



# FRONT-END FOUNDATIONS



# LEVEL 2

## CSS



# The early days of style on the web

When the Web was brand new, there was no separation between HTML and the **presentation** of that HTML.

HTML



```
<H3 COLOR=RED><CENTER>Ingredients</CENTER></H3>
```

*caps-lock got stuck a lot back then too*

HTML shouldn't determine how something **looks**,  
it should just determine how content is structured.



# Separating content from presentation

---

Thankfully, the authors of the web realized that, and created a way to make rules for how tags should look and put them in a separate place from the HTML.

HTML

```
<h3>Ingredients</h3>
```

CSS

*Make the **h3** tag green*

*Make the **h3** a bigger font*

*Make the **h3** have a border at the bottom*



# Cascading Style Sheets

CSS is code that changes the **appearance** of HTML.

## HTML without CSS



### Recipe World

- [Home](#)
- [Recipes](#)
- [Suggest](#)

### Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few have tried it and lived to tell about it, and these are their stories.

We also need to stress that whatever happens to you as a result of

## HTML with CSS



### Recipe World

[Home](#) [Recipes](#) [Suggest](#)

### Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few have tried it and lived to tell about it, and these are their stories.

#### Ingredients

- 2 eggs
- 1 pound sugar





# Writing your first selector

Tags are selected by creating something called a **selector**.

HTML

```
<p>Magic Cake is one of the tastiest...</p>
```

the simplest selector is the **type selector**, and is just the tag name without `<>` brackets.

CSS

```
p {  
  text-decoration: underline;  
}
```

this is one of many properties that can be applied to selectors

## Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few have tried it and lived to tell about it, and these are their stories.

each property can usually be set to one of a few different values



# The syntax of a selector

Selectors have a very specific syntax that needs to be followed or the CSS won't work.

an open-curly-bracket goes  
after the selector name

```
selector {  
  property: value;  
}
```

CSS

A semi-colon goes  
after the value  
of a property

a closed-curly-bracket goes  
after the property list

A colon goes after the  
property name and  
before the value



# Using multiple properties in one selector

A single selector can change multiple properties.

HTML

```
<p>Magic Cake is one of the tastiest...</p>
```

CSS

```
p {  
  text-decoration: underline;  
  color: red;  
}
```

## Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few have tried it and lived to tell about it, and these are their stories.

multiple properties applied to a single selector





# Selecting multiple tags with one selector

Selectors will select all matching tags on the page and apply properties.

## HTML

```
<h3>Ingredients</h3>
<ul>
  <li>2 eggs</li>
  <li>1 pound of sugar</li>
  <li>3 sticks of butter</li>
</ul>
```

## CSS

```
li {
  font-size: 24px;
}
```

## Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few have tried it and lived to tell about it, and these are their stories.

### Ingredients

- 2 eggs
- 1 pound sugar
- 3 sticks of butter

bigger font size now  
for all <li> tags

### Directions

1. Mix eggs, sugar, and butter in a large bowl
2. Spread into a non-stick dish
3. Bake at 350 degrees for 1 hour
4. Let sit at room temperature for 20 minutes
5. Eat and enjoy!



# Selecting only tags that are children of another tag

A **descendent selector** can be used to select tags only if they are children of another tag.

## HTML

```
<h3>Ingredients</h3>
<ul>
  <li>2 eggs</li>
  <li>1 pound of sugar</li>
  <li>3 sticks of butter</li>
</ul>
```



## Ingredients

- 2 eggs
- 1 pound sugar
- 3 sticks of butter

only the <ul> list items are bigger now

## Directions

1. Mix eggs, sugar, and butter in a large bowl
2. Spread into a non-stick dish
3. Bake at 350 degrees for 1 hour
4. Let sit at room temperature for 20 minutes
5. Eat and enjoy!

select only li tags that are children of ul tags

## CSS

```
ul li {
  font-size: 24px;
}
```

**TIP:** read the selector list from right-to-left. The left-most selector is the parent, with children following to the right.





# Selecting tags based on actions and conditions

A **pseudo-selector** is a modifier that can be added to a selector to select a tag only when a certain condition has occurred.

CSS

```
a {  
  text-decoration: none;  
}  
    removes the underline from all links on a page  
  
a:hover {  
  text-decoration: underline;  
  color: darkred;  
}  
    adds an underline and changes the color of all  
    links on a page ONLY when the mouse is over  
    the link
```

## Recipe World

- Home
- Recipes
- Suggest



# Using pseudo-selectors to narrow selection criteria

The **:first-child** pseudo-selector can be applied to narrow the amount of child tags selected

## HTML

```
<h3>Directions</h3>
<ol>
  <li>Mix eggs, sugar...</li>
  <li>Spread into a...</li>
  <li>Bake at 350...</li>
</ol>
```

select only the first li tag



## CSS

```
ol li:first-child {
  color: red;
}
```

## Directions

1. Mix eggs, sugar, and butter in a large bowl
2. Spread into a non-stick dish
3. Bake at 350 degrees for 1 hour
4. Let sit at room temperature for 20 minutes
5. Eat and enjoy!





# Where do we put all this stuff?

One place you can put CSS is in a **style** tag that's a child of the **head** tag.

## HTML

```
<html>
  <head>
    <style type="text/css">
      a {
        color: red;
      }
    </style>
  </head>
  <body>
    ...
  </body>
</html>
```

The `type` attribute lets the browser know that CSS is coming

Your CSS selectors can be written in between the **style** opening and closing tags.







# FRONT-END FOUNDATIONS



# Hexadecimal colors

A popular way to choose colors in CSS is to use hexadecimal numbers.

CSS

```
p {  
  color: red;  
  color: #FF0000;  
  
  color: black;  
  color: #000000;  
  
  color: yellow;  
  color: #FFFF00;  
}
```

red

black

yellow

Here's three keyword colors  
and their hexadecimal  
equivalents.



# Hexadecimal colors

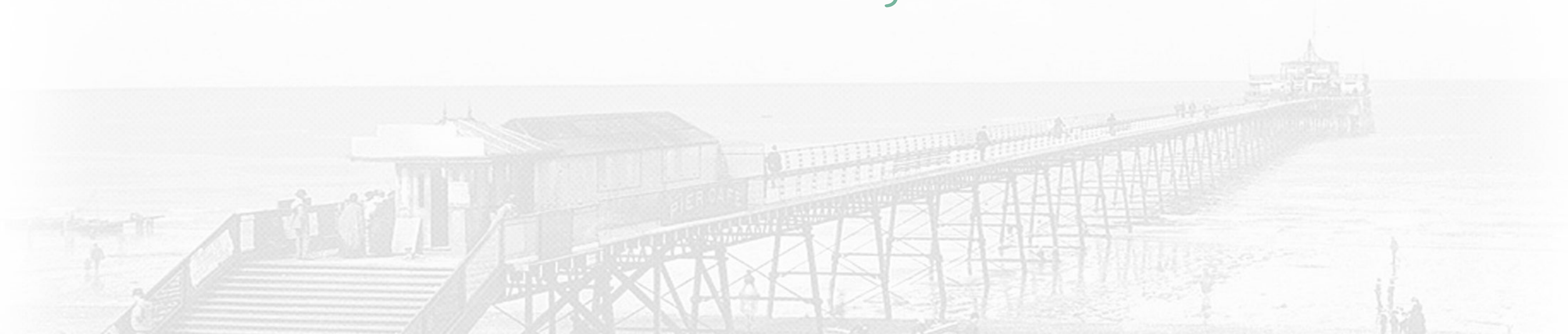
Each hex color is actually three different parts.

