Surveys

The following surveys are undertaken before a building project (i.e. before the 'Clear Oversite' mentioned in the gantt chart below)

If a question like this is in the exam make sure you refer the surveys to the specific building, structure, location and/or features mentioned in the question

Drainage survey

To assesses the impact of water on the land around a particular site. It does this by determining the direction of any natural drainage (in conjunction with data from the underground survey) and he flow capacity of the natural drainage (i.e. maximum volume of water that can be carried away from the site). CFD technologies can be used to model these parameters.

The drainage survey also locates the the position/elevation and nature of existing drainage channels and the position and nature of neighbouring waterways. From this this data the flood risk can be worked out, including the size and position of the flood plains and the additional drainage installations that will be required.

Underground survey

To assess the composition of the land down to a specified depth. It does this, depending on the nature of the build, using e.g. satellite imaging and ground penetrating radar technologies. Make-up of land in terms of geology, soil composition/mechanics, depth of bedrock, water table. Interrogate report on the lands previous use, including any mining reports, significant historical use (e.g. iron age settlement) geographical or conservational significance (within a national park or AONB area). Its purpose is to determine whether building is possible/ permissible and if so the nature of the foundations required.

Feature survey

To assess the condition, position and nature of visible 'hard-standings' (i.e. natural features such as trees, very large rocks) and 'hard landscaping' (i.e. man-made features such as street lighting, walkways (paving), public seating, indeed any feature that will remain during and after the building project.

Topographical survey

To assess the geography of the land, that includes contours (different height levels), features (natural and/or man-made in a wider area than the feature survey), existing buildings, service cover positions, outcrops and the nature of ground surfaces.

Stages in a construction project

Task	Duration (Days)	Time: Week 1 (01-Jun)	Week 2 (08-Jun)	Week 3 (15-Jun)	Week 4 (22-Jun)	Week 5 (29-Jun)	Week 6 (06-Jul)	Week 7 (13-Jul)	Week 8 (20-Jul)	Week 9 (27-Jul)	Week 10 (03-Aug)	Week 11 (10-Aug)	Week 12 (17-Aug)	Week 13 (24-Aug)
Clear Oversite	1													
Excavate Foundations	3													
Concrete Foundations	1													
Footings to DPC	4													
Drainage/Services	4													
Backfill	2													
Ground Floor	2													
Walls to First Floor	14													
First Floor Carcass	3													
First Floor Deck	2													
Walls to Wall Plate	15													
Roof Structure	5													
Roof Covering	10													
Rainwater Gear	2													
Windows	4													
External Doors	1													

Graphic ownership

Copyright

Copyright protects a "work", for example, a piece of writing, artwork, photograph, music or a performance, from being copied. It does not protect the conceptual content of the work, or the idea or essence within or behind the

Patents

Patents protect concepts, methods of manufacture, and the way a product works. One advantage of patent protection is that a patent can protect a product irrespective of the appearance of the product, thus giving

Example SQA Question and Answer

Question 1 f of the AH Specimen Paper on the SQA website

The Architecture Observer is an online design blog followed by millions of people worldwide. They plan on printing a monthly magazine publication to enhance their brand.

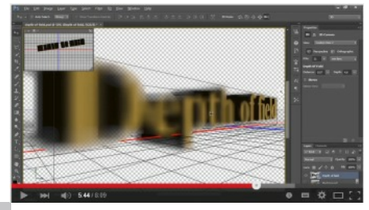
Explain **two** of the issues relating to Intellectual Property Rights that the Architecture Observer may encounter when publishing its magazine.

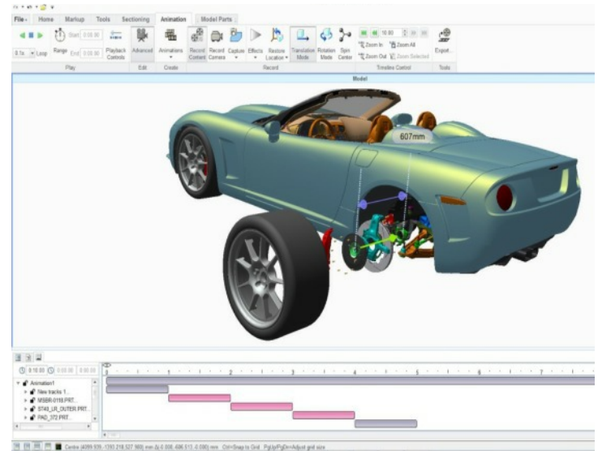
Answer 1 f of the AH Specimen Paper on the SQA website

Copyright issues of the publication:
Content in magazines is sometimes contributed by freelance journalists, authors, and photographers; therefore the magazine may require to purchase or lease the rights to content.
OR
Images, templates, photographs, designs are only copyright protected for a specific (or varying) period of time. After this time elapses, there is no legal protection on the publication.

Copyright issues of the images:
Any photographs for images may belong to others and not the magazine owner(s). They may not have the right to reproduce them in subsequent publications or edit and republish images as they wish.
OR
Any third party who wishes to use an image from the magazine can only legally do so if permission is obtained from the original owner(s).
OR
The digital version may face copyright infringement caused by people being able to copy and paste digital content from the website.

How to enhance a 3D model





HDRI

High Dynamic Range Imagery creates multiple exposures of an image and combines them to enhance colour and shadow.

Depth of Field

Changing the depth of field in an image changes what is focus and how much of the image is in focus

IBL

Image Based Lighting simulates how light and shadow from a real environment would interact with a 3D CAD model.

3DS

A file type containing 3D data, widely used in 3D animations or illustrations.

Volumetrics

A method of giving a light source a sense of volume or substance. For example, light streaming through a stained glass window.

Reflection

In this example the ground plane is reflective. There are also reflections of the light sources on the vehicle because of the texture mapping choice.

Specularity

The reflective capacity of material to create 'rings' of light reflection.

Bump mapping

A method of suggesting that materials have a rough or tactile surface, whilst not increasing the polygon count.

Lighting:

Ambient

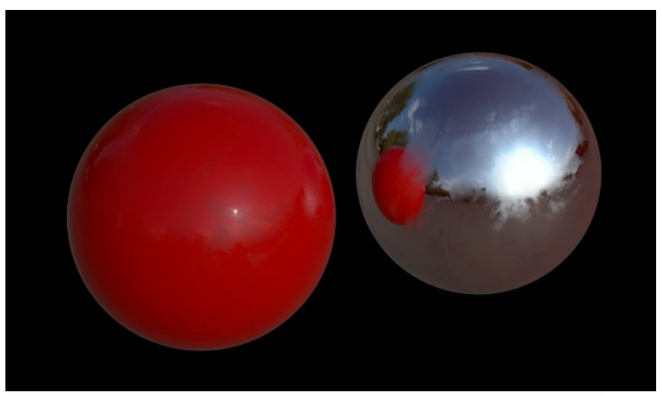
Spot/ Point

Distant/Directional

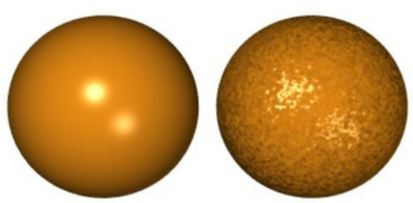
Texture mapping

Applying a texture to the surface of a 3D CAD model, to represent a real material. Often used in conjunction with bump mapping.

Marble Timber



For more detailed notes see the next page



AMBIENT

- Ambient light is the general background illumination.
- All objects reflect the light to some degree
- Light can reach parts of a room/ scene that are in no direct line of light.
- Illumination is constant on all surfaces regardless of position or orientation
- Light is uniform across the object.

POINT

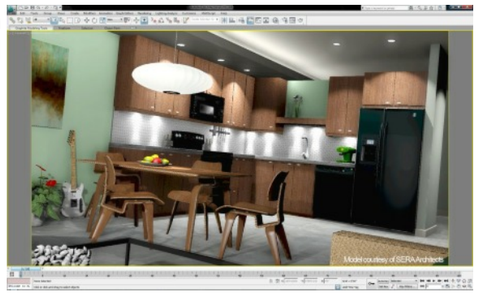
- Point light sources have a location and colour
- They emit light equally in all directions, like a light-bulb.
- Light strength attenuates. (I.e. gets weaker with distance)
- Gradients of illumination appear across a surface
- Point lights can be moved around with a scene.

DISTANT/ DIRECTIONAL

- Directional light sources emit light strongly in a particular direction like the sun.
- Objects in the line of light are more brightly illuminated than other objects.
- Light is uniformly provided in a fixed direction.
- Light source is assumed to be very far away so their is no need to deal with light distance calculations.
- Objects at the back of a scene lit to the same degree as objects at the front, provided they are directly in the path of light.

Mapping and Rendering

When rendering models using software, certain elements can be applied to create a higher level of realism. Some of these are listed below;



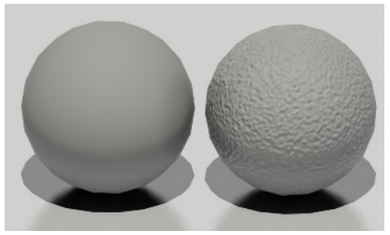
- Bump map
- Texture map
- Displacement map
- Lighting
- Environment/scene

Bump Map

Bump maps are grayscale textures you map to objects, to create the illusion of surface relief on an otherwise flat object. They are:

- unable to cast or receive shadows
- unable to be seen if you silhouette the mapped object
- takes less time to render than displacement maps

Before applying bump map



After applying bump map

Although the sphere with the bump map may appear to have physical raised and lowered areas, it is just an illusion created by the grayscale texture. The 'bumps' on the object will not show in the object's shadow, as illustrated above.

Texture Map

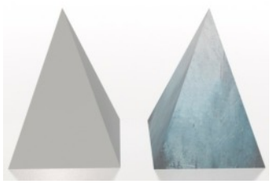
A texture map is the application of a 2D image/colour to the surface of a 3D object. Some characteristics of a texture map are:

- It does not show depth of colour
- It is shown in plain colour

A texture map can be a 2D image saved from the internet which is then applied to a 3D model. An example is given below.

Image from internet

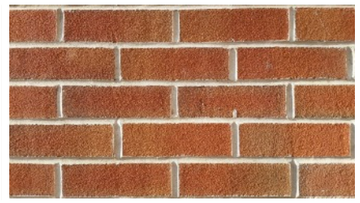
3D model of pyramid before and after image of texture was applied



Capturing Real Materials

There are different methods which can be employed to make renders as realistic as possible. One popular method is to capture the look of real materials and apply these to the model. This can be achieved using a **hand scanner**, or simply by **photographing** the material. An example is given below;

The 3 different materials shown were all photographed using a **camera**. These were then imported into a PC as .JPEG files.

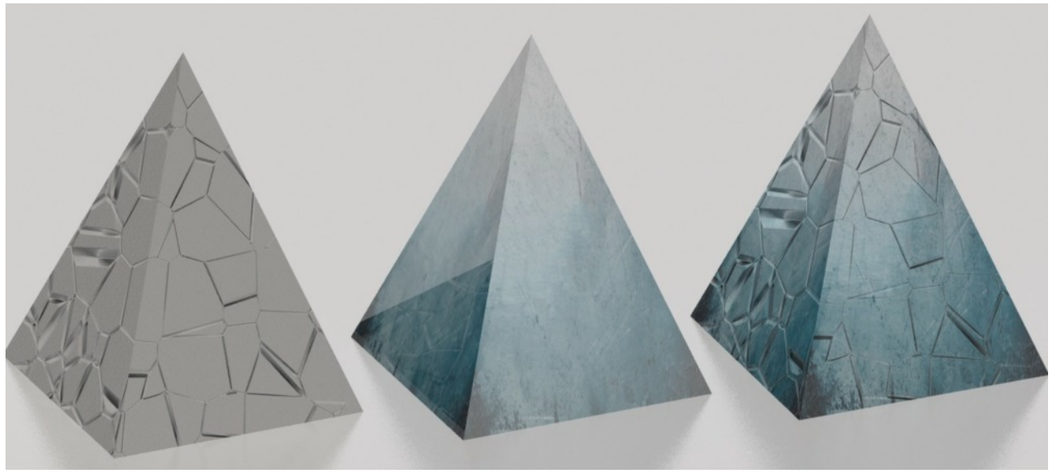


Following this the materials were imported into 3Ds Max and used as **texture maps** to make the room layout look as realistic as possible.

