Unit Reference Number	M/601/6630
Title	Digital graphics
Unit Level	Level 3
Guided Learning Hours	60
Unit Credit Value	10
SSAs	6.1 ICT Practitioners

Learning Outcome (LO) The learner will:		**Pass** The assessment criteria are the pass requirements for this unit. The learner can:		**Merit** To achieve a merit the evidence must show that, in addition the pass criteria, the learner is able to:	**Distinction** To achieve a distinction the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
1	Know the hardware and software required to work with graphic images	P1	describe the hardware and software used to create and edit graphic images		
2	Understand types of graphic images and graphical file formats	P2	explain how different types of graphic images relate to file formats		D1 evaluate how different delivery mediums for graphics influence file formats
3	Be able to use editing tools to edit and manipulate images	P3	demonstrate the use of editing tools to edit and manipulate images	M1 use advanced editing tools to enhance images	
4	Be able to create and modify graphic images to meet user requirements.	P4	create original graphic images to meet a defined user need	M2 combine original and edited images to meet a user need	
		P5	modify images as a result of user feedback		D2 evaluate how final images meet user requirements
		P6	explain the potential legal implications of using and editing graphical images		

Aim of the unit

This unit helps the learner to understand the different hardware and software that is available for working on graphic images and the file formats that exist. Learners will understand where these file formats are used and how the delivery method of a graphic has a bearing on the file used in terms of size, resolution and compression. Learners will be able to use the hardware and software needed to create, modify and manipulate images in accordance with clients' requirements. The learner will understand how to gain user feedback and make changes based on this feedback. Learners will understand the legal framework regulating the acquisition and use of digital graphics.

Teaching content

LO1 Know the hardware and software required to work with graphic images

Hardware required to create and edit graphics
- input devices
    - scanners
    - digital cameras (e.g. zoom, ISO, aperture f/stop)
    - graphic tablets
- output devices
    - printers
    - plotters
    - monitors
- computer
    - type (e.g. Mac or PC)
    - processor
    - graphics card
    - RAM
    - storage mediums (e.g. HDD, Removable mediums (USB, Flash Cards), Roms)

Software required to edit graphics (e.g. Photoshop, Serif Photoplus, Fireworks, Gimp)

LO2 Understand types of graphic images and graphical file formats

Differing graphic formats
- gaphic images
    - bitmap versus vector

- o lossy and lossless images
- o colour models (e.g. RGB and CMYB)
- o dots per inch
- file formats
  - o file conversion
  - o file size
  - o jpg
  - o bmp
  - o png
- file management
- compression techniques

Differing uses of graphics
- electronic graphics
  - o use on web
  - o use on mobile phones – icons
  - o use in interactive media – games, interactive TV, DVD/Blu-Ray menus
- printed graphics
  - o advertising
  - o magazines and newspapers
  - o billboards and hoardings

Differing display mediums
- how delivery methods affect size, resolution, compression, colour depth with consideration for
  - o web delivery (e.g. over dial up, 3G, Broadband, high speed internet)
  - o magazine (e.g. A4, A5)
  - o billboards, hoarding (ultra large images)

LO3 Be able to use editing tools to edit and manipulate images

Use editing tools to manipulate images
- using standard software tools to manipulate the created images (e.g. colour balance, filters, selection, hue and saturation, masking, layering, retouching, opacity)
- using advanced editing tools to manipulate the created image (e.g. retouching tools, toolbox, opacity/transparency, editing and combining paths, combining paths, patch, toning, sponge)

LO4 Be able to create and modify graphic images to meet user requirements

Creation of graphics
- creating graphics (e.g. scanned, using digital camera, copyright free stock images

Create images based on a client's need
- identify client's needs (e.g. house style, size of graphic and purpose including delivery method, timescales and production costs)
- combine images to realise the client's brief

Constraints
- identifying constraints leading to final file format
  - o format
  - o size
  - o resolution
  - o colour
  - o compression/optimisation
  - o software and hardware constraints

User feedback
- gather feedback from user (e.g. through questionnaire, interview, meeting, opinion poll)
- modify images in light of feedback gathered
- evaluate images to meet user requirements

Legal implications
- ownership
- copyrighted images versus copyright free images
- permissions (subject/location permission for use)
- IPR (Intellectual Property Rights)

Delivery guidance

This unit helps to prepare learners to work in the digital graphics industry. Learners will need to experience the hardware and software that is used to edit images. They need to be aware how to obtain digital images and then how to use software tools to manipulate the images. Learners need to realise that the images they create will vary in size, resolution and type depending on their use. They will understand how to gain feedback from a client and how to work to a client's brief.

