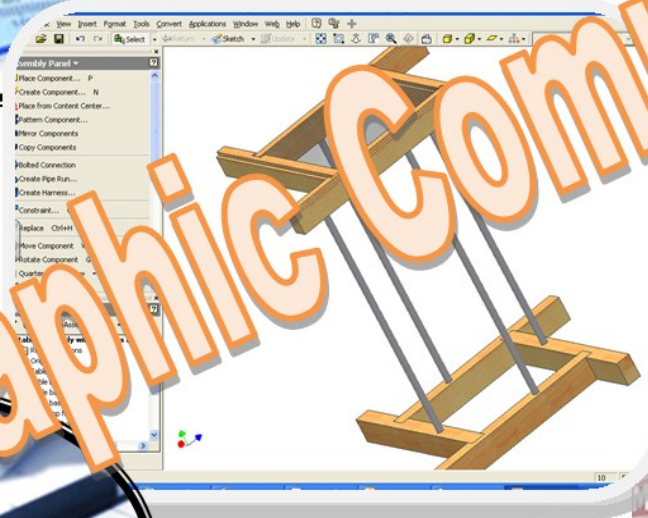


Faculty of
Business Education, Computing Studies & Design Technology



Graphic Communication



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Foreword:

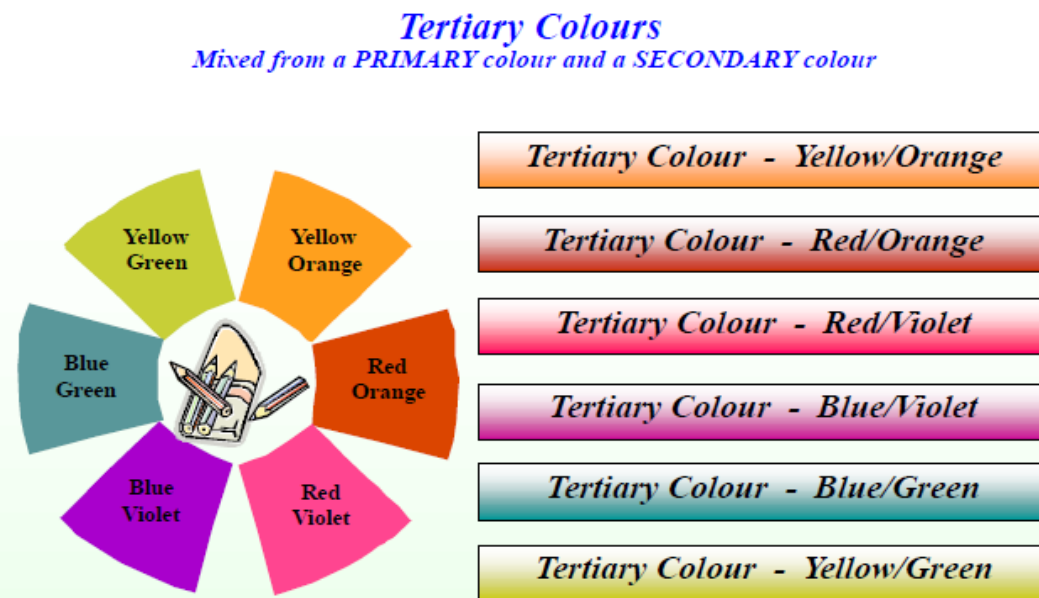
This book is a compilation of information sheets available from various sources. Some are available on the internet however most have come from other schools. Having an in depth knowledge and understanding of the topics covered in this book should mean that you cope well with National 4/5 Graphic Communication. At the point of production there is no commercially published alternative. If a published textbook becomes available the Faculty will endeavour to purchase copies however it is expected that this book will remain an important part of the course. The staff may add additional pages at a later date. If possible pupils are in no way discouraged from purchasing their own textbook. Please use this book to find the answers to both classwork and homework exercises. As the production of this book has been labour intensive for staff and led to a significant cost in **colour photocopying** to the Faculty, it is vital that it remains in excellent condition and on school premises at all times. **Please do not take it home.**

This book will also support pupils aiming for Intermediate 2 (S5 2013/14), and later, Higher.

We hope you find this book useful and appreciate the need to treat it with respect.

Mr Brown

The Colour Wheel



Primary Colours

RED **YELLOW** **BLUE**

All other colours are mixed from these basic three



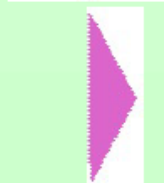
Secondary Colour - GREEN

Mixed from Yellow and Blue



Secondary Colour - ORANGE

Mixed from Yellow and Red

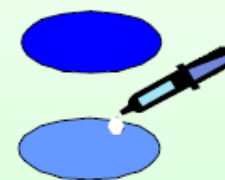


Secondary Colour - VIOLET

Mixed from Red and Blue

Tints and Shades

When WHITE is added to a colour it is called a **TINT** of that colour.
When BLACK is added to a colour it is called a **SHADE** of that colour.



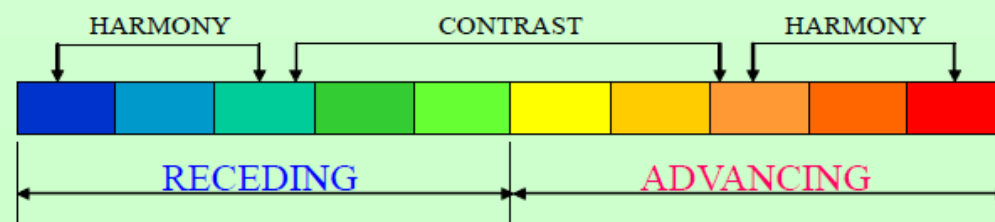
TINT



SHADE

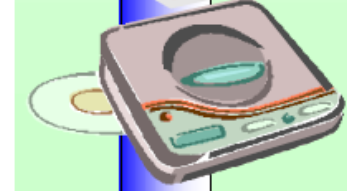
Receding, Advancing, Harmony and Contrasting Colours.

