

Unit 20: Client Side Customisation of Web Pages

Unit code: Y/601/7660

QCF Level 3: BTEC National

Credit value: 10

Guided learning hours: 60

● Aim and purpose

The aim of this unit is to ensure learners understand the fundamentals of cascading style sheets and scripting languages and are able to develop the skills required to implement web pages using these tools.

● Unit introduction

There is an increasing expectation that website design will adhere to web standards and that websites will consist of sophisticated, interactive web pages. This requires website designers and creators to be familiar with standard tools, techniques and languages in order to create such websites. In particular, web standards are beginning to expect mark-up to be done in XHTML, layout to be controlled by cascading style sheets (CSS) and client side interactivity by a scripting language such as JavaScript or VBScript.

XHTML is a stricter version of HTML and adheres to XML standards. CSS and JavaScript or VBScript are powerful scripting languages used to create sophisticated layouts and interactivity on web pages, respectively. A key feature of CSS/JavaScript/VBScript is that the script (code) is stored on the clients' system rather than on host server systems. As they do not need to interact with a web server, this can save resources and network bandwidth. CSS are capable of creating complex, sophisticated layouts which are easy to maintain and update across the whole website or individual pages. JavaScript/VBScript is able to validate information that users enter into a form before it is sent to a web server for processing.

This specialist unit is an introduction to the creation of web pages with some compliance with web standards. Layout will, therefore, be controlled by CSS, and interactivity controlled by a client side scripting language such as JavaScript or VBScript. Learners will develop an understanding of the fundamental characteristics of CSS and a chosen scripting language. Learners will develop web pages with sophisticated layouts in which calculations can be performed by combining the two tools.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand the fundamentals of cascading style sheets (CSS)
- 2 Understand the fundamentals of scripting languages
- 3 Be able to control the layout of web pages using CSS
- 4 Be able to create interactive web pages.

Unit content

1 Understand the fundamentals of cascading style sheets (CSS)

Characteristics of CSS: CSS frameworks; box model eg width, margins, padding, border, content area, inline, block; selectors eg type, class, ID; accessing CSS from HTML eg in-line, embedded, external, user

Uses of CSS: uses eg background colour, background images, formatting text, borders, padding, heading styles, positioning elements, creating columns; advantages

2 Understand the fundamentals of scripting languages

Characteristics of scripting languages: nature of language eg object oriented, event driven; objects; methods; handling events; hiding scripts; security issues eg reading, writing, client files, opening/closing user windows, reading information; including scripts inside HTML; HTML5

Uses of a scripting language: eg alerts, confirming choices, prompting the user, redirecting the user, browser detection, creating rollovers, checking/validating input, handling forms, maintaining cookies

Scripting language constructs: syntax eg dot operator, values, variables, operators, assignment, comparisons; loops eg for, for/in, do/while; decision making eg if, if/else, switch/case; functions (calling, parameter passing); handling events eg onfocus, onload, onblur, onmouseover; methods eg write(), click(), open(), selected(); properties eg name, width, ID, value

3 Be able to control the layout of web pages using CSS

Design: layout planned using appropriate graphical or other tool

Headings: styling eg adding colour, font size, font weight, background image; spacing eg applying padding, margins, borders

Lists: styling tags; hover effect; horizontal navigation; vertical navigation

Links and pseudo classes: setting pseudo class order; adding background images; styling eg removing underlines, adding borders, increasing active area

4 Be able to create interactive web pages

Script requirements: inputs; outputs; processing

Design script: use of appropriate tools eg flowchart, pseudo code

Implement script: appropriate objects eg properties, methods; writing eg required functions; creation of web pages eg rollovers, clocks, calendars, client-side calculations, forms validation, mouse movement followers

Good practice: eg comments in the script, correct indentation, naming variables

Testing: layout matches design; interactivity working; check using different browsers eg Internet Explorer, Firefox, Opera, Chrome, Safari

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 explain how HTML files access CSS		
P2 explain the features of the box model for CSS	M1 assess different implementation styles of CSS	
P3 explain the fundamentals of a scripting language	M2 discuss how a scripting language can improve functionality	D1 explore how web pages using scripts are implemented in different browsers [IE2]
P4 design web pages using CSS to control layout [CT3]		
P5 create interactive web pages using CSS and a scripting language [CT1]	M3 employ good practice in the design and implementation of web pages.	
P6 test interactive web pages.		D2 evaluate the web pages and discuss improvements. [RL5]

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers CT – creative thinkers	RL – reflective learners TW – team workers	SM – self-managers EP – effective participators
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Essential guidance for tutors

Delivery

Delivery starts with a study of the characteristics of CSS through whole-class teaching including tutor demonstrations of practical elements, which lead into learner exercises.

Care should be taken to cover sufficient ground to facilitate learners providing evidence for associated criteria. Ensure that implementation styles are covered (including how they are called from HTML) as well as methods of accessing external CSS (at least one from HTML).

There must also be in-depth coverage of the box model for CSS by discussion and, if possible, demonstration and learner exercise.

These elements must be treated seriously because they contain a lot of information which is the basis of several criteria in the assessment. The tutor should not underestimate the amount of time this is likely to require.

Any scripting language which can fulfil the requirements of the criteria may be used. The unit does not recommend which is more acceptable and it is entirely a matter for tutors and centres. The first topic in this group deals with characteristics of scripting languages which can be delivered using a mixture of whole-class teaching, handouts, quizzes and discussion groups. This is followed by uses of scripting language, using similar techniques for delivery.

Practical application of scripting, considering constructs, designing, implementing and good practice, can all be delivered by tutor demonstration backed up by informative commentary and followed by learner exercises.

