Web Design and Development

Definitions

World Wide Web

The World Wide Web (WWW) is a collection of multimedia information stored on the internet.

Internet: Network of computers around the World

Web: all the websites around the world

Web Pages vs Websites

Web pages are single documents that contain information such as text, graphics, audio and video.

A website is a collection of web pages with information about a topic, person, place, organisation and much more...

Web sites are a great way of distributing information

Browsers

A browser (e.g. Google Chrome/Edge/Firefox) allows you to browse the WWW.

The browser loads and displays web pages from other computers on the internet.

To access a web page you can enter the **URL (Uniform Resource Locator)** into the address line of your browser:

The URL

The **Uniform Resource Locator** uniquely identifies every single web page on the internet.

The URL is made up of several parts

http://www.bbc.co.uk/news/uk.html

Protocol   Domain Name   Pathway   Filename

The URL

Protocol: An agreed set of rules between the sender and the receiver that is used to transfer the file. (e.g. HTTP or HTTPS)

Domain Name: The address of the server that is hosting the page.
- Dots separate the different parts of the address.
- The parts are used to specify the type of organisation and country in which it is based.

Pathway: Specifies the route to the page.

Filename: The name of the actual file being accessed.

The Home Page

The 'landing' page of a website is called the **home page**.

Home pages provide the user with links to other pages in the website.

The process of jumping from one page to another or from one part of a web page to another part of the same page is achieved by using **hyperlinks**.

Hyperlinks

Hyperlinks are links to other web pages, another place in the current web page, or a file stored on a local disk

They are generally activated by clicking a piece of text, or on a graphic

Text colour may change once the hyperlink has been clicked on

Types of Hyperlinks

External Hyperlinks

- Clicking on the external hyperlink will take you to a different web site. E.g. if you were on the St Andrew's High School website and you clicked the link for SQA, you would be taken out of our school site to the SQA site.

Internal Hyperlink

- An internal hyperlink – when you click on this it will take you to a different page within the current website.

Absolute and Relative Addressing (of Hyperlinks)

Absolute Addressing (of a hyperlink)

This refers to the use of a complete URL to take you to a page e.g. www.bbc.co.uk/news.html (complete URL used!)

Relative Addressing (of a hyperlink)

This uses a path from the current page to the destination page. E.g. If you are on www.bbc.co.uk and you click on the News link, this will take you down a level to the /news.html page (complete URL is not used!)

Analysis

End-User Requirements

The term 'end-users' describes the group of people most likely to use a website.

If a web development company has a clear idea of the target audience, they should take account of what works best for that group of end-users when creating a website.

Common End-User Groups

• Young children

• Inexperienced users

• Skilled and expert users

• Users who require accessibility features
   • users with learning difficulties or disabilities
   • users who require voice recognition integration or screen readers

These categories are broad and not exhaustive. An end-user could fall into more than one of these categories.

End-User Requirements

The tasks that end-users need to be able to carry out are known as the 'end-user requirements'.

Let's think about a website for a new local gym. Who is our target audience, and what would they need to be able to do in our website?

End-User Requirements

Target audience: adults are members of the gym, or who would like to join the gym

Members would like to:

- navigate the site with ease
- have access to a timetable of classes
- have access to a virtual tour of the gym
- have access to profiles for personal trainers
- be able to may make online payments for classes

Functional Requirements

Functional requirements are what the website must be able to do. Functional requirements will state:

- processes that the website must be able to carry out
- areas of the site that require navigation
- interaction with databases/information that the website needs to have access to in order to function properly
- interaction with multimedia

Functional Requirements

Let's think about a website for a new local gym again.

Some functional requirements might be:

- all pages should link back to the homepage
- video that gives members a virtual tour of the gym
- online calendar and class timetable
- new members can sign-up to the gym

What are requirements used for?

Requirements will help to inform the Design of your website.

It will help to select colours, fonts and multimedia to include on your page. It will also help you decide what features and functionality should be included.

What are requirements used for?

During the Evaluation stage, we use both end-user requirements and functional requirements to measure fitness for purpose – does the website do what it was built for?

If a user wants to find contact details on your website, but you haven't provided that functionality, your website is not **fit for purpose**.

Design

Design Overview

When we design a website, we have to consider 3 areas:

• Website Structure (Navigation)

• Web page layout (Wireframes, Low-Fidelity Prototypes and High-Fidelity Prototypes)

• Legal Implications

Website Structure

When designing a website, we have to define the navigational structure of the website.

Navigation can be structured in two ways:

- Linear
- Hierarchical

Linear Navigation

Linear Navigation was popular in early web development, but it's rarely used in modern websites.

