The CSS Box Model

The CSS box model

margin-top

border-top

padding-top

height

margin-right
border-right
padding-right

This is the content.
It just shows the text.

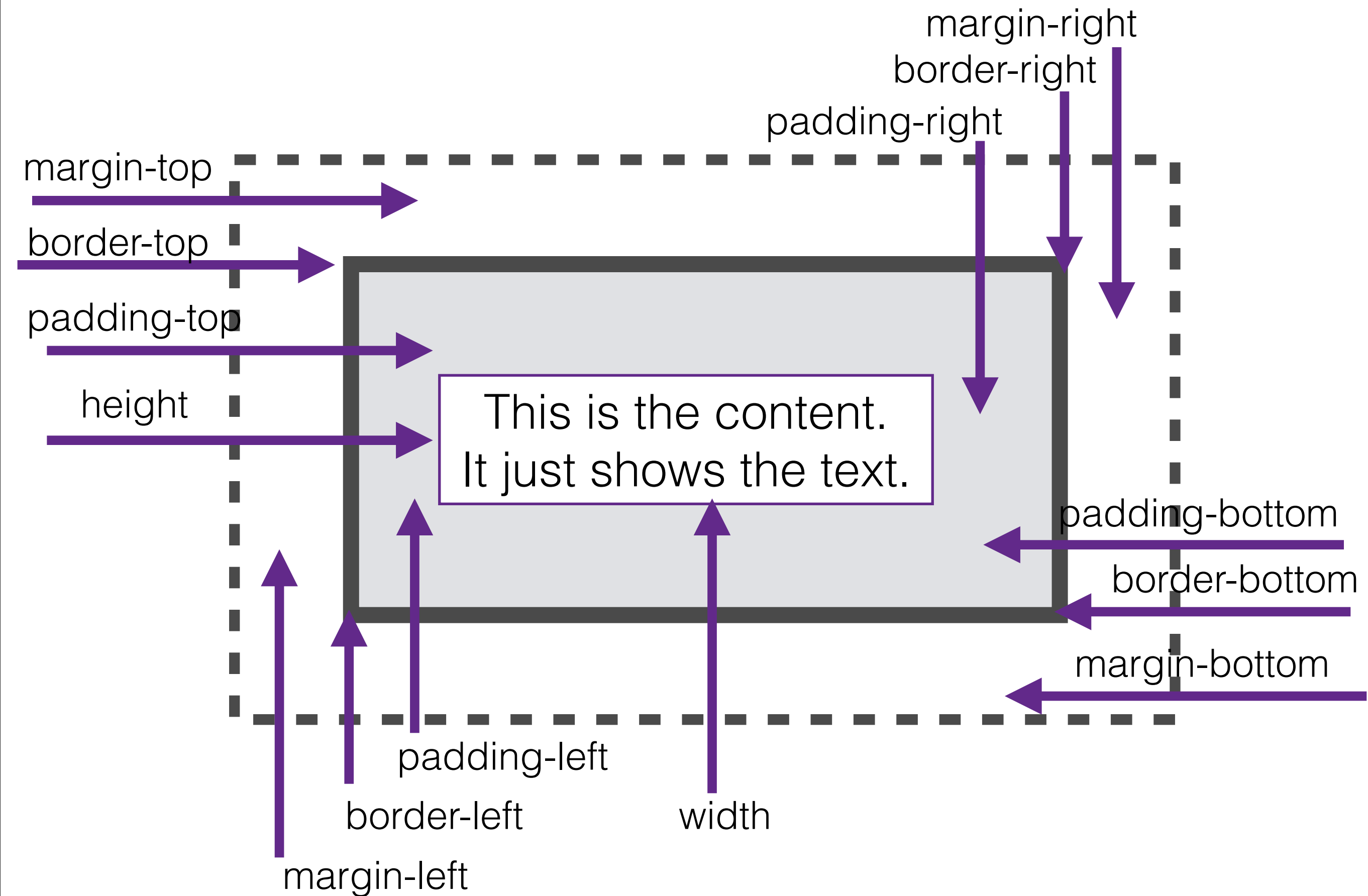padding-bottom

border-bottom

margin-bottom

padding-left

border-left

width

margin-left

The CSS box model

- The CSS box model lets you work with the boxes that a browser places around each block element as well as some inline elements. This lets you add formatting such as margins, padding, and borders.
- By default, the box for a block element is as wide as the block that contains it and as tall as it needs to be based on its content.