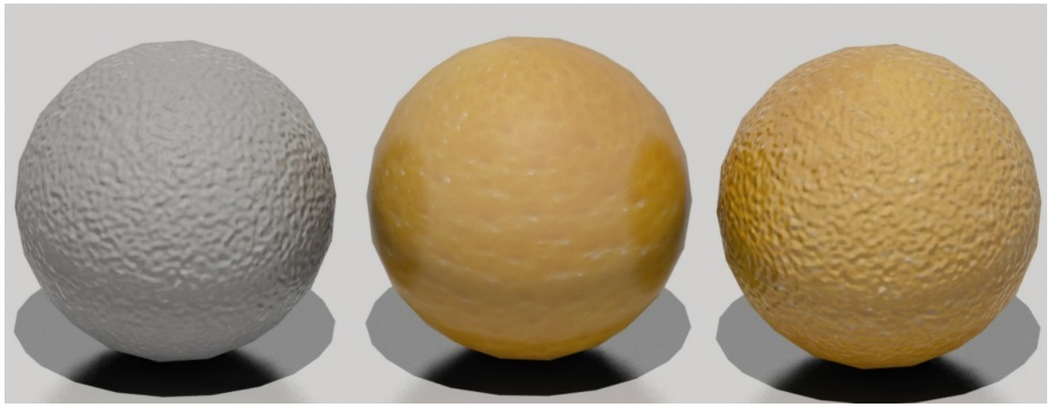
Creating Materials

When creating materials to render a 3D model it is common practice to add both **texture maps** and **bump maps** to the model. The bump map will create the illusion of 'surface relief' (3D texture effect) on the model, whereas the texture map will give the model the visual characteristics of the material being simulated (different colours, shades, patterns etc.). Some examples are given below.

Bump map applied | Texture map applied | Combination of both

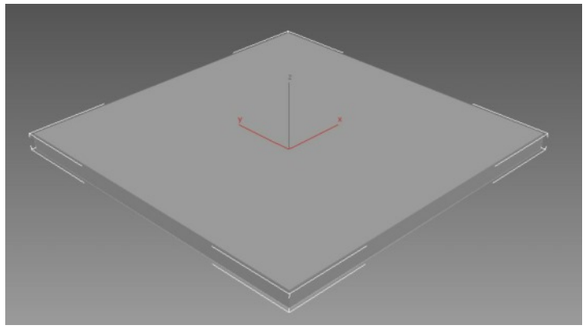


Bump map applied | Texture map applied | Combination of both



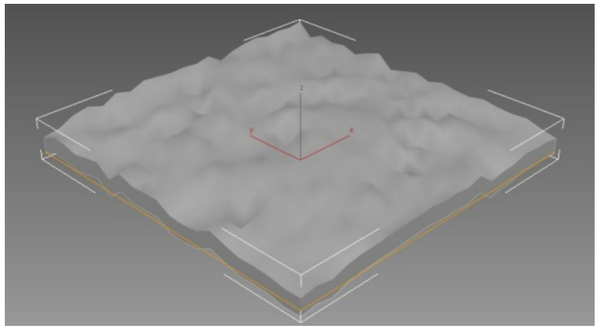
Displacement Map

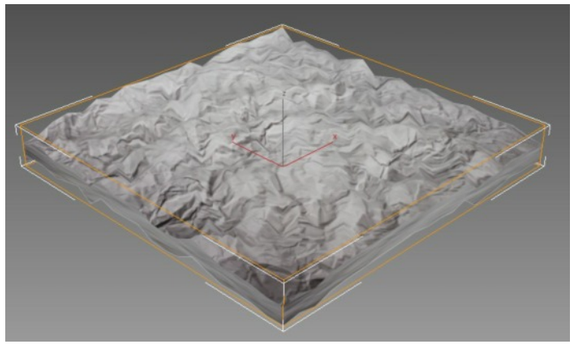
Displacement mapping is an alternative computer graphics technique in contrast to bump mapping, using a **texture** or 'height' map to cause an effect where the actual geometric position of points over the textured surface are **displaced**. It gives surfaces a greater sense of depth and detail and allows shadows to be cast of the 'displaced' parts of the model. Rather than creating the illusion of surface relief (like a bump map), this method creates **actual** surface relief by altering and moving the physical properties of the 3D model. An example is given below.



I created a cuboid using 3Ds max. I wanted to achieve a 'creased paper' effect on the top surface so I selected an appropriate image from the internet which mirrored the effect I needed.

I applied a **displacement map** to the model using the internet image as my texture to mimic. The software used the image to plot the displacement areas. I was able to increase the displacement effect gradually until I achieved the correct height of displacement (shown opposite).





I then also added the image of creased paper as a **texture map** to further add to the realism of the model.

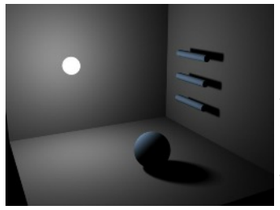
The displacement map created the 3D creased effect and the texture map made the model look more like paper.

Displacement maps have the following characteristics:

- they are able to cast and receive shadows
- they are able to be seen if you silhouette the mapped object
- takes more time to render than bump maps

Lighting techniques **(information courtesy of www.3D-ace.com)**

There are several well established 3D lighting techniques, and it is often predetermined by the type of an environment, which technique is most appropriate in the case. For instance, some techniques work well in an interior environment and make very little sense in an exterior modelling. The same approach works for the "studio" lighting as it requires procedures that differ much from lighting for 3D animations and films. Let's make an overview of some **standard lighting options** that are available in most 3D software packages:

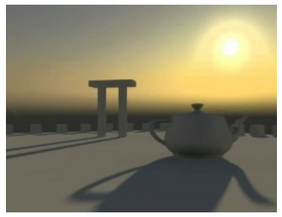


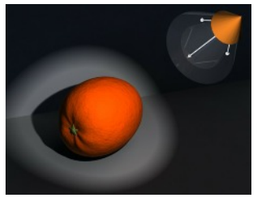
Point or Omni Light

A point light casts rays in every direction from a single, small source in 3D environment. It has no specific shape and size. Point lights can add "fill lighting" effect to a 3D scene, as well as simulate any light source like candles, Christmas tree lights, or others.

Directional Light

It is the opposite of omni light, it presents a very distant source of light (like the moon light). Directional rays go parallel in a single direction. This type of 3D lighting is often used to simulate sunlight. To change the illumination of the scene you can adjust the position or colour of the light and rotate the directional light source.





Spot Light

There are targeted spot lights and free sports, which means that they have no target objects. It is often used to simulate light fixtures, for example desk lamps or streetlights, as it casts a focused ray of light.

Volume Light— *Volumetrics*

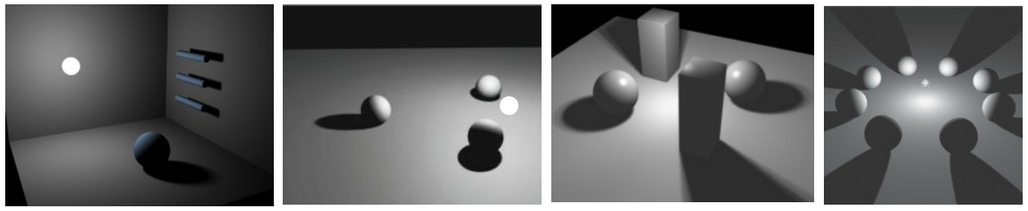
It is similar to omni light as it casts rays in all directions from a certain point. Yet, a volume light has a specified shape (any geometric primitive) and size. This volumetric light illuminates only surfaces within the set volume. **Volume Light provides the effect of smoke, fog, and so on.**

Ambient Light

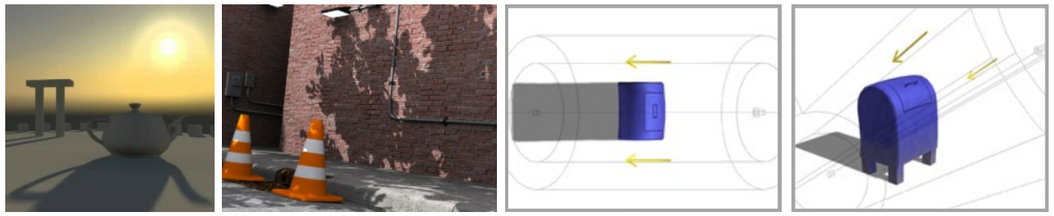
An ambient light is not similar to any other light type. It casts soft rays in every direction, though it has no certain directionality and emits no shadow on the ground. Often it sources as addition to the colour of the main light source for a 3D scene. When sun rays pass through the window of a room they hit the walls and are reflected and scattered into all different directions which averagely brightens up the whole room. This visual quality is described by ambient light.

Lighting techniques—**Examples**

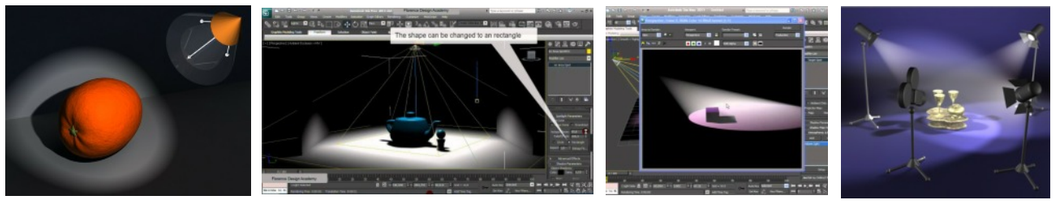
Point or Omni Light



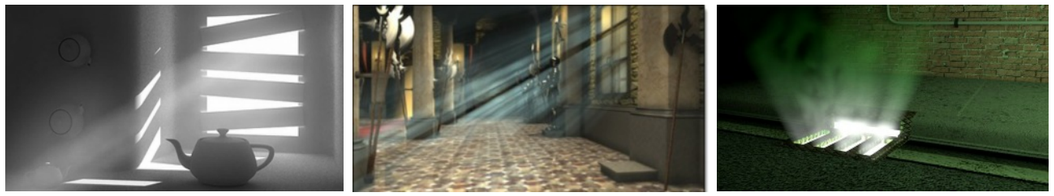
Directional Light



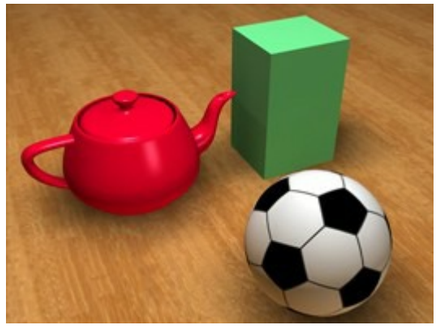
Spot Light



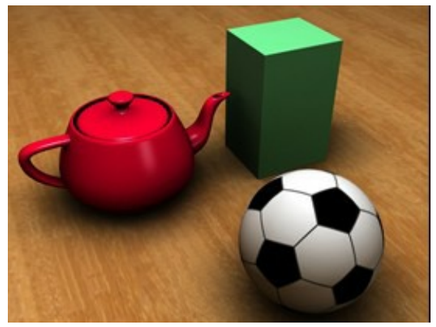
Volume Light— *Volumetrics*



Ambient Light



Before ambient occlusion is added



After ambient occlusion is added

Specularity

The SQA describe specularity as, "the reflective capacity of material to create 'rings' of light reflection". Most 3D rendering packages will offer the option to add, remove and edit the specularity of materials. This will edit the 'highlights' on the object and can make it appear more or less glossy. Some examples of how this is used within 3Ds Max are shown below.