Cold colours are said to be **RECEDING** colours
Warm colours are said to be **ADVANCING** colours
Similar colours are in **HARMONY** : Opposites are in **CONTRAST**



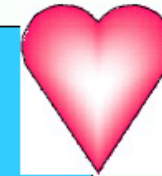
Colour Choices

Display, Flash Bars & Signs



Colour selection for a product is guided by the function of the product, the environment in which the product will be used and the market for which the product is intended.

- Red:** Great power of attraction. Hot, bold, exciting, festive, passionate and positive. Can be associated with rage, aggression, danger, courage and speed.
- Yellow:** Most easily seen, luminous, bright, pleasant, happy, sunny, lively and cheerful.
- Blue:** Formal, cool, sophisticated, aristocratic, serene, passive, elegant and reliable.
- Orange:** Sunny, cheerful, warm and happy.
- Green:** Restful, fresh, cool, soothing, natural and informal.
- Purple:** Rich, pompous, impressive and regal.
- Violet:** Cool, negative, retiring subdued and solemn.
- Grey:** Neutral, sedate, dignified and inconspicuous.
- White:** Luminous, positive, light delicate and clean.
- Black:** Subdued, solemn and profound.
- Brown:** Safe, reliable and earthy natural.



Flash Bars

Flash bars are used to make the subject of a display more prominent and eye catching

i. e. the perfume bottle shown opposite has three different 'flash' bar shapes. The shape of the flash bar is the designers choice.

In the cases opposite a blue 'gradient' bar was used because it recedes into the background.



PROHIBITION



MANDATORY



SAFE CONDITION



WARNING

DTP Page Layout



DTP Features

Alignment

Alignment can be applied in two ways.

Text Alignment The alignment of text within a text box. This can be left, centre, right, or justified.



Element Alignment The alignment of elements on a page.



Bleed

Any text or graphic element touching the edge of a page is called a bleed. Often done intentionally for non-text objects.

Caption

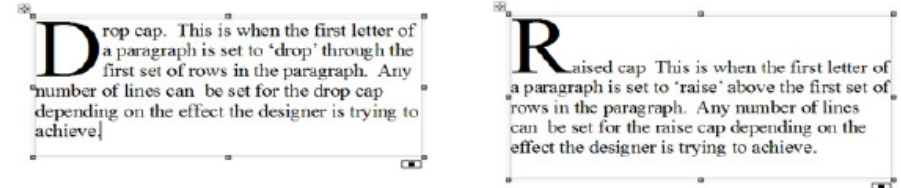
Text placed under an illustration to describe it.

Crop

To cut the edges of an illustration or image to fit in a given space or to show a particular detail.

Drop cap

This is when the first letter of a paragraph is set to 'drop' through the first set of rows in the paragraph. Any number of lines can be set for the drop cap depending on the effect the designer is trying to achieve. The opposite effect is Raised cap. In the examples below both the drop and raised caps are set to 3 lines.



Drop Shadow

This gives the effect of a shadow behind text or a shape. The shadow can be altered to appear anywhere around the selected element and any distance from the element.

Drop Shadow

Design Principles

These help us design a DTP page layout to make it easy for the customer or user to read.

Contrast - This enables us to communicate between elements on the page. Such as contrasting colours to make something stand out or contrast in size to make something seem more important.

Unity - This is about making items that relate to each other look similar visually. Such as making a headline and subheadings the same colour or font style in an article.

Dominance (Emphasis) - This is about giving an article or information graphic a focal point. Making an important feature stand out and "catch the readers eye".

Depth - This is about using images or shading to create the visual perception of depth (3D). Such as using drop shadow on text or using gradient fills on backgrounds/shapes.

Design Elements

These help us design a more interesting DTP layout or information graphic.

Lines - can be used to underline important items or, to separate two items on the page.

Shapes - these can be used to draw attention to items on the page (shapes of colour behind text or bullet points).

Space - White space on a page can separate items or help balance a page.

Colour - *Colour theory* can be used to make a page more dramatic, exciting, relaxing, warm, cold etc...

Fonts

Fonts are an integral part of desktop publishing. Historically, font refers to a specific typeface in a specific point size and style. Therefore, Times New Roman Bold 12 points is a single font while Times New Roman 10 points is another separate font. Today, in common usage font refers to any digital typeface that can normally be rendered in a variety of sizes.

Footer

Any information that's repeated in the page's bottom margin.

Guidelines/Guides

Non-printing lines, often dotted, that aid in flow and alignment of text and positioning of graphics during page layout are known as **guides**. Most desktop publishing software applications allow the user to drag guides onto the page or position them precisely using a dialog box. Groups of guides form a grid. There are three types of non-printing guides: margin guides, column guides, and ruler guides. Guide may act differently depending on if they are placed on master pages or regular publication pages in the document. Ruler guides can also be used on the pasteboard to align objects before moving them onto the page.



Gutter

The blank space between two columns of text is the **gutter**. Sometimes a **column-rule** is placed in the gutter, especially with close-set columns, to help keep the reader's eye from jumping the gutter over to the next column.

Header

Any information that's repeated in every page's top margin.

Heading

The name of the article or the headline on a page.

Handles

The small rectangles or circles that surround a selected shape or text box. By clicking and dragging on these you can alter their shape and size.

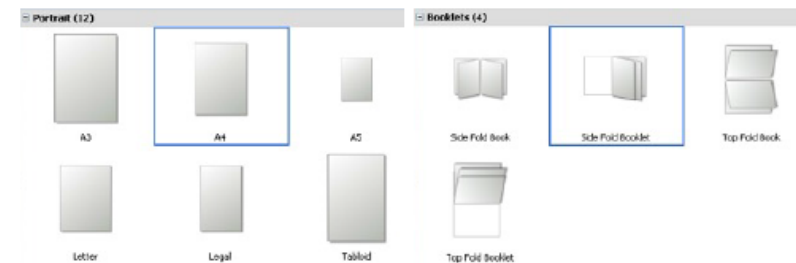
Margins

The margins (top, bottom, and either side) is that (usually) empty space between the trim (where the page is cut) and the live printing area (primary text and graphics) of the page. Sometimes headers or footers may be placed within the margins.



