



## HTML/CSS Lesson Plans

### Course Outline

- 8 lessons x 1 hour
- **Class size:** 15-25 students
- **Age:** 10-12 years

### Requirements

- Computer for each student (or pair) and a classroom projector
- Pencil and paper
- Internet access
- Google Chrome or Firefox web browser

### Online platform (one of the below)

<https://thimble.mozilla.org>

<https://trinket.io>

<http://jsbin.com>

### Objective

The aim of this program is to **provide the children with an understanding of how the Internet works, what a computer is, and how they can create their own content for the Internet.** Using the HTML language for web development, we will teach the children about the language behind the Internet, and the computational concepts of data and sequences. Students will also develop general skills including **attention to detail, computational thinking, debugging, and problem solving techniques.** The children will create a project that will require development of a website. Students will explore managing sound, imagery and story, and they will present their projects to their class.

### Technical Skills

- The computational concepts of sequences and data
- The concepts of web design and debugging

### Computer Skills

- Introduction to the Internet and the World Wide Web
- Introduction to computers and computing, and an understanding of hardware and software

### General Skills



- Problem solving
- Self-expression and creativity
- Cooperation / Team work
- Testing, editing, and attention to detail

## Overarching Computational Concepts & Methods

### Concepts

<b>Sequence</b>	Identifying a series of steps for a task
<b>Data</b>	Storing, retrieving, and updating values

### Practices

<b>Expressing</b>	Realizing that computation is a medium of creation: "I can create."
<b>Connecting</b>	Recognizing the power of creating with and for others: "I can do different things when I have access to others."
<b>Questioning</b>	Feeling empowered to ask questions about the world: "I can (use computation to) ask questions to make sense of (computational things in) the world."

### Perspectives

<b>Being iterative and incremental</b>	Developing a little bit, then trying it out, then developing some more.
<b>Testing and debugging</b>	Making sure that things work – and finding and fixing mistakes.
<b>Reusing and remixing</b>	Making something by building on what others – or you – have done.
<b>Abstracting and modularizing</b>	Building something large by putting together collections of smaller parts.



## HTML Lesson 1

### Topic

Introduction to Code and HTML

### Time

60 minutes

### Objectives

Students will be able to:

- Describe what code is
- Log into online platform and create a project
- Edit an HTML file

### Prerequisites

- Ask the teacher to create a Thimble/JSbin/ Trinket account for the class prior to the first session.

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### Procedure

#### **Welcome - 5 min** (Have students sit together without computers if possible.)

Welcome everyone to coding. Introduce yourself and any team members. Explain that over the next few weeks, they're going to learn how to make their own web pages by writing code!

#### **Introduction to Code - 15 min**

Start a discussion about code using the Introduction to Code presentation.

#### **Introduce HTML - 10 min** (Ask students to go to computers.)



Introduce HTML as the language they're going to use to build their programs. Explain that next, they'll take a look at what HTML looks like. Ask them to follow along and pause after each step:

1. First, point out that they should use Google Chrome if possible.
2. Ask them to visit the school's website.
3. Right click on the page and select "View Page Source".
4. Explain that this is the code that the browser reads to display the webpage. Most of it is HTML but there are other languages in there too.
5. Ask students to share their observations. Is there a pattern in the code? Are there symbols that repeat more than others?

### **Introduce Thimble/ Trinket/ JSbin - 10 min (notes will proceed with use of Thimble)**

Although the code they just saw might look intimidating, explain that they'll start with basics. First, they need to log into the Thimble website, where they'll be writing their code. Walk through the following steps with the class. Ensure that the class moves together.

1. Ask students to go to the Thimble website:
2. Click Sign In.
3. Ask students to enter the class's username and password. Write these on the board.
4. Enter your own username and password.
5. Click on Start a project from scratch.
  - a. Give the project a name. Ask students to use their names. Stress that it's important that everyone uses their own name so that everyone's work is saved.