#FFFFFF00

first two numbers set the  
amount of red

next two set green

last two set blue






# Hexadecimal colors - Minimum and Maximum

---

Color values for red, green, and blue run from **0** - **255** decimal, or **00** - **FF** hexadecimal.

#FFFFFF00

A diagram showing the hex color #FFFFFF00. Below the hex code, there are three colored bars: a red bar under the first two 'F's, a green bar under the next two 'F's, and a blue bar under the '00'. This illustrates that the color has maximum red and green, and no blue.

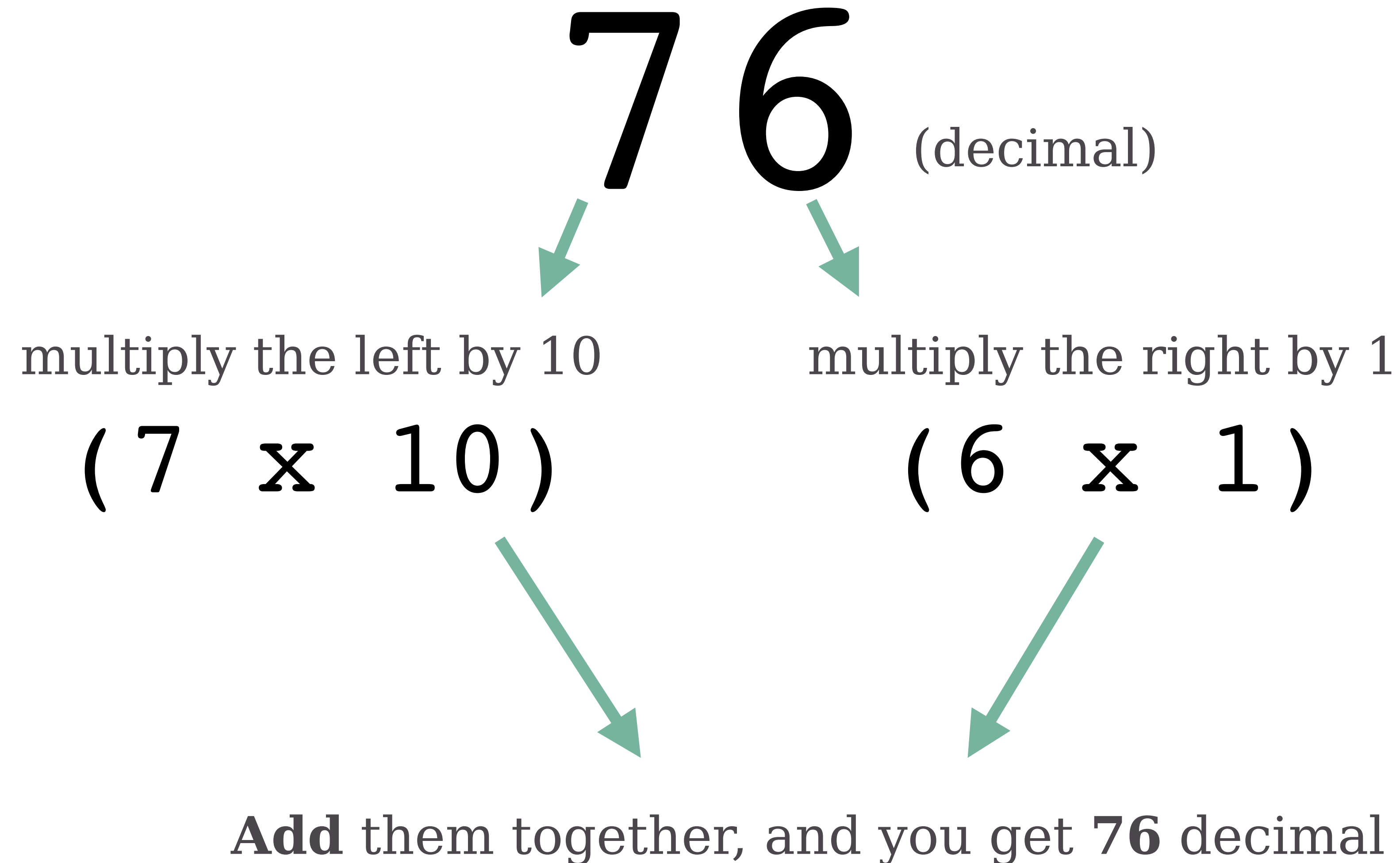
This color is maximum red, maximum green, and no blue.

That's equivalent to the color **Yellow**



# Breaking down decimal numbers

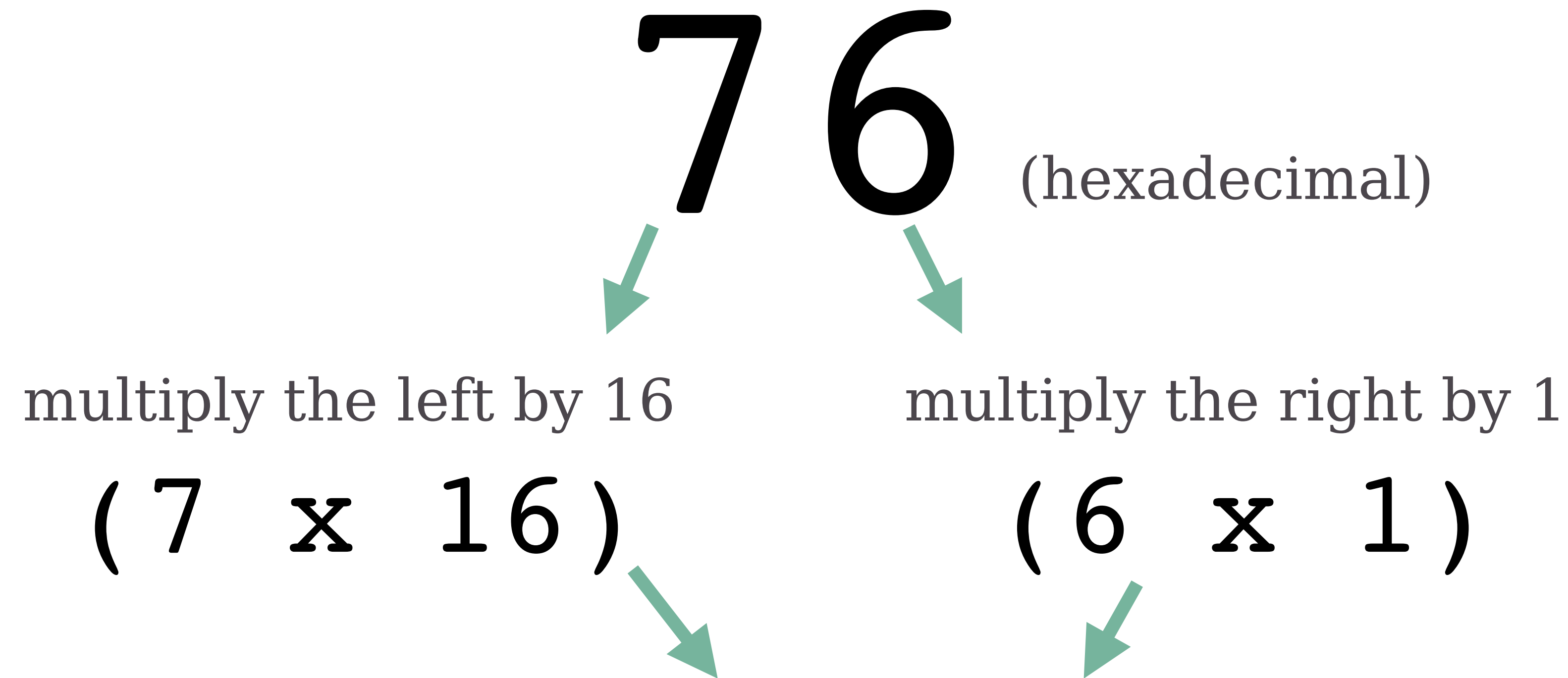
Decimal numbers run from 0-9.