Page Format

DTP layouts can be either single page format (like an informational graphic) or multi-page format (like a magazine or booklet).

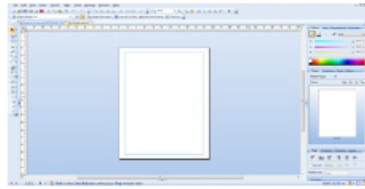


Single page format

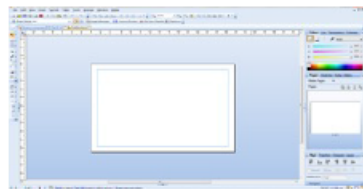
Multi-page format

Page Orientation

There are two ways a page layout can be set Portrait and Landscape. Both pages shown below are A4 size.



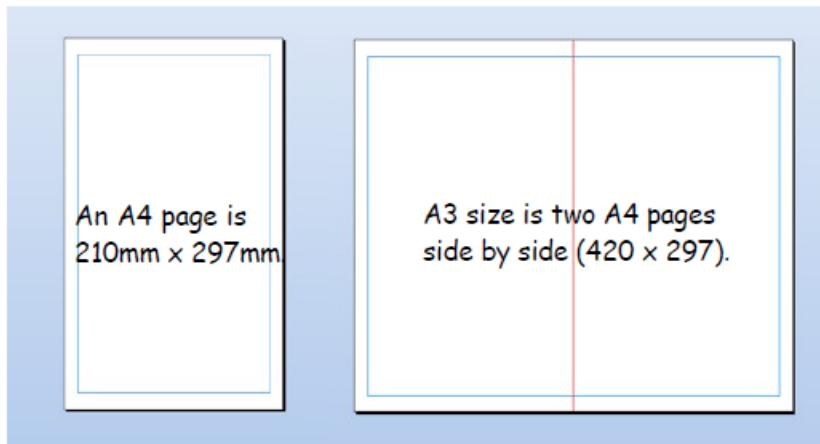
Portrait



Landscape

Page size

There are several sizes of page. The most commonly used page sizes in schools are A2, A3, A4, and A5.



Reverse

The technique of printing white or light coloured text on a black or dark background for emphasis.

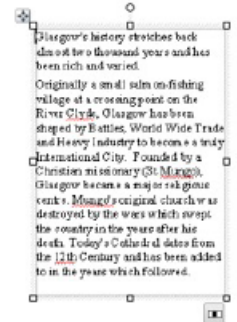
Rule

Horizontal or vertical lines used in design for separating sections or merely provide graphic elements for decoration.

Text format

As well as alignment, there are several styles of inputting text in a DTP layout.

Body text Sometimes called extended text. This style is restricted by the shape of the *text box* and is used to form columns for an article.



Free flowing text Sometimes called artistic text this style of text is not restricted by a box or shape. As such it can be altered in many more ways than *body text* and is very useful for *headings*.

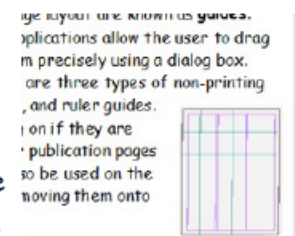
Text Column

Body text that is displayed in side-by-side columns. The text flows from the bottom of one column to the top of the next column of the article.



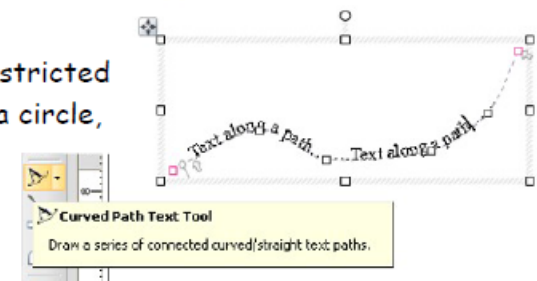
Text wrap

Used when you want text to "wrap" around a graphic or pullout quote. A text wrap is most commonly rectangular, but may also be tight to a cropped image or irregular shape.



Text along a path

The *free flowing text* is restricted by following a path such as a circle, wave or other shape.



Title

The main heading on a front cover or information graphic.

Transparency

This is where an image or shape can be altered to be "see through". The image can be altered uniformly or as a gradient. Very useful for creating **watermark** images on a background or blending an image into a background (gradient transparency).

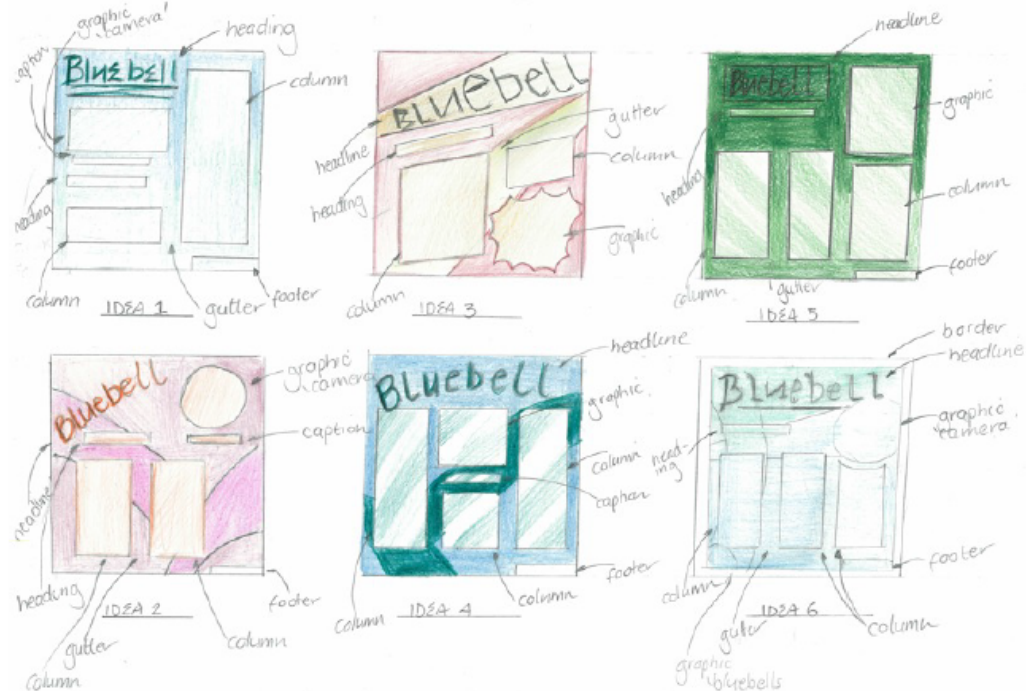


Solid Transparency (uniform)