Users move from one page of the site to another in a sequence. The example below shows a linear structure for a website designed for a gym:

Homepage	→	Membership plans page	→	Classes page	→	Contact us page

Linear Navigation Disadvantages

Users who wanted to contact the Gym would have to click through 4 pages until they found the information they needed.

Users who were not familiar with the website may end up confused!

| Homepage | → | Membership plans page | → | Classes page | → | Contact us page |

Hierarchical Navigation

In a hierarchical structure, pages are accessed dependent upon their position in the hierarchy. Here is a hierarchical example of the Gym website
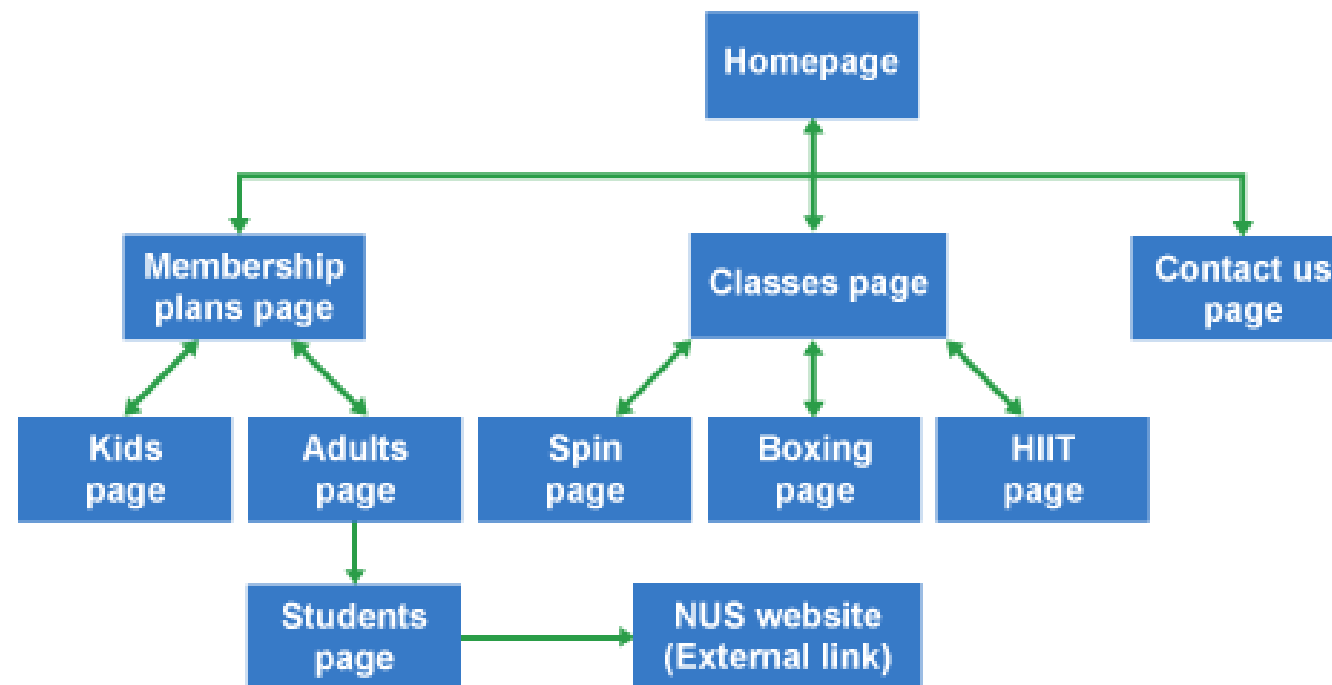
Hierarchical Navigation Advantages