The formula for calculating the height of a box

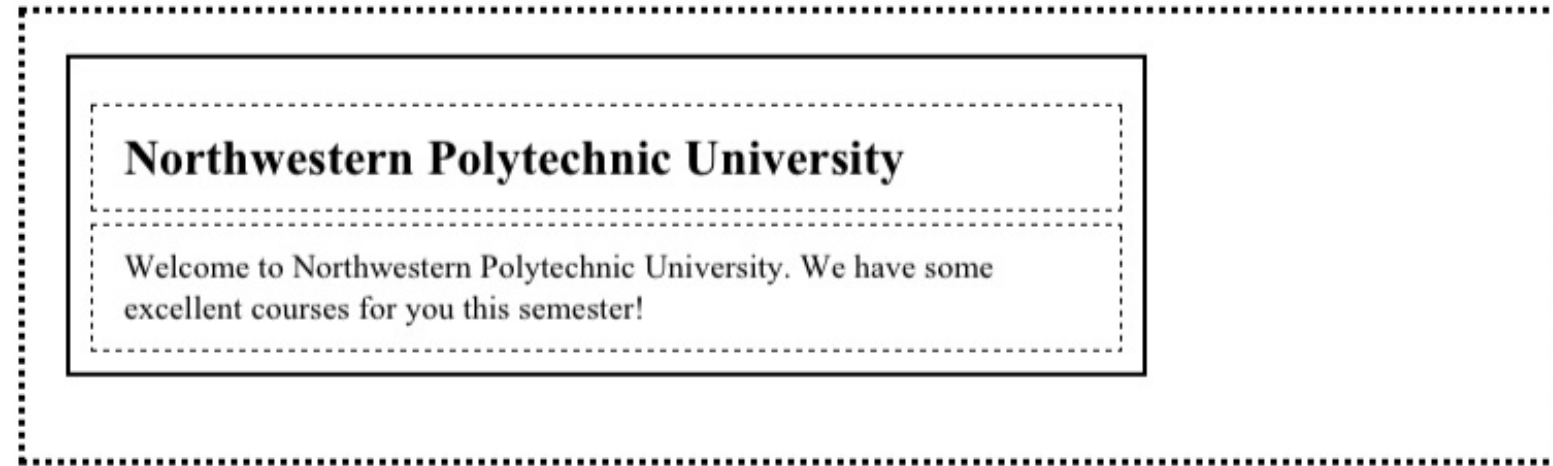top margin + top border + top padding + height + bottom padding + bottom border + bottom margin

The formula for calculating the width of a box

left margin + left border + left padding + width + right padding + right border + right margin

Example

```
<!doctype html >
<html >
    <head>
        <title>Box Model</title>
        <style>
            body {
                border: 3px dotted black;
                margin: 10px;
                padding-bottom: 20px;
            }
            section {
                border:  2px solid black;
                width:   500px;
                margin:  20px;   /* all four sides */
                padding: 10px;   /* all four sides */
            }
            h1, p {
                border: 1px dashed black;
                padding: 10px;
            }
            h1 {
                margin:  .5em 0 .25em;  /* .5em top, 0 right and left, .25em bottom */
                padding-left: 15px;
            }
            p {
                margin: 0;      /* all four sides */
                padding-left: 15px;
            }
        </style>
    </head>

    <body>
        <section>
            <h1>Northwestern Polytechnic University</h1>
            <p>Welcome to Northwestern Polytechnic University.
            We have some excellent courses for you this semester!</p>
        </section>
    </body>
</html>
```

Northwestern Polytechnic University

Welcome to Northwestern Polytechnic University. We have some excellent courses for you this semester!