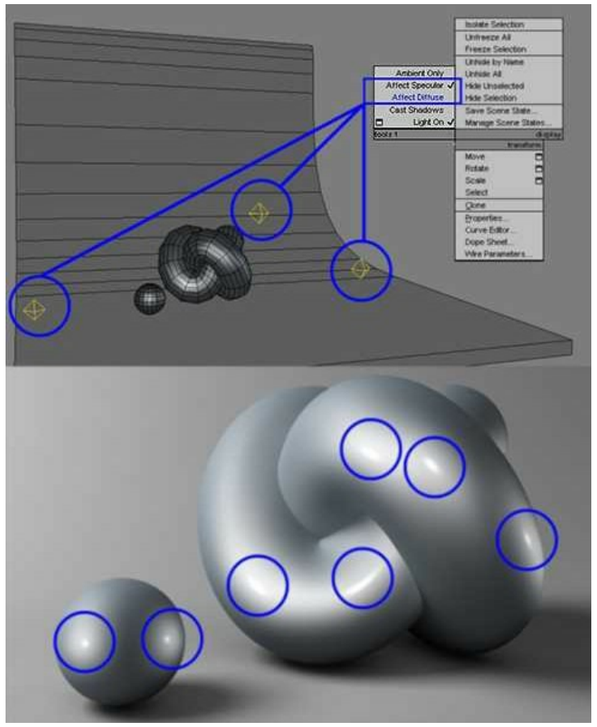


Image Based Lighting (IBL)

A popular method of simulating lighting in a 3D CAD render is a technique knows as **Image Based Lighting (IBL).** This would require the CAD technician to take a panoramic photograph (often using specialist camera equipment). This photograph would be wrapped around a sphere in the 3D software package and the model being rendered would be placed in the centre of this sphere. The software will generate lighting based on the illumination levels and positions in the photograph and render the model using this lighting. The link below will demonstrate how IBL can be used to illuminate an indoor environment. https://www.youtube.com/watch?v=VKmJt3VzrtA

Scenes/Environments

3D models are often placed within a scene/environment. The location of the environment is generally selected based on where the model would be most commonly used in a real life context. This helps give context to anyone viewing the model and can be useful for promotional purposes. An example of a bench is given below, with and without an environment. The environment enhanced the overall quality of the rendered and gives the model context (it is used in an outdoor 'square' setting where benches are commonly used).

Exercise A

Graphic 1

Graphic 2

Describe the 5 techniques used by the designer to change graphic 1 into graphic 2.

_____

_____

_____

_____

_____

Part 2: Commercial and Visual Media Graphics

Getting to know C.V. Media Graphic Audiences

Technical Graphics:

Audiences:
Designers, Consultants, Engineering trades (civil, structural, electrical, mechanical, structural, systems)
Manufacturers, fabricators, model makers, test labs, materials technologists, specification/conformity engineers, suppliers, production and planning.

Types of graphic they are most interested in

- Orthographic views (individual parts, assemblies and possibly exploded views)
- Pictorial views (isometric, perspective, planometric and/or oblique including parts, assemblies and exploded views)
- Sectional views
- Cutaways
- Auxilliary views
- Enlarged views
- Assembly animations

Technical Graphics: Built Environment

Audiences
Designers, architects, architectural technicians, landscape architects, construction trades, building surveyors, quantity surveyors, consultant engineers, town planners, conservation bodies, communities, model makers, interior designers, suppliers, production and planning, prospective purchasers and members of the general public

Types of graphic they are most interested in

- Elevation views (i.e. orthographic views of buildings/structutres)
- Sectional views
- Topographical views (i.e. views showing contour lines, neighbouring waterways, drainage etc)
- Floor plans
- Site plans
- Location plans

File types they might use

- Standard Tessellation Language/stereo lithography file format (STL),
- Direct Exchange Format (DXF),
- Drawing Format (DWG),
- Virtual Reality Modelling Language (VRML)
- 3D Studio (3DS) files

Commercial and Visual Media Graphics

Audiences
graphic designers, artists, sales and marketing, public, community, advertising, creative industries, retailers, cinematic, television, electronic and interactive media, animation, web designers

Types of graphic they are most interested in

- Printed media e.g. brochures, leaflets, pull up banners, magazines, posters, points of sale in retail
- Digital media e.g. websites, apps, digital displays including interactive displays, television/videos, cinema, creative industries including games design

File types they are most likely to use

- Joint Photographic Experts Group (JPG),
- Portable Network Graphics (PNG),
- Bitmap Image file (BMP),
- Portable Document Format (PDF),
- Adobe Illustrator file (AI),
- Windows Media Video (WMV),
- Audio Video Interleave (AVI),
- Third Generation Partnership (3GP),
- Apple QuickTime Movie (MOV),
- Moving Picture Experts Group (MPEG),

Exercise B

1. **Create a one note account (microsoft 365 free on GLOW) or keep a record in your jotter: write a one sentence job description for each of these professionals (listed as Audiences above)**
2. **Create a pinterest account (android and apple apps available) and collect images or sketch out examples in your jotter, of the main types of graphics these audiences would be interested in and explain why**

Desktop Publishing

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topics	Information Gathered
Desktop publishing Knowledge and skills in the application of: • techniques, customs and practices across a range of packages, generic terms and techniques in supporting context and audience requirements • planning strategies	Consider two users (Audiences) of DTP and describe the benefits to them of DTP in printed media and/or electronic media. **Describe the benefits of DTP in printed media and/or electronic media in general.** • Using DTP allows companies to improve page layout and create an effective design by balancing the contrast, space and colours to grab the attention of consumers. • An enhanced appearance with an attractive page layout will encourage consumers to buy a product increasing sales revenue. • DTP can allow a document to be customised to target a particular consumer. • Templates with common features can be produced to reduce the time and cost required to produce page layouts • Layouts can be constructed accurately using grid, guidelines, snap, align, scale, rotate and crop functions. • Modifications can be made quickly and easily using DTP editing tools. • Images can be edited and manipulated easily: colour, size, cropping and shaping can all be edited creatively • The time it takes to design and publish a document (the lead time) is greatly reduced **Describe the benefits of DTP in printed media and/or electronic media for:** **User 1: A Fast food company requiring posters, menus, booklets and large scale in-store advertising materials.** Additional to above • The quantities of paper and inks can be controlled digitally to minimise waste. • Modern printing technology can use paper that is 100% re-cycled without loss of quality. **Describe the benefits of DTP in printed media and/or electronic media for:** **User 2: Sportswear company hoping to expand into a Scandinavian market place and requiring a web-site.** Additional to above • Electronic newspaper and news feeds / websites further reduce the use of paper. • Text and graphics can be imported electronically from remote locations around the world. • Files can be sent electronically using email to the editor or client for approval. • Communication between the graphic designer, client and print company is easily done via email • Websites can be viewed globally, developed in one country and posted in another. • Can be made available in a variety of different languages

DESKTOP PUBLISHING - FILE TYPES

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Desktop publishing file formats and their use Knowledge and understanding of: • • JPEG, • PNG, • BMP, • PDF, • AI, • WMV, • AVI, • 3GP, • QuickTime file formats	Investigate and describe the benefits of the following DTP file formats: JPEG *Joint photographic Expert Group* What is special or different about this file? • *Raster image file.* • *A commonly used method for compression of digital image files.* • *Can be optimised to find the right balance of small file size and high quality.* What is it used for? • *Most commonly used image format by digital cameras and mobile devices.* • *Most common method of storing and sending images over the internet.* • *Ideal for websites due to small file size but high quality image*. PNG *Portable Network Graphic* What is special or different about this file? • *Raster image file.* • *Can have transparent background and generally larger and higher quality than JPG.* • *Not ideal for high quality professional prints.* What is it used for? • Web use where transparent background is preferred to allow background colours to show. • Logos, icons, overlay images. BMP *Bitmap Image File* What is special or different about this file? • *Raster image file.* • *Stores colour data for each pixel in the image without any compression.* • *Results in crisp, high-quality graphics but produces large file sizes.* What is it used for? • *Hard copy print outs – high quality results due to no compression* PDF *Portable Document Format* What is special or different about this file? • *Multi-platform file format; works on all computers.* • *Regardless of creation software/platform, fonts and graphics are 'flattened' into a single file.* • *Normally reduces file size from original creation software.* What is it used for? • *Sending documents (external storage or e-mail) that can be read on any platform.* • *Doesn't require individual computers to have matching hardware, OS or software types.*

DESKTOP PUBLISHING - FILE TYPES

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Desktop publishing file formats and their use Knowledge and understanding of: • • JPG, • PNG, • BMP, • PDF, • AI, • WMV, • AVI, • 3GP, • QuickTime file formats	Investigate and describe the benefits of the following DTP file formats: **AI** *Adobe Illustrator File* What is special or different about this file? • *Vector graphic file created using Adobe Illustrator* • *Due to algorithm based image creation, produces super crisp, high quality images.* • *Can be scaled up or down without loss of quality.* What is it used for? • *Images that can be used on small or large scales – therefore no loss in quality at either end.* • *Logos, illustrations, graphics and general high quality print outs.* **WMV** Windows Media Video What is special or different about this file? • *Video file type developed by Microsoft.* • *A file type which compresses video formats for optimum storage.* What is it used for? • Originally designed as a file format for internet video streaming applications. • Simple file playback but doesn't allow other data (subtitles etc). **AVI** Audio Video Interleave What is special or different about this file? • *Video file type developed by Microsoft.* • *Contains both audio and video data in a file container, allows for synchronous payback.* • *Umbrella file format to be used for various types of video playback (DivX, MPEG etc).* What is it used for? • *Popular file format for standard definition video playback on PCs.* • *AVI container files can also include additional features such as subtitles and chapters.* **3GP** 3rd Generation Partnership Project (3GPP) What is special or different about this file? • *Multimedia file container format used by 3G compatible mobile phones and devices.* What is it used for? • *Transmitting text, audio and video between 3G phones/devices and over the internet.* **Quicktime file formats** What is special or different about this file? • *Multimedia format developed by Apple.* • *Can handle various forms of digital video, picture, sound, panoramic images and interactivity.* What is it used for? • *Playback of a variety of digital video/audio files and formats.* • *Standard/default player associated with iTunes and most Mac systems.*

Exercise B

Create or source a graphic example of each of these file types used in Commercial and Visual Media applications e.g. a still from a animation movie for a 'Quicktime' file and suggest a target audience for the image.

	Image	Target Audience
.JPEG		
.PNG		
.BMP		
.PDF		
.AI		
.WMV		
.AVI		
.3GP		
.Quicktime		

Advantages and Disadvantages of different file types

File Type	Main Uses	Advantages	Disadvantages
.jpeg (joint photographic experts group)	frequently used for placing photographic imagery in websites. JPEGs work best for photographs, illustrations and other complex imagery. JPEGs are a lossy compression format	- JPEGs can be compressed to conserve disc space if high resolution is not required.> - smaller file size possible due to compression	unlike TIFF formats a JPEG will degrade each time it is saved, hence the term 'lossy compression'
.pdf (portable document format)	transferring printed pages over the web (often as attachments in email) either for downloading existing publications or for sending documents to commercial printers for output.	files can be read on a wide variety of platforms documents can be viewed and printed independently of the application used to create them> files are compact> - can be viewed in web - browsers> - can retain pantone/ CYMK tones	- cannot be easily edited (additional specialist software required)> - Not great for complex graphics
.png (portable network graphic)	it is a lossless file format used principally in web based projects	- uses lossless compression> - supports 8 and 24 bit colour generation and cvan therefore display a wide range of colours > - can control transparency information> - can define a background colour	due to a lack of support for the cymk colour space and the fact there are no colour separations the PNG is not normally used for print production
.ai (adobe illustrator) files	**Adobe Illustrator** Artwork (**AI**) is a proprietary **file format** developed by Adobe Systems for representing single-page vector-based drawings in either the EPS or PDF formats. The .**ai** filename **extension** is used by **Adobe Illustrator**.	- supports transparency> - vector format> - smaller file size than .eps> - the most common vector art editing program in use today.> - printing services may actually prefer the .ai format	- dependent on specialist software (Adobe, quakxpress, Flash, Indesign, Photoshop)> -