The different pages of a website are more easily accessed, and information is well organised
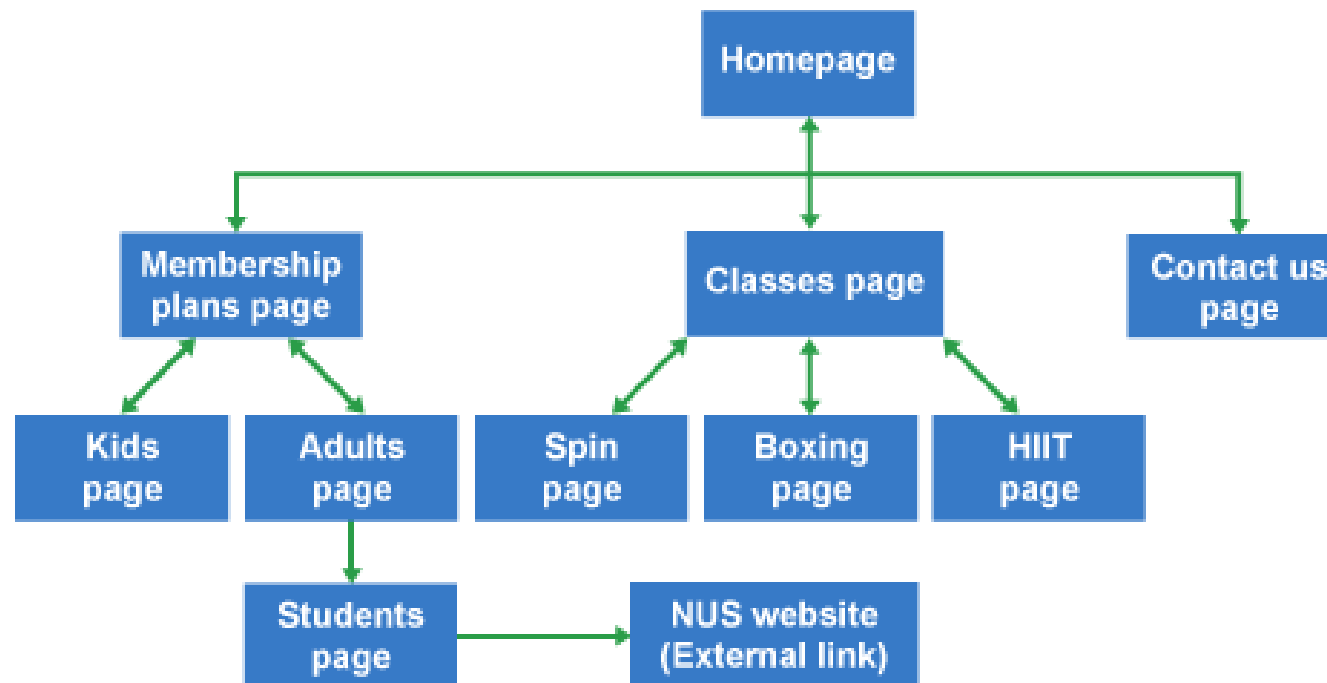
Design: Navigational (Structure) Diagram

To define the navigational structure of a website, we use Navigation Structure Diagram (sometimes called a Navigation Diagram)
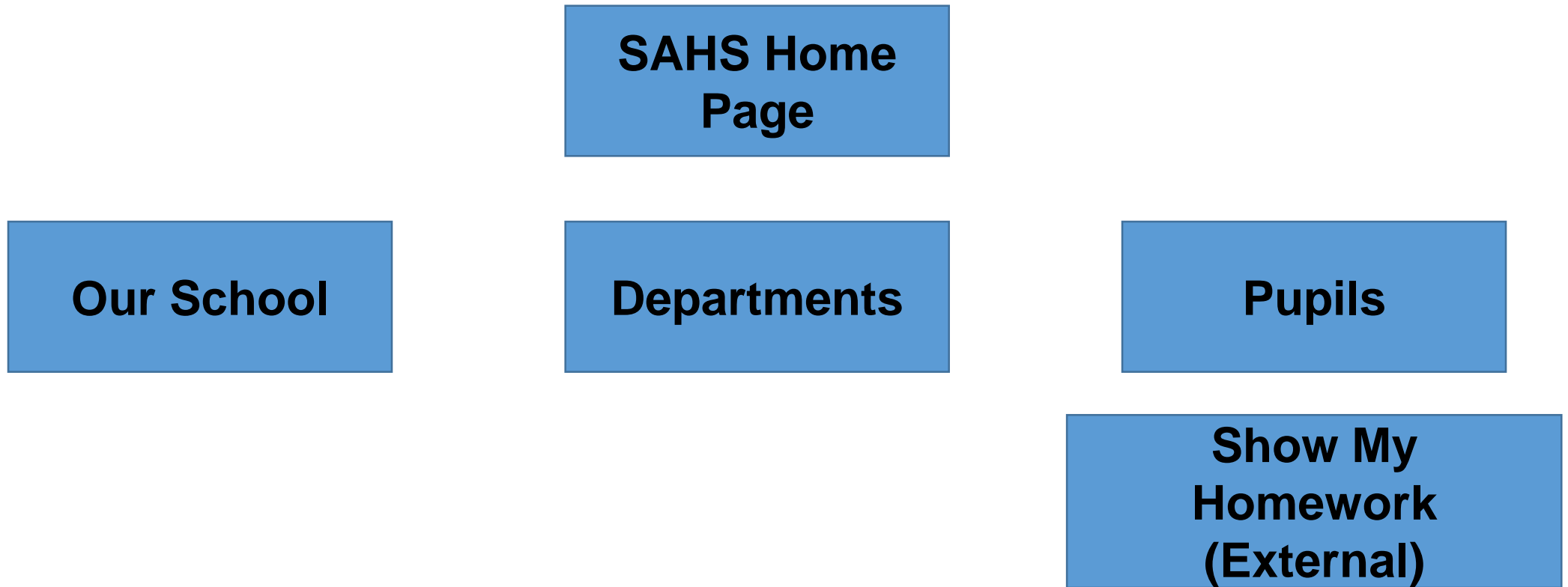
Design: Navigational (Structure) Diagram