### **Exploring HTML - 10 min**

Next, students will edit the content on the web page. Explain that the left hand side is the editor, where they'll write their code. The right hand side is the preview of their web page or the result of their code. If they want to change their web page, they'll need to edit the code on the left.

1. Ask students to look at the code and share their observations. Are there any similarities between the code for this web page and their school's web page?
2. Ask students to identify which part of the code displays the heading, "Welcome to Thimble". Ask them to change the heading.
3. Ask students to identify which part of the code displays the paragraph, "Make something amazing with the web." Ask them to change the paragraph.
4. Ask students why is the word "amazing" bold. Can they make another word bold?



## Wrap up - 10 min

Explain that the last thing you'll do today is discuss their projects. Through the course of the program, their goal is to create a web page about themselves, something they're really interested in, or a topic chosen by their teacher. Make sure the topic is appropriate.

Their homework is to start thinking about the topic for their web page.

- What is the title of their web page?
- What do they want to say?
- What images would they like to show?

Ask them to write their ideas down on a piece of paper and bring it to the next class. Give students the opportunity to ask questions.

Finally, remind students to log out of Thimble before signing out of their computers.

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## HTML Lesson 2

### Topic

HTML Elements and Tags

### Time

60 minutes

### Objectives

Students will be able to:

- Identify HTML elements
  - Explore HTML elements on [w3schools.com](http://w3schools.com)
  - Create heading elements
  - Create paragraph elements
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## Procedure

### Welcome - 5 min (Have students sit together if possible.)

Welcome everyone back! Review some of the concepts they learned last class.

- What did they learn last session?
- What is code?
- What is an algorithm?
- What is debugging?
- What symbols are important in HTML?

Give an overview for today. Explain that today, they'll learn:

- How to back up their projects
- What are the basic rules of HTML
- How to add headings
- How to add paragraphs

### Saving projects locally - 5 min (Have students go to computers.)

Explain that Thimble should save their projects automatically, but it doesn't always work. So it's a good idea to create a backup, a local copy of their projects. Ask students to follow along to learn how to create a backup. Pause after each step.

1. Open Google Chrome if possible and go to the [Thimble](#) website.
2. Ask students to sign in with the class username and password. Write these on the board.
3. Sign into your own account.
4. Click on your username and Your Projects.
5. Find and click on the project saved from last session. Remind students that they must only click on their own projects so that they don't accidentally delete another student's work. This is the project that students will use to build their web pages.
6. Click on your username and Export.

Explain that they now have 2 copies of their projects: 1 in Thimble and 1 on their computer.

### Opening projects saved locally - 10 min

Work with students to open their locally saved projects. Walk through the following steps:



1. Ask students to find the zip file that was saved using Explorer or Finder.
2. Extract the zip file.
3. Open the project folder.
4. Right click on index.html and open the file in a text editor.
5. Use Ctrl-A (Command A on Mac OS) to select all.
6. Use Ctrl-C (Command C on Mac OS) to copy.
7. Go back to Thimble.
8. Click in the editor.
9. Use Ctrl-A to select all.
10. Press delete.
11. Use Ctrl-V (Command V on Mac OS) to paste.

## Introduce HTML Elements and Tags - 10 min

Explain that before they start writing HTML, they first need to learn the vocabulary and rules of the language, just like they would when they learn any other language.

Compare sentences in a language like English with elements in HTML. In English, a sentence starts with a capital letter and ends with a period. An HTML element has a similar set of rules.

Use the HTML Elements and Tags presentation to discuss basic HTML syntax.

- Slide 2: Ask students to observe the HTML element and look for symbols and patterns.
- Slide 3: Give students another few seconds to observe the HTML element.
- Slide 4: Ask students if this example is an HTML element. Why or why not?
- Slide 5: Explain that most HTML elements follow this pattern.
- Slide 6: Explain that the content or what they want to say goes in the middle.
- Slide 7: Explain that they must "tag" the content to tell the browser what it is. For example, it could be a heading, paragraph, or link. Each piece of content must have a start tag and an end tag with the proper tag name to identity what the content is. Ask students the following questions:
  - How are the start and end tags the same? I.e. tagname and brackets
  - How are they different? I.e. the end tag has a slash or "finish line"

Explain that most HTML elements follow this pattern, but not all and there are variations.

