

DiDA

Diploma in Digital Applications

Specification

Pearson Edexcel Level 2 Diploma in Digital Applications (DiDA)

From October 2014

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Qualification title and Qualification Number

Qualification title	Pearson Edexcel Level 2 Diploma in Digital Applications
Qualification Number (QN)	601/4650/3

This qualification is on the National Qualifications Framework (NQF). It is eligible for public funding as determined by the Department for Education (DfE) under Section 96 of the Learning and Skills Act 2000.

The qualification title, units and QN will appear on each student's final certificate. You should tell your students this when your centre recruits them and registers them with us. Further information about certification is in the *Pearson Edexcel Information Manual* on our website, www.edexcel.com

Introduction

Key features

The Pearson Edexcel Level 2 Diploma in Digital Applications:

- is graded at A*, A, B and C
- is for students aged 14 years and over
- is available on the National Qualifications Framework (NQF)
- provides opportunities for synoptic assessment
- is available for first registration from autumn 2014
- is available for first certification from June 2015
- takes 240 guided learning hours to deliver
- is equivalent in level and teaching time to two GCSEs at grades A*-C.

Rationale

The UK is a world leader in the creative digital industries, such as in the creation of visual effects for films and computer games. However, there is growing recognition that we need to build on and improve the UK's capability and capacity for technical innovation and creativity in this area.

The Pearson Edexcel Level 2 Diploma in Digital Applications has been designed to engage and enthuse young people with an interest in creative computing, for example digital graphics and animations, interactive multimedia products and computer games. Our aim is to encourage learners to consider pursuing education, training and career paths which will contribute to the nation's economic wellbeing, while achieving job satisfaction and reward.

The UK has a well-deserved reputation for producing innovation and design. In an era in which creativity is intertwining with technology like never before, there is a danger that the UK will fail to nurture the next generation of world-class designers. The Pearson Edexcel Level 2 Diploma in Digital Applications has been designed to teach digital design skills and enable young people to use digital tools to express their creativity in an informed and responsible way.

Aims

This qualification aims to:

- equip young people with the knowledge, understanding and skills they need to design and make, effective digital products for others to use
- enable young people to use digital tools as a means of expression to inform, persuade and entertain
- foster young people's creativity and develop their independent learning skills
- challenge young people to reflect on what they produce and strive for excellence
- increase young people's awareness of their responsibilities in the digital world and their respect of other people's rights
- equip young people with professional, real-world skills in planning, project management and communication
- give young people the knowledge, understanding and skills they need to support future learning and exploit the creative digital industries.

Progression

This qualification provides a broad and solid foundation for further study of various aspects of creative computing, such as graphic design, web design, computer games design and interactive media.

It supports progress to further study, including:

- Level 3 BTECs in Creative Media Production
- Level 3 BTECs in IT

It also enhances young people's overall digital literacy and gives them a solid foundation for further study and employment.

Recommended prior knowledge, skills and understanding

Although students do not need to have achieved any other qualifications before registering for the Pearson Edexcel Level 2 Diploma in Digital Applications, they are expected to be familiar with the content of the Key Stage 3 Programme of Study for Computing (on which DiDA builds).

The following skills and aptitudes will also be helpful:

- basic literacy
- basic numeracy
- some motivation to work independently
- some aptitude for working with computers.

Qualification structure

Pearson Edexcel Level 2 Diploma in Digital Applications (DiDA)

The Pearson Edexcel Level 2 Diploma in Digital Applications (DiDA) is taught over 240 guided learning hours (GLH) and comprises four units.

Pearson Edexcel Level 2 Diploma in Digital Applications (DiDA)		
Unit	Mandatory units Students must complete both of these units.	GLH
1	Developing Web Products	30
5	Coding for the Web	30
Units	Optional units Students must complete two of the three optional units	GLH
2	Creative Multimedia	90
3	Artwork and Imaging	90
4	Game Making	90

Assessment Objectives

There are **four** Assessment Objectives (AOs). These detail the knowledge, skills and understanding that students are required to demonstrate.

	Students are required to demonstrate practical capability* in:
A01	applying creative processes to design digital products
A02	selecting and preparing appropriate digital content
A03	developing and testing effective, fit-for-purpose digital products
A04	evaluating the fitness for purpose of digital products.

*capability = ability to apply knowledge and skills purposefully

Assessment Objective weightings for the Pearson Edexcel Level 2 Diploma in Digital Applications (DiDA)

The weightings for each Assessment Objective for the Pearson Edexcel Level 2 Diploma in Digital Applications (DiDA) are shown below.

	Percentage weightings	
	Unit 1/Unit 5	Unit 2/Unit 3/Unit 4
AO1	16-24	27.3
AO2	20-30	15.1
AO3	42-56	42.4
AO4	8-12	15.2
Total	100%	100%

Assessment summary

The units will be assessed as follows:

Unit	Unit name	Assessment
1	Developing Web Products	Practical examination
2	Creative Multimedia	Summative project
3	Artwork and Imaging	Summative project
4	Game Making	Summative project
5	Coding for the Web	Practical examination

Practical examinations

The examinations will be set and marked by Pearson.

Summative Project Briefs

The Summative Project is the means by which students bring together the knowledge, skills and understanding they have acquired throughout the unit into a synoptic piece of work. There is one Summative Project for each unit, each based on a brief.

Summative Project Briefs are set by Pearson, administered and marked by the centre, and moderated by Pearson.

Availability of assessment

The first assessment opportunity for all units will take place in the June 2015 series and in each following January and June series for the lifetime of the specification.

	June 2015	January 2016	June 2016
Unit 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Unit structure

The units are divided into a number of sections.

Introduction: provides the rationale for the unit, including its vocational relevance.

Recommended prior learning: identifies other units or learning that students would benefit from having studied beforehand.

What you need to learn: sets out the knowledge, understanding and skills that students need to learn and apply.

How you will be assessed: summarises the assessment requirements for the unit.

The other sections are for teacher guidance.

Assessing students' work (Units 2, 3 and 4 only): provides detailed guidance on how to assess students' work, with mark descriptions.

Delivering this unit: gives some suggestions for delivering the unit.

Links: shows the relationship with other units.

Resources: provides some suggested resources.

Units

Unit 1: Developing Web Products

Level: 2

Guided Learning Hours: 30

Introduction

When your attention is captured by a web page advertising a competition, promoting an event or launching a new product, what makes you stop and look? Don't be fooled by technical wizardry. It may have spectacular images, eye-catching animation or attention-grabbing text, but what makes it effective is the way the components work together.

This unit aims to give you the knowledge and skills you need to produce attention grabbing web products using web authoring software, multimedia assets and navigation features.

You will demonstrate your ability to design, build and test a web product in a practical computer-based examination set by Pearson.

Recommended prior learning

This unit builds on the knowledge and skills developed by the Key Stage 3 programme of study for Computing.

What you need to learn

1.1 Audience and purpose

A web product is a self-contained and designed product which is viewed in a browser and hosted on the web or on an intranet. It may be linked from a parent website and include visual links such as a logo, which make users aware of this.

You need to know that the key to producing a successful web product is to be clear about its purpose from the outset. This may be to:

- convey a message (eg a campaign)
- attract attention (eg advertising)
- inform (eg educational webpages)
- persuade (eg to buy something)
- entertain (eg quizzes and online games).

You need to know who the target audience is so that the web product meets their needs. This may include:

- who will use the product, eg age, gender
- how much they know already
- their level of literacy/language skills
- what they want from the product and what will get them to look further.

1.2 Client briefs and the project lifecycle

The starting point is likely to be a client brief so you need to know what this typically includes:

- information about the client
- information about the target audience and purpose of the web product
- technical information about product, eg an overview of the:
 - site structure
 - functionality
 - content
 - design.

You need to know how to translate this brief into a project by following the project lifecycle. A typical project lifecycle is:

- design the product
 - site structure
 - product consistency, such as template and style
 - composition and page design
 - accessibility
- create the product
 - content selection and preparation
 - coding
 - testing
- evaluate the product.

1.3 Site structure

The first design step is to establish an overall structure for the web product – what pages are needed and how they are related. A client brief may specify some or all aspects of the required structure.

You need to know how to make use of a structure chart to give an overview of the hierarchy of a product. Although the main pages of a product are usually accessible via a navigation bar on every page, users will need to 'drill down' to find more detailed information. This is often achieved by links within the body of a main page.

1.4 Consistency

All the pages must have some consistency in terms of structure and appearance to help users find their way around the product. A useful method to achieve this is to produce a storyboard, which will map out the layout and features of web products, eg positioning of logos and navigation bar.

You need to understand that a simple navigation bar:

- includes two or more links to other pages within the product
- appears on the left-hand side or top area of every page
- uses text links or graphical links
- does not take up too much space.

You will learn how to create and use a template or master page to fix some aspects of every page:

- page size and resolution
- banner height and width
- logo size and position
- internal and external hyperlinks
- navigation bar.

If you are working to a brief there may be a house style (colour scheme, fonts, etc) which you must use.

Using a pre-defined colour scheme and a standard set of fonts will help to make your web products more consistent.

1.5 Composition and page design

Having designed a template and established some design rules for consistency, the next stage is to decide on the composition and design of each page:

- title
- text – writing for the web, quantity
- images, including dimensions and quality
- embedded multimedia files (video, sound, animation) and their appearance on the page
- links, hotspots and rollovers.

You will learn about important design concepts:

- composition
 - colour, shape and line
 - balance and contrast
 - visual hierarchy
- layout
 - headings and sub-headings to separate sections of text
 - tables to fix the position of content
 - use of white space
 - minimising scrolling.

1.6 Accessibility

You need to understand the importance of making your web products accessible to people with visual impairments. You will learn how to improve the accessibility of products by:

- avoiding colour combinations such as red and green on your web pages
- using a high contrast between text and background
- adding ALT (alternative) text to images
- using scaleable fonts.

1.7 Content selection and preparation

A client brief may specify some of the content required but you will need to make decisions about what to include and how it should look.

Quality content improves the user experience and it is important to avoid anything that distracts or irritates users. For example, animated graphics or scrolling text should be avoided unless they enhance the content or user experience.

To organise content, you will learn how to:

- create and use tables
- insert and position assets, including text, images, video, sound and animation on web pages
- resize images (percentage of original, fixed size, crop)
- retain proportions

- create and use thumbnail images
- control how users view multimedia assets.

You will learn how to present text clearly using formatting features, such as:

- alignment
- line spacing
- bullets and numbering
- case
- emboldening
- colour
- web-friendly fonts
- font sizes and styles
- headings and subheadings.

To allow users to access content you will learn how to create interactive components, including:

- navigation bars
- hotspots
- hyperlinks (internal, external, email)
- rollovers.

Assets need to be carefully prepared and optimised to ensure that pages are not slow to load. You will learn how to:

- use image compression formats (png, jpg, gif) and convert from one format to another

select and use compression formats for multimedia assets, including sound, video and animation, and convert from one format to another.

1.8 Coding

Web authoring software automatically creates the HTML code on which each page is based. However, sometimes it is easier to edit the HTML code directly. You will learn how to make simple changes to the code, for example to change the colour of a heading or position of an image.

You will learn to understand and use hexadecimal colour codes/RGB values.

1.9 Testing

You will learn how to carry out systematic functionality testing of a web product to ensure that it works as intended, ensuring that:

- the layout and presentation of pages are appropriate and consistent
- the content, including text, is accurate and appropriate
- multimedia assets work as intended
- hyperlinks work and go where expected with no dead ends
- any interactive actions work as intended.

You will need to learn how to save your website so that it can be viewed in modern web browsers. This means:

- saving your web pages as .htm or .html files

You will also learn how to carry out usability testing to assess the effectiveness of the product in terms of:

- a user interface
- accessibility
- ease of navigation
- overall user experience

1.10 Evaluation

It is always important to reflect on the success of a product and be able to review the extent to which it meets the needs of the:

- audience and purpose
- any client requirements.

You need to learn how to explain how your choice of design features has addressed these needs, and give examples. However good the product, there will always be room for improvement and you must be able to identify possible enhancements.

How you will be assessed for Unit 1: Developing Web Products

You will need to complete a 2.5 hour practical computer-based examination.