# Breaking down hexadecimal numbers

Since we're so used to reading decimal numbers, sometimes it makes sense to convert hexadecimal to decimal.




**Add** them together, and you get **118** decimal



# Breaking down hexadecimal numbers

Since we're so used to reading decimal numbers, sometimes it makes sense to convert hexadecimal to decimal.

**FF** (hexadecimal)



multiply the left by 16

**( F x 16 )**

multiply the right by 1

**( F x 1 )**

**?? ??**

How do we multiply by a letter?!\$#?\$!\$?





# Understanding letter-based hexadecimal numbers

Hexadecimal numbers run from 0-15, but use letters for numbers above 9.

$$A = 10$$

$$C = 12$$

$$E = 14$$

$$B = 11$$

$$D = 13$$

$$F = \underline{15}$$

FF

multiply the left by 16

multiply the right by 1

$$(\underline{15} \times 16)$$

$$(\underline{15} \times 1)$$


Add them together, and you get  $240 + 15$ , or **255** decimal



# Calculating the color from hexadecimal numbers

---

#7403AB

Three horizontal bars of equal length are positioned below the hex code. The first bar is red, the second is green, and the third is blue.

Red:  $(7 \times 16) + (4 \times 1) = 116$

Green:  $(0 \times 16) + (3 \times 1) = 3$

Blue:  $(10 \times 16) + (11 \times 1) = 171$

This color is some red, almost no green, and more blue than red.

That's a color that looks **Purple**






# Calculating the color from hexadecimal numbers

---

#FF00B3



Red:  $(15 \times 16) + (15 \times 1) = 255$

Green:  $(0 \times 16) + (0 \times 1) = 0$

Blue:  $(11 \times 16) + (3 \times 1) = 179$

This color is lots of red, no green, and a little less blue than red.

That's a color that looks **Hot Pink**

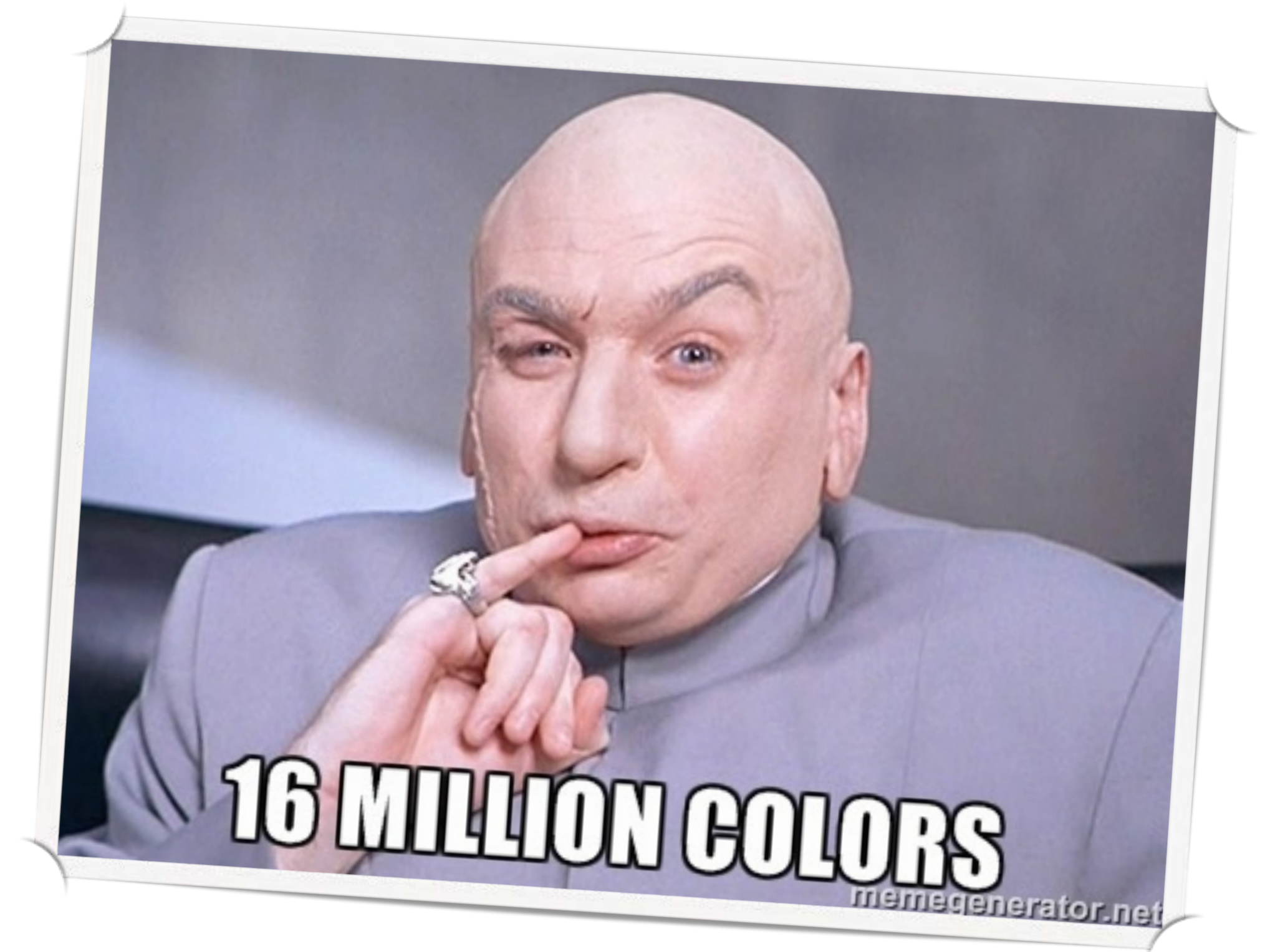


# Colors on the web

By using hexadecimal numbers to set colors, we get 256 possible combinations for each of the three color channels.

or...

$$256 \times 256 \times 256 = 16,777,216$$







# FRONT-END FOUNDATIONS



# Our page after changing some styles with CSS

## Questions

How does our page know how much vertical and horizontal space to put between tags?