## Identifying HTML elements - 5 min

Return to Thimble. Ask students to point out the HTML elements that follow the basic pattern. Be sure to cover and explain the purpose of the following elements:





- html - contains the entire html document
- title - contains the title displayed on the browser tab
- body - contains everything displayed on the web page

### Introduce w3schools.com - 10 min

Introduce w3schools.com as a website they can use to learn about HTML tags. Ask students to follow along to learn more about headings and paragraphs. Pause after each step.

1. Go to the [w3schools.com](https://www.w3schools.com) website.
2. Click on Learn HTML.
3. Click on HTML Headings on the left.
4. Point out the 2 sentences after the 2nd HTML Heading. Ask someone to read the sentences. Reiterate that there are 6 HTML headings and h1 is the most important.
5. Click on Try it Yourself.
6. Show students that they can edit the content and tags on the left, click See Result to see the changes on the right.
7. Give them 2 minutes to experiment. Ask students to try the following:
  - a. Change what the headings say.
  - b. Change an existing heading to another kind of heading.
  - c. Add another heading of their choice.
8. Ask students to close the Try it Yourself tab and return to the HTML Headings page.
9. Ask students to click on HTML paragraphs.
10. Read each of the sentences underneath HTML Paragraphs.
11. Point out the example with 2 paragraphs.
12. Click Try it Yourself.
13. Give students 2 minutes to practice changing and adding paragraphs.

### Adding headings and paragraphs to their projects - 10 min

Give students the rest of the class to add their headings and paragraphs to their projects.

### Wrap up - 5 min

Give students a 5 minute warning. Ask students to back up their projects, log out of Thimble, and their computers.



Their homework is to continue thinking about their projects: writing up their paragraphs, looking for images, and sketching their designs.

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## HTML Lesson 3

### Topic

HTML Attributes and Links

### Time

60 minutes

### Objectives

Students will be able to:

- Identify HTML attributes
  - Create link elements
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### Procedure

#### **Welcome - 10 min** (Have students sit together if possible.)

Welcome everyone back! Review the basics of HTML using the HTML Review presentation.

- Slide 2: Ask students to identify the bug.
- Slide 3: Show the corrected element.
- Slide 4: Ask students to identify the bug.
- Slide 5: Show the corrected element.
- Slide 6: Ask students to identify the bug.
- Slide 7: Show the corrected element.
- Slide 8: Ask students to identify the problem and how they would fix it.
- Slide 9: Reinforce that all content must be inside the body element.
- Slide 10: Reinforce that all content must be tagged.
- Slide 11: Ask students to identify the problem and how they would fix it.
- Slide 12: Reinforce that there should only be 1 body element.

## Introduce HTML Attributes - 15 min

Explain that today, they're going to learn a variation of the rule for HTML elements. Some HTML elements have one or more attributes. Use the HTML Attributes presentation to discuss.

- Slide 2: Ask students to observe the HTML element and focus on what's different.
- Slide 3: Repeat. Ask what's different about these elements from the basic element.
- Slide 4: Point out the extra text inside the start tag.
- Slide 5: Explain that the extra text is an HTML attribute that has the following properties:
  - It provides extra information about the element.
  - It follows a pattern.
- Slide 6: Explain that the pattern starts with the name of the attribute. Ex. href
- Slide 7: Point out that an equal sign must follow.
- Slide 8: Explain that the last part is its value surrounded by quotes. Do the following:
  - Ask students to look at their Thimble website and identify possible attributes.
  - Return to the presentation. See if they can predict what type of element it is.
- Slide 9: Reveal that this is a link element! Ask the following:
  - What is the href attribute for?
  - How is it different from the content? I.e. "Google" is what the link says, but href points to where the link should go.

## Creating links - 10 min (Have students go to computers.)

Demonstrate how to practice making links on the w3schools website. Pause after each step.