DTP Planning and production drawings

- **Thumbnails** A variety of quick sketches which show basic layout of proposed ideas. Thumbnails should have splashes of proposed colour schemes and annotation (notes on layout features such as images, columns, heading, header, footer etc...)
- **Working Rough** A sketched version of the final product featuring some annotation and representations of all images to be used. This would be the final proposal shown to a client.
- **Visual** An accurately drawn version of the final DTP proposal to aid the computer generation of the document. This should have accurate notes on the sizes and style of text to be used, as well as accurate sizes to position images etc...

Examples of annotated thumbnail sketches



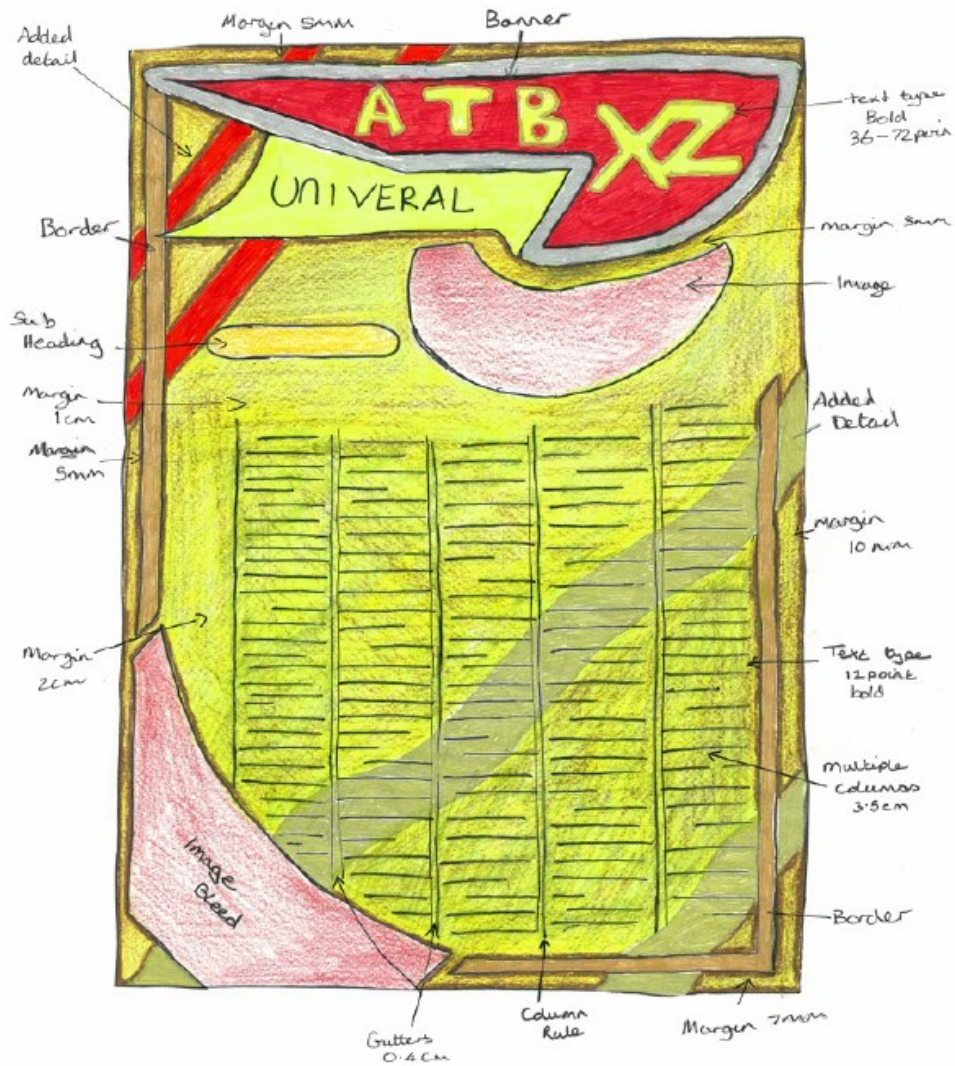
Watermark

A Graphic/Text that is semi-transparent overlaid or behind text or another graphic.