How can we control that spacing?

*why this much space?*

## Answer

The box model

## Recipe World

- [Home](#)
- [Recipes](#)
- [Suggest](#)

## Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known about it, and these are their stories.

We also need to stress that whatever happens to you as a result is your responsibility. You've been warned, and you can view our [legal page](#)

## Ingredients

- 2 eggs
- 1 pound of sugar
- 3 sticks of butter





# The Box

Every tag shown in the body is contained in an invisible rectangle that we'll call **the box**.

HTML

```
<p>Magic Cake is one of...</p>  
<p>We also need to stress...</p>
```

These two paragraph tags are shown as two boxes stacked on top of each other.

Magic Cake is one of the tastiest cakes the world has ever known. Few have tried it and lived to tell about it, and these are their stories.

We also need to stress that whatever happens to you as a result of consuming Magic Cake is your responsibility. You've been warned, and you can view our [legal page](#) for more information.



content  
boxes





# The boxes on our page

Here are the boxes for the current version of the magic-cake.html page.

## HTML

```
<body>
```

```
<h1>Recipe World</h1>
```

```
<ul>...</ul>
```

```
<h2>Magic Cake</h2>
```

```
<p>Magic Cake is one of...
```

```
<p>We also need to stress...
```

```
<h3>Ingredients</h3>
```

```
<ul>...</ul>
```

```
<h3>Directions</h3>
```

```
<ol>...</ol>
```

```
</body>
```

## Recipe World

- [Home](#)
- [Recipes](#)
- [Suggest](#)

## Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few have heard about it, and these are their stories.

We also need to stress that whatever happens to you as a result of consuming this cake is your responsibility. You've been warned, and you can view our [legal page](#) for more information.

## Ingredients

- 2 eggs
- 1 pound of sugar
- 3 sticks of butter

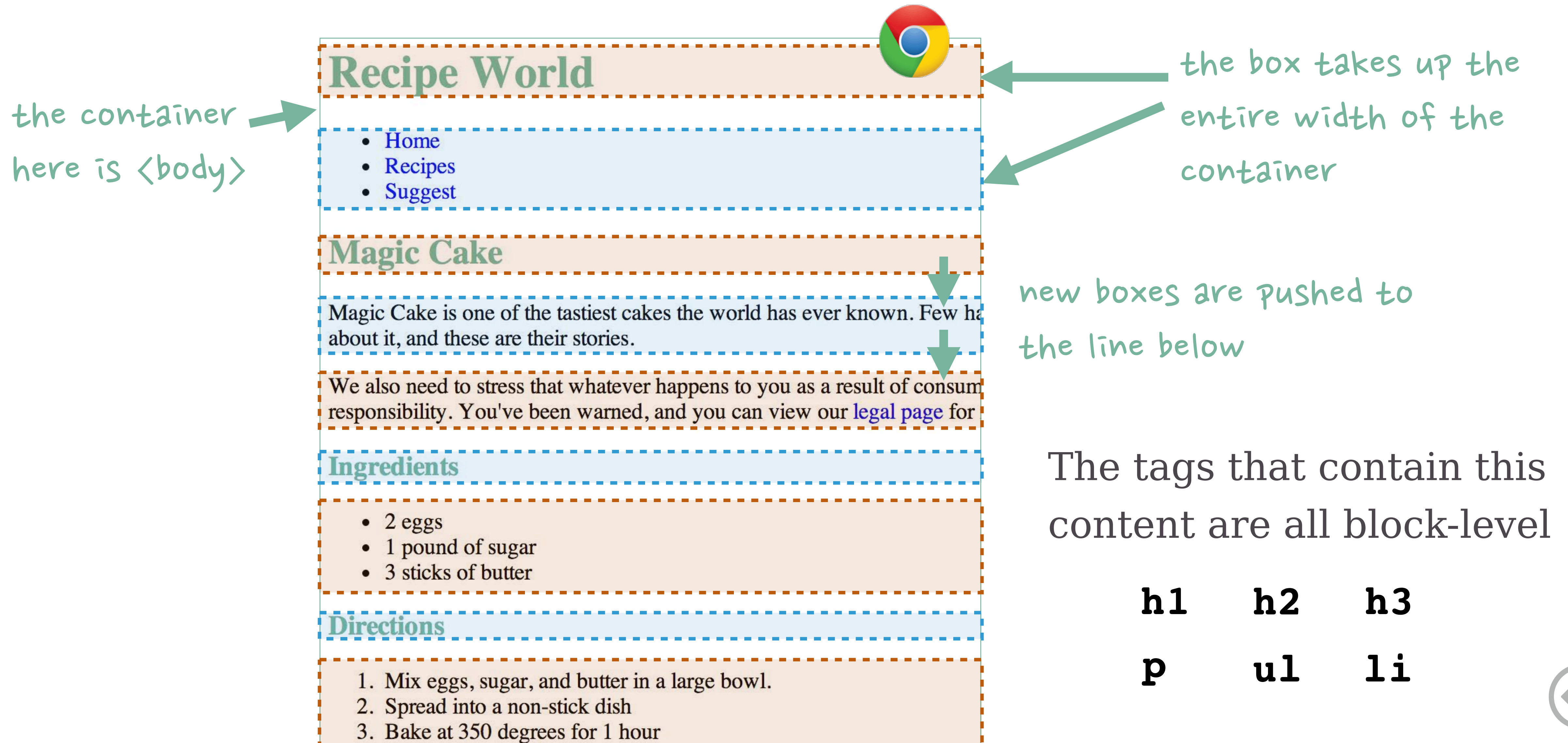
## Directions

1. Mix eggs, sugar, and butter in a large bowl.
2. Spread into a non-stick dish
3. Bake at 350 degrees for 1 hour



# Block-level tags

The content of **block-level** tags take up the entire width of the **container**.



# Inline-level tags

If a tag is not block-level, it's **inline-level**.

We also need to stress that whatever happens to you as a result of consuming Magic Cake is your responsibility. You've been warned, and you can view our [legal page](#) for more information.

inline-level tags don't try to take up more width than they need

```
<p>...can view our <a href="legal.html">legal page</a>  
for more information</p>
```

HTML

Some common inline-level tags

**a**            **img**

**input**   **label**





# Turning block-level into inline-level

Sometimes, you'll want block-level tags to be inline-level.

