# COMPUTING Knowledge Organiser - HTML and Web Development Page 1

| 1 | HTML | Hypertext Markup Language (HTML) is used by website developers to define the structure of a website. A website user then uses a browser (which can understand the HTML and render it) to view the webpage |
|---|---|---|
| 2 | HTML Tag | Used to define a HTML element (part of a page) such as a paragraph or heading |
| 3 | Formatting | Changing the appearance of a webpage; usually to make it clearer and easier to understand the content |
| 4 | Attribute | Used inside of a HTML tag in order to provide additional information about the HTML element |
| 5 | Directory | A directory (or folder) is a file on a computer which contains references (pointers) to other files. These other files may also be directories. |
| 6 | Render | In the context of web pages, rendering is the process which the browser carries out to understand the web page code and display the page to the user in the way that the web developer intended it to be viewed |
| 7 | CSS | Cascading style sheets (CSS) is the language that is used to format and style HTML web pages |
| 8 | Head | The head of a HTML page is a container for metadata (data about data) |
| 9 | Body | The body of a HTML web page is the part where the visible content goes |
| 10 | Search term | A word that the user types into a search engine as part of a search query |
| 11 | Keywords | A word which can be used to identify the fact that a web page is about a particular topic. For example, a website about UK rivers might include the keyword "Thames" as that is an important river in the UK. |
| 12 | Hyperlink | A clickable element on a web page which takes the user to another web page |
| 13 | Crawler / Spider | A crawler (also known as a spider) is a program that a search engine uses to find content on the world wide web |
| 14 | Indexing | The process by which search engines organise large amounts of information to enable very fast access times |
| 15 | Search query | A search query is the collection of search terms that a user enters into a search engine to perform a search of the world wide web |
| 16 | Ranking algorithm | A sequence of steps followed by a search engine to determine the order in which search results appear for a particular search term |
| 17 | Navigation | The part of a website, which is often a menu of some kind, which allows the user to move between pages on the website easily (i.e. without having to manually edit the URL in their browser) |
| 18 | Browser | A program (such as Google Chrome, Mozilla Firefox or Microsoft Edge) which can understand HTML, CSS and JavaScript code and display a website on a user's computer |

**HTML Tags**

HTML tags help the browser to know how to display a web page to the user.

HTML tags within the `<body></body>` tags define how the content of a page should be rendered by the browser.

HTML tags elsewhere, particularly those within the `<head></head>` tags are used for metadata, which is data about data. For example, in the `head` tags may contain the title of the web page.



**Headings**

Heading tags tell the browser to format the text within them in bold and a larger font size. This means that the text can then be used as a paragraph heading.

`<h1></h1>` tags produce the heading with the largest font size.

`<h6></h6>` tags produce the heading with the smallest font size.

h2, h3, h4 and h5 tags produce headings with font sizes in between h1 and h6.

**Example:** The code `<h1>Learning HTML</h1>` produces this result in the browser:

## Learning HTML

Changing the code to `<h6>Learning HTML</h6>` reduces the font size of the heading:

Learning HTML

**Paragraphs**

The `<p></p>` tag tells the browser that the text in between the tags should be formatted as one paragraph.

Building on the headings example, adding the code `<p>Students learn HTML in Year 8 at Birchwood High School</p>` produces this result:

## Learning HTML

Students learn HTML in Year 8 at Birchwood High School

**Bold text**

The `<b></b>` tag can be used to make text bold.

**Example:** This code:
```
<h1>Learning HTML</h1>
<p>Students learn HTML in Year 8 at
<b>Birchwood High School</b></p>
```
Will make the text 'Birchwood High School' appear bold.

**Learning HTML**

Students learn HTML in Year 8 at **Birchwood High School**

**Italics**

Text can be made to appear in italics using the `<em></em>` tag.

**Example:** This code:
```
<h1>Learning HTML</h1>
<p>Students <em>learn</em> HTML in Year 8 at
<b>Birchwood High School</b></p>
```
Will make the text 'learn' appear in italics.

**Learning HTML**

Students *learn* HTML in Year 8 at **Birchwood High School**

**Ordered lists**

An ordered list in HTML is a list which is numbered, created with `<ol></ol>` and `<li></li>` tags.

**Example:** This code:
```
<p>List of computing teachers at Birchwood High School:</p>
<ol>
    <li>Mr Keane</li>
    <li>Mr Sutton</li>
    <li>Mrs Leonowicz</li>
</ol>
```
produces this output in the browser:

List of computing teachers at Birchwood High School:

1. Mr Keane
2. Mr Sutton
3. Mrs Leonowicz

**Unordered lists**

Lists can also be unordered, created using `<ul></ul>` and `<li></li>` tags. These lists appear as bullet point lists.