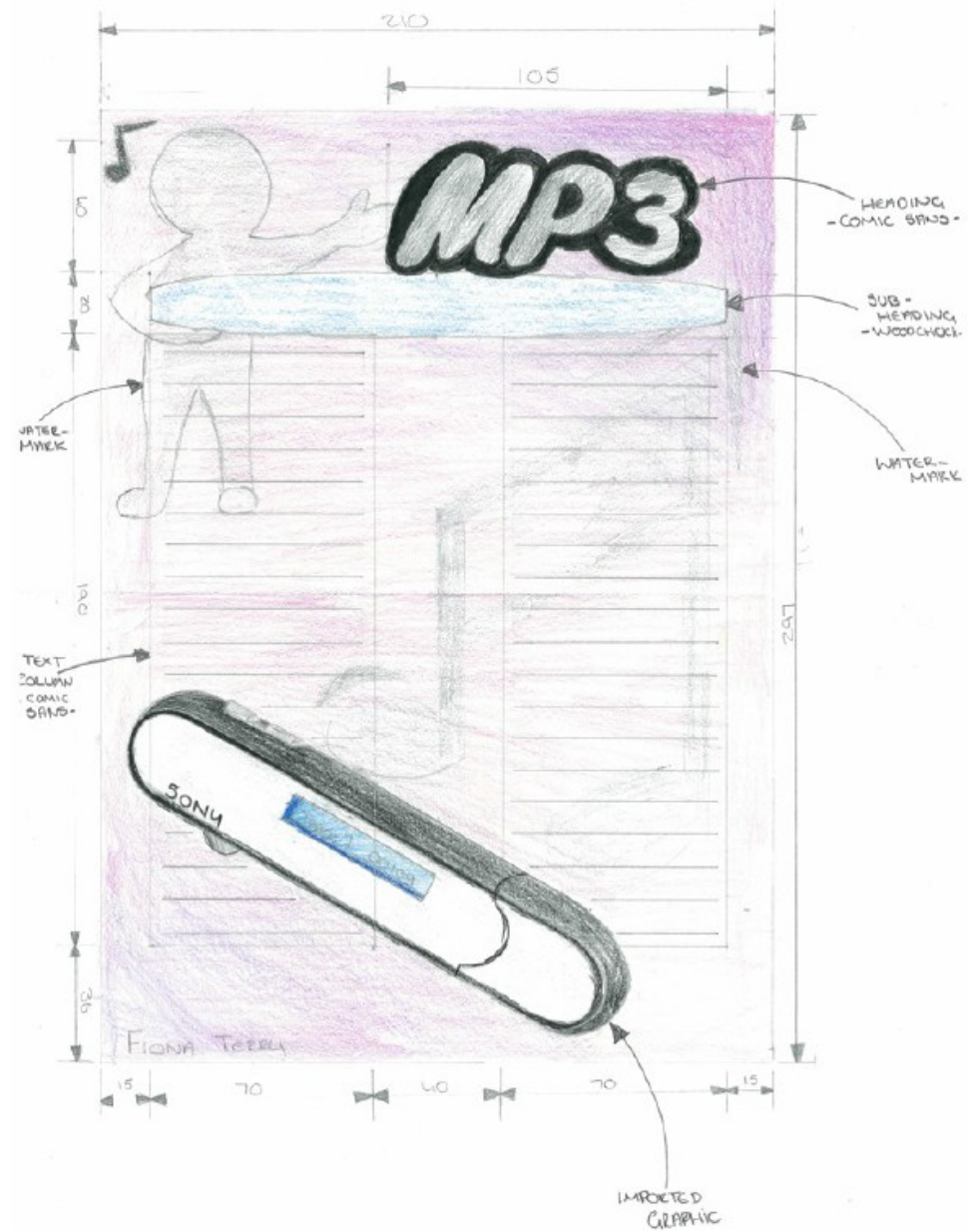
WhiteSpace

Areas on a piece which are free of type, graphics, and photos. White space is important in good design. It makes a DTP layout easier to read and can help make a busy layout less intense or help the visual balance of a layout.

Example of annotated working rough sketch



Example of accurate visual drawing



Common Computer Terms often used in DTP

Application Software

Software that has been specially written to carry out a certain task to solve a specific problem.

CAG Changing and altering pictures and basic text (posters / adverts).

CAD Line drawings of objects used for engineering drawings.
(Orthographic and Pictorial working drawings)

3D Modelling Computer generated 3D models from the line drawings.
(Animation & simulation)

DTP Changing, altering and arrangement of text and pictures
(magazine pages, leaflets).

Illustration & Presentation Changing and altering pictures and graphics
(e.g. photoshop).

Word Processing Changing and altering text. (Letters, reports etc..)

Spread Sheet Adding and altering statistical information. (e.g. Excel)

Back-up

Making a second copy of a computer file. In case the working copy is damaged the back-up files can be retrieved and used. Back up files are often stored on alternative storage devices, such as USB keys.

Copy/Paste

An image or text is copied onto the clipboard. The original stays in place. The object can then be pasted (inserted) from the clipboard.

Cut/Paste

As per copy/paste except that the original object is removed.

Export

Saving a copy of a file as a different filetype so that the file can then be used by an alternative computer program.

i.e. A CAD drawing file (.dwg) can be exported as a windows metafile (.wmf) and can then be imported into a CAG program.

Fill

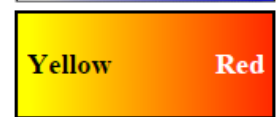
- **Solid Fill** Fills an object with colour.



- **Gradient fill** A fill that goes from white to a solid colour uniformly. A Gradient fill shows the *tonal range* of a colour.



- **Colour gradient fill** Goes from one colour to another uniformly.



- **Tonal Scale** This is similar to Gradient fill. A fill showing a colour becoming lighter or darker.

- **Highlights** Using Gradient or Colour Gradient fill to simulate the effect of light hitting a surface or an edge of an object.

Grid

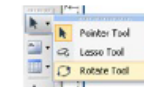
All CAG systems provide 'transparent' grids; patterns which appear on the screen as construction aids but do not form part of a drawing.

Hard copy

Simply means any copy of drawings produced as a plot or printout.

Import

To bring in a copy of a graphics or text file. Such as an image or text for use in a DTP layout.



Rotate

The designer can manipulate a shape, image or text box turning it to any angle. Some DTP software programmes have 'quick' rotate buttons for set angles such as 90°.



Undo

Means to reverse the last command.

Colour Theory

Primary Colours

Red, Yellow, Blue

Secondary Colours

mixing two primary colours
(Green, Orange, Violet)

Tertiary Colours

Mixing a primary and secondary colour
(Red-Orange, Red-Violet, Blue-Violet, Blue-Green,
Green-Yellow, Yellow-Orange)

Harmonising

These colours are close together on the colour wheel.
The effect is easy on the eye (a relaxing image).

Contrasting

These colours are far apart on the colour wheel.
Colours that are exactly opposite are said to be
complimentary colours. The effect is eye catching as
they stand out (a dynamic image).

Warm Colours

Red, Yellow and Orange make people feel warm. They
are also known as *advancing colours* as they make a
room feel smaller.

Cool Colours

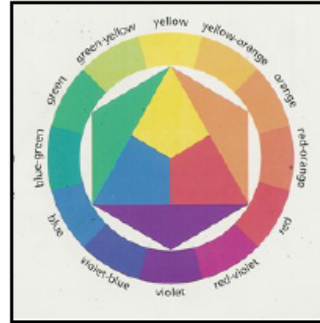
Blue, Violet and Green make people feel cool. They are
also known as *receding colours* as they make a room
feel larger.