Advantages and Disadvantages of different file types

File Type	Main Uses	Advantages	Disadvantages
.bmp (bitmap)	image composed of pixels (tiny square dots). Bitmaps are an example of a raster image	One of the advantages to using a bitmap image is that it can display a picture realistically. Bitmap images are made up out of pixels, which is basically a colored dot. Properly positioning the different colored dots next to each other will perform the illusion of one color blending into another. Thus, it is easier to get a more real-looking image using this format	- a bitmap image is that it does not tend to resize very well. While it may be easy to scale down an image without loss of clarity, it is not easy to enlarge the image without the image becoming pixelated. - large file size. An uncompressed image can be quite large because of the amount of information needed to display all the pixels in the various colors. Such a file can take a long time to load, send, or receive. - gto combat this, compressed file formats can be use however compressing a bitmap file can result in artifacts: areas of blurry or incorrect color that can ruin the detail and overall look of an image.
.eps (encapsulated post script)	placing graphics in documents created in word processing, page layout or drawing programs.	- supports both raster and vectored data - can be cross platformed, cropped or edited	may require additional software to open files

ADVANCED HIGHER GRAPHIC COMMUNICATION Exercise C

Advantages and Disadvantages of different file types

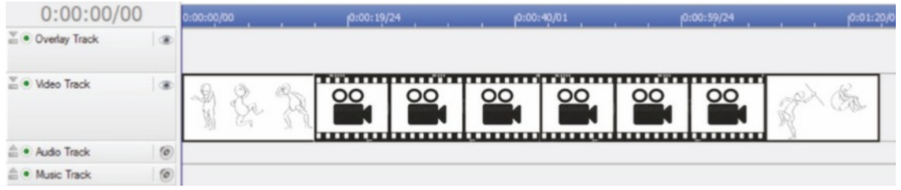
File Type	Main Uses	Advantages	Diadvantages
.png (portable network graphic)	it is a lossless file format used principally in web based projects	- uses lossless compression> - supports 8 and 24 bit colour generation and cvan therefore display a wide range of colours > - can control transparency information> - can define a background colour	due to a lack of support for the cymk colour space and the fact there are no colour separations the PNG is not normally used for print production
.wmv (Windows Media Video)	A file type which can contain video in one of several video compression formats developed by Microsoft. The original video compression format used in the file, also known as *WMV*, was originally designed for Internet streaming applications, as a competitor to RealVideo	- allows compression of large files without quality losses - offers digital rights management facilities - supported on many modern portable video devices and streaming media clients - can be played with numerous third-party players that use FFmpeg	- WMV is a Microsoft's Proprietary which means that it is not compatible with most of the other operating systems. It is not easy to find a Linux or Apple based media player to run WMV files. - WMV files have *digital rights management* system associated that makes it impossible to restore the licensing information attached with WMV files.
.avi (Audio Video Interleaved	known by its initials AVI, is a multimedia container format introduced by Microsoft AVI files can contain both audio and video data in a file container that allows synchronous audio-with-video playback. Like the DVD video format, AVI files support multiple streaming audio and video, although these features are seldom used.	- There are lots of codecs currently available that can be used to achieve desired compression ratio of AVI format. - AVI file format has exceptionally high quality audio fidelity. - In order to make it compatible with the DV standard, DV-AVI standard can be compressed unlike other audio/video formats. - AVI file format is developed by windows, which makes it playable with all the major Microsoft and non-	- If AVI files are compressed using some codecs then in order to retrieve and play the file it requires the same codec to be installed on the machine. - AVI files if uncompressed can be very large in size as compared to the other file formats. - AVI files if compressed beyond certain limits result in the loss of video quality.

Please read page 58 on video editing before attempting this question

MARKS DO NOT WRITE IN

1. (continued)

After the animation is created, the video game designer wants to place it into



When the sketched images and animation files are inserted into post-editing software, there is no smooth progression between the sketches and the animation.

(b) (i) Name a feature that could be added post-edit, to ensure smooth **1**

_____

(ii) Describe the way(s) in which the feature you have named in Q1b(i) above would ensure smooth progression in the final video. **1**

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Some of the developers have requested that the game designer submits his game presentation electronically.

(c) Identify an appropriate file format for saving the file. **1**

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Advantages and Disadvantages of different file types

File Type	Main Uses	Advantages	Disadvantages
.avi (Audio Video Interleaved) continued		Microsoft operating systems. - Playable DVDs and disks can be created by using AVI file format in order to store initial audio/video information. - AVI file format do not require any particular hardware device or software application for the file to run. - AVI file format is the most widely used video format for promos, short movies and advertisements owing to its compression capabilities.	
.3GP	3GP is defined in the ETSI 3GPP technical specification.[1] 3GP is a required **file format for video and associated speech/audio media types** and timed text in ETSI 3GPP technical specifications for IP Multimedia Subsystem (IMS), Multimedia Messaging Service (MMS), Multimedia Broadcast/Multicast Service (MBMS) and Transparent end-to-end Packet-switched Streaming Service (PSS).[	The major advantage of using the 3GP technology is that it allows fast downloading or transfer of video and audio clips over the Internet.	To play 3GP files on your computer, you need to get a codec. A codec decompresses different video file formats. It is important you download the right codec and enable the right options to play 3GP files on your computer
.Quicktime (.MOV file	The MOV format is a multimedia file type that works with Apple Inc.'s QuickTime player The format specifies a multimedia container file that **contains one or more tracks, each of which stores a particular type of data: audio, video, effects, or text (e.g. for subtitles)**. Each track either contains a digitally-encoded media stream (using a specific format) or a data reference to the media stream located in another file	MOV provides advantages over similar file types because it delivers simplicity in editing, enjoys enormous popularity and embeds itself well in other programs.	A digital device needs few minutes to read MOV videos.

Advantages and Disadvantages of different file types

Important Note: You should be aware of these file types but you will NOT be asked about them in the exam

File Type	Main Uses	Advantages	Disadvantages
.gif (graphics interchange format)	posting images online. Suitable for images containing large flat areas of colour and there fore suitable for logos, line art and other web graphics with limited colour range; not suitable for photographs	- because they use fewer colours GIF files are very small which makes them perfect for online use	GIF files do not support as many colours as other graphics file formats
.tiff (tagged image file format)	placing graphics in documents created in word processing, page layout or drawing programs. Unlike eps. it supports rasterised data but converts vectored images into bits	- TIFF supports layers which allows editing of images in software like photoshop. > - TIFF's retain colour information.> files are smaller than EPS.> - can be saved with minimum compression making it ideal for printing large size resolution images.	Files are not small. 5-15MB. TIFFs are not widely supported by the Web browser which makes them a poor choice for online use

DECISION MAKING IN GRAPHICS

CMYK (PRINTING COLOURS) V. RGB (SCREEN COLOURS).

- many colours in RGB cannot be reproduced accurately in printing using CYMK process colour Inks
- CMYK colour space is much smaller than RGB colour space (i.e.there are fewer CYMK colour combinations than RBG colour combinations)
- when an image is printed the resolution should be 300dpi. Most printers will not be able to reproduce an image of any greater resolution.

VECTOR (IMAGES CREATED BY MATHEMATICALLY PRODUCED CURVES) V. RASTER (IMAGES CREATED BY PIXELS)

VECTOR

Advantages of vector graphics

- vector graphics have smaller file sizes (because they only record information on the position of the the line, the angle and colour)
- vector images allow you to zoom in on curves and they will remain smooth
- the parameters of the objects in a vector image (e.g. the angle of a curve) are saved and can be modifiedt his means that modifications will not reduce the quality of the drawing. So if the image is edited in a vector graphics program like adobe illustrator the quality of the image will not change).
- When zooming in on a vector image the thickness of the line will not get wider proportionally.

Disadvantages of vector graphics

- vector graphics are filled with a solid colour or a gradient but can't display the lush color depth of a raster.
- vector graphics work better with straight lines or sweeping curves

Vector file extensions include: SVG (Scalable Vector Graphics), AI (Adobe Illustrator Graphics), CDR (CorelDraw Vector Graphics), WMF (Windows Metafile Format) and DRW (Vector Drawing file)

RASTERAdvantages of raster graphics

- Raster images are wonderful for rendering rich, full-color images, like photographs. Because every dot can be a different color, you can allow for any kind of color change.

Disadvantages of raster graphics

- Raster images are file heavy. All of the zeros and ones that are used to make up each pixel result in large file sizes. Your computer must keep track of the zeros and ones and must change each one when editing. This is memory-intensive and may cause slower editing.
- Rasters do not resize well. When you resize a raster image, the pixels just get larger, making the image appear distorted and chunky/grainy.

Common raster file types include e.g..BMP,(Bitmaps) .TIF (tagged image file format), .JPG (joint photographic expert group), .GIF (graphics interchange format), and .PNG (portable network graphic).

SCREEN GRABBING/CAPTURE V SAVING AS A PDF

- although dependent on screen resolution screen grabbing produces a low-resolution image
- screen grabbing captures everything on screen and will require further cropping: photoediting software is required for this
- screen grabbing saves an image which is only the same size as the original image. because it is saved a s a raster image scaling it will reduce image resolution

Exercise D

MARKS DO NOT WRITE IN THIS MARGIN

3. A major publicity drive is being conducted by the Blood Transfusion Service to raise awareness of the importance of Giving Blood in Scotland. They plan to organise a range of 5K and 10K races across the country.

Graphic Designers have been tasked to design and produce a range of graphic communications to promote the event.

The event "Blood Run" logo has been produced as a vector graphic, to be used in the online and printed advertising.

(a) Describe **three** advantages of vector images compared to raster images. **3**

The colours used within the promotional work must incorporate the colours used in the existing Give Blood logo.

(b) Explain how the Graphic Designers can ensure an exact colour match is achieved. **2**

DESKTOP PUBLISHING- PRINTING TECHNOLOGIES

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topics	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: • various printing technologies, including • Laser, • ink-jet, • wide-format, • screen printing, • offset lithography and • solid ink systems	Describe the special features of this process. Explain the types of printing jobs it is used for in terms of: Economy of print run size. Materials to be printed on, Print Quality, Printing speed **Laser printing** Main features • *Main features: The toner or ink in a laser printer is dry. In an inkjet, it is wet. The ink does not need to be changed as often as it does in an inkjet printer. The ink on a laser printed document will not smear.* Economy of print run size • *Economy of print run size: Personal laser printers are sufficient for printing an average of 200 pages per week. A workgroup printer is needed if an average of 1000 pages per week is needed. Production printers are needed for printing 50,000 or more pages per week. These are quite expensive and are used by commercial publishers.* Materials to be printed on • *Most laser printers use standard paper sizes. High-end production printers use continuous sheet paper. Laser printers can print on transparencies, adhesive labels, and lightweight cards.* Print Quality • *The standard resolution in most laser printers is 600 dots-per-inch (dpi). This resolution is sufficient for normal everyday printing including small desktop publishing jobs. A high-end production printer might have a resolution of 2400 dpi. Lower resolutions can cause jagged lines to appear on the outer edge of an image. Hewlett Packard created RET (Resolution Enhancement Technology) to correct this. RET inserts smaller dots at the edges of lines and to smooth the rough edges. RET does not improve the resolution, but the document looks better.* Printing speed • *Personal laser printers can print up to eight ppm (pages per minute). A workgroup printer can print up to 24 ppm. Production printers can print up to 700 ppm and can print 24 hours a day, seven days a week.* **Ink Jet Printers** Main features • *Inkjet printers are, in the main, inexpensive, lightweight and small. This makes them ideal for a personal computer. The copy from an inkjet printer needs a little time to dry. Adequate drying time is especially important if the hard copy contains large regions of solid black or colour.* Economy of print run size • *A limitation is the fact that most inkjet printers are slow and they are not designed for high-volume print jobs.* Materials to be printed on • *Inkjet printers also require non-porous paper. In bond paper containing cotton or other fibres, the ink may bleed along the fibres. Paper designed especially for inkjet printers is heavier than the paper used with laser printers, has a higher brilliance and is more expensive.* Print Quality • *A typical inkjet printer can produce copy with a resolution of at least 300 dots per inch (dpi). Some inkjet printers can make full color hard copies at 600 dpi or more* Printing speed • *Slow.*

DESKTOP PUBLISHING- PRINTING TECHNOLOGIES

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topics	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: • various printing technologies, including • Laser, • ink-jet, • wide-format, • screen printing, • offset lithography and • solid ink systems	Describe the special features of this process. Explain the types of printing jobs it is used for in terms of: Economy of print run size. Materials to be printed on, Print Quality, Printing speed **Wide-format Printing** Main features: *Wide format printers usually employ inkjet print technology to produce the printed image. CMYK colours are also used. The greatest difference between digital wide format printing and traditional methods such as lithography, flexography, or letterpress is that there is no need to replace printing plates in digital printing; in the other methods printing the plates are repeatedly replaced and are expensive to produce.* Economy of print run size: *They are more economical than other print methods such as screen printing for most short-run (low quantity) print projects, depending on print size, run length (quantity of prints per single original), and the type of substrate or print medium.* Materials to be printed on: *The media can be paper based, sheet vinyl, various banner materials, mesh, canvas or any other printable materials available. Wide format printers are usually designed for printing onto a roll of print media that feeds incrementally during the print process, rather than onto individual sheets. Wide format printers are used to print banners, posters, trade show graphics, wallpaper, murals, backlit film (aka duratrans), vehicle image wraps, electronic circuit schematics, architectural drawings, construction plans, backdrops for theatrical and media sets, and any other large format artwork or signage.* Print Quality: *High quality* Printing speed: *Slow, but bear in mind print runs will generally be very small or even one-off banners etc.*

Exercise E

State the name of this type of printer

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Describe the advantages and disadvantages of using this printer to produce a large window display advert for use in 50 music stores.