There will be one task divided into two activities.

In the first activity, you will have to use web authoring software and other software tools to create a web product for a specified audience and purpose, using a client brief. In the second activity, you have to evaluate your product.

The table below shows how the taught content will be assessed in the examination.

Section of content from this unit	How it is assessed in the examination
	Activity 1
1.1 Audience and purpose	In the first activity you will need to create a web product for a specified audience and purpose. There will be marks available for the ability to create a web product that demonstrates good awareness of audience and purpose as outlined in the client brief.
1.2 Client briefs and the project lifecycle	You will be given a client brief which you must use when creating the web product. Your knowledge of the project lifecycle will help you to approach the task in an organised and effective way.
1.3 Site structure	The client brief will specify some aspects of the site structure, but you will need to decide how exactly the site is structured. There will be marks available for the ability to create a site structure which meets client requirements.
1.4 Consistency	The client brief will specify some information about the template. It will also include other layout and design information. There will be marks available for the ability to use a consistent layout and design, including the ability to apply the template consistently.
1.5 Composition and page design	You will need to use your knowledge of composition and page design to create a web product that meets client requirements. There will be marks available for the ability to create a web product that presents content in an effective way.
1.6 Accessibility	You should aim to make your website accessible for the visually impaired. There will be marks available for the ability to use appropriate accessibility features.

Section of content from this unit	How it is assessed in the examination
	Activity 1
1.7 Content preparation and selection	<p>The client brief will specify some of the content required but you will also have scope to decide what other content to include, what it should look like and where it should go.</p> <p>There will be marks available for the ability to select and use content appropriately.</p>
1.8 Coding	<p>There will be marks available for the ability to meet the coding requirements in the client brief.</p>
1.9 Testing	<p>You should allow yourself time to test your web product during the exam to ensure that it is fully functional and meets all requirements.</p> <p>Marks will not be awarded directly for testing but failing to test the web product could mean that some aspects do not work as intended or do not meet client requirements.</p>
	Activity 2
1.10 Evaluation	<p>There will be marks available for your ability to evaluate the web product you have produced.</p>

Delivering Unit 1: Developing Web Products

This unit gives students an introduction to web authoring. Most students will already have used and experienced, lots of websites and other web products. However, they may not have given much thought to the features they like or dislike. They should be encouraged to look critically at a variety of web products for different audiences and purposes. They should also be encouraged to evaluate their fitness for purpose and assess the effectiveness of the features used to attract attention and engage the target audience.

It is important that students investigate aspects of successful design, including content, structure, navigation, screen and interactivity, and discuss possible alternatives to the assets and features used. They should try to establish the purpose and intended audience for each product investigated and judge whether it is fit for purpose.

The design process is crucial to the success of a web product. Students should be clear about any requirements which be may be presented in a client brief and/or outline design documentation. However, they will be expected to make many essential design decisions themselves.

Students need to gain experience of using web authoring software and other software tools for content preparation. They will need to be able to optimise images and embed sound, video and animation files but will not be expected to create assets of their own.

Students should be able to identify essential elements of html code and make simple alterations, such as changing a hex code to alter a colour or editing ALT text. Where site-wide amendments are required, they should be able to make use of a find and replace option to ensure that the HTML code is altered throughout.

Students must be encouraged to regard testing as an integral part of the development process, checking both functionality and usability, incorporating feedback from suitable test users.

Links

Other units

This unit provides a grounding in knowledge and skills that will be required in the optional units. It is therefore recommended that students undertake the learning for this unit before, or alongside, the optional units.

Resources

Books

Aho K, Dharkar, A and Miller G – *Digital Design Curriculum Guide* (Course Technology, 2003) ISBN: 0619055162
Burden K, Kuechel T and Smith A – *Pearson Edexcel DiDA: Multimedia* (Longman, 2005) ISBN 84690115-4
Chapman N and J – *Digital Multimedia* (John Wiley & Sons, 2004) ISBN: 0470858907

Software

Office applications

For example:

- Google Docs
- Microsoft Office
- Open Office

Web authoring software

For example:

- Adobe Dreamweaver
- Microsoft Front Page
- Serif WebPlus

Websites

Creative Commons – www.creativecommons.org.uk
Open Clip Art Library – www.openclipart.org
Professional vector clipart (includes free section) – www.cliparts-design.com

Unit 2: Creative Multimedia

Level: 2**Guided Learning Hours: 90**

Introduction

Digital tools can be used to communicate information using any combination of text, images, sound, video and interactive components such as buttons and hyperlinks. Products that use these different components at the same time, such as websites, presentations and games, are multimedia.

This unit aims to give you the skills to use the tools and techniques provided by multimedia authoring software to design and create effective multimedia products for specified purposes and audiences.

You will investigate a range of existing multimedia products to find out how different components are used to convey a particular message. You will discover that you like some of these products more than others and you will need to consider why this is the case.

Once you have a good understanding of the possibilities offered by multimedia, you will learn how to design multimedia products of your own. This will involve detailed designs setting out exactly how you want each screen to look, the components you need and how the user will interact with the product.

In some cases, you will be able to use existing components but you will also need to know how to create new components yourself, such as recording a sound or taking a photograph.

Finally, you will learn how to combine all the components you have collected into a multimedia product and how to test it thoroughly, making any necessary changes as a result of feedback.

You will demonstrate your ability to plan, design, build and test interactive multimedia products through your work on a major project set by Edexcel. This will include the development of an e-portfolio that exhibits your achievements and is in itself an effective multimedia product.

Recommended prior learning

It is recommended that you undertake the learning for *Unit 1: Developing Web Products* before, or alongside, this unit.

What you need to learn

2.1 Investigating multimedia products

Before you start to brainstorm ideas or plan the production of a multimedia product you will need to learn how multimedia is used in a variety of contexts, including:

- education, eg training materials, e-learning packages
- entertainment, eg games, videos, DVDs
- marketing and advertising, eg product promotions, catalogues, websites, presentations, digital adverts
- publishing, eg e-books, e-zines, online presentations, DVDs
- virtual reality, eg virtual tours, simulations, digital prototyping
- public access, eg information points.

You need to learn how to evaluate the techniques and technology used in each type of product by considering features such as:

- ease of access
- ease of navigation
- appropriateness of content
- impact
- interactivity
- use of colour
- balance and mix of different types of component, eg text, graphics, sound, video, animation
- use of presentation techniques
- fitness for purpose/audience.

2.2 Designing multimedia products

Like any other type of project, successful multimedia work needs careful planning so that the final products meet their intended objectives.

You should read the entire project brief first. There are a number of key questions you need to ask, including:

- What do I have to produce?
- What is it for?
- Who is the intended audience?
- What types of digital assets are required?
- What resources can I use?
- Is there a technical specification that I must meet?
- When do I have to have it finished?
- How will the success of the project be judged?
- Who will review my work and when?

You need to learn about how to generate and select ideas to meet the objectives:

- how to generate ideas, eg looking at other people's products, brainstorming ideas
- weighing up pros and cons of different alternatives
- narrowing down the possibilities and choosing one.

Multimedia products are designed to perform specific functions. The effectiveness of a multimedia product can be judged by how well it meets its objectives.

Your main aim must always be to produce user-centred designs that are fit for purpose and meet the needs of the intended users.

You will need to make decisions about:

- content/components
 - text
 - images, eg photographs, pictures, graphic elements
 - animations
- sound, eg effects, music, voice
- video layout
 - balance and proportions
 - sequence
 - emphasis
 - consistency
- structure
 - sequential or linear
 - hierarchical
 - networked
- navigation
 - links and buttons (including specification of link targets)
 - backtracking, eg breadcrumbs
 - sitemaps
 - guided tours
- interactivity and human-computer-interface (HCI)
 - user-interface
 - menus
 - text input boxes
 - usability and accessibility features
 - how to give users feedback on their actions, eg sound, animation.

You will learn how to create and use:

- storyboards and visuals to map out the intended layout and content of each screen

- timeline storyboards to map out the intended content and structure of time-related products
- structure charts or site maps to provide a graphical representation of the overall structure of the product
- flowcharts to indicate the paths that the user can take through the product.

You need to learn how to make use of feedback from others on your initial designs to ensure that your final products will meet the needs of the target audience.

2.3 Collecting and creating digital assets

You will need to collect suitable content for your multimedia products, bearing in mind the purpose of the application and the intended users.

You need to learn about ready-made assets that can be found, such as:

- images from picture galleries or clipart collections
- video and audio recordings from film libraries, video clip collections, archives or news websites
- text from websites, books or magazines.

You will learn how to use simple editing techniques, such as:

- cropping
- adjusting brightness and contrast
- resizing and optimisation
- colour/shading
- style formatting
- trimming
- cutting, copying and pasting
- re-ordering or re-sequencing
- altering the timing.

You need to learn about copyright and other constraints on the use of digital assets in products intended for the public domain. Wherever possible you should produce the digital assets you need yourself or gather them from copyright-free sources. You need to learn how to acknowledge sources of any assets you decide to use and to keep a record of:

- where each asset came from
- who created it
- the amount of copyright material used, eg two minutes of video footage or a logo
- where you have used the copyright material.

You will learn how to use a range of digital tools to create original assets, including:

- using word-processing or text-editing software to produce and format text

- capturing images using a camera, scanner or mobile phone
- using graphic and drawing tools to create and edit images and simple animations
- recording and editing sound (including music)
 - capture and import sound
 - use formatting and editing features
 - apply effects
 - mix tracks
 - clip and edit timeline
 - produce finished sound file
 - export to appropriate file type
 - compress sound to achieve optimisation
- recording and editing video
 - capture and import video footage, still images and sound
 - use formatting and editing features
 - overlays
 - transitions
 - clip and edit footage
 - titles and credits
 - produce finished movie
 - render to appropriate file type
 - compress movie to achieve optimisation.

You will need to learn how to select appropriate file names and formats for the assets you collect. You will learn about compression techniques for keeping file sizes as small as possible.

2.4 Developing multimedia products

There is a wide range of software available to enable you to create multimedia products. You will need to learn to use features of the software, including:

- frames, tables and divisions for layout
- templates
- fonts and styles
- colour schemes
- borders and backgrounds
- interactive elements
- pop-ups on web-based products
- linking screens.

You will learn how to produce products that meet technical specifications, including:

- file size
- download time
- compression.

Your products must be fit for purpose.

You will learn how to:

- use colour options
 - contrast
 - pattern
 - background
- create and modify tables or divisions
- optimise resolution and file size
- add lines and simple shapes
- use hyperlinks to link pages
- implement animations, moving images and sound
- create and use colour schemes
- create and use master slides and templates
- create slide transitions
- embed or link components to ensure functionality
 - sound
 - video
 - animation
 - navigation (buttons, text links, hotspots, rollovers)
- use frames

2.5 Prototyping and testing

No amount of eye-catching graphics and interactive features is going to make someone use your product if it does not do what they want or work as expected.

Prototyping involves producing working versions of a product at various stages during its development and testing them with users to find and iron out problems as you go along. You will learn how to create and utilise prototypes for use with test users.

You will learn about the importance of testing your products properly to ensure that:

- the content is correct, engaging and conveys the right meaning
- every link goes where it should with no dead ends
- all the interactive features work as intended
- the product is robust and cannot be made to fail
- the product works with different browsers and platforms
- other people can use the product without help
- the product meets all your objectives
- the product works away from the computer/network on which it has been created.

You need to learn what testing involves to:

- note any potential problems as they occur
- decide how you are going to put them right

- check that any changes you make do not affect other parts of the product.

You need to learn how to use feedback from a range of potential users, including those with a good knowledge of multimedia products and others who are complete novices.

2.6 Distribution

If you use specialised software to produce a multimedia product, it is quite possible that some of your target users will not have this software available on their computers.

You will learn how to create run-time versions of your products, so that they are accessible to as many people as possible.

You will need to use this method for your eportfolio.

2.7 Product review

You need to learn how to undertake a review of your products once they are completed. You should evaluate:

- how well they work
- how easy they are to use.

You should:

- consider feedback from end reviewers
- make valid suggestions for further improvement of the final products.