1. Go to the [w3schools.com](https://www.w3schools.com) website.
2. Click on Learn HTML.
3. Click on HTML Links.
4. Scroll down to the Syntax section.
5. Ask students to look at the example.
6. Click on Try it Yourself.
7. Explain that the link element on the left creates the link on the right.
8. Click on the link to prove that it works.
9. Click See Result to refresh the preview.
10. Open a new tab in the browser.
11. Go to the school's website and copy the url in the address bar.
12. Return to Try it Yourself.
13. Paste the url of the school's website into the value of the href attribute.
14. Edit the link text to be the name of the school.
15. Click See Result and test the link. (May need to hold Ctrl/Command to open a new tab.)



### Working on their projects - 20 min

Give students the rest of the time to continue adding headings and paragraphs to their web pages as well as links.

### Wrap up - 5 min

Give students their 5 minute warning. Remind students to save their projects to their computers and log off.

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## HTML Lesson 4

### Topic

Finding and adding images

### Time

60 minutes

### Objectives

Students will be able to:

- Find images labeled for reuse
- Create image elements

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### Procedure

#### Welcome - 5 min (Have students sit together if possible.)

Welcome everyone back! Celebrate what students have learned so far. You can ask students to raise their hands if they've accomplished the following:

- Created at least 2 types of headings in their project
- Added multiple paragraph elements to their project



- Successfully created a link

### **Finding images labeled for reuse - 10 min** (Have students go to computers.)

Explain that today, they'll learn how to add images to their web pages, but first, they need to find images that are appropriate to use.

Explain that when they use Google to do an image search, it returns all images that match their search phrase, but not all of the images are okay for them to use. Not everyone who owns the images wants others to reuse or modify their work. So how do they find images that are okay for them to reuse and/or modify?

Demonstrate how to search for reusable images. Have students follow these steps:

1. Go to Google.
2. Type in a search phrase, such as pandas.
3. Click on Images.
4. Explain that this includes all images that match their search phrase.
5. Click on Search tools.
6. Click on Usage rights.
7. Describe each option.
8. Recommend that they select Labeled for noncommercial reuse with modification.
9. Point out that the search results should have changed.
10. Ask students to select on one of the images and click on View image.

### **Creating image elements - 15 min**

Ask students to keep the image open and tell them that they'll go back to it later. Explain that before they add the image to their web page, they need to learn about the image element. Ask students to go to the [w3schools](https://www.w3schools.com) website in another tab or window and follow along:

1. On the [w3schools.com](https://www.w3schools.com) website, click on Learn HTML.
2. Click on HTML Images.
3. Scroll down to HTML Images Syntax.
4. Ask students to look at the pattern for the image element.
5. Ask students what's different, i.e., there is no content or end tag.
6. Describe the image element as a standalone tag.
7. Ask students what's the purpose of the src attribute.
8. Ask students what's the purpose of the alt attribute.
9. Scroll down to the example and click Try it Yourself.
10. Point out that in this example, the image doesn't exist so the alt text is displayed.



11. Change the alt text to describe the image you searched for and test it.
12. Return to the tab with the image.
13. Copy the url.
14. Return to Try it Yourself.
15. Copy the url into the value of the src attribute and test it.
16. Point out that the image may be squished.
17. Draw their attention to the style attribute with the width and height pixel values.
18. Ask students to adjust the width and height as necessary.

### Working on their projects - 25 min

Give students the rest of the time to work on their projects.

### Wrap up - 5 min

Give students their 5 minute warning. Remind students to save their projects to their computers and log off.

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## HTML Lesson 5

### Topic

Embedding videos

### Time

60 minutes

### Objectives

Students will be able to:

- Embed videos from YouTube

### Procedure

**Welcome - 5 min** (Have students sit together if possible.)



Welcome everyone back! Briefly review the elements they've learned so far: headings, paragraphs, links, and images. Ask for a few volunteers to share challenges that they've encountered. See if anyone has any specific questions.