**Example:** list items displaying horizontally instead of vertically

block-level list items

Recipe World

- Home
- Recipes
- Suggest



inline-level list items

Recipe World

Home Recipes Suggest



CSS

```
ul li {  
  display: inline;  
}
```

the default display is block-level



# Block-level vertical spacing

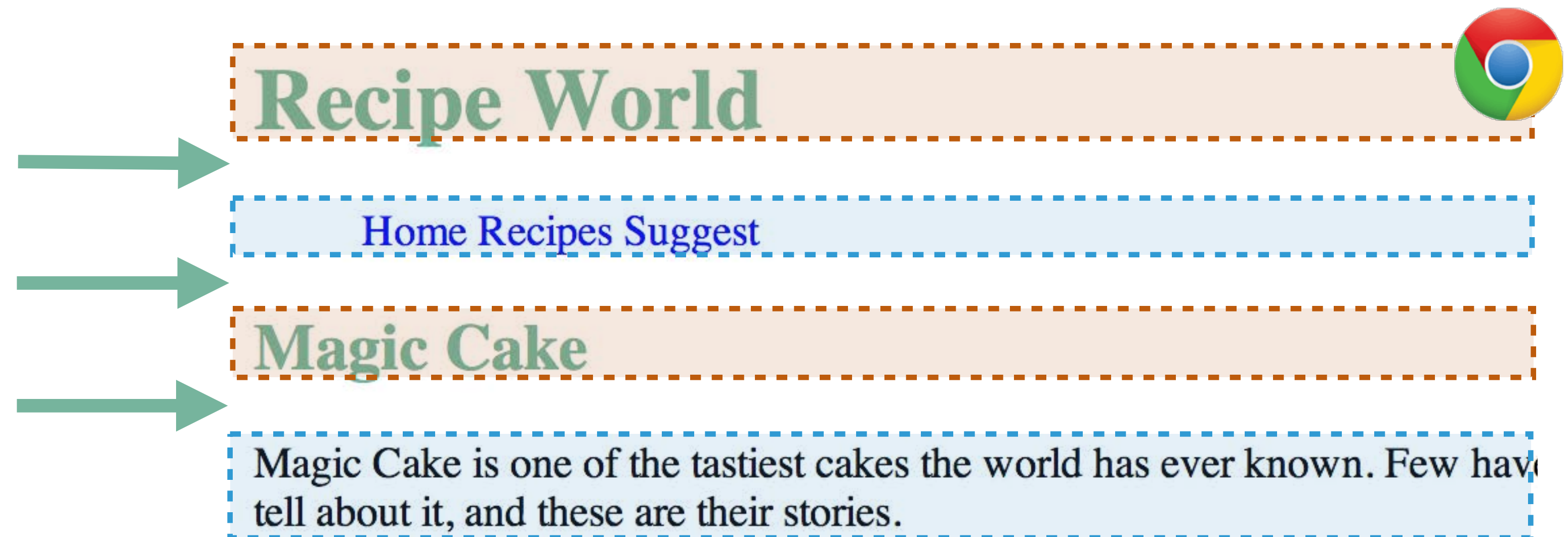
---

## What we know

- Each tag's content fits in an invisible box
- Each block-level tag's box takes up an entire line (horizontal space)

## Back to our problem

How does the browser know how much space goes between the boxes?



# The Box Model

---

The **box model** is a way to describe the borders and spacing in between the **boxes** of each tag.

- ◉ There are 4 parts of the box model:

1. Content area

The **content area** contains your actual content (text, images, etc.)



Magic Cake

The content area will only take up as much vertical space as it needs to display the content inside.





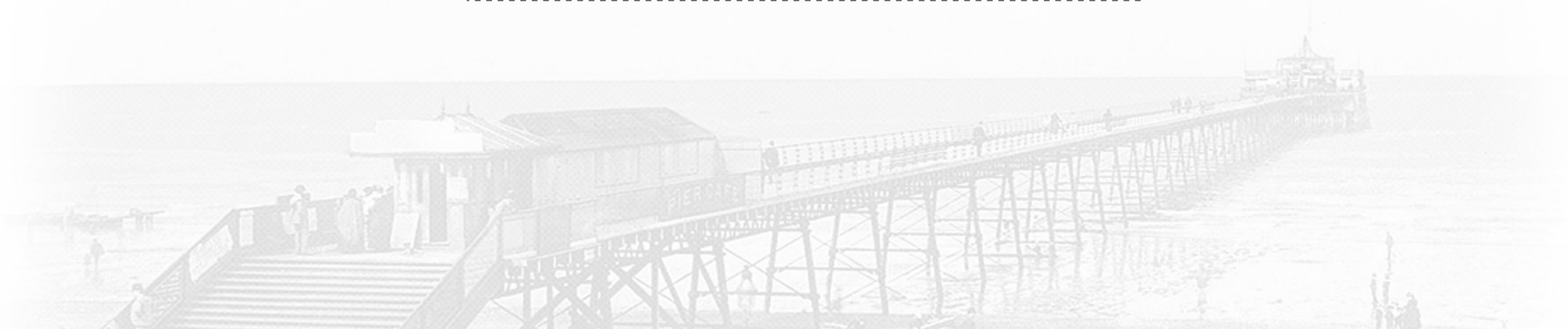
# The Box Model

---

- There are 4 parts of the box model:

## 2. Padding

Padding is added to the **top**, **right**, **bottom**, or **left** of the content area.