Text and Font style

- Customize the fonts in your pages with the font-family property.
  - You can specify more than one font using the font-family property. Just type the font names separated by commas.
  - Always put a generic font family name at the end, like "serif", "sans-serif", "cursive", or "monospace".

```
body {
    font-family: Verdana,   Geneva, Arial, sans-serif;
}
```

- Control the size of your fonts with the font-size property.

```
body {
    font-size: 14px;
}
```

For details, please visit: http://www.w3schools.com/cssref/

More on font size

- Control the size of your fonts with the font-size property.
  - Setting a font to 14 pixels high means that there will be 14 pixels between the lowest part of the letters and the highest.

```
body {
    font-size: 14px;
}
```
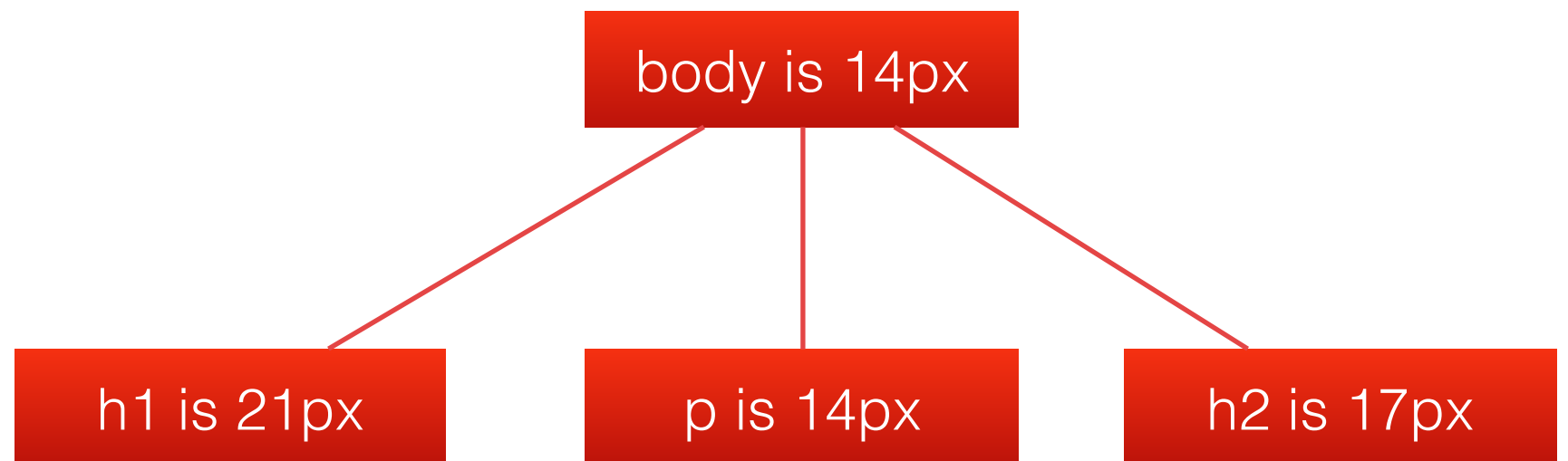
- Specify the size of your fonts in %.
  - A font size specified as a percentage tells the font how big it should be relative to another font size.
  - Here we've specified a body font size in pixels, and a level-one heading as 150%.

```
body {
    font-size: 14px;
}
h1 {
    font-size: 150%;
}
```

More on font size

- With em, you don't specify a percentage; instead, you specify a scaling factor.
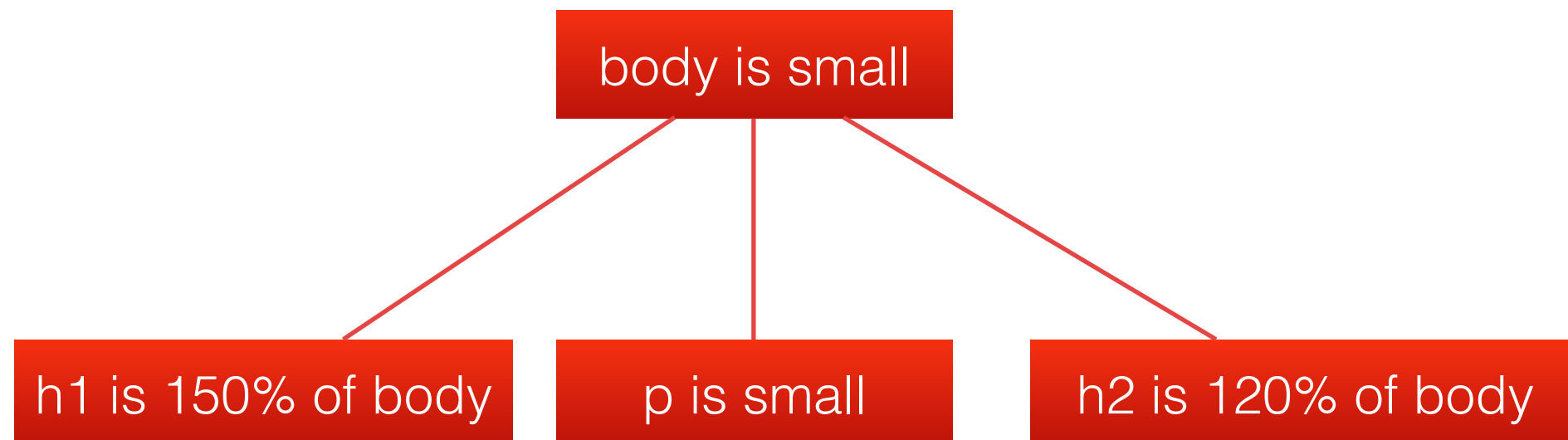   - This says that the font size should be scaled by 1.2.

```
body {
    font-size: 14px;
}
h1 {
    font-size: 150%;
}
h1 {
    font-size: 1.2em;
}
```