### **Embedding videos - 10 min (Have students go to computers.)**

Explain that today, they'll walk through how to add a video from YouTube. Ask students to follow along. Remember to pause after each step. If YouTube is unavailable, try Vimeo.

1. Open a new tab and go to <https://www.youtube.com/>.
2. Search for a video that's relevant to their projects.
3. Click on the video and pause it.
4. Click on Share.
5. Click on Embed.
6. Ctrl-C (Command-C on Mac OS) to copy the code.
7. Go to Thimble.
8. In the editor, move the cursor to a spot for the video.
9. Ctrl-V (Command-V on Mac OS) to paste the code.
10. Test the video. If the video doesn't play, it means that it's protected, and they'll need to find a different video.

### **Working on their projects - 40 min**

Give students time to complete adding all content to their web pages.

### **Wrap up - 5 min**

Remind students to save their projects and log off before the end of class.

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## **HTML Lesson 6**

### **Topic**

CSS Inline Styles



## Time

60 minutes

## Objectives

Students will be able to:

- Add CSS inline styles to HTML elements

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## Procedure

### Welcome - 5 min (Have students sit together if possible.)

Welcome everyone back! Remind students that today, they should have all content: headings, paragraphs, links, images, and videos added to their web pages. Today, they'll learn how to style their web pages.

### Introduce CSS - 10 min

Introduce CSS as the language they'll use to style their web pages. Use the CSS Inline Styles presentation to go over CSS syntax.

- Slide 2: Ask students to observe the CSS style and focus on the pattern and symbols.
- Slide 3: Repeat above.
- Slide 4: Repeat above. Then ask students the following:
  - What is the pattern?
  - What does it look similar to? I.e. attributes.
  - How is it similar to attributes? I.e., name and value.
- Slide 5: Explain that like attributes, CSS styles have a property and value. Then ask:
  - How are CSS styles different from attributes?
- Slide 6: Reinforce that CSS styles use a ":" instead of "=", and end with ";". Then ask:
  - Where does this CSS go?
  - Where have they seen this before? I.e. style attribute in the <img> tag.
- Slide 7: Point out they were writing CSS when they were sizing their images.
- Slide 8: Explain that CSS can be written inside the style attribute. They can have multiple CSS styles inside the style attribute as long as it's within the quotes, and they can add the style attribute to any HTML element.



### **Adding CSS to the body element - 15 min (Have students go to computers.)**

Explain that next, they'll walk through how to add CSS to the body element. Ask students to follow along. Remember to pause after each step:

1. Ask students to open their projects in Thimble.
2. Meanwhile, open an unstyled project, ex.,  
<https://thimbleprojects.org/marshmallowcoding/74970/>
3. Point out that their projects look well formatted in the preview.
4. Click on the fullscreen icon.
5. Point out how their pages stretch across the entire screen, which makes it hard to read.
6. Explain that they'll use CSS to format their web pages.
7. Exit the fullscreen preview.
8. Locate the body element in the code editor.
9. Recall the body element contains everything on their web page, and they can style it.
10. Place the cursor inside the <body> tag just before the end bracket.
11. Create a space and enter style="".
12. Place the cursor between the quotes.
13. Enter max-width:600px;
14. Test in full screen and return to the code editor.
15. Place the cursor after the last semicolon.
16. Enter margin:20px auto;
17. Test in full screen and return to the code editor.

### **Exploring CSS on w3schools - 15 min**

Explain that they can continue styling the body element by adding more CSS styles to the style attribute, or they can add the style attribute to other elements. They can find other CSS properties on the w3schools website. Ask students to follow along.

1. Go to [w3schools.com](https://www.w3schools.com).
2. Click on Learn CSS.
3. Point out that on the left, they can explore other CSS properties.
4. Go to CSS Backgrounds.
5. Scroll down to the Background Color.
6. Explain that background-color changes the background colour of an element.
7. Draw their attention to the example.