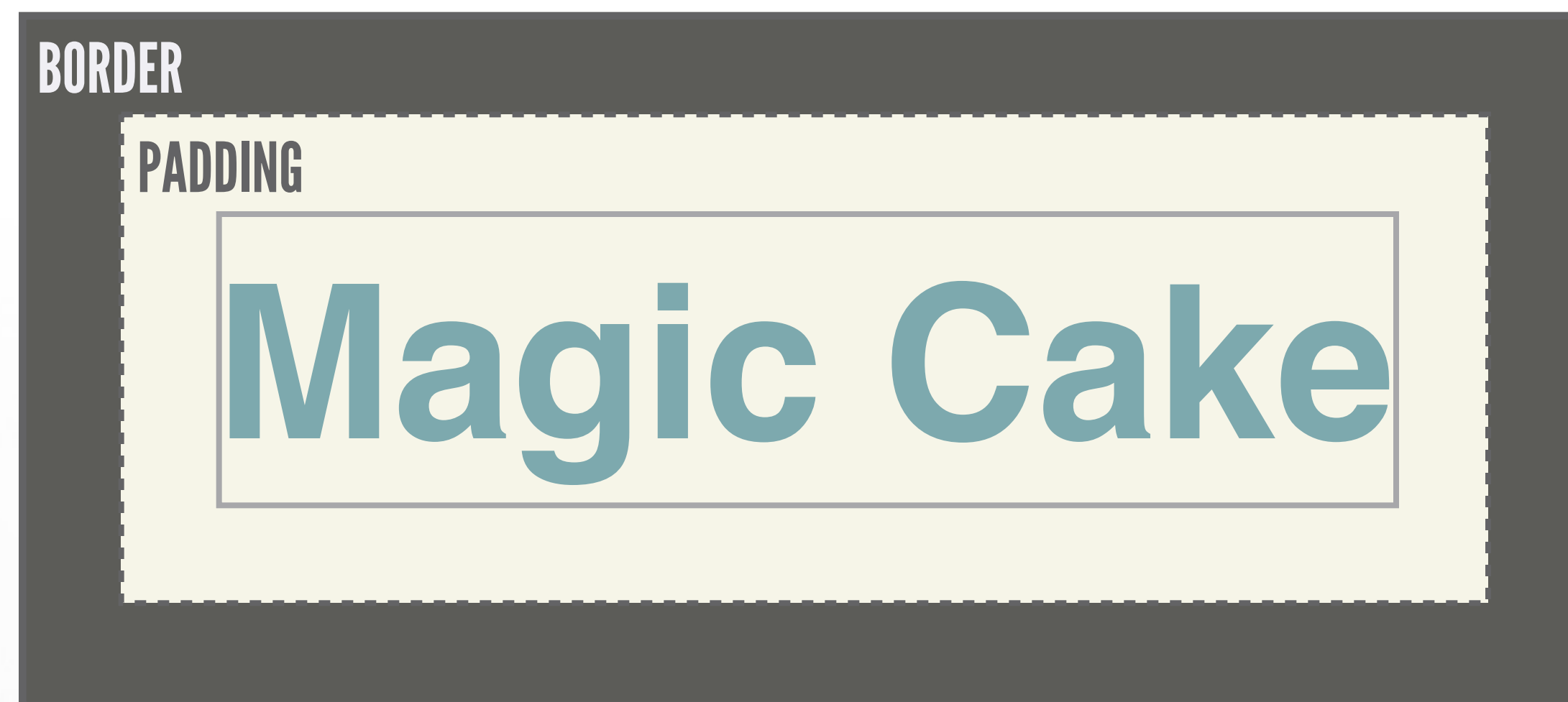
# The Box Model

---

- There are 4 parts of the box model:

## 3. Border

Borders are added around the **top**, **right**, **bottom**, or **left** of the padding





# The Box Model

---

- There are 4 parts of the box model:

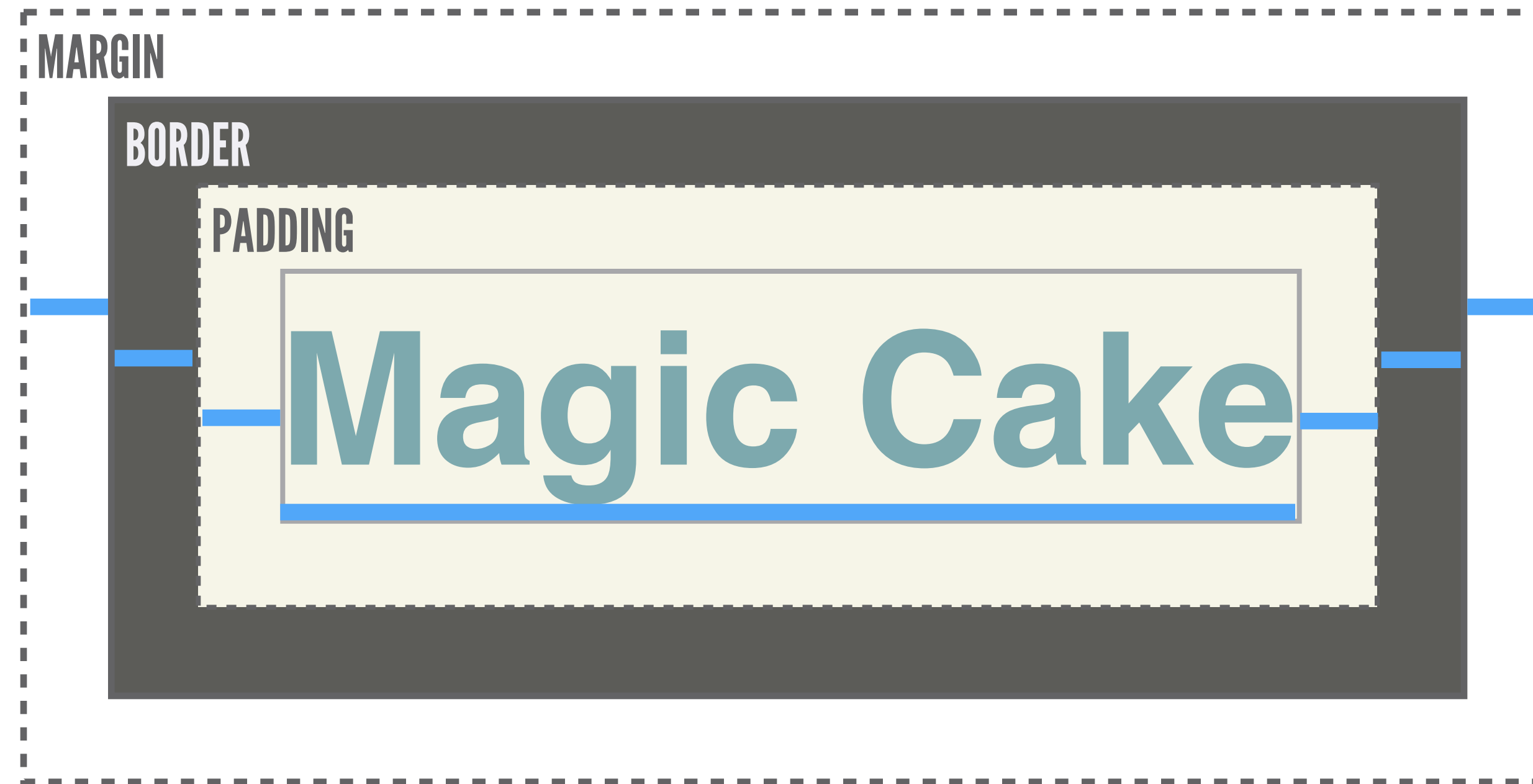
## 4. Margin

Margins are added to the **top**, **right**, **bottom**, or **left** of the border.



# How to calculate the size of the box

The full size of a box after these four properties have been set can be calculated like this:



+ content area width  
+ padding-left + padding-right  
+ border-left + border-right  
+ margin-left + margin-right  
= the full box width

use top, bottom, and  
height to calculate  
full box height





# Applying the box model properties

Apply padding to one side at a time...

CSS

```
h2 {  
  padding-top: 6px;  
  padding-right: 3px;  
  padding-bottom: 0;  
  padding-left: 0;  
}
```

If we want to put some space above and to the right of some text, one option is to adjust the padding.



...or all at once in a clockwise order

CSS

```
h2 {  
  padding: 6px 3px 0 0;  
}
```

top right bottom left



# Applying the box model properties

You can apply borders all at once and not specify a side.

CSS

```
h2 {  
  border-width: 6px;  
  border-style: solid;  
  border-color: black;  
}
```

BORDER

PADDING

Magic Cake

Creating borders has a shortcut version, too.

CSS

```
h2 {  
  border: 6px solid black;  
}
```

width style color





# Applying the box model properties

You can also just pick one side and just add a border there.