body is 14px

h1 is 21px

p is 14px

h2 is 17px

More on font size

- There's one more way to specify font sizes: keywords. You can specify a font size as xx-small, x-small, small, medium, large, x-large, or xx-large and the browser will translate these keywords into pixel values using defaults that are defined in the browser.
  - This is typically how the various keyword sizes relate to one another. Each size is about 20% larger than the previous size, and small is usually defined to be around 12 pixels in height.

```
body {
    font-size: small;
}
h1 {
    font-size: 150%;
}
h1 {
    font-size: 1.2em;
}
```

body is small

h1 is 150% of body

p is small

h2 is 120% of body

Colors

- The most straightforward way to describe a color in CSS is just to use its name. There are 16 basic colors and 150 extended colors that can be specified this way.

Black = #000000
Silver = #C0C0C0
Gray = #808080
White = #FFFFFF
Maroon = #800000
Red = #FF0000
Purple = #800080
Fuchsia = #FF00FF

Green = #008000
Lime = #00FF00
Olive = #808000
Yellow = #FFFF00
Navy = #000080
Blue = #0000FF
Teal = #008080
Aqua = #00FFFF

```
body {
    background-color: silver;
}
```

More on colors

- Specify color in red, green, and blue values

```
body {
    background-color: rgb(80%, 40%, 0%);
}
```

```
body {
    background-color: rgb(204, 102, 0);
}
```

```
body {
    background-color: #cc6600;
}
```