Having developed the skills required to undertake practical work, elements of what is considered to be good practice are introduced.

The next group of topics of delivery are all related to the practical application of CSS. Design, styling (in various forms), spacing, hover effect, navigation pseudo-classes, and background images can all be demonstrated and practised.

Learners should look at the design stage first. It is recommended that learners receive guidance to ensure that their designs are suitable and will transfer into a workable design. Tutors should also make sure that designs can be created with the available tools.

The next element of the unit is to combine the learning on scripting and on CSS to learn how to create and test a microsite that uses both. Learners could work individually, drawing on the knowledge they have gained in the rest of the unit.

Finally, learners test and review web pages containing CSS, once again through tutor demonstration and learner exercise with some tutor-led discussion to emphasise the important aspects.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit
Fundamentals of CSS: <ul style="list-style-type: none">whole-class exercise – tutor presentation on the characteristics of CSSdirected research – class activity on the uses of CSS.
Assignment 1 – Features of CSS
Fundamentals of a scripting language: <ul style="list-style-type: none">whole-class exercise – tutor presentation on the characteristics of scripting languagesdirected research – what are the main uses of scripting languages?individual exercise – learn the different scripting language constructs.
Assignment 2 – Using CSS
Laying out a web page using CSS: <ul style="list-style-type: none">whole-class exercise – tutor presentation on how to style headings for use in web pagesindividual exercise – how can list tags be formatted using CSS?directed research – learn CSS pseudo-classes and how they can be used on hyperlinks.
Creating an interactive web page: <ul style="list-style-type: none">whole-class exercise – tutor presentation on script requirementsindividual exercise – create design scriptsindividual exercise – implement a working scriptwhole-class exercise – understanding good practice in codingindividual exercise – be able to test and review a web page which uses JavaScript and CSS.
Assignment 3 – Using Scripting

Assessment

Suggested Assignment 1 – Features of CSS

The suggested evidence for this assignment is the production of information leaflet(s).

Criterion P1 is a straightforward explanation of how CSS code can be linked to an HTML file.

Criterion P2 is another straightforward explanation, in this case of a box model for CSS, together with the related selectors and how they are used. Illustrations/diagrams should be used to support the explanation.

For M1, the learner must be able to assess different implementation styles for CSS. The descriptions need to be detailed and show that the learner has fully comprehended what the different implementations can be, and why they should be used for a particular purpose.

Suggested Assignment 2 – Using CSS

To vary assessment, a presentation is suggested for this assignment but any method can be used.

Criterion P3 is an explanation of the main features of the chosen scripting language. Learners should endeavour to include something about all of the prescriptive elements of LO2. Since the unit is fundamentally about web pages it is suggested that a series of web pages would be suitable evidence

M2 is concerned with how script languages improve the functionality of web pages. Learner must show that they understand how scripting works in a front-end context, how it is commonly used on the web; analytics, client-side calculation, etc.

D1 requires an exploration of how web pages using scripts are implemented in different browsers. Learners will need to research and include examples as part of their explanation.

Suggested Assignment 3 – Using Scripting

For P4, learners must methodically and systematically design web pages that make use of both CSS and scripting languages using CSS to control layout. This can be evidenced by the production of a design document.

For P5, learners must then take their design and use it to actually create a micro-site, programming in the CSS and scripting elements. This can be evidenced by tutor observation and printouts/screen dumps.

For P6, learners must test the site, documenting a systematic approach as evidence that they have completed the task.

M3 should be evidenced as a natural extension of P5 using an annotated program code.

D2 is an evaluation of the learner's micro-site, which should include suggestions for improvements.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1	Features of CSS	You work for a website development company which has asked you to produce some information on CSS.	Information leaflets
P3, M2, D1	Using Scripting	The company also wants a similar briefing on how scripting can be used to improve their web pages' functionality.	Presentation
P4-P6, M3, D2	Using CSS and Scripting	The company would like a micro-site to demonstrate practically the use of scripting and CSS.	Set of web pages Tutor observation

Links to other BTEC units

This unit forms part of the BTEC in IT sector suite. This unit has particular links with the following unit titles in the IT suite:

Level 1	Level 2	Level 3
		Unit 27: Web Server Scripting

Essential resources

Learners will need access to a suitable integrated development environment (IDE) in which to write scripts eg Dreamweaver, FrontPage, Notepad. They will also need access to an appropriate computer, the internet and to a variety of different web browsers to allow cross-browser testing.

Employer engagement and vocational contexts

This unit is an opportunity for a real client to become involved with a defined requirement.

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are ...
Independent enquirers	planning and carrying out research to explore how web pages using scripts are implemented in different browsers
Creative thinkers	connecting their own and others' ideas when designing web pages using CSS to control layout generating ideas and exploring possibilities when creating interactive web pages
Reflective learners	evaluating experiences and informing future progress when assessing web pages and discussing improvements.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Self-managers	organising time and resources to design, create and test web pages.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Using ICT	
Plan solutions to complex tasks by analysing the necessary stages	designing web pages for a specific purpose
Select, interact with and use ICT systems safely and securely for a complex task in non-routine and unfamiliar contexts	creating interactive web pages
ICT – Developing, presenting and communicating information	
Enter, develop and refine information using appropriate software to meet requirements of a complex task	creating interactive web pages using CSS and a scripting language
Combine and present information in ways that are fit for purpose and audience	producing a briefing on the use of web page scripting
Evaluate the selection, use and effectiveness of ICT tools and facilities used to present information	evaluating interactive web pages.