Leaners could visit companies that carry out graphical manipulation – this may be a local newspaper or magazine that would give an insight into image capture (this may be through photographs that reporters have taken or archive/stock photographs from the newspapers own archives). There may also be local photographers that would visit the centre to give talks on how they carry out their work.

LO1 Know the hardware and software required to work with graphic images

Both the hardware and software that is used in the creation and editing of computer graphics needs to be investigated. Learners should investigate the different input devices that allow images to be digitally created. They may work in groups and each be given different image capture methods to work with so they can feed back to the group as to ease of use and availability of images. Input may range from a digital camera, which they should be able to experiment with in terms of zoom, ISO, aperture f/stop, to scanners and stock images. (For example, from CDs given away with photography magazines to online stock images e.g. http://openphoto.net/ http://www.stockvault.net/.) They should look at different ways of outputting these images in terms of monitors with differing resolutions, and different printing methods, including size of images from A5 through to image output on plotters. It may be possible to see plotters in the centre's design and technology department or by arranging a visit to, for example, an architect's office that produces images in different sizes. Learners could look at the different hardware that can be used to manipulate images, they could compare PC to Mac and then differing processor speeds, graphic cards and memory within the computer.

Learners will be taught how to use different image manipulation packages and the tools that are available in them and be able to compare the packages and tools in each. The software will range from basic ones like Paint, freeware like Gimp, and then onto professional software like Photoshop and Fireworks (depending on the software the centre has available). This will allow the learner to compare and contrast the different software packages once they have been taught how to use them. Learners should be allowed to try out the software tools so they can understand the limitations of each package. They should be taught about different hardware and peripherals and which are best suited to different tasks. Please note – it is not necessary for centres to purchase bespoke software solutions; web demonstrations may be available, trial/demonstration copies of software may be available and the centre could generate some sample output from such packages.

LO2 Understand types of graphic images and graphical file formats

Learners should be taught about compression techniques and how and why these are used. This can include dots per inch and why this is used, lossy and lossless compression and the differences between these, as well as the use of colour models e.g. RGB and CMYB. Learners can explore different graphic types (BMP. JPEG, GIF, PING, etc.) and where they are used (web, posters, magazines, advertisements) to do this they could be given images and use compression techniques, saving images in different formats and understanding naming conventions. They should be taught to look at file sizes and the differences between each depending on file type and the compression types that have been used. They should be able to look at lossy and lossless images as well as saving with different DPI and colour modes. Learners should be looking at where images are used in everyday life e.g. advertising and promotion from A5 leaflets through to road side hoardings and how images are manipulated for advertising e.g. how models are "airbrushed" so they look thinner or their skin looks better than it actually is. Learners should explore images on different mediums, for

example the web or mobile devices in order to understand the effects resolution size has on the delivery medium. This will link to file size in terms of web graphics compared to print graphics and the quality. Learners may be split into groups and be given different image types and display mediums to look at, they can then prepare information in order to feedback to the rest of the group.

LO3 Be able to use editing tools to edit and manipulate images

Learners should be shown and taught about different tools and techniques within image editing software. They should be given images to manipulate that will enable them to practice with various tools and techniques. This should include setting image/canvas size, image resolution, output sizes – for print and screen, crop, cut, copy, paste, rotate and flip selecting part of the image, moving, align and ordering. Learners should explore the use of line creation, curves and shapes, changing stroke and fill (colour, thickness, style), draw/paint (using pencil, brush, bucket), inserting and editing text (colour, font size). Learners should explore the use of more advanced tools depending on the software available within the centre this may include using filters (blur, noise, levels and curves), using selection tools (marquees, magic wand, lassoes), working with selections (add, subtract, deselect)and working with layers (selection, hide/display, insert new, activating a layer, duplicating, renaming, reordering, deleting, moving, blending). They should practice combining multiple images into one image, retouching tools (clone, red eye, trace, hue/saturation, edit and combine paths), using the toolbox (smudge, focus, toning), opacity/transparency, transform, scale, rotate and distort) and text effects (attach to path, guides).