8. Ask them to ignore the curly braces, and focus only on the property and value.
9. Copy the property and value.
10. Return to the project in Thimble.
11. Paste the code inside the style attribute of the <body> tag.
12. Verify that the code works.
13. Point out that they can apply other colours.
14. Return to w3schools.
15. Click on CSS Colors on the left.
16. Scroll down, find the "140 standard color names" link, and click on it.
17. Ask students to choose a colour and add it to their web page.

### Working on their projects - 10 min

Direct students back to the CSS page on w3schools, i.e., click CSS on the main navigation. Explain that for the remainder of the class, you'd like to them to begin exploring other CSS styles that they can incorporate into their web pages. Remind students that they can style ANY element, not just the body element, but suggest starting with the body element. Also suggest on starting with the most used styles:

- Borders
- Margins
- Padding
- Text
- Fonts

Explain that they're welcome to explore other styles! Show an example of a styled web page, ex., <https://thimbleprojects.org/marshmallowcoding/72280>.

### Wrap up - 5 min

Remind students to save their projects and log off before the end of class.

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## HTML Lesson 7

### Topic

CSS Inline Styles

## Time

60 minutes

## Objectives

Students will be able to:

- Add a border
- Add padding
- Modify the background colour
- Modify the font

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## Procedure

### Welcome - 5 min (Have students sit together if possible.)

Welcome everyone back! Explain that today, they have the entire class to style their web pages and that next day, they'll have the chance to present their web pages. Remind them that they should at minimum style their web pages by adding a border, and changing the background colour and font.

It may be helpful to go over how to style specific elements, i.e., ask and/or demonstrate how they would change the font of one of their headings. Also suggest and/or demonstrate adding padding to create white space between the border and content.

### Working on their projects - 50 min (Have students go to computers.)

Help students with their projects during this time.

### Wrap up - 5 min

Remind students to save their projects and log off before the end of class.

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## HTML Lesson 8



## Topic

Presentations

## Time

60 minutes

## Objectives

Students will be able to:

- Publish their projects
- Create a div element (optional)

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## Procedure

### Welcome - 5 min (Have students sit together if possible.)

Congratulate everyone for making it to the last day! Explain that today, they'll have more time to work on their projects. Then they'll present. Address any concerns.

### Creating a div element - 15 min (Optional. Have students go to computers.)

Some students may be curious how they can have 2 different background colours: one inside the border and another outside the border. If they'd like, explain that they can create a container inside the body element that holds all the content. This container is called a division or div element, and it can be styled separately from the body.

Continue with the demonstration. Students may follow along. Pause after each step:

1. Ask students to open their projects in Thimble.
2. Meanwhile, go to a partially styled project, ex. <https://thimbleprojects.org/marshmallowcoding/72280/>
3. Locate the start tag for the body element.
4. Place the cursor underneath the start tag and add the `<div>` start tag.
5. Locate the end tag for the body element.
6. Place the cursor above the end tag and add the `</div>` end tag.
7. Return to the start tag for the body element.
8. Highlight the style attribute inside the start tag.
9. Use Ctrl-X (Command X on Mac OS) to cut.
10. Place the cursor inside the `<div>` start tag just before the end bracket.



11. Press the spacebar.
12. Use Ctrl-V (Command V on Mac OS) to paste.

Ask students to verify that their websites now have a white background outside of their border. Encourage them to change the background colour of the body element and the div element, so that they can have 2 different colours.

### **Working on their projects - 10 to 25 min (Have students go to computers.)**

Give students time to complete their projects. Students who want to present can write their names on the board.

### **Publishing their projects - 5 min**

Explain that before they begin presentations, you'd like to demonstrate how to publish their projects so they can share their projects with others without giving them the account information.

1. Go to a project in Thimble.
2. In the top right corner, click Publish
3. Provide a description.
4. Explain that they can copy and send the link to others.

### **Presentations - 20 min (Have students sit together if possible.)**

Have each presenter describe their project, their challenges, what they enjoyed the most, etc.

### **Wrap up - 5 min**

Remind students to save their projects and log off before the end of class. Thank them all for their hard work and encourage them to keep coding!