Your review could be any combination of:

- a written evaluation
- a verbal evaluation recorded in an appropriate way
- a presentation.

2.8 Presenting multimedia products in an eportfolio

You need to learn about what an eportfolio is and how it is used to create an interactive showcase for your achievements in a way that is self-explanatory and easy to use.

You will need to learn how about how to construct an eportfolio, making decisions about:

- content
 - home page
 - context pages with commentaries
 - multimedia products
 - supporting evidence
- organisation
 - structure
 - links
 - user interface

- packaging
 - storage medium
 - file formats, compression and compatibility
- accessibility.

You must learn which file formats are suitable for your content so that people can view it even if they do not have the same software as you.

An eportfolio must be thoroughly tested to ensure that its functions properly. You should get other people to test your eportfolio and give you feedback. You will need to decide whether or not to make modifications in the light of the comments you receive.

2.9 Standard ways of working

While working on a project you will be expected to use ICT efficiently, legally and safely. You need to learn about:

- file management
 - save work regularly
 - use sensible filenames
 - set up directory/folder structures to organise files
 - make regular backups and versions to show progress
 - choose appropriate file formats
 - convert files to appropriate formats
 - limit access to confidential or sensitive files
 - have an awareness of viruses
- personal effectiveness
 - select appropriate ICT tools and techniques
 - customise settings
 - create and use shortcuts if appropriate
 - use available sources of help
 - use a plan to organise work and meet deadlines
- quality assurance
 - use tools such as spell and grammar check and print preview
 - proofread
 - seek views of others
 - authenticate work
 - test components
- legislation and codes of practice
 - acknowledge sources
 - respect copyright
 - avoid plagiarism
 - protect confidentiality

- work safely
 - select and adjust system settings
 - take regular breaks
 - handle and store media correctly
 - use the internet in a responsible and safe way.

How you will be assessed for Unit 2: Creative Multimedia

This unit takes a holistic approach to the assessment of knowledge, understanding and skills. You will demonstrate your knowledge and understanding of the content through how well you perform the tasks in the project brief that will be given to you.

This project brief will require you to create multimedia products for a specified audience and purpose.

It should take you approximately 30 hours to complete.

You will be expected to:

(a)	Design multimedia products (7 marks)
(b)	Collect, edit and create digital assets (5 marks)
(c)	Develop multimedia products (9 marks)
(d)	Present evidence in an eportfolio (7 marks)
(e)	Review the products (5 marks)

Assessing students' work

Five activities are used to assess achievement on **Unit 2: Creative Multimedia**.

Students will be expected to:

- | | |
|---|-----------|
| (a) Design multimedia products | 0–7 marks |
| (b) Collect, edit and create digital assets | 0–5 marks |
| (c) Develop multimedia products | 0–9 marks |
| (d) Present evidence in an eportfolio | 0–7 marks |
| (e) Review the products | 0–5 marks |

Mark descriptions are written in bands. **In each band, the description relates to the top of the band.**

Whenever assessments are made, the mark descriptions given should be used to judge the mark which best fits the student's performance. Students should be placed in a band on a 'best fit' basis, making allowance for balancing the strengths and weaknesses in the work presented.

The Moderator's Toolkit stipulates the acceptable file formats for content. Work must be submitted in formats that will be accessible by the moderator. Work that cannot be accessed by the moderator (for example, because files are corrupted, infected by viruses or presented in formats that are not acceptable) cannot be moderated.

A recommended maximum size for the eportfolio is published in each SPB. This is to encourage students to produce manageable eportfolios with optimised download times. However, there is no penalty for exceeding the recommended size.

Strand	Strand total	Mark allocation per AO for Unit 2			
		AO1	AO2	AO3	AO4
A	7	7	-	-	-
B	5	-	5	-	-
C	9	-	-	9	-
D	7	2	-	5	-
E	5	-	-	-	5
Total	33	9	5	14	5

(a) Unit 2: Creative Multimedia – Design multimedia products (maximum 7 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	<p>The student has produced up-front designs that provide a superficial indication of how the products will function and what the user experience will be.</p> <p>They have identified most of the assets required and have made brief comments on design decisions.</p>
4–5 marks	<p>The student has produced up-front designs that provide a clear indication of how the products will function and what the user experience will be. They have described most of the assets required and have made detailed comments on design decisions.</p>
6–7 marks	<p>The student has produced up-front designs that provide a comprehensive level of detail of how the products will function and what the user experience will be. They have described all of the assets required and have fully justified their design decisions.</p>

(b) Unit 2: Creative Multimedia – Collect, edit and create digital assets (maximum 5 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has gathered and prepared a variety of assets, most of which are suitable for the intended purpose. They have provided relevant information about most aspects of the development process.
4–5 marks	The student has gathered and prepared a variety of assets, all of which are suitable for the intended purpose. They have provided relevant information about the complete development process.

(c) Unit 2: Creative Multimedia – Develop multimedia products (maximum 9 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has produced a set of products, some of which fully meet the requirements of the project brief. The products incorporate features and assets, some of which are appropriate for the audience and purpose.
4–6 marks	The student has produced a set of products, most of which meet the requirements of the project brief. The products incorporate features and assets, most of which are appropriate and effective for the audience and purpose.
7–9 marks	The student has produced a set of products, all of which meet the requirements of the project brief. The products incorporate features and assets, all of which are appropriate and effective for the audience and purpose.

(d) Unit 2: Creative Multimedia – Present evidence in an eportfolio (maximum 7 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has produced an eportfolio with a basic user interface that includes multimedia assets and facilitates access to most of the student's evidence. There are brief comments that introduce the content of the eportfolio.
4–5 marks	The student has produced an eportfolio with a suitable user interface that includes multimedia assets and facilitates access to all of the student's evidence. There are clear comments that introduce the content of the eportfolio.
6–7 marks	The student has produced an eportfolio with an intuitive user interface that includes multimedia assets and facilitates access to all of the student's evidence. There are detailed explanations that introduce the content of the eportfolio.

(e) Unit 2: Creative Multimedia – Review the products (maximum 5 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has produced evaluative comments about some of the final products, some of which are superficial. They have included feedback from reviewers.
4–5 marks	The student has produced evaluative comments on each of the final products, all of which are supported and include responses to feedback from reviewers.

Delivering Unit 2: Creative Multimedia

Most students will have already used, and experienced, lots of multimedia products. However, they may not have given much thought to the features they like or dislike. They should be encouraged to look critically at a range of multimedia products such as: websites, presentations, e-learning materials, information points, virtual tours and games. Resources are readily available at the library, in shops, on the internet and on games machines. It is important that students investigate aspects of successful design, including content, structure, navigation, screen and interactivity and discuss possible alternatives to the components used. They should try to establish the purpose and intended audience for each product investigated and judge whether it is fit for purpose.

Students will probably need help with planning their multimedia projects. It may be useful to model successful strategies and give them examples of how professionals go about planning major projects.

Students should be encouraged to review their progress and prototype products at key points during the lifecycle of the project. They should make a list of success criteria at the outset and use this as a measure when testing their products. They should involve others in the review process. It should be impressed on them that it is difficult, if not impossible, to make major changes to completed multimedia products and that it is therefore imperative to iron out faults during development.

The design process is crucial to the success of a multimedia product. It may be useful to draw upon students' experience of design technology projects, which require a very similar structured developmental approach. Before beginning production, students should be encouraged to make all the important decisions necessary. Storyboarding, structure charts and flowcharts are important design tools which students must be able to use.

Students need to gain experience of using a range of software applications before embarking on the Summative Project. It may be useful to give them a series of small projects to carry out which will help them appreciate the functionality and limitations of the different software applications available to them. They will need to become skilled at editing ready-made components and creating their own.

It is important that students are provided with a range of sources for components. While collecting these materials they must be continually reminded about the laws of copyright and the importance of acknowledging sources. They will need to learn how to check whether it is permissible to use a source. They should be encouraged to keep an on-going record of all sources of the components they collect.

Students will need time to explore the features of the multimedia authoring software. They should be set a number of mini-projects which will help them become familiar with the features provided by the software.

Students need to be aware of and take into account differing download time according to the medium used and the effects this can have on the end user. For example, a user could become disillusioned and frustrated if the time taken to load in a multimedia application is perceived to be too long. The results of this should be discussed, for example the product may never be used.

Links

Other units

This unit develops and builds on skills covered in *Unit 1: Developing Web Products*. There are also links to *Unit 3: Artwork and Imaging* and *Unit 4: Game Making*.

Resources

Books

Aho K, Dharkar, A and Miller G – *Digital Design Curriculum Guide* (Course Technology, 2003)
ISBN: 0619055162

Burden K, Kuechel T and Smith A – *Pearson Edexcel DiDA: Multimedia* (Longman, 2005) ISBN 84690115-4

Chapman N and J – *Digital Multimedia* (John Wiley & Sons, 2004) ISBN: 0470858907

Software

Artwork and imaging software

For example:

- Adobe Fireworks
- Adobe Freehand
- Adobe Illustrator
- Adobe Photoshop
- Google Picasa 3 (freeware)
- Irfanview (freeware)
- Serif DrawPlus
- Serif PhotoPlus

DVD authoring software

For example:

- Adobe Encore
- Adobe Premiere Elements
- Apple iDVD
- Apple DVD Studio Pro
- Serif DV Suite
- Ulead Studio

Media players (free downloads)

For example:

- Flash Player
- Real Player
- QuickTime Player
- Windows Media Player

Multimedia authoring software

For example:

- Adobe Flash
- Matchware Mediator

Multimedia tools

For example:

- Audacity (freeware)
- QuickTime Pro

Video capture and editing software

For example:

- Adobe Premiere
- Apple iMovie
- Final Cut Express
- Microsoft Moviemaker
- Pinnacle Studio 14
- Corel VideoStudio

Screen recording software

For example:

- Adobe Captivate
- BB FlashBack
- MatchWare ScreenCorder
- TechSmith Camtasia
- Debugmode Wink (freeware)

Websites**Resources**

Creative Commons – www.creativecommons.org.uk

Freeplaymusic.com – Morguefile.com

Open Clip Art Library – www.openclipart.org

Professional vector clipart (includes free section) –
www.clipart-design.com

Providers' solutions

Adobe

www.adobe.co.uk/education

Apple Learning Interchange

<http://edcommunity.apple.com/ali>

Serif

www.serif.com/education/tutorials/dida.asp

Unit 3: Artwork and Imaging

Level: 2

Guided Learning Hours: 90

Introduction

Images of one sort or another are all around us, often influencing what we do and how we think. They are used to communicate messages in many different contexts including advertising, music, fashion, interior design, computer games and architecture. We see them everywhere – as we work or study, out shopping or on holiday.

This unit aims to give you the skills to use the tools and techniques provided by artwork and imaging software to design and create effective graphic products for specified purposes and audiences. You will investigate a range of graphic products to find out how images are used to convey a particular message. You will discover that you like some of these products more than others and you will need to consider why this is the case.

Once you have a good understanding of the possibilities offered by artwork and imaging, you will learn how to produce images that communicate effectively onscreen and in print and how to combine them with other components to produce graphic products. You will need to consider the medium, purpose and audience as well as file format and size.

You will demonstrate your ability to create effective images and graphic products through your work on a major project set by Pearson. This will include exhibiting your work and supporting evidence in an eportfolio.

Recommended prior learning

It is recommended that you undertake the learning for *Unit 1: Developing Web Products* before, or alongside, this unit.

What you need to learn

3.1 Investigating artwork and images

Images are an important part of how we communicate with each other. You will need to learn how artwork and images are used in a variety of contexts and graphic products, such as:

- illustrations in books, magazines, newspapers and posters
- symbols and signs in public places
- buttons and icons on websites and other user interfaces
- websites, presentations and animations
- posters, leaflets and calendars
- labels and packaging including the net and all surface graphics
- plans, diagrams and models.

You need to learn how to evaluate the effectiveness of these images by considering factors such as:

- audience and purpose
- composition
- use of colour
- impact/visual effect
- size and position
- the nature of the message, for example
 - obvious or subtle
 - persuasive
 - informative.

3.2 Designing artwork and images

Like any other type of project, production of successful artwork and imaging needs careful planning so that the final products meet their intended objectives.