Flow of block elements
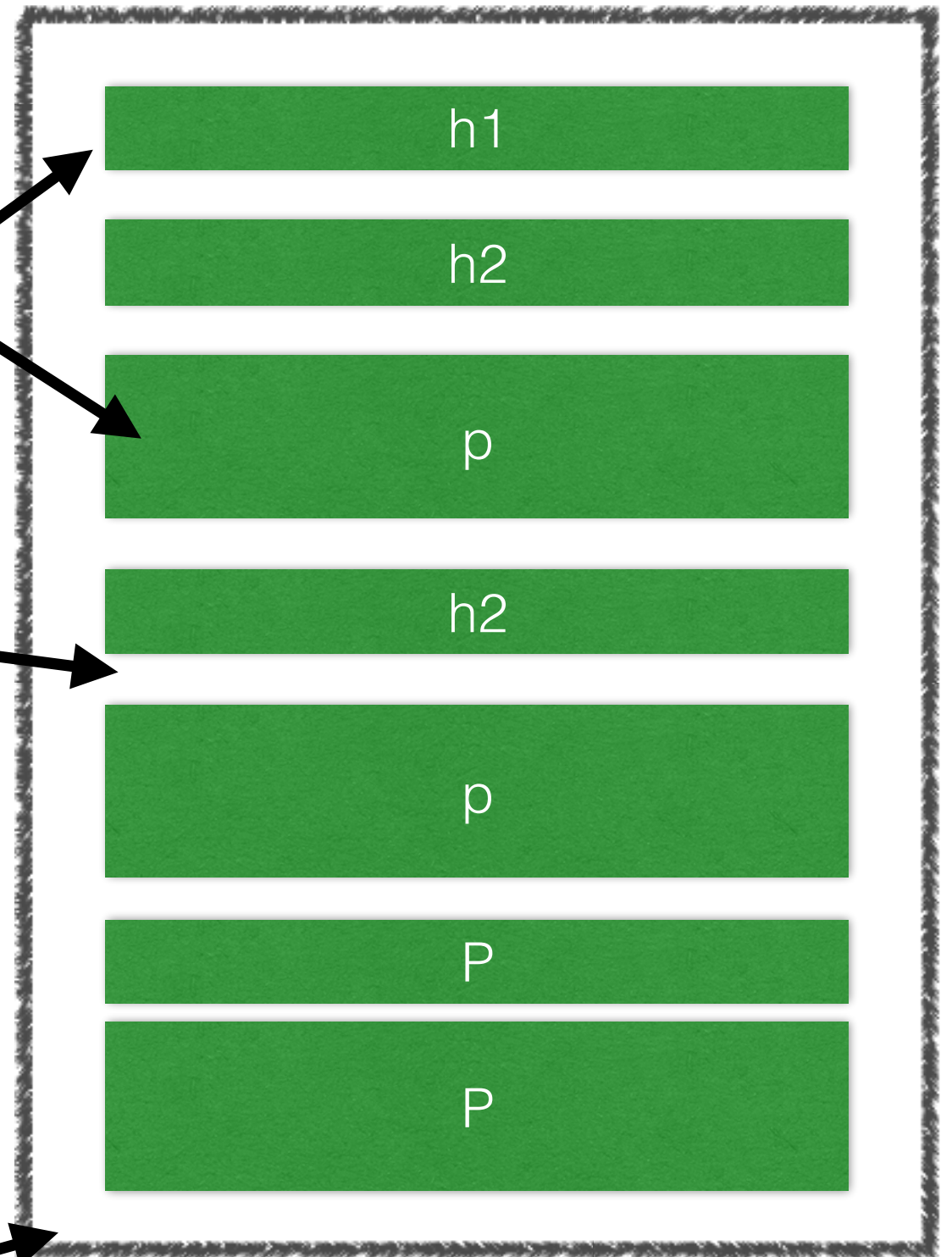
```
<html>
    <head>...</head>
    <body>
        <h1>...</h1>
        <h2>...</h2>
        <p>...</p>
        <h2>...</h2>
        <p>...</p>
        <p>...</p>
        <p>...</p>
    </body>
</html>
```
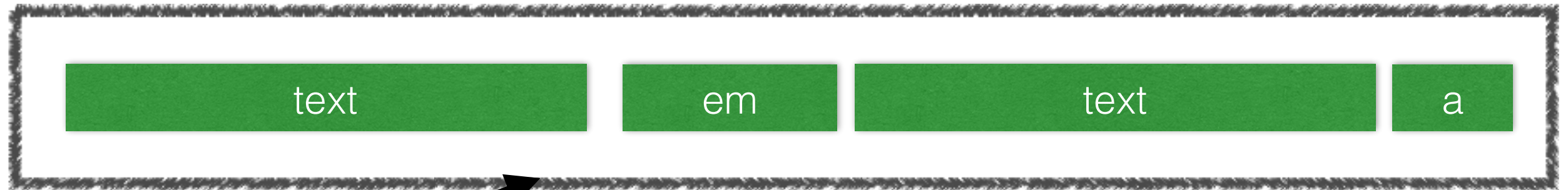
Each block element is taken in the order it appears in the markup, and placed on the page.

Each new block element causes a linebreak.