CSS

```
h2 {  
  border-bottom: 6px solid black;  
}
```

width style color

PADDING

Magic Cake

BORDER

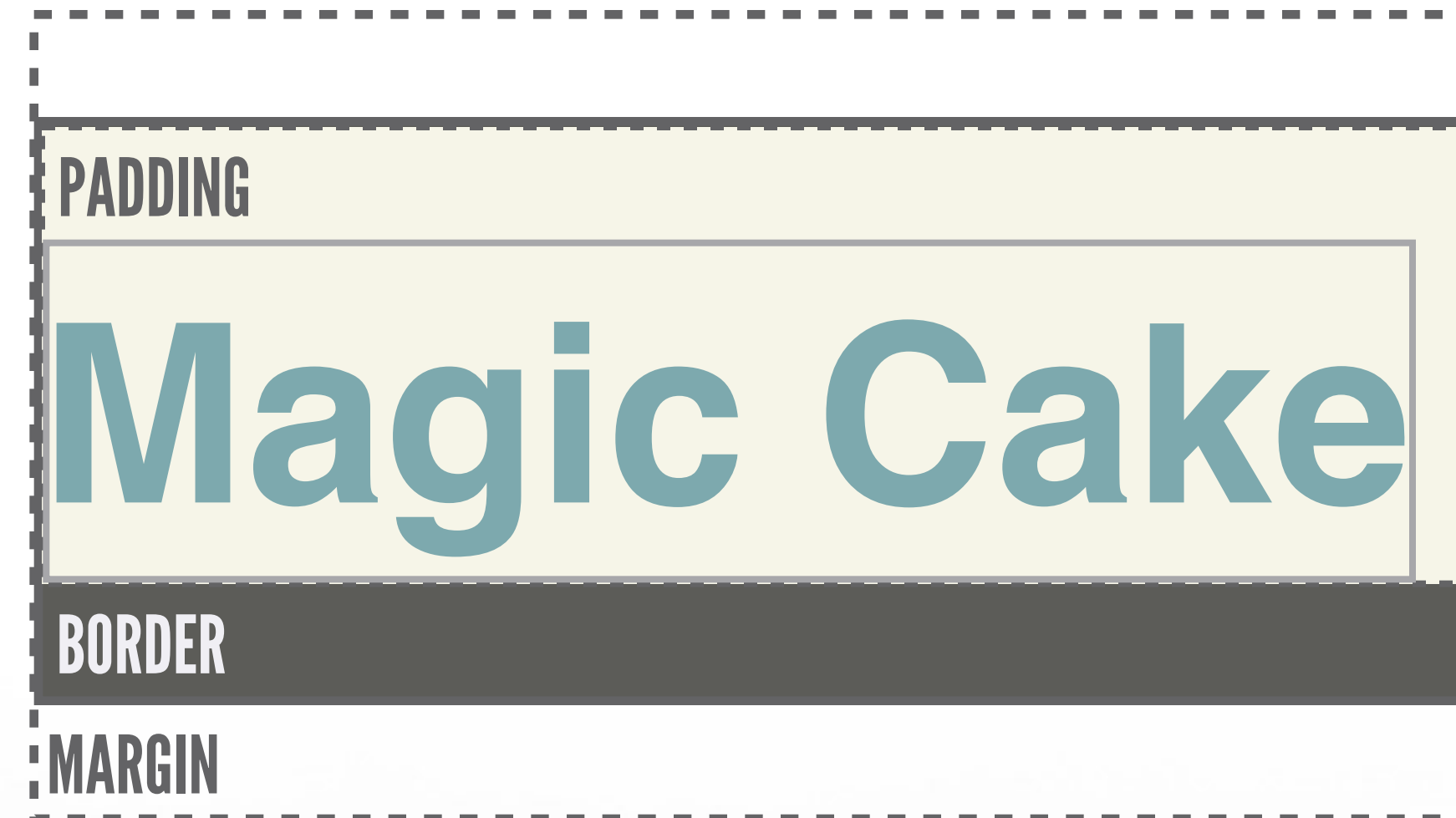


# Applying the box model properties

Add margins the same way you add padding...

CSS

```
h2 {  
  margin-top: 6px;  
  margin-right: 0;  
  margin-bottom: 6px;  
  margin-left: 0;  
}
```



...or use the same shortcut syntax as padding.

CSS

```
h2 {  
  margin: 6px 0 6px 0;  
}
```

top right bottom left





# When should you use padding?

Padding is used to control the size of a box *without* adjusting the size of the content inside the box.

CSS

```
h2 {  
  padding: 0 0 0 0;  
}
```

CSS

```
h2 {  
  padding: 10px 0 10px 0;  
}
```

Home Recipes Suggest

**Magic Cake**

Magic Cake is one of the tastiest cakes tell about it, and these are their stories.

Home Recipes Suggest

**Magic Cake**

Magic Cake is one of the tastiest cakes tell about it, and these are their stories.



# When should you use margin?

Margin is used to control the space between boxes.

CSS

```
h2 {  
  margin: 20px 0 20px 0;  
}
```

CSS

```
h2 {  
  margin: 4px 0 4px 0;  
}
```

Home Recipes Suggest

**Magic Cake**

Magic Cake is one of the tastiest cakes tell about it, and these are their stories.

Home Recipes Suggest

**Magic Cake**

Magic Cake is one of the tastiest cakes tell about it, and these are their stories.





# Summary of our new box model knowledge

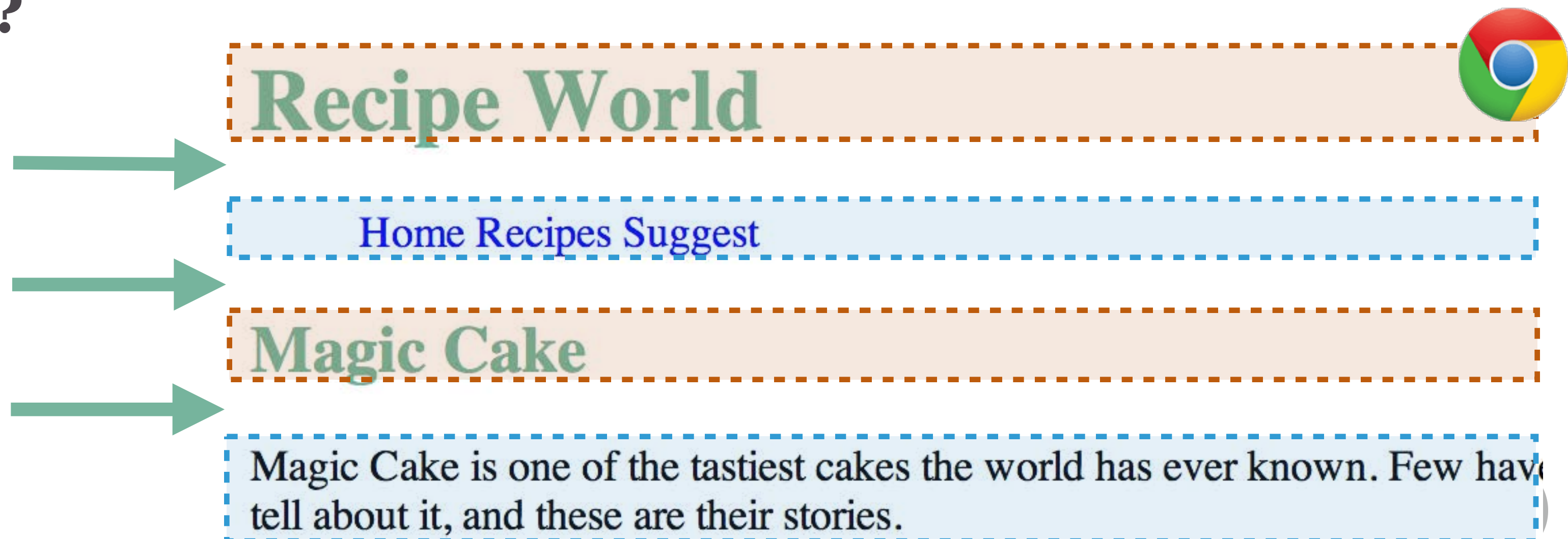
---

## What we now know:

- Each tag's content fits in an invisible box
- Each block-level tag's box takes up an entire line
- Padding can be used to adjust spacing within a container
- Margin can be used to adjust spacing between containers

## Why is there spacing here?

We didn't set any margins or padding?!@!#?#





# Default browser styles

Browsers actually have a default stylesheet for when no custom styles are set.