Tint

Adding White to a colour giving a more calming effect.

Shade

Adding Black or Grey to a colour giving a more
dominating effect.



Colour Psychology: Moods and Representations

Colours can make us feel differently and also represent certain aspects of society. Some colours have different representations depending on which part of the world you live in (i.e. Black reminds most Britons of death or un-happiness, however in Russia Black represents power and authority).

Red

Exciting, Dangerous, Passionate, Revolutionary, Active,
Aggressive, Vibrant, Courageous, Festive.

Green

Restful, Natural, Fresh, Calm, Soothing, Informal, Quiet.

Violet

Solitary, Peaceful.

Purple

Rich, Luxury, Pompous, Royal.

Blue

Elegant, Formal, Reliable, Sophisticated, Heavenly, Water.

Orange

Energy, Happy, Sunny, Cheerful.

Yellow

Happy, Sunny, Lively, Bright.
(the most easily seen colour)

Grey

Dignified, Comfortable, Boring.

Brown

Natural, Calm, Safe, Reliable, Good.

Black

Death, Dramatic, Powerful, Authority, Sophisticated, Elegant.

White

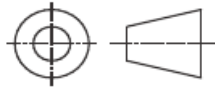
Pure, Hygienic, Angelic, Snow.

Drawing types

There are two main groups of drawings - Orthographic and Pictorial.

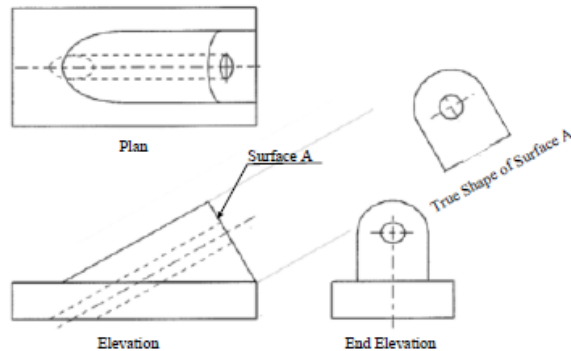
Orthographic Views

These drawings are commonly used as production drawings. They contain exact dimensions and are drawn to an exact scale. They are easily recognisable by the third angle symbol.



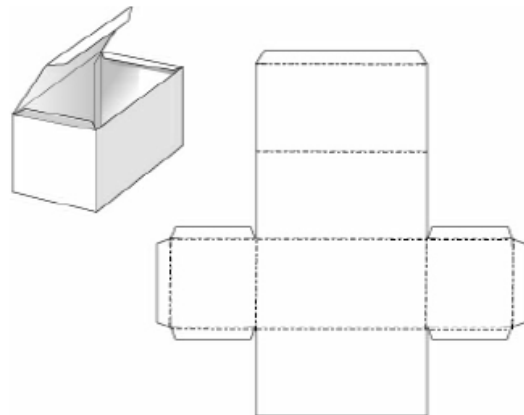
Orthographic Projection :

(Elevation, Plan, End Elevation, True Shape).



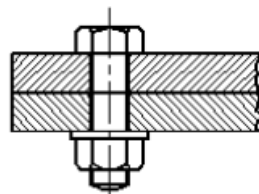
Surface Developments (Nets) :

This type of orthographic is very common. Developments are needed when an object is to be folded up to create a hollow form (like a box). Remember to add fold lines to show how the development folds!



Sectional Orthographics :

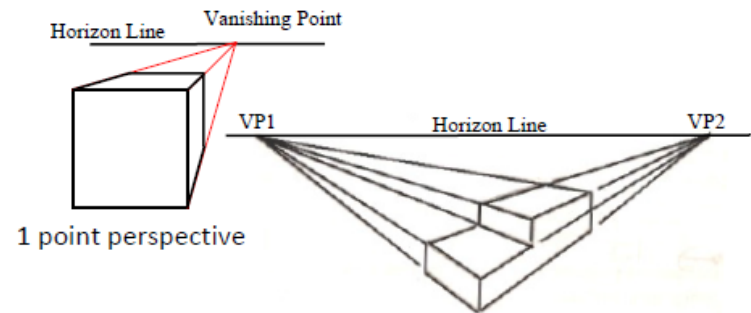
A sectional view shows the inside of an object. They can show how components join together.



Pictorial Views

Perspective :

There are two types of perspective views. They give a 'realistic' view of an object or building. Often used to promote or advertise an item.

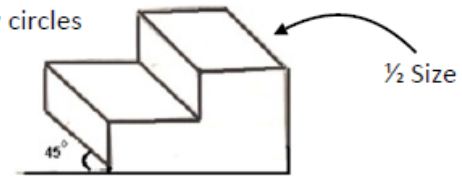


1 point perspective

2 point perspective

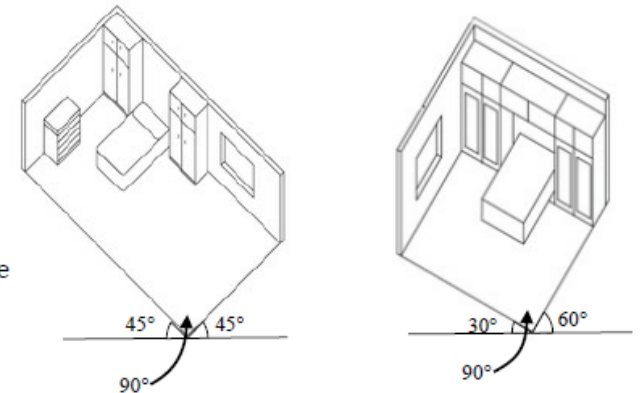
Oblique :

The main advantage of an oblique view is that the initial drawing is 2d. This allows us to easily draw circles before extending the shape back to give a depth. All depth sizes are drawn half size to ensure the drawing looks more realistic.