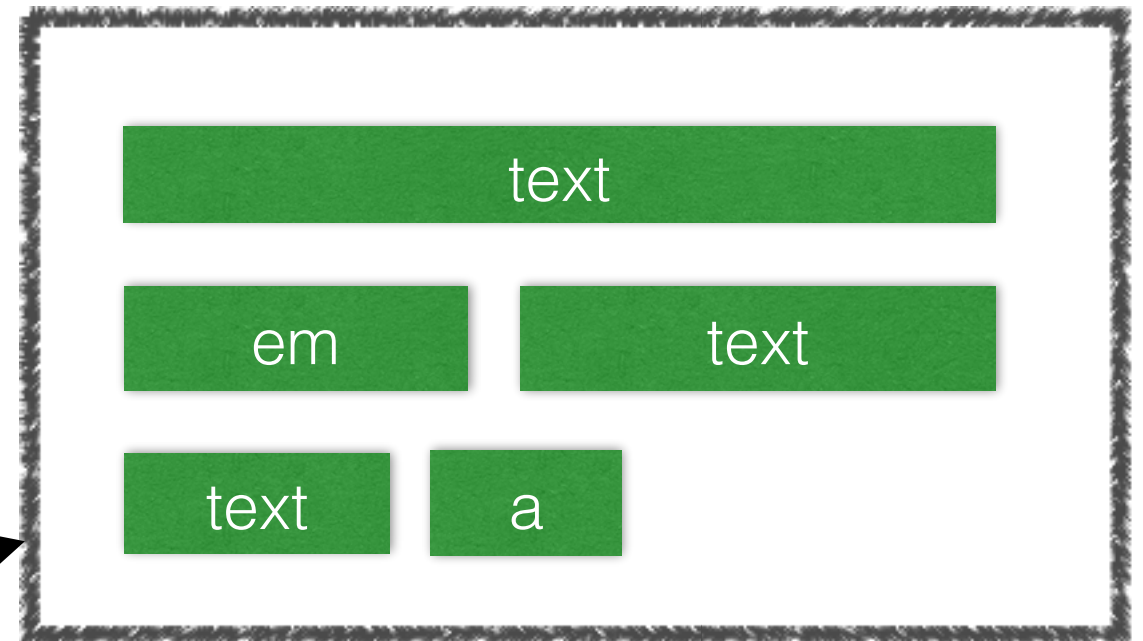Notice that elements take up the full width of the page.

h1

h2

p

h2

p

P

P

Flow of inline elements

```
<p>
    Sign up our <em>certificate program</em> in our career training center
    <a href="certificate.html" title="Certificate Program">Certificate</a>.
</p>
```

| text | em | text | a |

The inline elements are laid next to one another horizontally, as long as there is room on the right to place them. In the case, the browser's width is enough to fit all the inline elements horizontally.

Now the content has been flowed left to right until there's no more room, and then the content is placed on the next line.

| text |
| em | text |
| text | a |

Test inline element flow

```
<DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>Testing the Flow of Inline Elements</title>
    <link type="text/css" rel="stylesheet" href="style.css">
  </head>
  <body>
    <p>This is a test</p>
    <p>
      <img class="mybox1" src="images/logo.gif"
alt="NPU logo should be here.">
      <img class="mybox2" src="images/logo.gif"
alt="NPU logo should be here.">
    </p>
  </body>
</html>
```
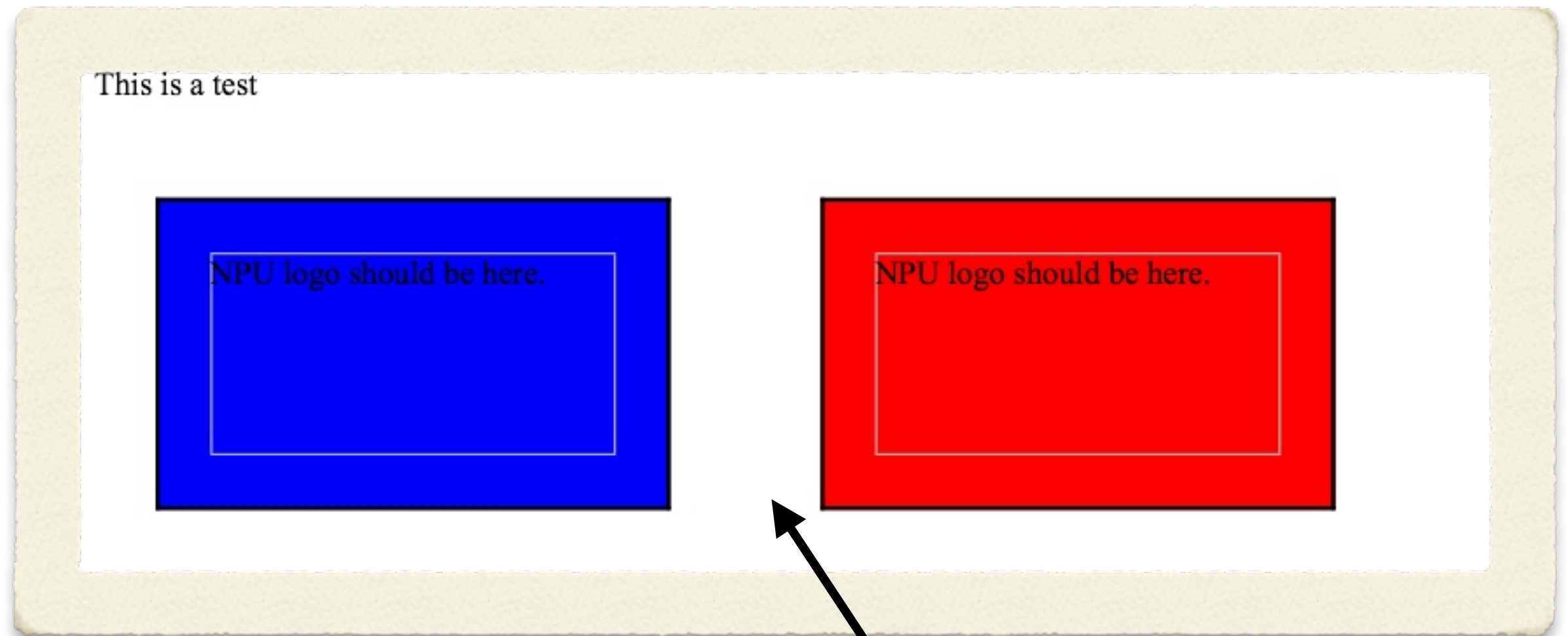
```
.mybox1 {
    border-color: black;
    border-width: 2px;
    border-style: solid;
    background-color: blue;
    padding: 25px;
    margin: 30px;
    width: 200px;
}
.mybox2 {
    border-color: black;
    border-width: 2px;
    border-style: solid;
    background-color: red;
    padding: 25px;
    margin: 30px;
    margin-left: 10px;
    width: 200px;
}
```