You should read the entire project brief first. There are a number of key questions you need to ask, including:

- What do I have to produce?
- What is it for?
- Who is the intended audience?
- What graphic elements are required?
- How will the elements be combined?
 - layout
 - balance and proportions
 - emphasis
 - consistency
- What resources are needed?
- Is there a technical specification that I must meet?
- When do I have to have it finished?
- How will the success of the project be judged?
- Who will review my work and when?

You need to learn about how to generate and select ideas to meet the objectives:

- how to generate ideas, eg looking at other people's products, brainstorming ideas
- weighing up the pros and cons of different alternatives
- narrowing down the possibilities and choosing one.

You will need to learn where to get ideas for your designs and about the wide range of stimulus materials that are available to you such as:

- photographs or parts of photographs taken by you or from secondary sources such as the internet
- sketches, drawings or paintings of people, places, or objects
- diagrams, maps, plans
- background images or textures
- text in a particular typeface or font
- interesting colours and colour combinations, patterns or effects you would like to re-create.

To create the most effective artwork and images you will need to experiment with a range of design ideas so that you can see what works and what does not. You may finally decide not to use a particular technique but this will be only after you have tried it out to see if it does what you need it to do, or if you like the effect it produces.

You need to learn how to make use of feedback from others on your initial designs to ensure that your final products meet the needs of the target audience.

3.3 Image types

You will work with two different image types: vector and bitmap (also sometimes called raster). You need to know how these differ from one another, the advantages and limitations of each and which purposes each is most suitable for.

You will learn that vector images:

- are made up of objects that can be edited and filled with colour
- are used for more precise images, eg maps or technical drawings, logos, clipart, lettering
- can be scaled up or down without losing any details
- are not used to create photographic images (although bitmap images can be included in vector art)
- generally require less storage space than bitmap images.

You will also learn that bitmap images:

- are made up of individual pixels that can be set to one colour
- are used for photographs or images with continuous colours
- will lose detail if they are scaled up or down to excess
- generally require considerably more storage space than vector images.

3.4 Developing artwork and images

You will need to experiment with a variety of tools and techniques for creating and editing vector and bitmap images in order to test out ideas.

You need to learn about the various options available:

- trying out particular tools to see how they can be used in your images
- exploring alternative ways of achieving the same effect
- using the work of another designer, illustrator or artist as a stimulus
- experimenting with different ways of conveying messages
- using combinations of vector and bitmap images.

While you are experimenting with the software to produce design ideas you will need to remember the objectives of your project and evaluate what makes a good design solution. You may find it helpful to use paper and pencil to sketch out your ideas.

You will need to check and refine your work to make sure that your final images are fit for purpose.

You will save your final images and the designs on which they are based in an eportfolio, so that the development of your images from initial ideas through to final product can be seen.

3.5 Use drawing tools

You will learn how to:

- create and edit objects
- path and point
- stroke and fill
 - paint the stroke separately from the fill
 - alter the thickness of the stroke
 - alter the properties of the fill, such as pattern or gradient
- edit and arrange vector images
 - cut, copy and paste
 - duplicate or clone objects
 - crop, trim and resize
 - cut and join lines or shapes
 - combine and break apart objects
 - align and order objects
 - group/ungroup
- move and order objects
- use layers in vector images
- apply effects to selected areas
- trace objects
- insert, modify and transform text using vector tools
- combine basic shapes and freehand drawing
- insert, create and add text
 - insert, format and edit
 - fit text to path
 - apply filters and special effects such as shadows
- save vector images
 - native formats that only the software can read
 - common file formats
 - formats for print and web and/or screen display.

3.6 Use image editing tools

You will learn how to:

- create bitmap images or elements
- scan images or use other capture devices such as digital microscopes
- download pictures from a digital camera
- draw/paint images
- edit bitmap images
 - cut and move bitmap elements
 - crop bitmap elements
 - select parts of bitmap images
 - apply special effects and filters to bitmap images
 - use layers in bitmap images
 - combine images and parts of images
 - apply an effect or change to a selected area
- use text in bitmap images
- adjust image and canvas size
- adjust colour in bitmap images
 - convert images to grayscale or BW
 - colour balance (HSB)
 - understand where and how to use levels and curves
 - using and customising colour palettes
- make basic corrections and adjustments to colour
- save bitmap images
 - native formats that only the software used to make them can read
 - common file formats
 - formats for print and web and/or screen display
- combine bitmap images and parts of graphics in a composite image.

3.7 Preparing images for screen

In preparing images for screen or web publication you will need to consider:

- the quality of the image
 - the resolution of the image (the number and size of the pixels)
 - the colours used
- the file format
 - compression and compressibility
 - converting files to different formats
 - the size of the file
 - bandwidth (download speed)
 - browsers and platforms.

There are several different colour systems that can be used to create images. You will learn about:

- different colour systems (RGB, CMYK, grayscale, BW)
- colours and fonts that are suitable for the web.

You will learn how different properties of monitors affect image size and quality, including:

- maximum resolution
- viewable area – aspect ratio, screen size
- refresh rate for CRT.

3.8 Preparing images for print

When preparing images for use onscreen you have the advantage of being able to see what they will look like. What you see is what you get (WYSIWYG)! However, if your image is destined for another medium, such as paper, you will need to make sure that it will look how you want it to. There are a number of factors that you need to learn about, including:

- type of printer, number of colours, resolution
- medium on which it is to be printed, eg paper, acetate, fabric
- paper size
- layout and orientation
- image size
- distance between the image and the person viewing it.

You will learn how to make sure that your printed image looks how you want it to by:

- setting an appropriate resolution and image size
- selecting an appropriate file type

3.9 Product review

You need to learn how to undertake a thorough review of your products once they are completed. You should evaluate:

- how well they meet user requirements
- their fitness for purpose.

You should:

- consider feedback from end reviewers
- make valid suggestions for further improvement of the final products.

Your review could be any combination of:

- a written evaluation
- a verbal evaluation recorded in an appropriate way
- a presentation.

3.10 Exhibit work in an eportfolio

You need to learn about what an eportfolio is and how it is used to create an interactive showcase for your achievements in a way that is self-explanatory and easy to use.

You will need to learn how to construct an eportfolio, making decisions about:

- content
 - home page
 - context pages with commentaries
 - graphic products
 - supporting evidence
- organisation
 - structure
 - links
 - user interface
- packaging
 - storage medium
 - file formats, compression and compatibility
- accessibility.

You must learn which file formats are suitable for your images and documents so that people can view or read them even if they do not have the same software as you.

You must test your eportfolio to ensure that it functions properly. You must check that:

- the content is correct and complete
- the file sizes are appropriate for download
- every link goes where it should with no dead ends
- the eportfolio displays and works correctly with commonly used browsers
- other people can use the eportfolio without help.

You should get other people to test your eportfolio and give you feedback. You will need to decide whether or not to make modifications in the light of the comments you receive.

3.11 Standard ways of working

You will be expected to use ICT efficiently and safely, including:

- file management
 - save work regularly
 - use sensible filenames
 - set up directory/folder structures to organise files
 - make regular backups and versions to show progress
 - choose appropriate file formats
 - convert files to appropriate formats
 - have an awareness of viruses
- quality assurance
 - use tools such as spell and grammar check and print preview
 - proofread
 - seek views of others
 - authenticate work
 - test components
- work safely
 - select and adjust system settings
 - take regular breaks
 - handle and store media correctly
 - use the internet in a responsible and safe way.

How you will be assessed for Unit 3: Artwork and Imaging

This unit takes a holistic approach to the assessment of knowledge, understanding and skills. You will demonstrate your knowledge and understanding of the content through how well you perform the tasks in the project brief given to you.

This project brief will require you to produce images and artwork for a specified purpose and audience. It should take you approximately 30 hours to complete. You will be expected to:

(a)	Design and develop graphic products (9 marks)
(b)	Develop scaleable images and artwork (5 marks)
(c)	Develop bitmap images and artwork (7 marks)
(d)	Exhibit work in an eportfolio (7 marks)
(e)	Review the products (5 marks).

Assessing students' work

Five activities are used to assess achievement on **Unit 3: Artwork and Imaging**.

Students will be expected to:

- | | |
|---|-----------|
| (a) Design and develop graphic products | 0–9 marks |
| (b) Develop scalable drawings and artwork | 0–5 marks |
| (c) Develop bitmap images and artwork | 0–7 marks |
| (d) Exhibit work in an eportfolio | 0–7 marks |
| (e) Review the products | 0–5 marks |

In each band, the description relates to the top of the band.

Whenever assessments are made, the mark descriptions given should be used to judge the mark which best fits the student's performance. Students should be placed in a band on a 'best fit' basis, making allowance for balancing the strengths and weaknesses in the work presented.

The Moderator's Toolkit stipulates the acceptable file formats for content. Work must be submitted in formats that will be accessible by the moderator. Work that cannot be accessed by the moderator (for example, because files are corrupted, infected by viruses or presented in formats that are not acceptable) cannot be moderated.

A recommended maximum size for the eportfolio is published in each SPB. This is to encourage students to produce manageable eportfolios with optimised download times. However, there is no penalty for exceeding the recommended size.

Strand	Strand total	Mark allocation per AO for Unit 3			
		AO1	AO2	AO3	AO4
a	9	3	-	6	-
b	5	1	3	1	-
c	7	3	2	2	-
d	7	2	-	5	-
e	5	-	-	-	5
Totals	33	9	5	14	5

(a) Unit 3: Artwork and Imaging – Design and develop graphic products (maximum 9 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has produced a set of products, each of which meets most requirements of the project brief and incorporates combinations of elements, some of which are appropriate for audience and purpose. They have made comments on their design decisions.
4–6 marks	The student has produced a set of products, each of which meets all requirements of the project brief and incorporates combinations of elements, all of which are appropriate for audience and purpose. They have made detailed comments on their design decisions.
7–9 marks	The student has produced a set of products, each of which meets all requirements of the project brief and incorporates combinations of elements that are effective and well matched to the audience and purpose. They have justified their design decisions.

(b) Unit 3: Artwork and Imaging – Develop scaleable drawings and artwork (maximum 5 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has used drawing tools to develop a variety of scaleable graphic elements, most of which are suitable for the intended purpose. They have provided brief comments on their use of drawing tools to develop some of the elements.
4–5 marks	The student has used drawing tools to develop a variety of scaleable graphic elements, all of which are suitable for the intended purpose. They have described clearly their use of drawing tools to develop most of the elements.

(c) Unit 3: Artwork and Imaging – Develop bitmap images and artwork (maximum 7 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has used bitmap tools to develop a variety of graphic elements, most of which are appropriate for the intended purpose. They have described their use of bitmap tools to develop some of the elements.
4–5 marks	The student has used bitmap tools to develop a variety of graphic elements, all of which are appropriate for the intended purpose. They have described their use of bitmap tools to develop most of the elements.
6–7 marks	The student has used bitmap tools to develop a variety of graphic elements, all of which are effective and well-matched to the intended purpose. They have described their use of bitmap tools to develop each of the elements.

(d) Unit 3: Artwork and Imaging – Exhibit work in an eportfolio (maximum 7 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1-3 marks	The student has produced an eportfolio with a basic user interface that includes graphic elements and provides access to most of the student's evidence. Most elements are appropriate for the audience and purpose. There are brief comments that introduce the content of the eportfolio.
4-5 marks	The student has produced an eportfolio with a suitable user interface that includes graphic elements and provides access to all of the student's evidence. All elements are appropriate for the audience and purpose. There are detailed comments that introduce the content of the eportfolio.
6-7 marks	The student has produced an eportfolio with an intuitive user interface that includes graphic elements and facilitates access to all of the student's evidence. All elements are effective and well-matched to the audience and purpose. There are clear explanations that introduce the content of the eportfolio.

(e) Unit 3: Artwork and Imaging – Review the products (maximum 5 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1-3 marks	The student has made evaluative comments about the final products, most of which are realistic and has included feedback from reviewers.
4-5 marks	The student has produced realistic evaluation of each of the final products, including their response to feedback from reviewers.