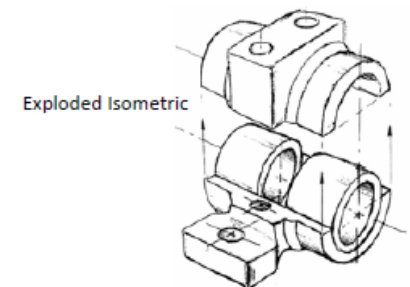
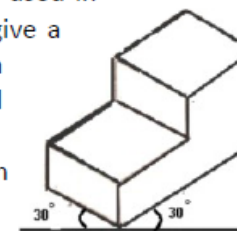
Planometric :

The internal angle of planometric drawings is 90°. There are two types of planometric view. They are mainly used to show the inside arrangement of rooms.



Isometric :

Isometric views are often used in engineering as they can give a very clear view of how a component or object will look. This is especially so with exploded views which help show how several components are assembled together.



Location / Building Drawings

Promotional Drawings :

This type of drawing is used to advertise and promote a property. Usually a perspective drawing (like the one shown below). Sometimes drawn by hand although computers are being used more often as the software technology advances to produce realistic views.



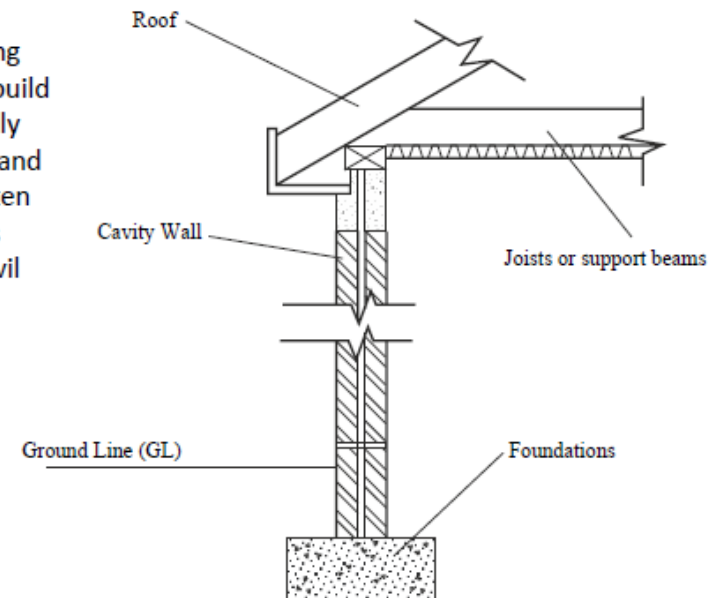
Elevations :

These are orthographic views to show how a building will look from the front (like the one shown) or, either side or, the back.



Sectional Views :

A sectional view of a building shows the materials used to build the building. They are usually orthographic sectional views and building plans (blueprints) often have several sectional views drawn by the architect or civil engineer to aid construction.



Scales are used a great deal in building drawings. They are used in three main areas, Floor plans, Site plans and Location plans. Each of the three types of drawings have preferred scales.

| Type of Drawing | Floor Plans | Site Plans | Location Plans (Block Plans) |
|------------------|---------------|----------------|------------------------------|
| Preferred Scales | 1:50 or 1:100 | 1:200 or 1:500 | 1:1250 or 1:2500 |

Location Plans (Block Plans) :

A *Site Location Drawing* or *Block Plan* shows where the site is located within the local area. It shows roads, outlines of buildings, site/plot boundaries, and often show land contour lines.

The block plan below shows where a bungalow is to be situated within the surrounding area. It is normally drawn to a scale of 1:1250.

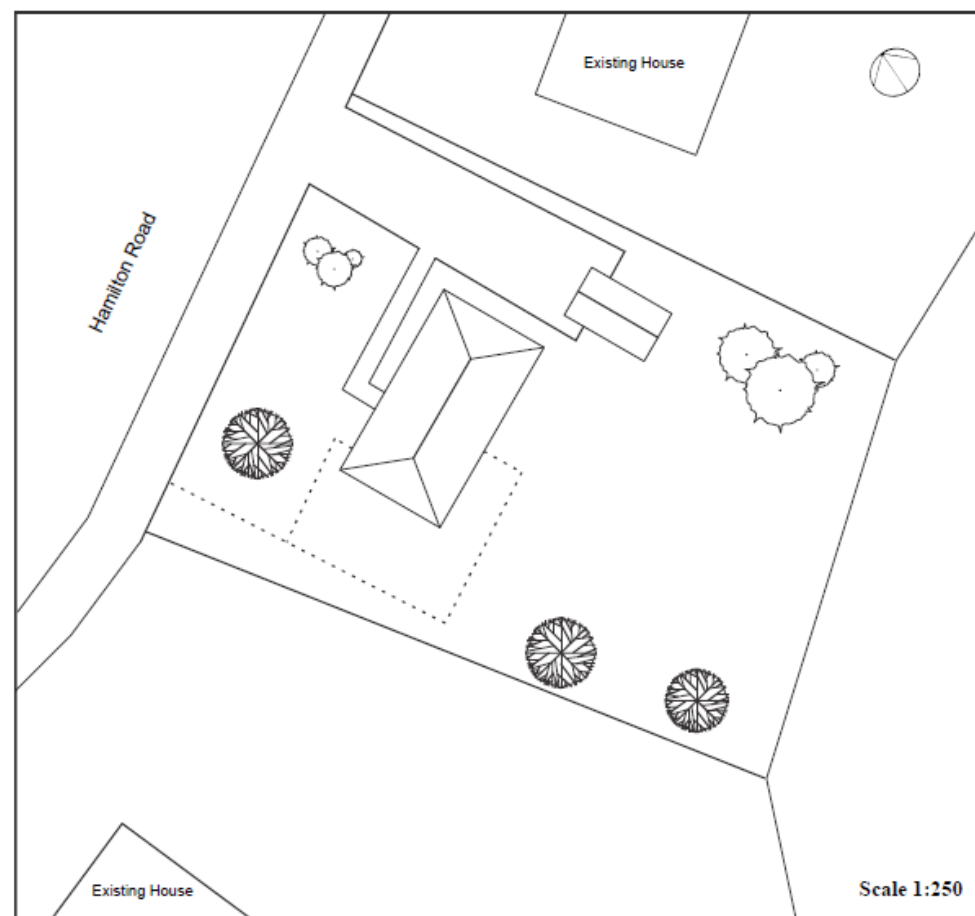


North Point indicator and scale.