Learners should further be exploring the use of level adjustment layer, curve adjustment layer, they should explore the effect of using the channel mixer, histogram pallet and try using the filter gallery, the healing brush tool (maybe on an old damaged scanned image), and then the patch, smudge, focus, toning, and sponge tool.

Learners should be taken through the tools with demonstration as well as practice so they understand the best use of them and when they should be used in order to be able to critically evaluate their use. (It may be that some tools are not so easy to use depending on hardware available e.g. graphics tablets to carry out drawing or selection).

LO4 Be able to create and modify graphic images to meet user requirements

Learners can be shown how to create original images using cameras (they will be shown techniques for taking good photographs – leading lines, rule of thirds), scanners. They should shown how an image can be created within a graphics software programme

Within the centre learners can be shown pre-prepared images and in a team review these images and understand how feedback can be gained and used. Learners should explore how feedback can be gained from questionnaires (the use of open and closed questioning), interview,

conversation and opinion polling. Learners should be shown different images and different scenarios so they can look at appropriateness of audience and client use. Some of the sources for stock images can be used within this LO in order to gain a good range of images. They should explore the differences in file sizes and quality for printing and download speeds for web based images as well as graphic quality depending on size of the image e.g. large size for hoardings down to graphics created for mobile phone icons. They should consider how the images could be modified to improve their appearance based on the feedback they have shared. As a group they could evaluate whether the images meet their intended requirements.

Learners should be taught about legal issues surrounding copyright images and ownership; they may look at different websites with copyrighted images and copyright free images. They may also research into legal frameworks that exist with regard to copyright law, intellectual property rights, photo permissions and releases (model releases, location permissions) and how to acknowledge and reference sources.

Suggested assessment scenarios and task plus guidance on assessing the suggested tasks this unit might lend itself to project work

Assessment Criterion P1
Learners could prepare a handbook for those new to digital graphics to describe the hardware and software that is used to create and edit graphic images.

Assessment Criteria P2,D1
For P2, earners should explain the different types of file formats and how different graphical images can have an impact on what file format can be used. They should also explain when the different file formats are used. They could present the evidence in the format of a table, a presentation or report incorporating examples of different graphical images and the file formats that are used depending on the use of the graphical image.

For the distinction assessment criterion D1, learners must evaluate how different delivery mediums have an influence over the file format that is used. This could be evidenced in a report format which includes screen captures or graphic images, to illustrate the points being referenced.

Assessment Criteria P3,M1

For P3, learners must provide evidence of using editing tools to edit and manipulate at least six different images. These images may be provided for the learner or ones that they have created themselves. This could be evidenced in the form of before and after screen captures in a document or video capture of the edits being carried out on their images.

The Merit Criterion M1 builds on from the pass criteria and calls for evidence of use of advanced editing tools, as outlined in the teaching content. Screen captures or screen casts of the editing could be used to demonstrate this

Assessment Criteria P4,M2

For P4, learners must evidence the creation of the original graphic images they have created (a minimum of three original graphic images should be created). They must refer to the user needs to explain why they have made the choices they have when creating the graphics. This could be evidenced through the use of screen prints in a presentation or report or a video capture, including sound, of the work as it is being carried out.

For the Merit assessment criterion M2 learners include combining original and edited images to meet a user need. Evidence would be the combined original and edited images supported by annotated screen captures if appropriate. The user requirement must also be presented.

Assessment Criteria P5,D2

For P5, learners should provide evidence of user feedback; this could be through questionnaires or testing. Learners must then show the modifications they have made to the images based on this feedback. This could be evidenced in the form of annotated before and after screen captures showing how they have made these changes and why.

The Distinction assessment criterion D2 could be evidenced through a report or presentation to the user which gives an evaluation of how their final images meet the requirements given to them.

Assessment Criterion P6

Learners must explain about the potential legal implications of using and editing graphical images to include the listed items in the teaching content under legal implications. This could be in the form of an information leaflet.

Suggested scenarios
Candidates could design a new logo for a local school or college and manipulate images that could be used to convey an image for the school or college for their new prospectus.

Resources
Scanner, camera, image manipulation software

Links to NOS

4.6 Human Computer Interaction/Interface (HCI) Design
5.2 Software Development.