Each web page in a website in represented by a box:

SAHS Home Page

Our School	Departments	Pupils

Show My Homework
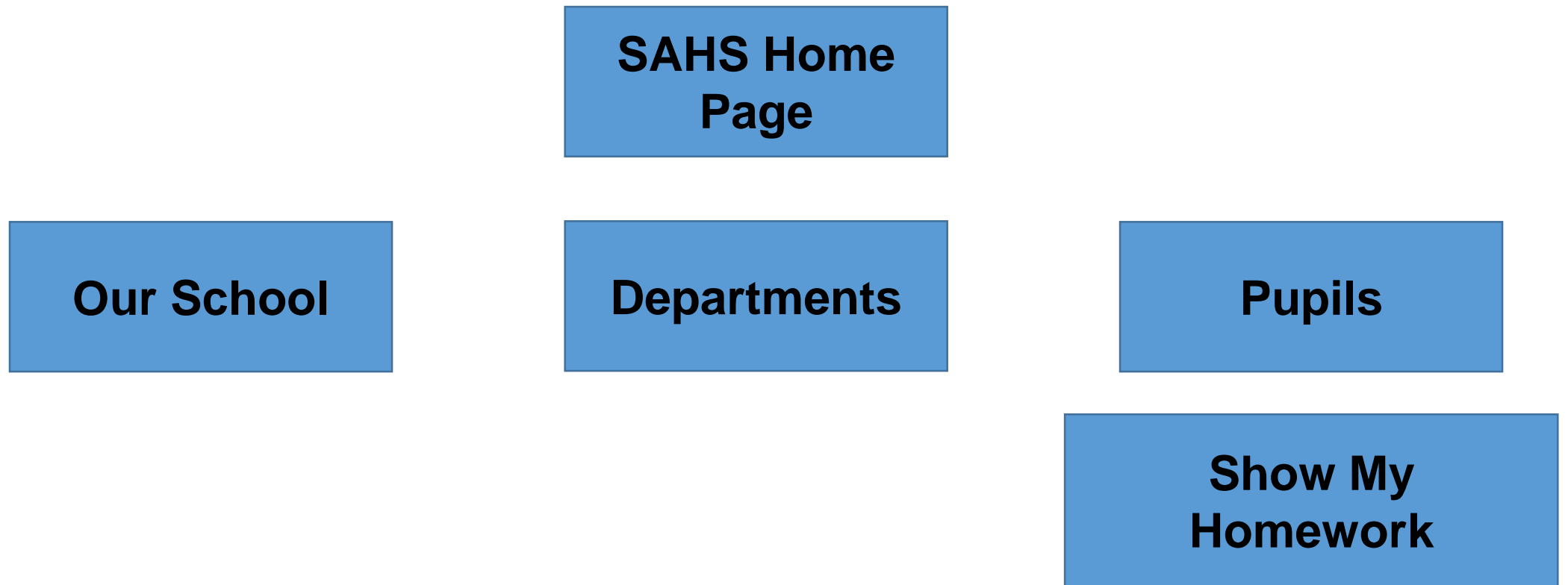
Design: Navigational (Structure) Diagram

You must label any external hyperlinks:

SAHS Home Page

Our School

Departments

Pupils

Show My Homework (External)