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DESKTOP PUBLISHING- PRINTING TECHNOLOGIES Cont..

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topics	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: • various printing technologies, including • Laser, • ink-jet, • wide-format, • screen printing, • offset lithography and • solid ink systems	Describe the special features of this process. Explain the types of printing jobs it is used for in terms of: Economy of print run size. Materials to be printed on, Print Quality, Printing speed **Screen printing** Main features: *At its simplest, Screen printing involves making a stencil which is adhered to a fine nylon mesh screen attached to a frame. Using a squeegee, the ink is pushed through the stencil and onto the print surface. Screen printing is the best option for designs that require a high level of vibrancy, when printing on dark shirts, or for specialty products. The ink in screen printing is applied thicker than digital printing, which results in brighter colours even on darker shirts.* Economy of print run size: *Screen printing has a strong commercial presence, and as press speeds increase. Screen printing is also economical over short print runs because it is relatively cheap to set up. High speed, large format inkjet printing and other advances in print technology have made Screen printing less competitive for certain types of work. Screen-printing also tends to be used for more specialist items, such as printing onto metals, plastics or for one-off items for which digital printing is not viable, due to the shape or thickness of the surface.* Materials to be printed on: *The advantage of screen-printing is the ability to print on a wide range of materials. These include cloth (T-shirts) self-adhesive vinyl, aluminium, PVC, wood and plastics. This means that a very wide range of products can be created, including posters, point-of-sale displays, dashboard markings, estate agents' boards, industrial and office equipment markings, labels and decals – just about anything you can think of. The vinyl fire exit signs in your school may well be screen printed.* Print Quality: *An advantage of Screen printing is its adaptability. One screen can be used again and again. There are no limits on the amount of colours that may be used and light colours can be overprinted easily onto dark colours. Screen printing is the best option for designs that require a high level of vibrancy, when printing on dark shirts, or for specialty products. The ink in screen printing is applied thicker than digital printing, which results in brighter colours even on darker shirts. The print quality can be excellent.* Printing speed: *Modern cylinder-based screen presses are capable of 4,000:6,000 impressions per hour and ink-drying systems shorten the drying time of the inks. The modern process can be very economical.* **Offset lithography** Main features: *This is the most popular printing technique used for most printed matter we encounter such as leaflets, booklets, magazines, catalogues.* Economy of print run size: *The cost of offset printing is the cheapest method of producing high quality printing in commercial printing (high volume) quantities. It is too expensive to set up to be useful on smaller print runs.* Materials to be printed on: *Offset lithography is one of the most common ways of creating printed materials. Common applications include: newspapers, magazines, brochures, stationery, and books. Compared to other printing methods, offset printing is best suited for economically producing large volumes of high quality prints.* Print Quality: *For offset printing a lot more attention to detail is required but the quality of the results is excellent. The advantages of this are:* • *Allows the widest range of colour re-production. Bright florescence, Pantones®. metallic, foils and varnishes can all be produced using this method of printing.* • *Allows the most accurate colour re-production and consistency.* • *A wide variety paper weights, size and textures.* Printing speed: *It is the fastest and most economical method of printing large runs (magazines & newspapers etc) hence the reason it is widely used.*

DESKTOP PUBLISHING- PRINTING TECHNOLOGIES Cont..

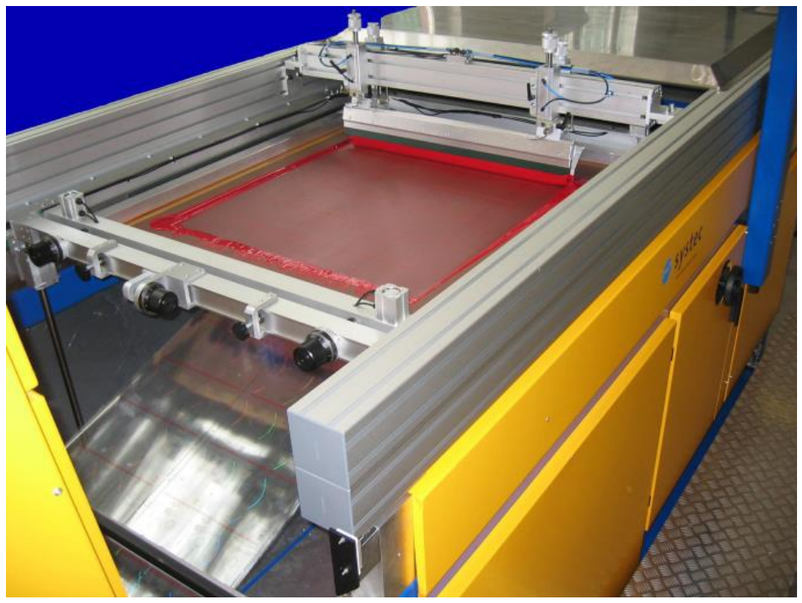
HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topics	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: • various printing technologies, including • Laser, • ink-jet, • wide-format, • screen printing, • offset lithography and • solid ink systems	Describe the special features of this process. Explain the types of printing jobs it is used for in terms of: Economy of print run size. Materials to be printed on, Print Quality, Printing speed **Solid ink systems** Main features: *Solid ink technology utilizes solid ink sticks instead of the fluid ink or toner powder. Some types of solid ink printer use small spheres of solid ink, which are stored in a hopper before being transferred to the printing head. After the solid ink is loaded into the printing device, it is melted and used to produce images on paper in a process similar to offset printing. Xerox claims that solid ink printing produces more vibrant colours than other methods, is easier to use, can print on a wide range of media, and is more environmentally friendly due to reduced waste output. The sticks are non-toxic and safe to handle.* Economy of print run size: *Solid-ink printing has several advantages that make it attractive for business, including good print quality at speeds up to 40 pages per minute and less packaging waste compared to inkjet and laser models. The technology also has a few downsides, such as the time needed to heat the ink.* Materials to be printed on: Mainly paper where it maintains its quality on a range of paper types. **<u>Print Quality</u>** *When evaluating print quality, you should examine print samples across a variety of prints on a variety of media. Solid Ink pixels are much more discrete and can be precisely placed to within ½ of a pixel. Although Solid Ink pixels (spots) are not smaller than toner particles, they can be placed as a single pixel, unlike toner particles that are placed on the image in "clumps" to create a single pixel. Color-to-color output is more consistent with Solid Ink than with laser toner* *Due to the way solid ink printers put the ink onto the page, print quality is considered to be excellent, with bright colours. Excellent results can be achieved with low-quality stock, as the wax covers the stock with a glossy, almost opaque, surface. Solid ink printers are able to print on many different types and thicknesses of media.* *Because solid blocks of ink are used, there is less waste generated than is with laser printers or inkjet printers, which produce empty ink or toner cartridges, in addition to packaging and packing materials. A loose ink block does not leave any residual cartridge after it is consumed - only a crushable, thin, plastic packing tray and a recyclable cardboard packaging box.* *Solid ink printers have an advantage over ink-jet printers for situations involving intermittent use with long periods of downtime. This is because melted solid ink that has subsequently cooled and re-solidified inside the ink-delivery pathways is a normal part of printer operation. So, this cooled-and-solidified ink does not dry out. And, while the printer is not operating, the solidified wax helps to prevent oxygen and moisture from interacting with many internal parts of the ink-delivery components.* Printing speed: *The average solid ink printer can print up to 40 pages per minute. Not as quick as offset litho printing.*

Offset lithography 4 colour Printer

Wide format Printer could be laser or inkjet

Laser Printer



Screen Printer

Solid state Ink Printer

DESKTOP PUBLISHING - PRINTING TECHNOLOGIES - COLOUR SYSTEMS

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: quality and standards in colour printing, including an understanding of • RGB, • CMYK, and • Pantone • edge-to-edge, bleed, gutter, registration marks, colour calibration, dots-per-inch (DPI) • photo-reduction, • Duplexing, • camera-ready copy, • paper weight, • paper opacity, • use of calendaring for glossy print	Investigate and describe the benefits of the following colour standards: **RGB** RED, GREEN & BLUE Where is this standard applied? *The RGB colour model is an additive colour model in which red, green, and blue light are added together in various ways to reproduce a broad array of colours. The name of the model comes from the initials of the three additive primary colours, red, green, and blue.* *The main purpose of the RGB colour model is for the sensing, representation, and display of images in electronic systems, such as televisions and computers, though it has also been used in conventional photography.* What are it's special features? *Typical RGB input devices are colour TV and video cameras, image scanners, video games, and digital cameras. Typical RGB output devices are TV sets of various technologies (CRT, LCD, plasma, OLED, Quantum-Dots etc.), computer and mobile phone displays, video projectors, multicolor LED displays.* *Each pixel on the screen is built by driving three small and very close but still separated RGB light sources. At common viewing distance, the separate sources are indistinguishable, which tricks the eye to see a given solid color. All the pixels together arranged in the rectangular screen surface conforms the color image.* **CMYK** CYAN, YELLOW, MAGENTA, BLACK (Key Colour) Where is this standard applied? *The CMYK colour model is a subtractive colour model, used in coloured printing, and is also used to describe the printing process itself. CMYK refers to the four inks used in some color printing: cyan, magenta, yellow, and black.* What are it's special features? *CMYK colour space, traditionally, when the final proof is agreed, the designer will make up "Colour Separations". These split the image up into its constituent colours for four-colour printing. There will be one separation each for Cyan (Blue), Magenta (Red), Yellow and Key (Black), known as CMYK colour.* *In theory, there need only be three colours in printing, because every colour is made up from the three primary colours, red, yellow and blue. As a result of the impurities of printing ink and the reflective qualities of paper, the three colours mixed would make up a muddy brown, so a black separation is added to give definition.*