**Example:** This code:
```
<p>List of computing teachers at Birchwood High School:</p>
<ul>
    <li>Mr Keane</li>
    <li>Mr Sutton</li>
    <li>Mrs Leonowicz</li>
</ul>
```
produces this output in the browser:

List of computing teachers at Birchwood High School:

- Mr Keane
- Mr Sutton
- Mrs Leonowicz

**Inline CSS**

Inline CSS allows the web developer to apply CSS rules, which change the appearance of a HTML element, to individual elements. It works by adding CSS rules inside the opening tag of a pair of HTML tags using `style=`.

Example: Inline CSS could be used to make each teacher in the teachers list appear a different colour:

```
<p>List of computing teachers at Birchwood Community
School:</p>
<ul>
    <li style="color:red;">Mr Keane</li>
    <li style="color:blue;">Mr Sutton</li>
    <li style="color:green;">Mrs Leonowicz</li>
</ul>
```

List of computing teachers at Birchwood Community School:

- Mr Keane
- Mr Sutton
- Mrs Leonowicz

Other CSS rules including, but not limited to, `font-family`, `font-size` and `background` can also be used inline.

**Adding images**

Images can be added to HTML pages using the `img` tag. This is an example of a self-closing tag. This is because, unlike the majority of HTML tags, a closing tag is not required.

**Example:**

```
<img src="bchsLogo.webp" alt="Birchwood High School
Logo">
<h1>Learning HTML</h1>
```



**Learning HTML**

The `src` attribute specifies the path to the image file that should be loaded. The `alt` attribute specifies alternative text. This is displayed if the image cannot be loaded or if the user is using a screen reader and cannot see the image so they can still understand the content of the page.

**Adding hyperlinks**

Hyperlinks help users (and crawlers) navigate between web pages. In HTML, a hyperlink can be added using the `<a></a>` tag.

Example:
```
<a href="https://www.birchwoodhigh.org/"><img
src="bchsLogo.webp"></a>
<h1>Learning HTML</h1>
```

Now, clicking on the school logo will take me to the school website. Hyperlinks can also be applied to other HTML elements, such as text.

**External CSS**

CSS rules can also be defined in an external style sheet which is created in a separate file to HTML code.

To use an external style sheet, you must tell the browser that you want to use it using a `link` tag within the `head` tags.

**Example**

HTML File:
```
<html>
     <head>
          <link rel="stylesheet" type="text/css"
href="style.css">
     </head>
     <body>
          <img src="bchsLogo.webp">
          <h1>Learning HTML</h1>
          <p>Students <em>learn</em> HTML in Year 8 at
<b>Birchwood High School</b></p>

          <p>List of computing teachers at Birchwood High
School:</p>
<ul>
     <li>Mr Keane</li>
     <li>Mr Sutton</li>
     <li>Mrs Leonowicz</li>
</ul>
     </body>
</html>
```

CSS File:
```
li {
     color: blue;
}
```

Result when rendered by the browser:



# Learning HTML

Students *learn* HTML in Year 8 at **Birchwood High School**

List of computing teachers at Birchwood High School:

- Mr Keane
- Mr Sutton
- Mrs Leonowicz

The rule in the external CSS file (turn list items blue) has been applied to all the list items in the HTML file.

Using external CSS can be useful as it makes your HTML code less cluttered and it becomes much easier to change the styling of a web page if required.

**Search Engines**

Search engines are used by people when they want to find a resource on the world wide web. The user enters keywords and the search engine provides them with a list of the most relevant web pages or other resources (such as PDF files).

To do this, search engines use programs called crawlers (sometimes called spiders). Crawlers follow links between web pages, recording common keywords. By travelling between web pages crawlers can find new content to add to the search engine's index.

An index records information about a web page such as the keywords on it, the type of content the crawler found and the date the page was last updated.

Crawling process:
1. Crawlers first examine the source code of a web page, looking for metatags which explain what the web page is about.
2. The crawler records important keywords that it finds.
3. The crawler adds any hyperlinks it finds to a queue, ready to be visited when the search of this page is complete.

**Spam**

In the early years of the world wide web, it was common for web designers to use knowledge of how search engines work to create spam websites. By filling a website with common keywords, they could make it appear at the top of search results, by tricking the search engine into placing more importance on the page.

Since then, search engines have become more sophisticated and now use more complex ranking algorithms to determine the order of search results.

**Case Study: Google's PageRank algorithm**
Google's PageRank algorithm works by counting the number and quality of links to a web page and using this to determine a rough estimate of the importance of the web page. It was the first algorithm used by Google to determine the importance of resources on the world wide web.



This cartoon illustrates the principle behind Google's PageRank algorithm for Google search. The size of each face is proportional to the total size of all the other faces pointing to it.