Design: Navigational (Structure) Diagram

We then add arrows to show how the user can navigate through the website.
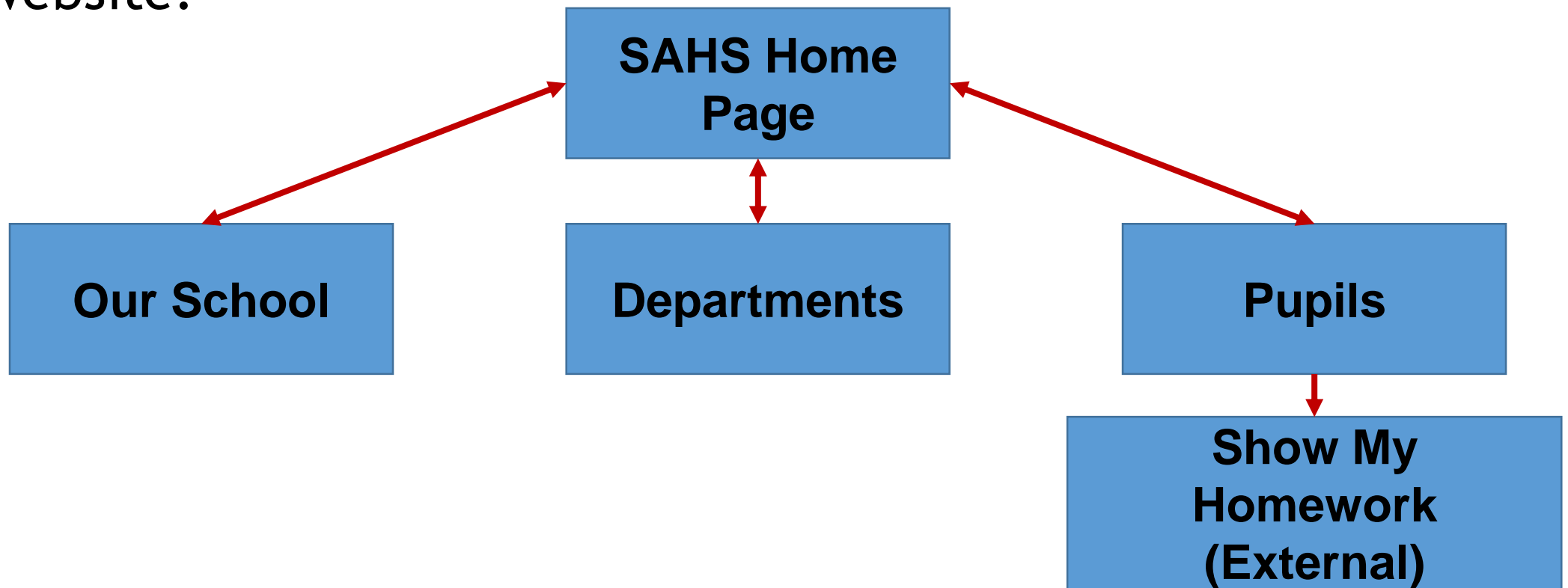
Layout: Accessibility

What do we need to consider when thinking about the accessibility of a website?

What additional hardware or software requirements does someone with a disability require to be able to access our website?