DESKTOP PUBLISHING - PRINTING TECHNOLOGIES - COLOUR SYSTEMS

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: quality and standards in colour printing, including an understanding of • RGB, • CMYK, and • Pantone • edge-to-edge, bleed, gutter, registration marks, colour calibration, dots-per-inch (DPI) • photo-reduction, • Duplexing, • camera-ready copy, • paper weight, • paper opacity, • use of calendaring for glossy print	Investigate and describe the benefits of the following colour standards: **Pantone** Where is this standard applied? *The Pantone Matching System (PMS) is a proprietary colour space used in a variety of industries, primarily printing, though sometimes in the manufacture of coloured paint, fabric and plastics.* *The Pantone colour guides have been widely adopted and are used by artists, designers, printers, manufacturers, marketers and clienThe Pantone Matching System (PMS) is a proprietary colour space used in a variety of industries, primarily printing, though sometimes in the manufacture of coloured paint, fabric and plastics.* *The Pantone colour guides have been widely adopted and are used by artists, designers, printers, manufacturers, marketers and clients in all industries worldwide for accurate colour identification, design specification, quality control and communication.ts in all industries worldwide for accurate colour identification, design specification, quality control and communication.* What are it's special features? *The PANTONE® name is known worldwide as the standard language for colour communication from designer to manufacturer to retailer to customer.* *The Pantone Colour Matching System is largely a standardised colour reproduction system. By standardising the colours, different manufacturers in different locations can all refer to the Pantone system to make sure colours match without direct contact with one another.* *Pantone can be used for both CYMK and RGB colour spaces. Colour variance also occurs based on the paper stock used (coated, matte or uncoated).*

DESKTOP PUBLISHING - PRINTING TERMS

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: quality and standards in colour printing, including an understanding of • RGB, • CMYK, and • Pantone • edge-to-edge, bleed, gutter, registration marks, colour calibration, dots-per-inch (DPI) • photo-reduction, • Duplexing, • camera-ready copy, • paper weight, • paper opacity, • use of calendaring for glossy print	Explain the following printing terms: use sketches where possible. Edge-to-edge printing *A full bleed or edge to edge printing is when the graphics extend to the physical edge of the paper on all edges. A bleed is required on all edges of the publication. Usually commercial printers will achieve an edge to edge look by cropping the paper to size after the print however modern inkjet printers now can print to the actual edge of the paper by over spraying the page, this method however does waste ink. Off-set litho printing (the most common commercial method) requires printing on OS (oversized) paper which is then trimmed to size.* Bleed *If you want a graphic to reach the edge of the paper you need to extend the graphic outside the edge of the publication. This is known as a bleed. Graphic designers usually add a bleed margin during the page set up and extend items by 3mm or 5mm to achieve a bleed. The publication is printed on oversized (OS) paper to enable this additional bleed size. The paper is trimmed to size after printing.* Gutter *The vertical space or alley space between columns of text is referred to as the gutter. It also refers to the inside margins or blank space between two facing pages. In this case the gutter space may need to be adjusted to allow for creep, the movement associated with some book binding methods.* Registration marks *When off-set litho printing with multiple plates for each individual colour (e.g. CMYK) precise alignment is needed to ensure each plate/colour is printed exactly on top of the others.* *This is called registration. The registration marks (right) are positioned in the margins of each page to help the printer operator to align the colours on the press properly.* *They are trimmed off during cropping.* *The duck image shows the result of poor registration.*  Colour calibration *Colours will appear duller when printed than to what they look like on screen (difference of RGB/CMYK colours and issues of monitors having independent colour values). This can cause issues for a designer who may unwittingly make his colours too bright or too warm (monitors are often too blue-ish in hue). In order to avoid this, the monitor should be calibrated to match the printer. A colour calibration device is set on the screen which reads the colours and brightness of the display and then adjusts the colour settings of the output to match a dataset of colour values. Likewise it is important that a printer also bases it colours on the same dataset of colour values - so that both printer and screen match. The colour values of a printed sheet can be scanned and checked by a calibration device and then the printer colour data calibrated accordingly.* Dots-per-inch (DPI) *Refers to the number of dots that can be printed within 1 inch. The higher the number of dots (resolution), the sharper and clearer the image. For photos to appear crisp and sharp they need to have a resolution of around 300 dpi. Many screens only output at around approx 100 pixels per inch (PPI) so images for screen can have a smaller file size. Your school printer will print to a resoulution of 300dpi.* Photo-reduction *This refers to the compression of image files so that they are a smaller file size but with limited loss of quality. This is useful for images for the web as it allows for quicker load times. Photo editing programs reduce file size by removing meta data such as camera model, white balance and photo date and so on. This could reduce a file from around 4MB to 1MB relatively easily.*

DESKTOP PUBLISHING - PRINTING TERMS

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Commercial print media Print technologies Knowledge and understanding of: quality and standards in colour printing, including an understanding of • RGB, • CMYK, and • Pantone • edge-to-edge, bleed, gutter, registration marks, colour calibration, dots-per-inch (DPI) • photo-reduction, • Duplexing, • camera-ready copy, • paper weight, • paper opacity, • use of calendaring for glossy print	Explain the following printing terms: use sketches where possible. **Duplexing** Put simply, it is when a printer can print on both sides of a sheet of paper. Duplexing is achieved when the printer catches the piece of paper after the first side has been printed on, then flips it, and prints again. **Camera-ready copy** This is the final stage of a publication before it is printed. The document will have been exported as either a EPS file or a PDF file; it will be set for the correct colour scheme, and will be set to the correct size for printing without any need for scaling. Fonts should be set to vector graphics, and any raster images should be at least 300 Dpi. **Paper weight** Paper is measured in GSM - “Grams per Square Metre”. Low quality sheets have a Low GSM value; such as the paper used in a photocopier (approx. 80 GSM). High quality paper has a higher value GSM; such as the paper used to print on Leaflets/flyers (approx. 130 GSM). **Paper opacity** Paper opacity describes how much light can pass through a piece of paper. Paper with High Opacity is good for duplex printing as not much light can pass through and you are unlikely to be able to see what’s been printed on the opposite side. Paper with Low Opacity allows light to pass through easily; for example Tracing Paper. **Use of calendaring for glossy print** Calendaring is the process of smoothing the surface of a piece of paper by pressing it between cylinders or rollers. This produces a very smooth, uniform surface on the paper, which then makes it suitable to have a gloss coating applied. The gloss coating requires a very smooth, flat surface rather than a rough, bumpy one.

ADVANCED HIGHER GRAPHIC COMMUNICATION

FILE TYPES USED IN THE PRINTING INDUSTRY

PRINTING INDUSTRY
(refer to CYMK printing colours)

Graphics for the printing industry must be…

- created using software commonly used in the the printing industry (e.g. Adobe In Design, Adobe Illustrator, Quarkexpress) and exported in a commonly used file format (.EPS,.AI, .PDF***)
- page size on the DTP package must match that of the final printed piece so no scaling is requited
- if bleed is required it must be extended off the digital page file the correct amount (i.e crop marks should be indicated)
- fonts used in the digital file mast be converted to the vector graphic format to be included in the final digital package sent to the printer
- raster or image files are originally created at high resolution settings (300dpi)
- if RGB colour used CMYK colours should be specified

***

THE IMPORTANCE OF PDF FILES IN PRINTING

- type fonts and images can be embedded within the file,

so the recipient can see them as intended

- PDF files are compact — useful for emailing and reducing

storage needs

- PDF files are platform-independent (can be opened in a

number of platforms other than the one it was produced in)

- PDF files can be viewed in web browser platforms
- PDF files also retain Pantone/CMYK tones exactly

http://www.detstudio.com/advhgccommercialprinting.html

Exercise F

MARKS DO NOT WRITE IN THIS MARGIN

The process Offset Lithography was used to produce promotional work for the event.

(d) Describe how the process would be used to produce the flyer shown above.

4

What is meant by Prepress

After designing a document comes **prepress**. It is the process of preparing digital files for the printing press — making them ready for printing

Prepress or make-ready tasks will vary depending on file complexity and printing method but some may include:

- double-checking fonts
- making sure graphics are in the right format
- preparing camera ready artwork
- creating color separations,
- adding crop marks
- trapping (done to prevent color gaps when colors touch in a layout)
- imposition (putting pages in the right order for printing)
- producing prepress proofs
- obtaining film for creating printing plates

What is meant by Camera Ready (copy)

a digital file is usually considered camera-ready if it meets several conditions:

1.It is created with a software program commonly used in the printing industry, such as LaTeX, InDesign (Adobe), Illustrator (Adobe), Freehand (Adobe/Macromedia), Quark XPress (Quark, Inc), and exported in a commonly used file format, such as EPS, PDF and sometimes TIFF. JPEG images are usually considered not camera-ready, as the compression used in the JPEG format deteriorates the quality of the image.

2.The document uses the correct color setup. If printing a (full) color document, all graphics should be converted to CMYK (cyan, magenta, yellow, and black). If it is a spot color document, the color(s) to be used by the printer must be specified in the digital file.

3.The layout is created at the correct and final size to be printed, and the document size in the desktop publishing program matches the size of the final printed piece.

4.Text or graphics that are intended to bleed off the page of the final printed piece should be extended off the document boundary in the digital file. The amount varies depending on location, but is usually 1/8 inch in the US, and 3mm in metric systems.

5.Fonts used in the digital file are converted to vector graphics (usually defined by the software as "convert to paths" or "outline text"), or alternatively, the fonts are included in the final digital package sent to the printer.

6.Raster or image files are originally created at high resolution settings, such as 300 DPI (dots per inch). This ensures a high quality image. Images saved from Internet web pages are usually low-resolution, 72-dots-per-inch JPG or GIF files, which are not considered camera-ready.

Check Out

http://www.lynda.com/InDesign-tutorials/Print-Production-Essentials-Prepress-Press-Checks/144079-2.html

http://www.lynda.com/Acrobat-tutorials/Print-Production-Fundamentals/100221-2.html

DIGITAL VISUAL MEDIA - ANIMATION

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Animation Knowledge, understanding of, and application as required of: ● creation of animated graphics making use of motion-capture, stop-frame, or motion tweening ● post-editing of video files and use of video graphic technologies, including blend/fade, zoom, transition and overlays	Investigate and describe the benefits of the following digital animation techniques: Creation of animated graphics making use of: **Motion-capture:** *Motion capture involves the process of recording live motion events and translating it into actionable data that allows the recreation of the motion in a digital environment.* *Optical motion capture requires the use of special markers , these markers are attached to a special suit and are easily identified by image processing software.* *The benefits are that it is accurate ,reliable but is expensive to set up and is time consuming.* *The latest developments are in markerless motion capture using advanced computer vision technology will identify and track subjects without the use of specialist suits.* *The benefits of this latest technology are that there is an increase in accuracy and a reduction of set up time, reducing the overall costs.* **Stop-frame animation:** *Stop frame animation is a cinematic process or technique used to make static objects appear as if they are moving. The process involves recording the position of an object (normally a photograph) then a small incremental change is made and new position is recorded . This process is repeated a number of times to create a sequence which when played back gives the illusion of movement.* *Stop frame animation has a relatively low set up cost but is labour intensive and time consuming.* **Motion tweening:** *Motion tweening is a process where the user defines the start and finish key frames and the system automatically calculates and create the in- between frames . This will then appear to move the shape over a specified distance within a specific period of time.* *The benefits of this process is that it gives a smoother animation without the need to draw every frame, giving a quicker more cost effective animation.*

DIGITAL VISUAL MEDIA - ANIMATION

HOMEWORK - RESEARCH THE TOPICS LISTED BELOW AND WRITE CONCISE DESCRIPTIONS

Topic	Information Gathered
Animation Knowledge, understanding of, and application as required of: ● post-editing of video files and use of video graphic technologies, including blend/fade, zoom, transition and overlays	Investigate and describe the benefits of the following digital animation techniques: Post-editing of video files and use of video graphic technologies, including: Blend/fade ● *"Blending" and "fading" refers to the transition effect when a film/animation dissolves from one scene to another.* ● *"Fade to black" is a common technique where a scene dissolves to total blackness. This helps soften the transition between scenes rather than simply cut from one scene to the next.* ● *A blend can be used to dissolve two scenes together without first fading to black. This is useful as it can be used to convey a passage of time or separate parts of film/animation.* Zoom ● "Zoom" is similar to the term used in CAD software. It refers to enlarging or reducing the view of an object or scene. ● Zoom can be used to focus in on a particular part of a scene to draw the viewers attention to it. ● Inversely, "zooming out" will reduce the size of view for a scene, allowing the viewer to see more of a scene. ● The speed of a zoom can be critical in creating an effect or mood. For example a very quick zoom-in can be used to really emphasise an object within a scene and create a dramatic or exciting mood. ● A slower zoom-in will instead create a more relaxed mood. Transition ● Transitions are techniques used to combine scenes and shots. Fading and blending are examples of transitions. ● Other transition techniques include: Wipe, Dissolve, Cut, Flip, Pan. Overlays ● PIP (Picture in Picture) is when two or more video clips share the display at the same time. ● Text overlays - where static or moving written information is displayed on top of the video itself. ● Image overlay - where an image is displayed on top of the video. ● A combination of the above can also be used. ● In the example shown below, of a sports news programme, the main film has a number of layers above it, including a PIP, static text and dynamic text (text that moves across the screen). 