Delivering Unit 3: Artwork and Imaging

There are real opportunities here to work collaboratively with colleagues teaching art and design or graphic products. However, it is also perfectly possible for students to be taught this unit in discrete lessons. What is important is that whoever teaches this unit has a good grasp of graphics technical concepts such as file size, image size, colour models etc.

Students will almost certainly already have some experience of developing images by hand and will be familiar with the design process. They will probably have experimented with different tools to produce artwork and will know something about the work of other artists.

Students should be encouraged to evaluate a variety of images in terms of how well they serve the purpose for which they are intended. It may be useful to use group work here. Asking a group of students to evaluate the success of a graphic and present ideas to the wider group will be helpful in exploring a range of ideas and sources.

Students must work with images they have created themselves from primary sources and will need to gain experience in methods of image capture. It is also vital that they are given access to a range of secondary sources, including photographs, image libraries, maps, etc. While collecting these images it is important that students are made aware of the correct means of storing the image: using image databases such as Adobe Album or Picasa and choosing the correct file extension, for instance. It is also crucial that students are constantly reminded of the laws of copyright and the need to reference all sources. Providing students with a model of an accurate bibliography may be useful. Students must also be continually warned of the dangers of plagiarism when using and exploring the resources of others.

It is important that students can access a range of graphic software, including vector-based and bitmap. They should be aware of the most suitable uses for each graphic type. It may be useful to ask students to produce the same graphic using both types, to examine the suitability of each type for a particular purpose. Students need to be given opportunities to explore the tools and techniques of the software available to them.

The developmental process of producing artwork and images is crucial in ensuring its success. It would be useful for students to be introduced to a suitable design methodology. This might include evaluation of the work of others, experimentation with different tools, and detailed explanation of the message that needs to be conveyed. This approach will ensure that students accurately store the stages in the development of their design. Keeping a record of all their experiments is important for the final eportfolio. Students should be encouraged to allow others to evaluate their work, to help in its development. It is important that the correct atmosphere is created for the exchange of such views. Suggesting that students give permission to others to closely examine their work is helpful.

It is important that students appreciate the need to prepare the graphics they produce for the intended medium, whether this is digital or print.

In preparing artwork and images for the screen, students need to be aware of such things as resolution, colour, file format and size, compatibility etc and how these may impede the ability of the audience to view the graphic. It may be useful to ask students to explore a series of poorly constructed websites. This way they will be introduced to the issues of download speed and use of colour and how these can hinder a project's success.

Information about the best ways to reproduce artwork and images on different types of printed media may be gained by visiting computer or printing shops, as staff should be aware of the range of different print resolution and paper types available. If this is not possible, exploring the range of products on the market will allow them to evaluate the success of each printer and consumable. Students should be encouraged to test out different printer consumables. It will be difficult for students to think beyond the idea of the paper in the printer, therefore they need to be introduced to as many other types of printed media as possible, such as textured paper and acetate. A visit to a print shop would be invaluable, especially if they have the large format printers.

When producing a graphic for a particular purpose and audience, it is important that students continually test the product and evaluate their progress. It is difficult for students to make extensive changes at the end of a project, as they have invested much time and energy in the idea. It is essential to build in periods of evaluation at different stages during the development of the graphic. Peer support may be a useful strategy here, as it will help students to build their evaluative skills, while helping someone else.

In addition, there must be a thorough period of testing once the graphic has been produced. It may be useful to model successful methods to access the views of the target audience. Students need to use a clear method of documentation to record the testing and correction cycle.

Students need to be encouraged to evaluate their own performance in the production of the product as well as the product itself.

Students will need to use the skills and knowledge gained throughout this unit and in the design of their eportfolio, ie content and its presentation, organisation, packaging and access rights. The eportfolio should be seen primarily as an e-exhibition for their graphic products.

It is vital that suitable file formats are used for images and documents so that people can view or read them, even if they do not have the software that was used to create them installed on their computers.

Links

Other units

This unit develops and builds on the skills covered in *Unit 1: Developing Web Products*. It also has links to *Unit 2: Creative Multimedia* and *Unit 4: Game Making*.

Resources

Books

Chasemore R – *Basic Paint Shop Pro 8* (Payne-Gallway Publishers, 2004) ISBN: 1904467369

Tilley P and Gillies M – *Pearson Edexcel DiDA: Graphics* (Longman, 2005) ISBN 84690117-0

Software

Bitmap-based software

For example:

- Adobe Photoshop
- Adobe Photoshop Elements
- Corel PaintShop Photo
- Serif PhotoPlus
- Adobe Fireworks

Image database software

For example

- iPhoto
- Picasa

Screen recording software

For example:

- Adobe Captivate
- BB FlashBack
- MatchWare ScreenCorder
- TechSmith Camtasia

Vector-based software

For example:

- Adobe Fireworks
- Adobe FreeHand
- Adobe Illustrator
- CorelDRAW
- Serif DrawPlus
- SmartDraw
- Microsoft Vista

Websites

Copyright and rights

www.dacs.org.uk

Graphic design

www.davidairey.com/5-vital-logo-design-tips/

www.flickr.com/photos/benheine/sets/72157623587191460

www.ideabook.com

Resources

About Graphic Design – <http://graphicdesign.about.com>

Creative Commons – <http://creativecommons.org.uk>

Graphics.com – www.graphics.com

Packaging Design – www.design-technology.org/TVSPackaging.htm

Professional vector clipart (includes free section) – www.cliparts-design.com

Unit 4: Game Making

Level: 2

Guided Learning Hours: 90

Introduction

The computer game industry is one of the fastest-growing sectors of the economy. Some games have crossed over into blockbuster entertainment territory, with people queuing overnight to get the latest releases.

What makes some games better than others? How do designers come up with good ideas and how do these initial ideas get transformed into games that people want to play?

In this unit you will learn about different types of computer games, investigate what makes a game successful and learn how to plan, design and create great games for others to play.

Recommended prior learning

It is recommended that you undertake the learning for *Unit 1: Developing Web Products* before, or alongside, this unit.

What you need to learn

4.1 Investigating computer games

Before you start to produce computer games yourself you need to learn about the different types of computer games created by others, including:

- action
- adventure
- platform
- puzzle
- role-play games (RPG)
- massively multi-player online games (MMOG)
- simulation
- sport and strategy
- serious games.

When you are playing games pay attention to features, such as:

- style, eg cartoon, retro, realistic, environment (3D, 2D), single/multi-player
- platform, eg PC, mobile phone, console, online
- PEGI rating
- game elements, eg light effects, sound (effects, music, speech), story, characters, sprites, 3D models, backgrounds, tiles, textures, fonts
- game play, eg scoring, levels, rules, instructions, controls, interaction.

4.2 Using a moodboard

You need to learn how to use a moodboard to show other people what you have in mind and how it can be used to provide information about the game, including:

- purpose
- target audience
- genre and style
- rating
- platform
- key features, eg theme, objective, environment, story outline, game play, characters, assets.

Even at this early stage, you should be able to explain how you will test the game for functionality and playability.

You need to learn how to make use of feedback from others, how to explain the choices you have made and how to be flexible enough to make changes to your plans in response to feedback.

4.3 Developing games for others to play

Games must be carefully designed if they are to work as intended and be fun to play. You will learn how to produce detailed designs for games that include details of:

- audience and purpose of the game
- the game environment
- pathways
- levels
- assets
- story – narrative
- challenges
- rules
- navigation and controls
- interaction.

You need to learn how to make use of feedback from others on your designs and be prepared to make changes if necessary.

You need to learn how to keep a record of your progress, noting down the key design decisions that you make and why you made them.

You will need to collect and prepare all the digital assets for the game, including:

- backgrounds
- 3D models
- objects
- sprites
- sounds.

You can use ready-made assets providing you have permission to do so, but you will be expected to produce some original assets of your own.

You need to learn how to break down the task of developing the game into a number of sub-tasks, including:

- preparing assets
- importing assets
- creating features, eg levels, scoring systems, events, controls and actions
- producing prototypes
- asking for and responding to feedback from test users, eg experienced game player, novice, representative of target audience
- testing for functionality (logic, rules, levels, events, actions and controls, user instructions)
- getting feedback on the user experience (playability, interactivity).

You must be able to:

- select, create and modify images suitable for using as sprites
- import images for sprites into a game engine
- select appropriate sprite properties
 - size
 - background transparency
- colour/pattern
- select, create and modify sounds and their properties
 - effect (chorus, echo, reverb)
 - type (effect, music)
 - use (play once, looped, volume, pan)
 - trigger a sound effect on a game event
- select and use appropriate sound types, eg wav, midi, mp3, ogg
- select and create appropriate properties for game objects, such as:
 - visibility
 - solidity
 - depth
 - rotation
 - scale
 - health
- select appropriate game events associated with game objects
- trigger game events associated with mouse/keyboard
 - object movement (and timings)
 - collisions detection
 - health
 - score
 - next level
- select appropriate background
- select and apply effects, eg emitters, fog, rain
- select and apply an appropriate player starting point
- create a game with a number of levels, game objects and a background
 - add a level
 - level size
 - window size
- select appropriate naming conventions for assets and games

- save game in an appropriate format
 - executable (.exe) file
 - editable file
 - exportable file for use in a viewer

You must be able to:

- select and use 3D objects/props/models
- create, import and apply textures
- select and use appropriate scenery
- select and apply effects, eg emitters, fog, rain
- select and apply appropriate lighting
- manipulate assets in 3D space
 - position
 - scale
 - rotate
- allow objects/models to move within your 3D world, eg character moves, door opens

4.4 Promoting games

There is no point producing a fantastic game if no-one knows about it. You will learn how to use assets from the game to create a promo that attracts interest and persuades people to play.

4.5 Reviewing games

You will learn how to review the strengths and weaknesses of game by evaluating factors, such as:

- playability, eg challenge, interest, duration, start-up, progress
- interactivity, eg controls, effects)
- rules, eg clarity, logic
- instructions, eg clarity, prompts, help
- originality
- user ratings and comments.

You will also learn how to select extracts from the game to illustrate your comments.

4.6 Be able to use ICT efficiently and safely

While working on a project you will be expected to use ICT efficiently, legally and safely, including:

- file management
 - save work regularly
 - use sensible filenames
 - set up directory/folder structures to organise files
 - make regular backups and versions to show progress
 - choose appropriate file formats
 - convert files to appropriate formats
 - limit access to confidential or sensitive files
 - have an awareness of viruses
 - create 'read me' files where appropriate to provide technical information, eg system requirements
- personal effectiveness
 - select appropriate ICT tools and techniques
 - customise settings
 - create and use shortcuts if appropriate
 - use available sources of help
 - use a plan to organise work and meet deadlines
- quality assurance
 - use tools such as spell and grammar check and print preview
 - proofread
 - seek views of others
 - authenticate work
 - test components
- legislation and codes of practice
 - acknowledge sources
 - respect copyright
 - avoid plagiarism
 - protect confidentiality
- work safely
 - select and adjust system settings
 - take regular breaks
 - handle and store media correctly
 - use the internet in a responsible and safe way.

How you will be assessed for Unit 4: Game Making

This unit takes a holistic approach to the assessment of knowledge, understanding and skills. You will demonstrate your knowledge and understanding of the content through how well you perform the tasks in the project brief given to you.

This project brief should take you approximately 30 hours to complete. You will gain marks for:

(a)	Your design and development work (9 marks)
(b)	The functionality of your game (7 marks)
(c)	The user experience (7 marks)
(d)	Your promo for the game (5 marks)
(e)	Your game review (5 marks)

Assessing students' work

Five activities are used to assess achievement on **Unit 4: Game Making**.

- | | |
|---------------------------------|-----------|
| (a) Design and development work | 0-9 marks |
| (b) Game functionality | 0-7 marks |
| (c) User experience | 0-7 marks |
| (d) Game promo | 0-5 marks |
| (e) Game review | 0-5 marks |

Mark descriptions are written in bands. **In each band, the description relates to the top of the band.**

Whenever assessments are made, the mark descriptions given should be used to judge the mark which best fits the student's performance. Students should be placed in a band on a 'best fit' basis, making allowance for balancing the strengths and weaknesses in the work presented.