Layout: Accessibility

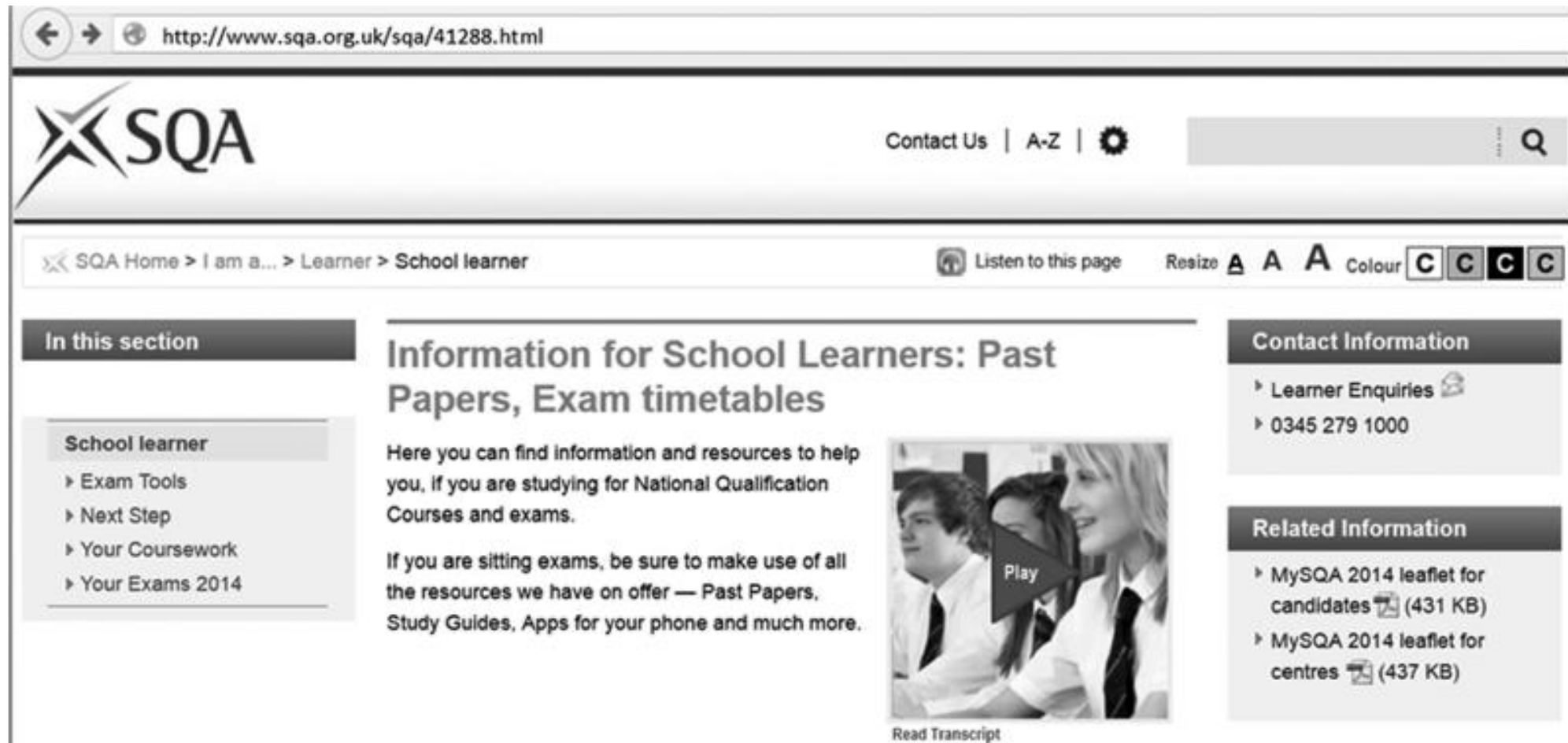Voice recognition software

Screen reader

Head wand

Eye tracking

Braille keyboard

Layout: Accessibility

What 4 accessibility options are available on this site?

User Interface

Types of Device

E.g. smartphone, tablet, smart TV, desktop, laptop

These devices are used in different ways in different situations

Layout: User Interface

User Interface

Should have an appealing layout and colour scheme

Layout: User Interface

User Interface

This is a poorly designed, chaotic layout:

- Designers should think about consistent, easy to read font and colour schemes
- Consistent looking pages across the site
- Well organised pages, uncluttered

Layout: Consistency

What things do we need to consider when making web pages consistent?

- Layout of the page
- Colour scheme
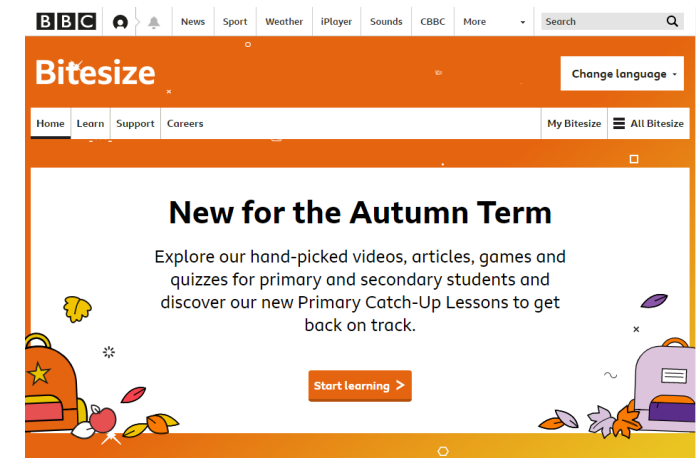- Font
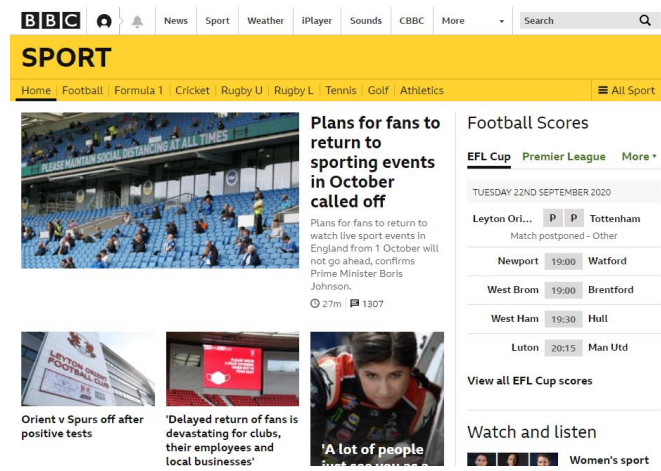- Navigational links
- Search bar

CONSISTENCY IS

Layout: Consistency

Look at these three websites:
- [BBC News](#)
- [BBC Sport](#)
- [BBC Bitesize](#)

In what ways are these websites **consistent**?

Layout: Consistency

- BBC branding is in the top left corner on every page
- Sign-in option is in the same place on every page
- Search bar is in the same place on every page
- Navigation in the same place on every page
- Consistent font used across all web pages
- Page specific branding always under the BBC icon

Layout: Consistency

Why do you think consistency is important in a website?

- Users get familiar with the layout and can navigate between pages easily
- Improved usability
- Different sections of the pages can be identified by the way they look

Layout: Interactivity

What do you think the term "interactivity" means?

To make a web page **interactive** we can add the following to a page:

- Sounds, animations, images
- Use quizzes and games
- Include animations which require user input

This will improve the experience of the user who is visiting the website.

Layout: Readability

This is very important as it allows a user to understand the website.