ANIMATION TYPES

1. MOTION CAPTURE>

Motion capture>
www.youtube.com/watch?v=fm-A1lknrxE**>**

Summary >
Motion capture is the process of recording a live motion event and translating it into aactionable data that allows for a 3D recreation of the performance. In other words, transforming a live performance into a digital performance.>

Motion capture is the process of recording the movement of objects or people. It is used in military, entertainment, sports, medical applications, and for validation of computer vision[2] and robotics. >

In filmmaking and video game development, it refers to recording actions of human actors, and using that information to animate digital character models in 2D or 3D computer animation.[3][4][5] When it includes face and fingers or captures subtle expressions, it is often referred to as **performance capture**.[6] >

In many fields, motion capture is sometimes called **motion tracking**, but in filmmaking and games, motion tracking usually refers more to **match moving**.In motion capture sessions, movements of one or more actors are sampled many times per second.>
(https://en.wikipedia.org/wiki/Motion_capture)>

Disadvantages >

Can only recreate human abilities (restricted)

Hug e am ount of data created that needs to be processed>

Com plex process that requires specialist software>

Advantages>

Very realistic: Complex movement and realistic physical interactions such as secondary motions, weight and exchange of forces can be easily recreated in a physically accurate manner>

More rapid, even realtim e results can be obtained.**>**

SQA Exam Question

1. A visual media design team has been commissioned to produce an animation to help present a new video game proposal to potential developers. The video game designer has supplied the following brief for the animation:

"As part of my presentation to potential developers, I require an animation lasting around 10 seconds that gives some indication of the form and movement of one character. I do not require the character to be placed in any type of complex environment and I would like the character to be modelled using clay. The game's target audience is a child of primary school age. I would like the costs to be kept to a minimum."

The team specialise in the following types of animation:

- motion-capture
- stop-frame
- motion-tweening.

(a) With reference to the advantages and disadvantages of each of the above animation types, explain why stop-frame animation is the most appropriate. 10

2. STOP FRAME>

Summary>
Stop motion(also known as **stop frame**) is an animation technique to make a physically manipulated object or persona appear to move on its own. The object is moved in small increments between individually photographed frames, creating the illusion of movement when the series of frames is played as a continuous sequence. >

Dolls with movable joints or clay figures are often used in stop motion for their ease of repositioning. Stop motion animation using plasticine is called clay animation or "clay-mation". Not all stop motion requires figures or models; many stop motion films can involve using humans,

ANIMATION TYPES cont.

household appliances and other things for comedic effect. Stop motion using objects is sometimes referred to as object animation>

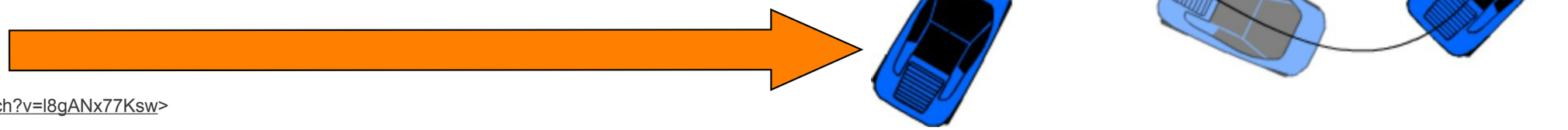
Disadvantages>

- **very time consuming>**
- **Limited by quality of model and accuracy of movement**

Advantages>

- **Widely available easy to use software**
- **Low cost of hardware**
- **Simple process appeal of its distinct look.**
- **□□□□□□□□□□ □□□□□□□□□□ □□□□□□□□□□>**

3. MOTION TWEENING>



Motion Tweening>
www.youtube.com/watch?v=l8gANx77Ksw>

Summary>
A motion tween is a feature available in Adobe Flash (formerly Macromedia Flash) that allows you to easily animate the motion of an object. Instead of defining the location of the object in every frame, you can create a motion tween, which will automatically move the object from the beginning location to ending location.>

To create a motion tween, simply select a layer in the timeline and drag an object onto the stage. Then select the number of frames in the timeline you would to use for the duration of the animation. To create the motion tween, you can either right-click in the timeline and select "Create Motion Tween," or simply choose Insert → Motion Tween from the menu bar. **NOTE:** In order for Flash to create the tween, you may need to convert the object to a symbol.>
Once the tween has been created, you can click on any frame within the motion tween and move or rotate the object. For example, you can click on the last frame in the motion tween and move the object to a different part of the stage. When you run the animation, Flash will automatically calculate the location of the symbol for each frame and smoothly move the symbol from the start location to the end location. You can modify the acceleration of the object using the "Ease" property in the Properties palette.>
Motion Tweening has become the standard way of animating symbols in Flash animations. While the name "motion tween" is specific to Adobe Flash, the phrase is sometimes used to refer to automated movements in other animation software as well. Graphic File Formats >

Disadvantages>

- **Expense of software**
- **Complex plotting path of movement**

Advantages>

- **Can animate a number of frames very quickly**

Answer to SQA Exam Question on previous page

Explanations of the advantages and disadvantages of animation types are likely to include those such as:

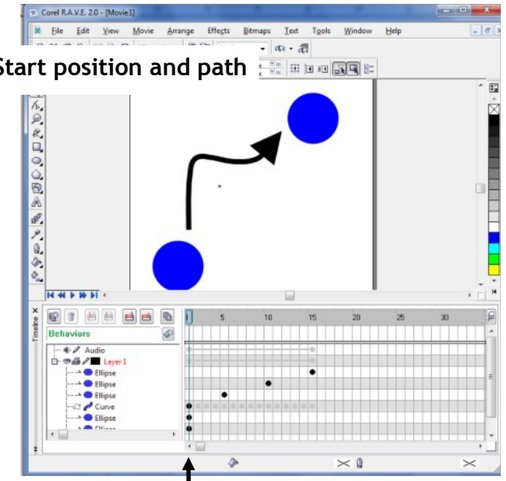
Motion-capture
- complex process that requires specialist software
- can only recreate human abilities (restricted)
- huge amount of data created that needs to be processed
- very realistic

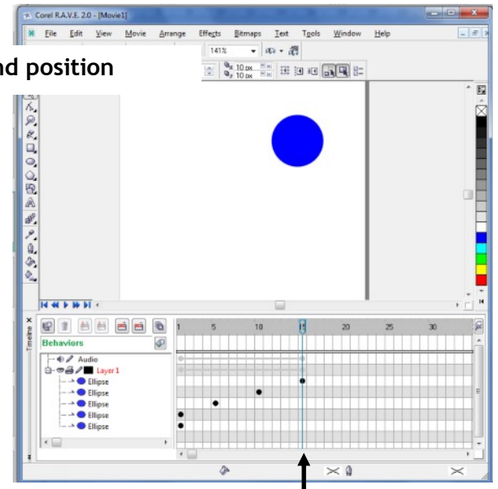
Stop-frame
- widely available, easy-to-use software
- low cost of hardware
- simple process
- very time consuming for longer animations
- limited by quality of model and accuracy of movement

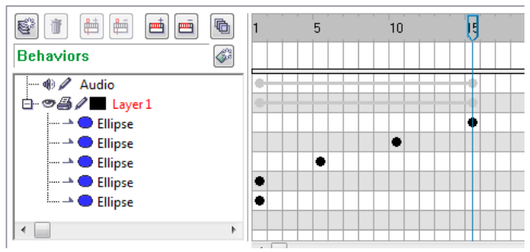
Motion-tweening
- expense of software
- complex plotting path of movement
- can animate a number of frames very quickly

10. The logo designer has been creating the 'dynamic logo' and has been designing the animation in graphics software. The path for the logo is being tested and is shown below. The graphics show two different screenshots of the process. Marks

DO NOT WRITE IN THIS MARGIN







The animation is not smooth and shows the blue circle jumping. It does not look realistic.

(n) Describe the process required to fix this animation. 3

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Exercise G

10. The client has tasked the 3D CAD modeller to create an animated 'dynamic logo' for the project which will be used on the project website, promoting the project and advertising the type of work the company do. Marks

DO NOT WRITE IN THIS MARGIN

The logo has been described by the client as follows -

> *"We want a dynamic and animated logo that really jumps out at the web site user and has fly-throughs of customers entering a building and ariel footage looking down onto one of our major buildings we have worked on, it needs to be quick loading even on phones or tablets"*

(j) State a suitable filetype for the 'dynamic logo'. 1

_____

(k) Describe two benefits of this file type for the application described. 2

_____

_____

_____

The animated graphic techniques of motion capture and motion tweening are options for the 'dynamic logo' designer tasked with the work.

(l) Describe how the designer can use these techniques when creating the 'dynamic logo'. 4

_____

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_____

_____

m) 2

Explain why stop-motion animation techniques were **not** chosen by the logo designer.

_____

_____

_____

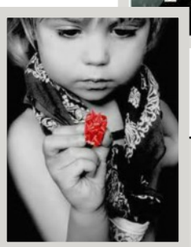
Exercise H

ADVANCED HIGHER GRAPHIC COMMUNICATION

ADVANCED HIGHER
Design Elements an Principles

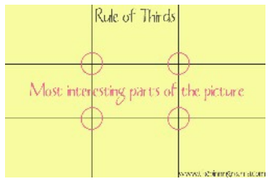
- golden ratio,
- rule of thirds,
- pace,
- dynamic effects,
- focal points,
- radial balance,
- negative space,
- silhouettes.

?



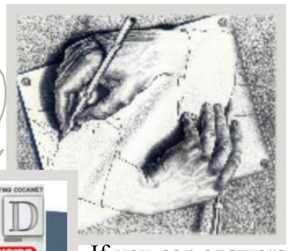
Focal Point

In the double dog poster the centre aligned text and the dogs noses help create a focal point (the beer). Colour, and the child's gaze create it in other image



Rule of thirds

The important features are placed in the points where the grid lines cross



If you can answers yes to either of these questions then its radial balance:

Does the piece radiate from a central point or does it have a spiral effect?

Does the design pull you in or send you out to the edges of the piece?

Radial Balance

In addition to symmetrical and asymmetrical balance a layout can spiral from a point on the page creating radial balance.

Don't forget to revise your higher elements and principles…

HIGHER
Design Elements and Principles

- colour (warm, cool, contrast, harmony, accent, advancing and receding),
- line,
- shape,
- texture,
- value,

mass/weight,

- alignment,
- balance,
- contrast,
- depth,
- dominance,
- emphasis,
- proportion,
- rhythm,

unity/proximity,

- white space
- grid structure.

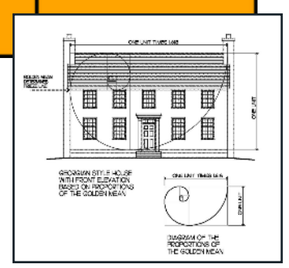
Pace (refer also to Higher notes on rhythm)

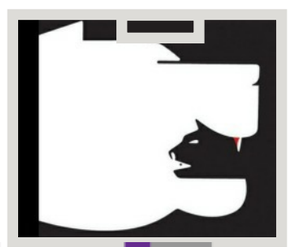
Techniques used by the designer can slow down or increase the speed with which a message is communicated.
An advert on the side of a bus will have large text and eye catching images getting the message across quickly. A newspaper article would have a slow pace.

Design Elements and Principles

Golden Ratio

A grid (also drawn as spiral) that divides the page and helps define an aesthetically pleasing layout. The spiral leads the eye to the main focus of the page at its centre.