The Moderator's Toolkit stipulates the acceptable file formats for content. Work must be submitted in formats that will be accessible by the moderator. Work that cannot be accessed by the moderator (for example because files are corrupted, infected by viruses or presented in formats that are not acceptable) cannot be moderated.

Recommended file size limits are published in each SPB. Students who exceed this recommended limit will not be penalised. However, it should be noted that working within these guidelines will allow students to meet all requirements of the brief.

Strand	Strand total	Mark allocation per AO for Unit 4			
		AO1	AO2	AO3	AO4
a	9	9	-	-	-
b	7	-	5	2	-
c	7	-	-	7	-
d	5	-	-	5	-
e	5	-	-	-	5
Totals	33	9	5	14	5

(a) Unit 4: Game Making –Design and development work (maximum 9 marks)

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has provided relevant information about some aspects of the development process from initial ideas through to the final game. They have gathered and prepared content for the game, most of which is appropriate for the intended purpose.
4–6 marks	The student has provided relevant information about most of the development process from initial ideas through to the final game. They have gathered and prepared a variety of content, all of which is appropriate for the intended purpose.
6–9 marks	The student has provided relevant information about the complete development process from initial ideas through to the final game. They have gathered and prepared a variety of content, all of which is effective and well-matched to the intended purpose.

**(b) Unit 4: Game Making – Game functionality
(maximum 7 marks)**

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has produced a game with challenge and game logic that shows limited awareness of audience interests and capability. Limited functionality testing has been carried out. User instructions cover most key aspects.
4–5 marks	The student has produced a game with challenge and game logic that shows consideration of audience interests and capability. Functionality testing has been carried out, some of which was effective. User instructions are complete.
6–7 marks	The student has produced a game with challenge and game logic that is well matched to audience interests and capability. Effective functionality testing has been carried out. User instructions are complete and easy to follow.

**(c) Unit 4: Game Making – User experience
(maximum 7 marks)**

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has produced a game with playability and interactivity that will have limited appeal for the audience. Limited usability testing has been carried out.
4–5 marks	The student has produced a game with playability and interactivity that will appeal to the audience. Usability testing has been carried out, some of which was effective.
6–7 marks	The student has produced a game with playability and interactivity that will appeal to the audience and sustain their interest. Effective usability testing has been carried out.

**(d) Unit 4: Game Making – Game promo
(maximum 5 marks)**

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has created a promo that makes use of appropriate assets from the game. It will have some success in attracting interest and persuading people to play.
4–5 marks	The student has created a promo that makes use of well-chosen assets from the game. It will be effective in attracting interest and persuading people to play.

**(e) Unit 4: Game Making – Game review
(maximum 5 marks)**

Mark	Mark descriptions
0 marks	No rewardable content.
1–3 marks	The student has made evaluative comments about the game, including aspects of its functionality and usability, most of which are realistic. They have included some relevant extracts from the game and feedback from players.
4–5 marks	The student has made a realistic evaluation of the game, including its functionality and usability, illustrated with well-chosen extracts and feedback from players.

Delivering Unit 4: Game Making

Most students will already have plenty of experience of playing computer games and will be able to explain why they like playing their favourite games. However, they will almost certainly have little or no understanding of the process of creating a computer game or know why certain features work on certain genres of computer game. With this in mind, they must be given the opportunity to evaluate different types of computer games, considering their graphics, music and sound effects, playability, challenge, originality.

Students may need help to produce their moodboard, as some students may be tempted to skip this important stage. It may be useful to look at how successful designers go about coming up with ideas for good games and trying to model what they do. It is the idea of a computer game upon which everything else depends. Students need to devote enough time to this stage to ensure that the initial ideas that they come up with are viable given the limitations of the ICT tools available to them, their level of expertise and the amount of time they have to produce the finished game. Teachers should instigate a formal sign-off process which has to be completed prior to serious development work getting underway.

Students need to be taught the importance of good design and how to capture key aspects of the design process, showing how their designs developed from initial ideas through to final product. They must learn the value of feedback and ensure that they get feedback from suitable people throughout the project. The selection of a team of 'test buddies', who will give them honest and critical feedback, could be a key success factor.

Students need to be able to use a wide range of software tools, including sound, graphics and games creation software, in order to create and edit game objects and build their game engine. They should be set a number of smaller game making projects which will help them familiarise themselves with the tools before embarking on their final game.

Students must use dedicated games authoring software or multimedia software capable of creating 2D and 3D games, such as Flash or Flash variants. The software needs to be able to create rules to control the game (by handling variables); this is in addition to manipulating the graphics and audio.

Students do not have to produce all the game objects themselves. However, when considering materials produced by others they must be mindful of legal and other constraints and the importance of acknowledging sources.

Students must recognise that prototyping and testing is an integral part of game creation. They will need help to develop a suitable testing strategy and a test plan. Test buddies have an important role to play in this process. Students will need to be taught how to be a good test buddy. Among other things, this is likely to entail attempting to 'bust' someone else's game!

Continual evaluation of their own and others' work will help students develop reflective skills.

Students will need to be familiar with the content and format of games reviews in magazines and practise producing reviews themselves.

While there is no requirement for students to produce an eportfolio, they will need to present their finished game and supporting materials in an appropriate format.

Links

Other units

This unit develops and builds on the skills covered in *Unit 1: Developing Web Products*. This unit has links to *Unit 2: Creative Multimedia* and *Unit 3: Artwork and Imaging*.

Resources

Books

Creighton R– *Unity 3D Game Development by Example Beginner's Guide* (Packt, 2010) ISBN 1849690545

Darby J – *Game Creation for Teens* (Delmar, 2008)
ISBN-10: 159863500X

Goldstone W – *Unity Game Development* (Packt, 2009)
ISBN: 184719818X

Habgood J, Nielsen N, Crossley K and Rijks M– *The Game Maker's Companion* (Apress, 2010)
ISBN-13: 978-1-4302-2826-4

Thompson J and Berbank-Green, B – *The Computer Game Design Course: Principles, Practices and Techniques for the Aspiring Game Designers* (Thames and Hudson, 2007)
ISBN: 9780500286586

Software

For game authoring

For example:

- Gamemaker
- The Games Factory
- Multimedia Fusion
- Flash
- Unity 3D

For sprite production

For example:

- Fireworks
- Serif Draw Plus
- Chars.EX – animated sprite character creator
- Spriteforge
- World Creator

3D modelling

For example:

- Google Sketchup (Free) – pro version needed for dxf export
- Blender (Free)

For sound

For example:

- Audacity
- Magix Music Maker
- Jamstudio (online)
- Soundation (online)

Video capture and editing software

For example:

- Adobe Premiere
- Apple iMovie
- Final Cut Express
- Microsoft Moviemaker
- Pinnacle Studio 14
- Corel VideoStudio

Screen recording software

For example:

- Adobe Captivate
- BB FlashBack
- MatchWare ScreenCorder
- TechSmith Camtasia

Websites

unity3d.com/support/resources/tutorials/ – Unity tutorials
www.3dcafe.com – texture and model resources
www.hongkiat.com/blog/60-excellent-free-3d-model-websites/ - free 3d models sites
www.reinerstilesets.de/ – sprites and models
www.turbosquid.com – textures, models and 3D tutorials
www.unitymagic.com/shop/en/unity-tutorials/ – Unity tutorials
www.widgetworx.com/widgetworx/portfolio/spritelib.html – sprite collection
www.yoyogames.com – Gamemaker site, tutorials and resources

Websites that upload finished games:

<http://fuse.microsoft.com/page/kodu.aspx>
<http://gamesalad.com/products>
www.sploder.com/

Unit 5: Coding for the Web

Level: 2

Guided Learning Hours: 30

Introduction

Have you ever wondered how to build your own website in a modern way, which works across multiple devices? The way we access the internet is changing; the range of web-enabled devices now includes smartphones, tablets, televisions and games consoles and the way we design for the internet is changing too.

Web design is a dynamic and evolving landscape that requires an understanding of different programming languages if you want to create complex and interactive websites that will work across multiple devices.

This unit is about front-end web development. You will learn coding methods and techniques in HTML, CSS and JavaScript.

You will demonstrate your ability to create a website from a design or plan provided by Pearson within a practical computer-based examination.

What you need to learn

1.1 Writing code

You will need to write and edit HTML and CSS using:

- a text editor
- a HTML editor
- the code view of a visual editor

Organisation and structure are key when

programming for the web and you will need to organise, structure and test your files appropriately in order to produce fully functioning web pages.

You will understand how to:

- create a directory structure with:
 - a top-level folder (root folder)
 - sub-directories
- adopt appropriate file naming conventions:
 - index.html (homepage)
 - lowercase file names
 - separating words with a dash
- save files in an appropriate format e.g. html
- use relative and absolute URLs to link to assets and other web pages

You will need to test your page layout regularly to ensure it is fully responsive and fit for purpose.

1.2 Planning

As part of the planning for a website project, you will learn how to create and use wireframes showing:

- page size
- the key information to be included on each page
- the hierarchy of the information
- how much space is required for each element, measured in pixels

1.3 HTML

HTML describes the structure of web pages. You will learn how to write and edit:

- HTML elements – opening and closing tags, attributes and values
- structural elements – DOCTYPE, html, head, meta, title, link and body
- HTML5 structural elements – header, nav, section, article, hgroup, aside, footer
- comments to describe your code
- organisational elements – div, span, table
- global attributes – class, id, title

- elements that control text – headings, paragraph, bold and italic, superscript and subscript, mark, line break, horizontal rule, citations and definitions, abbreviations and acronyms, quotations, address, time, data
- elements and attributes that control images – adding images, specifying height and width, aligning images horizontally and vertically, alternate text, figure and figure caption
- links – <a> element and href attribute, internal, external, email, linking to another part of the same page or a specific part of another page (anchors)
- lists – ordered, unordered, definition, nested
- elements that control tables – table, row, cell, headings, spanning columns and rows, splitting into table head, body and foot

1.4 Styling with CSS

CSS controls the presentation of the page content. You will learn how to write and edit:

- internal and external style sheets
- CSS rules:
 - selector and declaration blocks (containing properties and values)
 - using universal selectors
 - combining selectors
 - referencing – elements, id attributes, class attributes
 - inheritance
- comments to describe the purpose of style rules
- units – pixel, percentage, em
- color – names, hexadecimal numbers, RGB, HSL, RGBA, HSLA
- properties that style text – font-family, font-size, font-style, font-weight, line-height, word-spacing, letter-spacing, text-indent, white-space, text-decoration, text-transform, text-align, vertical-align
- properties that style links – link, visited, focus, hover, active
- pseudo-elements and pseudo-classes
- properties that style boxes – background, display, width and height, min-width, min-height, max-width, max-height, margin and padding, border, overflow, visibility
- properties that style images – size, aligning images, background images, image rollovers and sprites

- CSS3 enhancements – border-image, border-radius, box-shadow, text-shadow, multiple backgrounds, gradients, opacity
- browser pre-fixes - -webkit- (Webkit/Safari/Chrome), -moz- (Firefox), -ms- (Internet Explorer), -o- (Opera)
 - web fonts - @font-face
- properties that style lists – bullet point styles, images for bullets, positioning the bullet
- properties that style tables - padding on cells, distinguish headings, shade alternate rows, align numerals, add borders to empty cells, gaps between cells
- properties that style forms- styling text inputs, submit buttons, fieldsets and legends, aligning form controls, cursor styles

1.5 Controlling layouts with CSS

CSS can also be used to create a wide variety of layouts. You will learn how to position elements using:

- normal flow
- relative positioning
- absolute positioning
- fixed positioning
- overlapping elements
- floating elements and clearing floats

Web designers have to design for different screen sizes and resolutions. You will learn how to create and control:

- fixed layouts
- fluid (liquid) layouts:
 - responsive - flexible, grid-based layout, percentages used to set width, margin and padding properties, assets sized with percentages, media queries to detect the dimensions of the screen being used to view the content, polyfills and shims
 - adaptive layouts
- elastic layouts

1.6 Creating forms

HTML forms are used to collect information from visitors to your site. To learn how to create forms, you need to know:

