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:

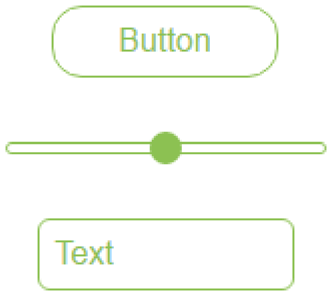
```
<input type="button" value="Button">
<input type="range">
<input type="text" value="Text">
```

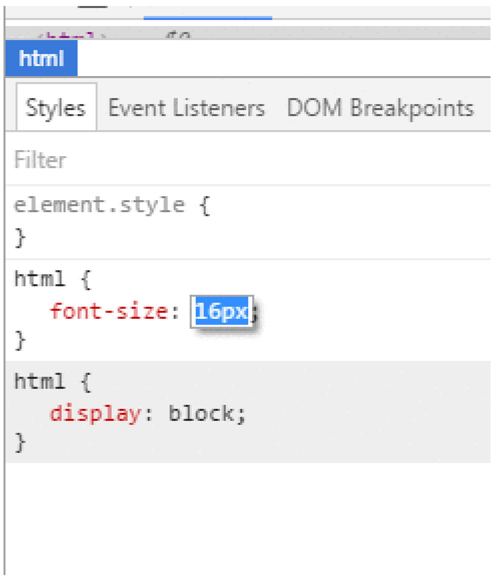
Relevant CSS:

```
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:





```
element.style {
}
html {
    font-size: 16px;
}
html {
    display: block;
}
```

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**.

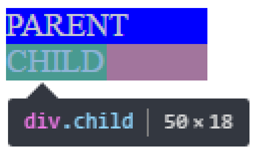
HTML

```
<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



```
PARENT
CHILD
```