Negative Space

Where the image and the white space around it communicate information

Negative Space forms an arrow on the FedEx logo. A clever use of negative space as it tells us something about the company

Silhouette

A dramatic effect create by a clear outline and black filled image

Before After

Dynamic Effects

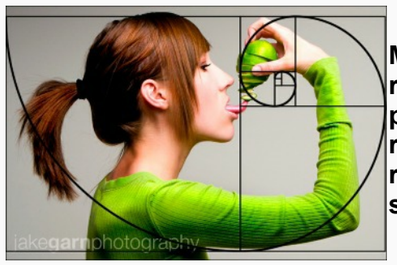
Manipulating images like those below and text along a path are some ways of increasing the movement or flow on a page. These create what are known as dynamic effects

Note : Dynamic effects are more than just a blurred image created when a camera takes a picture of a fast moving image. It involves additional effects added by the designer.

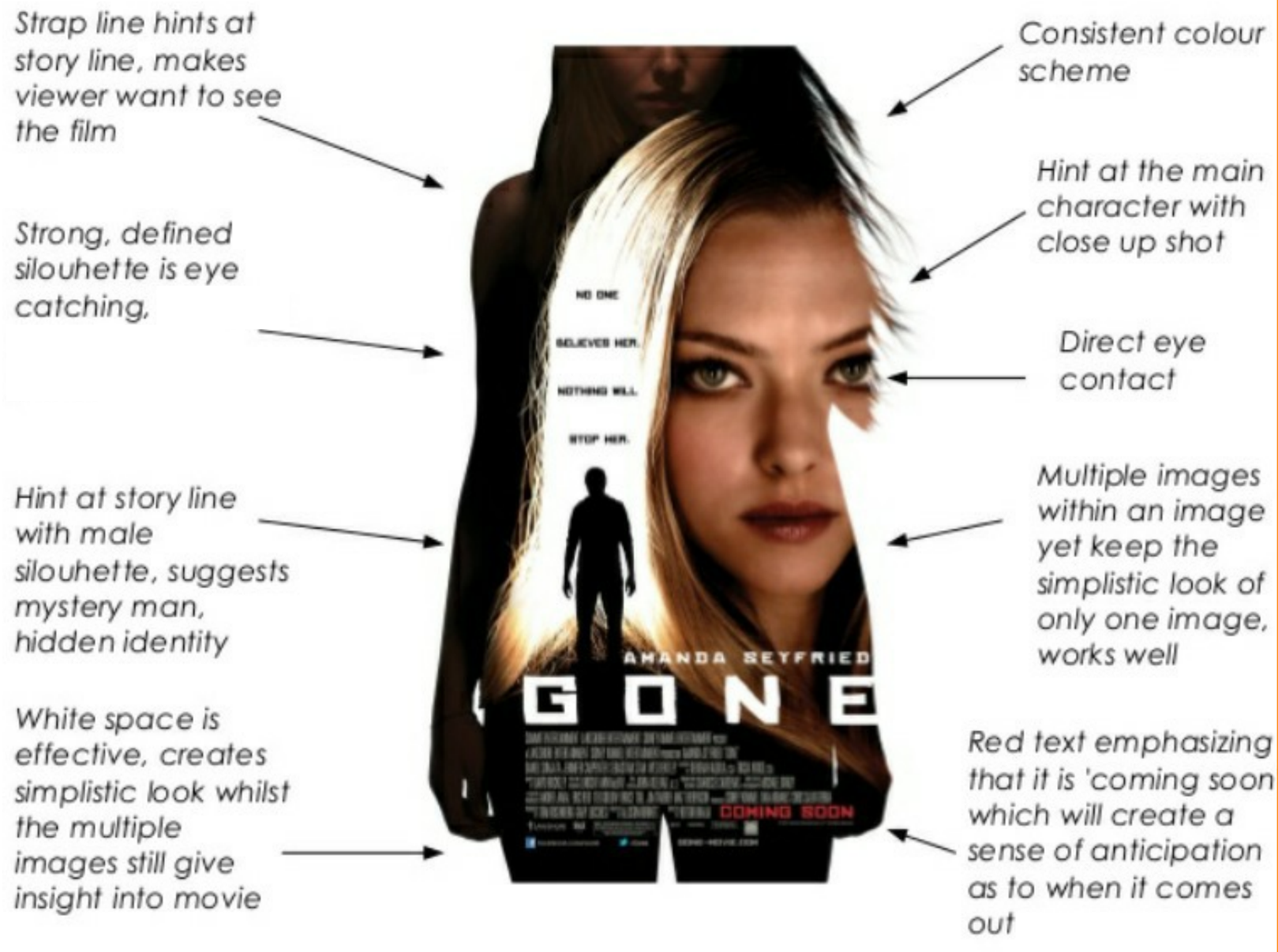
DESIGN ELEMENTS AND PRINCIPLES

Element or Principal	Definition	Example	Effect	Exercise Image	Exercise
Focal Point	A focal point is created by arranging and/or sizing components to lead the eye to a feature or to a specific area of a page. It can also be done by editing on image so that one area is in focus/in colour. Effective use of a golden section or rule of thirds can create a focal point.		The focal point is the beer glasses and the name of the company. This draws the eyto the product and the compant name **- the contrasting colour of the beer-** **- the company name layered on top of the beer glasses** **- the dogs noses pointing at the glasses** **- the central location on the page**	Find another example of an advert with a focal point.	**Explain how the designer has created the focal point in your example.**
Radial Balance	Features on a page placed in a radial balance seem to 'radiate' out from a particular point in a circular fashion.		Radial balance is used by the graphic designer in this magazine cover. Its is done by arranging items (in this case the heads) on the page in circular pattern. Note the distribution of red coloured text contributes to the radial pattern. The effect of this is… **- it makes the cover interesting and distinctive** **-it adds contrast : the radial balance v. rectangular page**		**Explain why the designer has used radial balance in this double page spread, rather than symmetrical or asymmetrical balance.**
Negative Space	Negative space is the space around and between the subject(s) of an image. It is more than just white space because it is used to communicate information.		The negative space in this example is actually the dog. The cat etc… is the positive space (because it would be printed). The dog is not white space because it is used to communicate information and not to give the viewers eyes a rest	FedEx Corporation	**Explain how the FedEX logo uses negative space?**
Silhouette	Negative space is the space around and between the subject(s) of an image		A dramatic effect create by a clear outline and black filled image in this case the soldiers against the sky.		**Describe two ways the designer has used silhouette to enhance this Film Poster.**

DESIGN ELEMENTS AND PRINCIPLES continued

Element or Principal	Definition	Example	Effect	Exercise Image	Exercise
Golden Ratio	A grid (also drawn as spiral) that divides the page and helps define an aesthetically pleasing layout. The spiral leads the eye to the main focus of the page at its centre.		**Making use of the Golden ratio makes the layout more pleasing to the eye. The reason for this is it mimics the ratios, found in nature e.e a sea shell.**		**Explain how the figure emphasises the golden section used in this picture?**
Rule of Thirds	The important features are placed in the points where the grid lines cross		The effect of using the the rule of thirds is to draw the eye to these points on the page. Designers will position the things that grab the viwers attention in these potions. They may also place apeice of information they want the consuemer to remember.		Explain 2 ways in which the rule of thirds has been used in this Poster
Pace	Techniques used by the design-er can slow down or increase the speed with which a message is communicated. An advert on the side of a bus will have large text and eye catching images getting the message across quickly. A newspaper article would have a slow pace. If you identify rythym in DTP item pace is how fast or slow it is.	 	The often designer uses pace to create a certain feel on the pae and/or to communicate with a particular audience. An DTP document with quick pace wil often appeals to youthful audience or be about a subject that is fast pace, for example racing or superfast broadband.	Sketch a thumbnail of an article that you think has a fast pace.	Explain what it is about the layout that that gives it a fast pace
Dynamic Effect	Manipulating images like those below and text along a path are some ways of increasing the movement or flow on a page. These create what are known as dynamic effects		These additional effects added by a designer in a DTP package will create, interest, movement and excitement in a DTP document		Explain why the designer has used dynamic effects in this image and how it improves communication with the target Audience

Exercise J



Exercise K

Read the Course Assessment Specification Document before attepting this question

Select the annotation that would be worth marks in a higher
or advanced higher examination

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_____

Add a piece of annotation about a DTP feature that has been missed

_____

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Instead of 'consistent' colour scheme (top right annotation) what should have
been written?

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Appendix 1 SQA terms for exam purposes

Essential Information and Definitions supplied by SQA to be used in exam answers

3D CAD Terms

Texture mapping	Bump mapping	Specularity	IBL
Applying a texture to the surface of a 3D CAD model, to represent a real material. Often used in conjunction with bump mapping.	A method of suggesting that materials have a rough or tactile surface, whilst not increasing the polygon count.	The reflective capacity of material to create 'rings' of light reflection.	**Image Based Lighting** simulates how light and shadow from a real environment would interact with a 3D CAD model.

HDRI	Volumetrics	VRML	3DS
High Dynamic Range Imagery creates multiple exposures of an image and combines them to enhance colour and shadow.	A method of giving a light source a sense of volume or substance. For example, light streaming through a stained glass window.	**Virtual Reality Modelling Language** – a method of passing 3D CAD data to programmes for testing or simulation.	A file type containing 3D data, widely used in 3D animations or illustrations.

STEP/IGES	CFD	FEA
STEP and IGES files are a method of sharing 3D CAD components and assemblies between CAD platforms. Widely used for stock or library components.	**Computational Fluid Dynamics** – a method of testing how well a 3D CAD model would pass through a liquid or gas (or how the liquid or gas would pass the 3D CAD model).	**Finite Element Analysis** is a method of testing the strength and mechanical properties of a 3D CAD model.

Continued on the next page

Printing and Production Terms

3D printing	CMYK	RGB	DPI
3D printing a method of converting 3D CAD data into a physical object, by 'adding' material, rather than cutting.	**Cyan, Magenta, Yellow and Key** (the key colour is usually black) are used in commercial printing systems, as they allow a greater range of colours and appear more natural.	**Red, Green, Blue** is used in electronic displays and works by mixing the three colours to generate secondary and tertiary colours.	**Dots-Per-Inch** is a method of describing the resolution for printing. The higher the number, the sharper and better quality the image is.
PPI	**Overprint**	**Additive colour**	**Subtractive colour**
Pixels-Per-Inch is a method of describing the resolution of a screen. The higher the number, the sharper and better quality the images can be on a screen.	Printing beyond the required region to ensure the layout will appear edge-to-edge printed after being cut.	When colours are added together through an electronic display, the result will be white, due to the light emitting rather than being reflected by the sun/room light.	When colours are added together through a print, the result will be black, due to the light being absorbed rather than reflecting.

Motion tweening	STL	CAM	Tool path generation
A method of animating 2D or 3D CAD, by specifying the start and end positions of a graphic, and allowing the computer to plot the animation.	**Standard Tessellation Language** – 3D file format used to manufacture 3D CAD models in 3D printers or other CAM equipment.	**Computer Aided Manufacture** is technology used to take 2D or 3D CAD data and machine the shapes or forms from a material.	Software used to plan the movement of cutting or shaping tools in CAM systems.
Screen printing	**WMV/AVI/Quicktime**	**Motion-capture**	**Stop frame**
A cost-effective method of creating large prints of moderate volume. Typically used for advertising banners or T-shirts.	WMV, AVI and Quicktime are all movie formats.	A method capturing physical data about the movement of a person, animal or object and applying it to a 3D CAD model.	A method of animation, relying on shooting individual frames of a graphic and combining them. Typically 25 frames are required for 1 second of animation.

References and acknowledgements

References

Acknowledgements

This set of notes would not have been possible without the work of P.Linton, A. Phee , N. Tait and a significant number of other technologies teachers across Scotland. Their commitment to understanding curriculum content, developing resources and engaging in appropriate pedagogy in supporting the young people in our educational establishments is part of what makes teaching in Scotland such a positive and collective experience.