- the structure of a HTML form:
 - how to use the form element and action attribute
 - how to include the URL of the script that will process the form
 - which method to use – get or post
- the different form controls:
 - adding text - text input, password input, text area
 - making choices - radio buttons, checkboxes, drop down list boxes, multiple select boxes
 - submitting forms - submit buttons, image buttons
 - uploading files - file upload
- label form controls
- group form elements
- HTML5 controls – date, email, url, search inputs
- how to add JavaScript form validation to check for empty fields and valid responses

1.7 JavaScript

JavaScript is a cross-platform, object-oriented scripting language designed for embedding in applications such as web browsers. You need to learn the following aspects of client-side JavaScript:

- how to write and edit the following JavaScript:
 - statements and blocks
 - identifiers
 - variables and literals
 - data types (string, number, Boolean, array, object, null, undefined)
 - objects (properties and methods, constructors)
 - functions (keyword, name, parameters, arguments, return statements, expressions, constructors)
 - events
 - single line and multi-line comments
- how to write JavaScript in order to:
 - change the background colour of a webpage
 - display the date
 - display the time
 - create popup boxes (alert, confirm, prompt)
- how to incorporate JavaScript into HTML:
 - through embedded script
 - linking to external files

JavaScript and libraries such as JQuery can be used for many functions, you will need to incorporate and adapt JavaScript into your web pages to control:

- an image slider/slideshow
 - interactive galleries
 - tabbed content
 - animated infographics

1.8 APIs

APIs (Application Programming Interfaces) for websites are used to share content. You will need to learn how to incorporate:

- the iframe element:
 - to embed a Google Map on the page
 - adding attributes to control the appearance of the iframe – src, height, width, scrolling, frameborder, seamless
 - social media feeds
 - image hosting sites

1.9 Audio and video

You will need to learn how to include video and audio on your web pages, using:

- hosted video sites
- HTML5 video element and attributes – src, poster, width and height, preload, controls, autoplay, loop
- source element – to specify different formats
- HTML5 audio element and attributes – src, controls, autoplay, preload, loop
- track element
- your own playback controls

How you will be assessed for Unit 5: Coding for the Web

You will need to complete a 2.5 hour practical computer-based examination.
The table below shows how the taught content will be assessed in the examination.

Section of content from this unit	How it is assessed in the examination
	Activity 1
1.1 Writing Code	In the examination you will need to create web pages in response to a specific client brief.
1.2 Planning	You will need to organise and structure your files appropriately in order to produce fully functioning web pages for assessment.
1.3 HTML	You will be given a wireframe that you must use to create your web pages.
1.4 Styling with CSS	There will be marks available for creating page layouts in accordance with the wireframe.
1.5 Controlling Layouts with CSS	You will need to write and edit HTML in order to produce web pages that meet the requirements of the client brief.
1.6 Creating Forms	There will be marks available for the ability to write and edit HTML, including the ability to add functioning links.
1.7 Javascript	You will need to write and edit CSS in order to produce web pages that meet the requirements of the client brief.
1.8 APIs	There will be marks available for the ability to write and edit CSS, including the ability to use external style sheets.
1.9 Audio and Video	You will need to be able to position elements on the page in accordance with the client's requirements.

Delivering Unit 5: Programming for the Web

This unit introduces students to the main programming languages involved in front-end web design: HTML, CSS and JavaScript. Students are not expected to learn server-side scripting languages such as PHP, ASP.NET, Ruby or Python.

Students should be encouraged to look at the source code of the websites they visit to learn from their structure.

Students will have to design web pages based on wireframes, or partial wireframes, which will be provided for them and consequently students should be familiar with the importance of wireframes in the production process.

Students will use HTML to build the overall structure of their web pages and should be encouraged to embrace HTML5 elements, although this will provide students with some interesting programming issues regarding older browsers, which they will have to solve. However, the design and layout of the site should be controlled through Cascading Style Sheets (CSS). This will allow students to separate content from presentation, so that they can change the way the site looks without having to change the way it works.

JavaScript is a powerful scripting language commonly used to create the dynamic, interactive elements of web pages. As it can run in the browser, responding to user actions immediately rather than going back to the server, it is possible for students to experiment with JavaScript on their web pages. Students should be able to incorporate JavaScript into their pages to add functionality, for example to add an image slider to the page.

With the growth of web-enabled devices, students must understand that the structure of their site must provide shape, organisation and flexibility. Students should be able to produce fixed and fluid layouts, as this is an essential element of programming for the modern Web.

Including multimedia, forms and APIs are also part of web programming and students should be able to add these features to their web pages in order to create attractive and dynamic page elements that bring a page to life.

Links

Other units

This unit develops and builds on the skills covered in *Unit 1: Developing Web Products*.

Resources

Books

Castro E & Hyslop B - HTML5 & CSS3: Visual QuickStart Guide (Peachpit Press, 2011) ISBN: 9780321719614

Duckett J - *HTML & CSS* (John Wiley & Sons, 2011) ISBN: 9781118008188

Duckett J – *JavaScript & JQuery: Interactive Front-end Web Development* (John Wiley & Sons, 2014) ISBN: 9781118531648

McManus S – *Web Design In Easy Steps* (In Easy Steps, 2011) ISBN: 9781840783803

Magazines

.net
Web Designer

Software

Text Editors

For example:

- Notepad
- TextPad
- TextEdit
- TextWrangler

HTML Editors

- Coda
- TextMate
- Sublime Text

Web authoring software

For example:

- Adobe Dreamweaver
- Microsoft Front Page

Image Manipulation software

For example:

- Adobe Fireworks
- Adobe Photoshop
- Serif PhotoPlus

Browser Developer Tools

For example:

- Chrome: Developer Tools
- Firefox
- Internet Explorer
- Opera: Dragonfly
- Safari: Web Inspector

Websites

World Wide Web Consortium – www.w3.org

CodeSchool's JavaScript Path –

www.codeschool.com/paths/javascript

W3C Validators – www.validator-suite.w3.org

JavaScript Testing – www.jshint.com

J Query – www.jQuery.com

Assessment information for the externally assessed unit

Unit 1: Developing Web Products	
Type of external assessment	<p>A practical computer-based examination.</p> <p>There will be one activity in which students will have to use web authoring software and other software tools to design, build and test a web product for a specified audience and purpose as outlined in a client brief. This single activity will require students to draw on a range of knowledge and skills from across the different areas of taught content and integrate them in order to complete the task.</p> <p>Task instructions will be provided on a question paper supplied by Pearson.</p> <p>Students will also be provided with data files which they will need to use to complete the tasks.</p> <p>Further information about the conduct of assessment can be found in the <i>Instructions for Conduct of Examinations</i>, available on the CiDA/DiDA section of the Pearson Edexcel website at www.edexcel.com</p>
Length of assessment	The examination will last 2 hours and 30 minutes.
Number of marks	The total number of marks available is 50.
Assessment availability	The assessment will be available for a 5-day assessment window in June and January examination sessions.
First assessment availability	The first assessment of this unit will be June 2015.

Centres need to make sure that students are:

- fully prepared to sit the external assessment
- entered for assessments at appropriate times, with due regard for resit opportunities as necessary.

Sample assessment materials

Sample assessment materials will be available to help centres prepare students for assessment. Specific arrangements for external assessment are available before the start of each academic year on our website: www.edexcel.com/quals/cida/

Language of assessment

Assessment of these units will be available in English. All student work must be in English.

Assessment information for internally assessed units

Controls for task setting

Units 2, 3 and 4 will be solely assessed via a Summative Project Brief (SPB). Each unit has its own SPB.

The SPB will present students with a scenario, requiring them to produce multimedia (Unit 2), artwork/images (Unit 3) or a game (Unit 4) that meets the requirements outlined in the brief. Students will draw on knowledge, skills and understanding from across the relevant unit, integrating them into a synoptic piece of work.

The SPBs are made available *only* on the CiDA/DiDA qualification section of the Pearson Edexcel website at www.edexcel.com.

For each unit an SPB will be released in September each year. They are live and useable for two years.

Controls for task taking

The Summative Projects are subject to controls that define the conditions under which they are taken.

Supervision and authentication of student work

Unless specifically stated, students are able to work on the SPB only in a lesson, under the supervision of a teacher. This means that there must be adequate supervision to ensure that work can be authenticated.

The Teacher Support Notes will also specify any work that may be completed without supervision outside of the classroom, for example background research and asset gathering. All other work, including any manipulation or development of this material must be done under supervision in the classroom. Any material brought back into the classroom must be checked by the teacher to ensure that it can be authenticated as the student's own work. At the end of the lesson, all of the student's materials, paper-based and electronic, must be collected in, stored securely and handed back at the beginning of the next session.

The role of the test buddy

Each student will work with a test buddy to give and receive feedback on their product designs, prototype products and final product. Students must be made aware of what is expected of a test buddy: they can comment on the '*what*' (what they think is good and what they think could be improved), but they could not feedback on the '*how*' (eg how to make changes or specific solutions to any problems).

Feedback and collaboration at each stage of the project

The controlled assessment task for each unit can be divided into three broad stages. The level of feedback and collaboration allowed varies between stages, as outlined below.

Proposal (Units 2, 3) / Game overview (Unit 4)

This stage starts with the learners being provided with the SPB and ends when the proposal/game overview has been completed and all additional assets gathered.

Students must work individually to come up with their own proposal/game overview.

The teacher may provide feedback on the planned approach, such as highlighting strengths, weaknesses and possible problems with the planned product(s) and approach, but teachers must not suggest, or direct students towards, specific solutions.

Students may receive feedback on the proposal/game overview from their test buddy (see *Role of the Test Buddy* above) and use this to modify their proposal/game overview before seeking approval from the teacher.

Design, building and development (Units 2, 3, 4)

This stage covers all work that happens after the proposal/game overview has been completed. It ends when all products are complete (including eportfolio for Units 2 and 3) but before the review begins.

Students must work individually to design, build and develop their products.

The teacher may provide feedback at the beginning of this stage on students' designs, such as highlighting strengths, weaknesses and problems with the planned designs, but teachers must not suggest, or direct students towards, specific solutions.

The teacher must not provide feedback on their final products, but can suggest general questions for students to consider (which will be useful in the Review), eg 'how do you think x looks?', 'how do you think x could be improved?'

Students may receive feedback from their test buddy (see *Role of the Test Buddy* above) on the designs and building and incorporate this into their final products.

Review (Units 2, 3, 4)

Students must work individually to complete the review.

Before starting their review, the students must seek feedback from their test buddy on the final product (see *Role of the Test Buddy* above), which will be incorporated into the final review. No other feedback from any source is allowed.

Resources

The same range of resources must be made available to all students within a centre. These should include:

- the internet
- relevant software programs
- relevant general guidance documents (electronic or paper), for example software user manuals.

Students must not be provided with:

- any guidance or exemplars that are specific to the project being undertaken (eg examples of work that has been created on the same SPB)
- writing frames

Time

Centres must allow 30 hours for students to complete their Summative Project. As a guide, it is recommended that this time is divided up as follows:

- Proposal/game overview – 5 hours
- Design, building and development – 22 hours
- Review – 3 hours

Authentication

All students must sign the authentication statement that is included in the Assessor Record Sheet (see Annexe C). Statements relating to work not sampled should be held securely by the centre. Those which relate to sampled students must be included with the work sent to the moderator.

Any student unable to provide an authentication statement will receive zero credit for the component. Where credit has been awarded by a centre-assessor to sampled work without an accompanying authentication statement, the moderator will inform Pearson Edexcel and the mark will be adjusted to zero.

Submission of work to the teacher

Students must present their work for Units 2 and 3 in an eportfolio. They will need to understand the difference between document creation and document publication and to distinguish between file formats appropriate for document creation and file formats appropriate for viewing. Students will be expected to present eportfolio content in a format appropriate for viewing at a resolution of 1024 x 768 pixels.

The eportfolio must be constructed so that its contents can be accessed using the Moderator's Toolkit, details of which can be found on the Pearson Edexcel website.

Information about how to present work for Unit 4 will be available on the Pearson Edexcel website.

Recommended file size limits are published in each SPB. Candidates who exceed this recommended limit will not be penalised. However, it should be noted that working within these guidelines will allow candidates to meet all requirements of the brief.