Test inline element flow

This is a test

NPU logo should be here.

NPU logo should be here.

Here we've got two images side by side, and images are displayed as inline elements by default. So, the browser uses both of their margins to calculate the space that goes between them.

How to flow a block element to one side

1. Give the element you're going to float a unique name using an id. That's already done.
2. Make sure the element's HTML is just below the element you want it to float under—in this case, the header.
3. Set a width on the element.
4. Float the element to the left or the right.

```
<DOCTYPE html>
<html>
 <head>
  <link type="text/css" rel="stylesheet"
href="style.css">
 </head>
 <body>
  <h1>This is a Heading Level 1.</h1>
  <h1>This is a Heading Level 2.</h1>
  <p id="accrediation">
   ...
  </p>
  <p id="maim">
   ...
  </p>
 </body>
</html>
```

```
#accrediation {
   line-height: 1.9em;
   font-style: italic;
   font-family: Georgia, "Times New Roman",
Times, serif;
   border-color: black;
   border-width: 2px;
   border-style: solid;
   background-color: #a7cece;
   padding: 25px;
   margin-left: 30px;
   width: 200px;
   float: right;
}
```

How to flow a block element to one side

This is a Heading Level 1.

This is a Heading Level 2.

The Admissions Office at Northwestern Polytechnic University prides itself on providing the highest quality customer and information services possible for our students, alumni, faculty, and staff. Our primary concern is to help our new and existing students understand the administrative requirements for study at a nationally-accredited American university, and to help those students at every step of the way in their pursuit of an American bachelor's, master's, or doctoral degree at NPU. Our friendly and professional staff is standing by to help you, in nearly any language, to make your transition to an American university as easy and convenient as possible. We look forward to serving your educational and professional development needs.

Northwestern Polytechnic University is an academic institution accredited by the Accrediting Council for Independent Colleges and Schools (ACICS) to award bachelor's degrees, master's degrees, and doctorate degrees. ACICS is listed as a nationally recognized accrediting agency by the United States Department of Education and is recognized by the Council for Higher Education Accreditation.

Now that you've known NPU *virtually*, isn't it time to check us out *for real*? We're located right in the heart of Sillicon Valley, and we've created some detailed directions to get you here in no time. No appoinment necessary; come and talk to us anytime.

Because the floated paragraph has been removed from the normal flow, the block elements are filled in, like the paragraph isn't even there. But it flows around the boundaries of the floated element.

When the browser encounters the floated element, it places it all the way to the right. It also removes the paragraph from the flow, like it's floating on the page.