section 20.4: vh and vw

CSS3 introduced two units for representing size.

- `vh`, which stands for `viewport height` is relative to 1% of the viewport height
- `vw`, which stands for `viewport width` is relative to 1% of the viewport width

`Version ≥ 3`

```
div {
  width: 20vw;
  height: 20vh;
}
```

Above, the size for the div takes up 20% of the width and height of the viewport

Section 20.5: using percent %

One of the useful unit when creating a responsive application.

Its size depends on its parent container.

Equation:

> (Parent Container`s width) * (Percentage(%)) = Output

For Example:

Parent has **100px** width while the *Child* has **50%**.

On the output, the *Child*'s width will be half(50%) of the *Parent*'s, which is **50px**.

HTML

```
<div class="parent">
   PARENT
   <div class="child">
     CHILD
   </div>
</div>
```

CSS

```
<style>

*{
  color: #CCC;
}

.parent{
  background-color: blue;
  width: 100px;
}

.child{
  background-color: green;
  width: 50%;
}

</style>
```

OUTPUT