A **readable** information system has:

- Long passages of text broken up by heading and sub-headings
- Use readable fonts and sizes

Also, for visually impaired users include screen reader software

Layout: Selection

Selection is the way that a user makes a choice on your website. How do you think the devices people use to access your website will impact selection?

- On desktops and laptops, users click the mouse on a menu/sub menu item to make a selection
- On smartphones and tablets use icons for selection e.g. tap the option

Design: Wireframes

Wireframes are used to design the **visual layout** of a webpage and are used to ensure **consistency** across multiple web pages.

When creating a wireframe, we have to keep in mind our end users and any requirements they have.

How might our end users impact our design?

Target Audience and Design Impact

Have a look at the [Nickelodeon](#) website

Target Audience: Children

Design Impact: Bright colours, pictures in the navigation instead of text, dynamic images to keep children engaged

Target Audience and Design Impact

HMRC website

Target Audience: Adults or companies looking for information about tax

Design Impact: Professional colour scheme (black, white, blue), text-based navigation, no distracting images or adverts
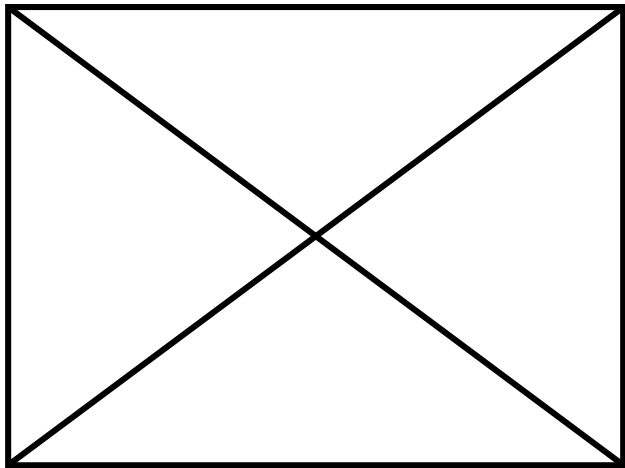
Wireframes

Wireframes should clearly show:

- navigational links
- text areas
- media used (including file format)
- position and type (internal or external) of hyperlinks on a page

How do we represent these in a wireframe?

Wireframe Symbols

Shows multimedia, such an images or videos

You must include the file name and extension e.g. "sahs.jpg"

We need to add an annotation to include:

- the size of any images e.g. 150 x 200 pixels
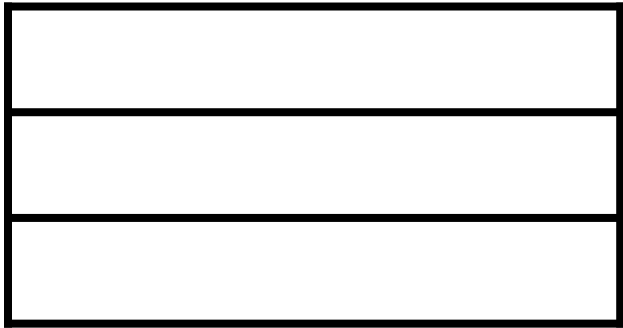
Wireframe Symbols

Shows an area of text

We need to add an annotation to include:

- background colour
- text font
- text size
- text alignment
- text colour

Wireframe Symbols

OR

Shows a navigation bar

We need to add an annotation to include:

- background colour
- text font
- text size
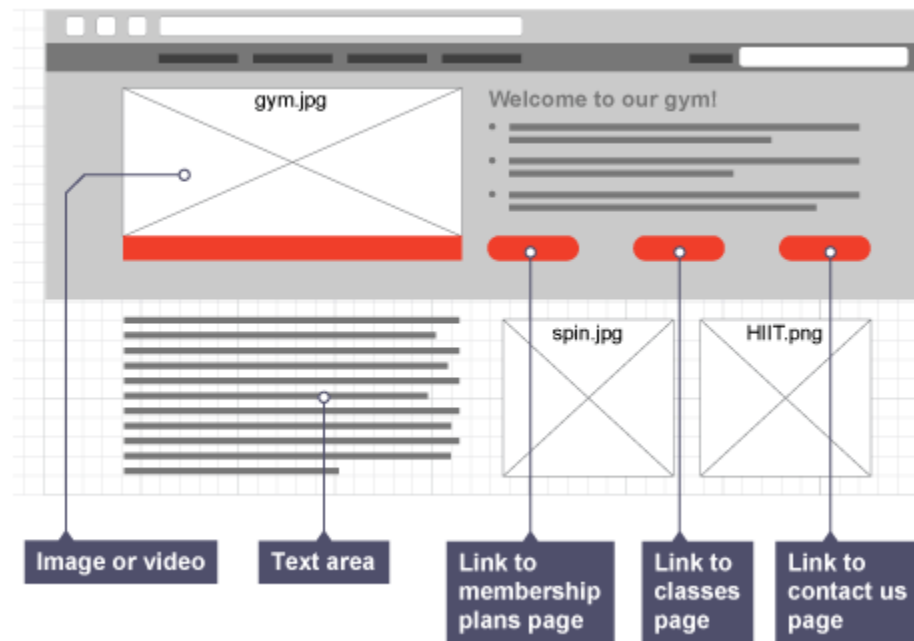- text alignment
- text colour

Wireframe Symbols

Shows a link

We need to add an annotation to include:

- background colour
- text font
- text size
- text alignment
- text colour
- is the link in internal or external?