Marking, standardisation and moderation

The Summative Project is marked by centre staff using the detailed mark descriptions provided for each unit. Where marking for this specification has been carried out by more than one teacher in a centre, there must be a process of internal standardisation carried out to ensure that there is a consistent application of the criteria laid down in the marking grids, across all the units.

Marks awarded by the centre will be subject to external moderation by Pearson. This is to ensure consistency with national standards. Following the submission of marks, Pearson will notify centres of the students whose eportfolios have been selected for moderation.

Work must be submitted in an approved digital format.

If the moderation indicates centre assessment does not reflect national standards an adjustment will be made to students' final marks to compensate for this.

Security and backups

It is the responsibility of the centre to keep secure the work that students have submitted for assessment. Centres are strongly advised to utilise firewall protection and virus checking software and to employ an effective backup strategy, so that an up-to-date archive of students' evidence is maintained.

Centres are advised to archive completed, assessed work so as to free up work space for work in progress.

Language of assessment

Assessment of these units will be available in English. All student work must be in English.

Further information

For more information on annotation, authentication, mark submission and moderation procedures, please refer to *Moderation of ePortfolios: Guidance for Centres CIDA*, available on the Edexcel website.

For up-to-date advice on teacher involvement, please refer to the *Joint Council for Qualifications (JCQ) Instructions for conducting coursework* document on the JCQ website: www.jcq.org.uk.

For up-to-date advice on malpractice and plagiarism, please refer to the Joint Council for Qualifications (JCQ) *Suspected Malpractice in Examinations and Assessments* document on the JCQ website (www.jcq.org.uk).

Grading information

The Pearson Edexcel Level 2 Diploma in Digital Applications is awarded using uniform marks, which are derived from subject raw marks. The conversion from raw marks to uniform marks will be determined at an awarding meeting.

Qualification awards

	Uniform mark totals			
	Unit 1*	Unit 5*	Units 2, 3, 4**	DiDA cash-in
Maximum	20	20	120	160
A*	16	16	96	128
A	14	14	84	112
B	12	12	72	96
C	10	10	60	80

*Unit 1 and Unit 5 are mandatory units.

**Two units from Units 2, 3 and 4 must also be completed.

Grade descriptors

C

Grade C students demonstrate the ability to carry out some appropriate design work. There are comments about some of the design decisions but a full explanation is not provided.

Students select and produce content for use in their digital products. Not all the content selected is suitable for the intended purpose. Some relevant information about the content is supplied.

They select and use appropriate digital tools and media, adopting safe, secure and responsible practices.

They create products that have some appropriate features and demonstrate some awareness of audience and purpose.

They demonstrate some understanding of legal requirements and other constraints associated with the use of digital content.

They make some valid evaluative comments about the products they produce.

A*

Grade A* students demonstrate the ability to design effective products. Design decisions are clearly explained and justified.

Students select, prepare and produce appropriate content for use in their digital products, demonstrating an astute sense of purpose. Detailed and relevant information about the content is supplied.

They select appropriate digital tools and media and use them efficiently, adopting safe, secure and responsible practices.

They create effective products that are fully functional and demonstrate an astute awareness of audience and purpose.

They demonstrate sound awareness of legal and other constraints associated with the use of digital content.

Their evaluation of their digital products is thoughtful and realistic. They are able to identify valid opportunities for further improvement.

A and B

Performance at A and B grades should be extrapolated from the grade descriptions for C and A*.

Additional information

Registration and entry

Pearson operates a registration system for the Pearson Edexcel Level 2 Diploma in Digital Applications. Centres must register all students who intend to follow this qualification at the start of the academic year in which they begin their study.

The registration code is:

- DIDA

Further information on registration and entry procedures can be found in the *Pearson Edexcel Information Manual*.

Unit codes

Unit	Title	Level	Unit code
1	Developing Web Products	2	DA201
2	Creative Multimedia	2	DA202
3	Artwork and Imaging	2	DA203
4	Game Making	2	DA204
5	Coding for the Web	2	DA205

Cash-in codes

Centres wishing to claim a qualification for a student in a particular examination series can do so by making an entry for a cash-in, along with any unit entries required in that examination series. In order to be eligible for a particular claim, the student must have completed the required number of units.

Qualification	Cash-in code	Requirements
Pearson Edexcel Level 2 Diploma in Digital Applications	GDDA2	Unit 1 and Unit 5 plus two optional units

Availability of assessment

The first assessment opportunity for all units will take place in the June 2015 series and in each following January and June series for the lifetime of the specification.

	June 2015	January 2016	June 2016
Unit 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Resitting of units

There is no restriction on the number of times a unit may be attempted prior to claiming certification for the qualification, provided the SPB used is within its lifespan at the time of submission. The best available result for each unit will count towards the final grade.

Results of units will be held in Pearson's unit bank for as many years as this specification remains available.

Further information regarding cash-in procedures can be found in the *Pearson Edexcel Information Manual*.

Awarding and reporting

The grading, awarding and certification of this specification will comply with the requirements of the *GCSE, GCE, Principal Learning and Project Code of Practice (Ofqual, 2011)*.

The qualification will be graded on a four-grade scale. Individual unit results will be published.

Forbidden combinations and classification code

Every specification is assigned a national classification code indicating the subject area to which it belongs. Centres should be aware that students who enter for more than one qualification with the same classification code at level 2 will have only one grade (the highest) counted for the purpose of the school and college performance tables.

Access and recruitment

Our policy regarding access to our qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from any barriers that restrict access and progression
- there should be equal opportunities for all those wishing to access the qualifications.

Your centre is required to recruit students with integrity. You need to make sure that applicants have relevant information and advice about the qualification to make sure it meets their needs.

For students with disabilities and specific needs, this review will need to take account of the support available to the student during the teaching and assessment of the qualification.

Access to qualifications for students with disabilities or specific needs

Equality and fairness are central to our work. Our equality policy requires that all students should have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic
- all students achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

You can find details on how to make adjustments for students with protected characteristics in the JCQ policy document *Access arrangements reasonable adjustments and special considerations*, which is on our website, www.edexcel.com/Policies

Further information and useful publications

Teacher support

There is a full range of support material designed to support this qualification. This includes:

- sample assessment materials (SAM)
- sample materials for assessing the Summative Projects
- Chief Examiner reports
- the Pearson Edexcel website – www.edexcel.com.

The national programme of training we offer is on our website at www.edexcel.com/training. You can request customised training through the website or you can contact one of our advisers in the Training from Pearson Edexcel team via Customer Services to discuss your training needs.

For further information about the qualification featured in this specification, or other Pearson Edexcel qualifications, please call Customer Services on 0844 576 0026 (calls may be monitored for quality and training purposes) or visit our website (www.edexcel.com).

Related information and publications include:

- *Equality Policy*
- *Information Manual (updated annually)*
- *Access arrangements reasonable adjustments and special considerations*
- *Quality Assurance Handbook (updated annually)*.

Our publications catalogue lists all the material available to support our qualifications. To access the catalogue and order publications, please go to www.edexcel.com/resources/Pages/home.aspx

Annexe A: Mapping to Key Stage 4 Computing Programme of Study

The table below explains which aspects of the Key Stage 4 Programme of Study are covered within the Pearson Edexcel Level 2 Diploma in Digital Applications.

The Key Stage 4 Programme of Study states that:

'All pupils must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career.'

All pupils should be taught to:	Extent of coverage of KS4 Programme of Study within the Pearson Edexcel Level 2 Diploma in Digital Applications
a) Develop their capability, creativity and knowledge in computer science, digital media and information technology	<p>Most units focus on digital media and some elements of information technology. For example students will explore, develop and interpret information to produce digital solutions that meet users' needs.</p> <p>Unit 5 Coding for the Web, only available in the DiDA qualification, allows students to cover some aspects of computer science. For example, students will write computer programs in order to solve web based problems. Also, some aspects of computational thinking, such as problem decomposition, are covered in other units available in both CiDA and DiDA qualifications.</p>
b) Develop and apply their analytic, problem-solving, design, and computational thinking skills.	<p>In all units students work to a brief that requires them to design and make a variety of digital products. They have to decide what type of information (text, images, sounds, video, animation etc) is required and where they will get it from. For example:</p> <ul style="list-style-type: none"> • in Unit 1, students are encouraged to do some initial designs before starting to build the web product they have been asked to create. • in Units 2 and 4, students use storyboards and other design documentation to illustrate what their products will look like and how they will function. <p>However, since students are not expected to produce systems that manipulate data, there is no requirement for them to produce representations of a system including inputs, outputs and processes used.</p>
c) Understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.	<p>Within all of the optional units 2, 3 and 4 learners are expected to use ICT safely, efficiently and legally. As part of working safely learners are expected to:</p> <ul style="list-style-type: none"> • select and adjust system settings e.g. privacy setting • take regular breaks • handle and store media correctly • use the internet in a responsible and safe way.

Annexe B: DiDA and Synoptic Assessment

Synoptic assessment in the next generation DiDA qualification is embedded throughout the units of study. The external units (Unit 1 Developing Web Products and Unit 5 Coding for the Web), provide the essential knowledge, understanding and skills required in the subject and which underpins the content of the optional specialist units. Learners studying the qualification are able to demonstrate a number of synoptic approaches towards meeting the assessment criteria, including:

- developing an appreciation of how tools and techniques relate to one another, and how each may contribute to different uses and applications of creative computing
- demonstrating their ability to use and apply a range of different methods and/or techniques, e.g. following the same project life cycle to investigate, design, create and test and review.
- synthesising information and techniques from different creative computing activities
- using specialist terminology in different creative computing activities
- demonstrating use of transferable skills, e.g. communication skills and independent learning skills
- demonstrating analytical and interpretation skills, e.g. when they are testing products
- evaluating and justifying their decisions, choices and recommendations, e.g. when they are reviewing their products.

Annexe C: Centre assessor sheets

Unit 2: Creative Multimedia				
Centre name:			Centre number:	
Candidate name:			Candidate number:	
Strand		Max mark	Mark awarded	Comments <i>Comment box expands as you start entering text</i>
(a)	Design multimedia products	0–7		
(b)	Collect, edit and create digital assets	0–5		
(c)	Develop multimedia products	0–9		
(d)	Present evidence in an eportfolio	0–7		
(e)	Review the products	0–5		
TOTAL				

Assessor declaration

I declare that the work submitted for assessment has been carried out without assistance other than that which is acceptable under the scheme of assessment.

Assessor name:			
Assessor signed:		Date:	

Candidate declaration

I certify that the work submitted for this assignment is my own. I have clearly referenced any sources used in the work. I understand that false declaration is a form of malpractice.

Candidate signed:		Date:	
Additional Candidate declaration:			
<i>By signing this additional declaration you agree to your work being used to support Professional Development, Online Support and Training of both Centre-Assessors and Pearson Edexcel Moderators. If you have any concerns regarding this please email: ePortfolio@edexcel.com</i>		Sign:	

Unit 3: Artwork and Imaging				
Centre name:			Centre number:	
Candidate name:			Candidate number:	
Strand		Max mark	Mark awarded	Comments <i>Comment box expands as you start entering text</i>
(a)	Design and develop graphic products	0–9		
(b)	Develop scaleable images and artwork	0–5		
(c)	Develop bitmap images and artwork	0–7		
(d)	Exhibit work in an eportfolio	0–7		
(e)	Review the products	0–5		
TOTAL				

Assessor declaration

I declare that the work submitted for assessment has been carried out without assistance other than that which is acceptable under the scheme of assessment.

Assessor name:			
Assessor signed:		Date:	

Candidate declaration

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Unit 4: Game making				
Centre name:			Centre number:	
Candidate name:			Candidate number:	
Strand		Max mark	Mark awarded	Comments <i>Comment box expands as you start entering text</i>
(a)	Design and development work	0–9		
(b)	Game functionality	0–7		
(c)	User experience	0–7		
(d)	Game promo	0–5		
(e)	Game review	0–5		
TOTAL				

Assessor declaration

I declare that the work submitted for assessment has been carried out without assistance other than that which is acceptable under the scheme of assessment.

Assessor name:			
Assessor signed:		Date:	

Candidate declaration

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Candidate signed:		Date:	
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Candidate signed:		Date:	
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