## Default box styles left on

### Recipe World

[Home Recipes Suggest](#)

### Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few about it, and these are their stories.

We also need to stress that whatever happens to you as a result of con responsibility. You've been warned, and you can view our [legal page](#) for more inform

### Ingredients



## Default box styles turned off

### Recipe World

[Home Recipes Suggest](#)

### Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known about it, and these are their stories.

We also need to stress that whatever happens to you as a result of con responsibility. You've been warned, and you can view our [legal](#)

### Ingredients

2 eggs 1 pound of sugar 3 sticks of butter

### Directions

Mix eggs, sugar, and butter in a large bowl.

Spread into a non-stick dish

Bake at 350 degrees for 1 hour

Let sit at room temperature for 20 minutes

Eat and enjoy!





# Resetting default browser styles

Add this to the very top of your CSS file to reset default styles.

include each tag that's in your  
HTML for that page

CSS

```
html, body, h1, h2,  
h3, p, ol, ul, li, a {  
  padding: 0;  
  border: 0;  
  margin: 0;  
}
```

Now, all of the default box properties are reset, and we need to set the box model properties ourselves.

## Default box styles turned off

### Recipe World

Home Recipes Suggest

#### Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known about it, and these are their stories.

We also need to stress that whatever happens to you as a result of responsibility. You've been warned, and you can view our [legal](#)

#### Ingredients

2 eggs 1 pound of sugar 3 sticks of butter

#### Directions

Mix eggs, sugar, and butter in a large bowl.

Spread into a non-stick dish

Bake at 350 degrees for 1 hour

Let sit at room temperature for 20 minutes

Eat and enjoy!





# A Box Model process - Start with the body

The order that you apply the box model properties is personal preference, but here's one approach:

Start from the highest parent element  
This is often **<body>**

CSS

```
body {  
  padding: 20px 20px 20px 20px;  
}
```

This padding has the effect of pushing all of the children away from the edges of the **<body>**.

this padding is applied to every side of the body



## Recipe World

Home Recipes Suggest

### Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. I to tell about it, and these are their stories.

We also need to stress that whatever happens to you as a result of c your responsibility. You've been warned, and you can view our [leg](#) information.

#### Ingredients

2 eggs 1 pound of sugar 3 sticks of butter

#### Directions

1. Mix eggs, sugar, and butter in a large bowl.
2. Spread into a non-stick dish
3. Bake at 350 degrees for 1 hour
4. Let sit at room temperature for 20 minutes
5. Eat and enjoy!





# A Box Model process - Next, look at headings

Next, focus on the heading tags  
<h1>

```
h1 {  
  margin: 10px 0 15px 0;  
}
```

CSS

Use margin to put vertical  
space between tags.

Before

no margins

Recipe World

Home Recipes Suggest

Magic Cake



After

margins

Recipe World

Home Recipes Suggest

Magic Cake



# A Box Model process - Next, look at headings

Next, focus on the heading tags  
<h2>

```
h2 {  
  margin: 10px 0 20px 0;  
}
```

CSS

no margins

Before

Home Recipes Suggest

**Magic Cake**

Magic Cake is one of the tastiest cakes the world has to tell about it, and these are their stories.  
We also need to stress that whatever happens to you



After

Home Recipes Suggest

**Magic Cake**

Magic Cake is one of the tastiest cakes the world has to tell about it, and these are their stories.



margins





# A Box Model process - Next, look at headings

Next, focus on the heading tags


**<h3>**

CSS

```
h3 {  
  margin: 15px 0 15px 0;  
}
```

no margins


**Before**



Magic Cake is one of the tastiest cakes  
about it, and these are their stories.  
We also need to stress that whatever happens  
responsibility. You've been warned, and

**Ingredients**  
2 eggs 1 pound of sugar 3 sticks of butter

**After**



Magic Cake is one of the tastiest cakes  
to tell about it, and these are their stories.  
We also need to stress that whatever happens  
your responsibility. You've been warned,  
information.

**Ingredients**  
2 eggs 1 pound of sugar 3 sticks of butter

margins




# A Box Model process - borders

After your margins are in place, think about where borders might be necessary.

CSS

```
h3 {  
  margin: 15px 0 15px 0;  
  border-bottom: 1px solid #CCCCCC;  
}
```

this bottom border visually  
separates the sections



to tell about it, and these are their stories.  
We also need to stress that whatever happens  
your responsibility. You've been warned, and you  
information.

## Ingredients

2 eggs 1 pound of sugar 3 sticks of butter

## Directions





# A Box Model process - padding

Use padding to put more space between the content and border.

CSS

```
h3 {  
  margin: 15px 0 15px 0;  
  border-bottom: 1px solid #CCCCCC;  
  padding-bottom: 3px;  
}
```

Before



After



now we've got a little  
more space between  
the content and border



# A Box Model process - padding

Padding is also used to adjust list and list item indentation.

## Before



### Ingredients

2 eggs 1 pound of sugar 3 sticks of butter

### Directions

1. Mix eggs, sugar, and butter in a large bowl.
2. Spread into a non-stick dish
3. Bake at 350 degrees for 1 hour
4. Let sit at room temperature for 20 minutes
5. Eat and enjoy!

## After



### Ingredients

→ 2 eggs 1 pound of sugar 3 sticks of butter

### Directions

- 1. Mix eggs, sugar, and butter in a large bowl.
2. Spread into a non-stick dish
- 3. Bake at 350 degrees for 1 hour
4. Let sit at room temperature for 20 minutes
- 5. Eat and enjoy!





# A Box Model process - padding

Padding is also used to adjust list and list item indentation.

After

## Ingredients

→ 2 eggs 1 pound of sugar 3 sticks of butter

## Directions

- 1. Mix eggs, sugar, and butter in a large bowl.
- 2. Spread into a non-stick dish
- 3. Bake at 350 degrees for 1 hour
- 4. Let sit at room temperature for 20 minutes
- 5. Eat and enjoy!



CSS

```
ul {  
  padding: 0 0 0 50px;  
}  
  
ol {  
  padding: 0 0 0 50px;  
}
```

left padding



# Result after adjusting box model properties

Here's where our page stands right now:



## Recipe World

[Home](#) [Recipes](#) [Suggest](#)

### Magic Cake

Magic Cake is one of the tastiest cakes the world has ever known. Few have tried it and live  
We also need to stress that whatever happens to you as a result of consuming Magic Cake is  
view our [legal page](#) for more information.

### Ingredients

2 eggs 1 pound of sugar 3 sticks of butter

### Directions

1. Mix eggs, sugar, and butter in a large bowl.
2. Spread into a non-stick dish
3. Bake at 350 degrees for 1 hour
4. Let sit at room temperature for 20 minutes
5. Eat and enjoy!