What might a wireframe look like?
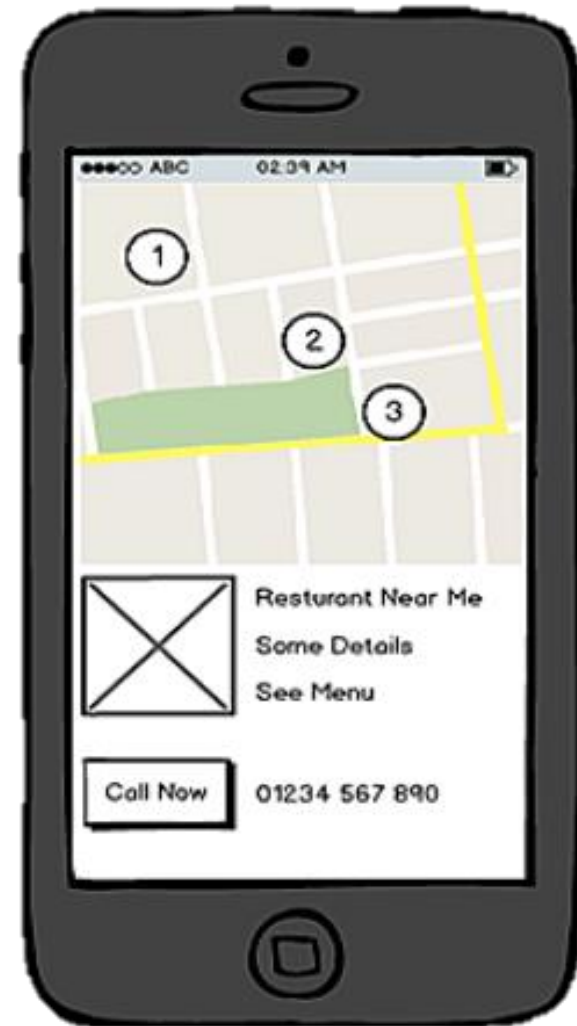
Low-Fidelity Prototype

A graphic design artist will take a wireframe and create a low-fidelity prototype, using pen and paper.

Low fidelity prototypes will often include more detail than a wireframe:

- text areas might contain all intended text
- image and video areas might contain hand-drawn versions of the final image/video still

Low-Fidelity Prototype Example

Here is a low-fidelity prototype of an app to find restaurants near you

High-Fidelity Prototype

A high-fidelity prototype is a draft version of the user interface produced early in the development process.

This prototype usually allows realistic (mouse-keyboard) user interactions.

- This is also used to gain feedback from the end-user to allow the developer to make changes before the website is coded

High-Fidelity Prototype

High fidelity prototypes are assumed to be much more effective in collecting true human performance data (e.g. time to complete a task) and in demonstrating actual products to users, clients, management, and others.

High-Fidelity Prototype Example

Here is a high-fidelity prototype of an app to find restaurants near you

Prototype – Usability Testing

Usability Testing uses prototypes to gain **feedback** from the end-user

The end-user is given **paper copies** of each page of the website and asked to perform tasks. An observer watches the tasks being completed and makes notes about any usability problems.

The low-fidelity prototype is shown to the end-user group and their feedback should be considered and used to update the interface before any coding takes place.

Legal Implications

During Web Development we must consider the Copyright, Designs and Patents Act (1988)

Web developers need to consider the copyright status of the following elements of a webpage:

- Text
- Graphics
- Video
- Audio

Use of any copyrighted media must be acknowledged (stated) on the webpage

Copyright, Designs and Patents Act (1988)

- Text is generally specific to a website, developers can specify if it is able to be copied

- Images, Video and Audio may not be owned by the web developer. Credit for use of the multimedia must be included on the webpage

- Any relevant permission to enable the media to be used must be sought prior to it being included on the webpage, this may incur a fee

Copyright, Designs and Patents Act (1988)

Failure to comply with the Copyright, Designs and Patents Act (1998) can result in a fine and/or prosecution. This applies to:

- end-users who illegally download media (images/video/audio) without the permission of the copyright holder
- businesses who include copyrighted material on their site without permission