Site Plans :

This type of drawing is concerned with one or more buildings which are within the same area and shows these buildings within their own site (or plot) boundary.

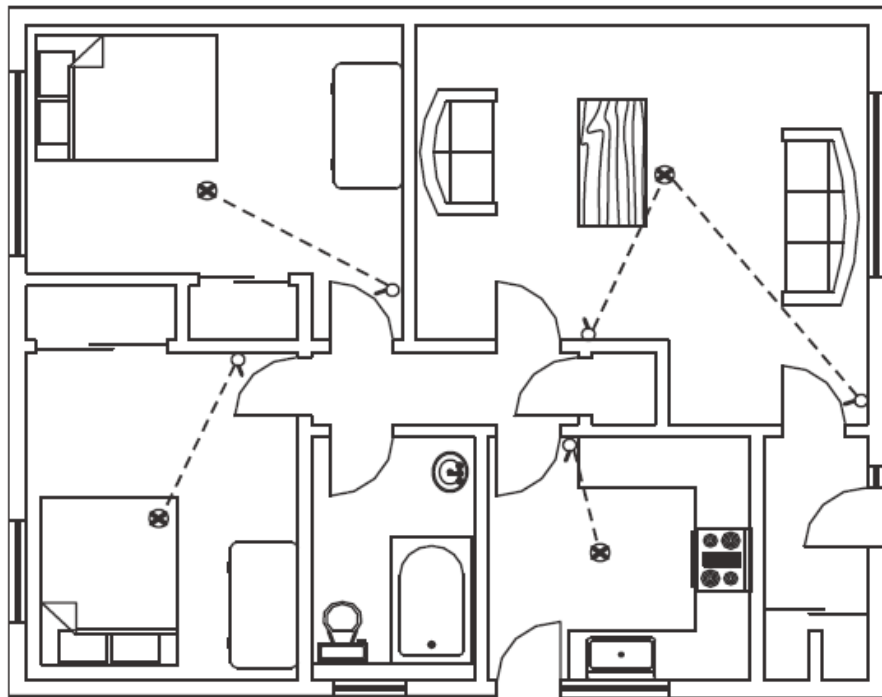
The buildings are shown as outlines and boundaries are marked slightly darker. The scale and the north point are both indicated on the drawing. The site is numbered (usually as plots). Waste pipe runs, manholes and trees are also indicated. Important dimensions are shown.



Floor Plans :

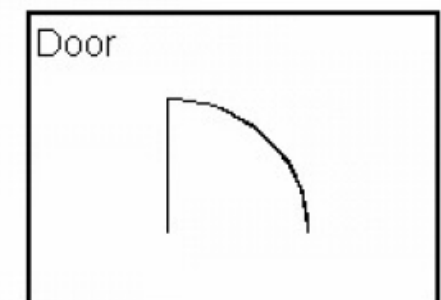
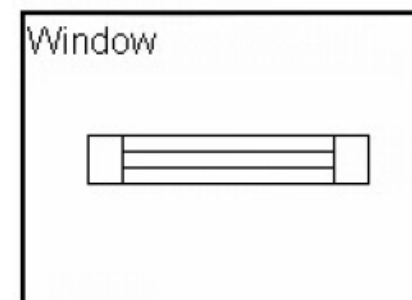
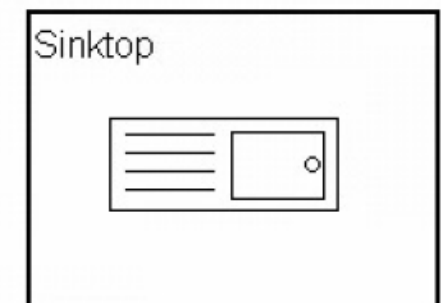
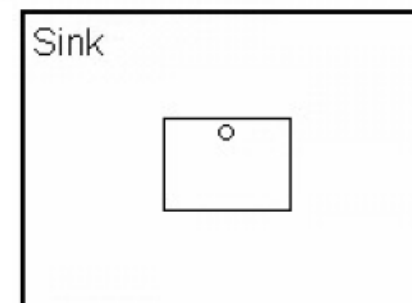
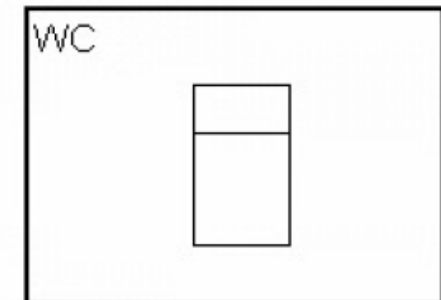
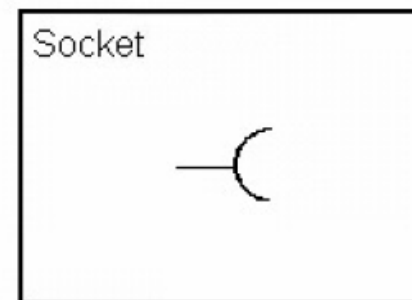
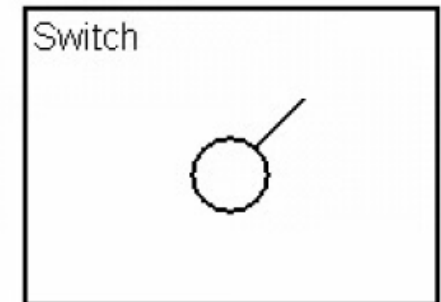
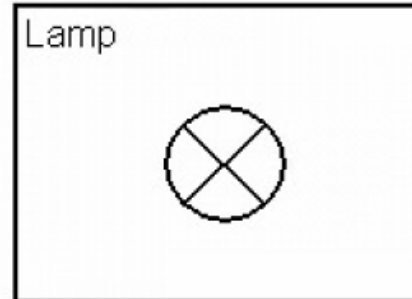
This type of drawing shows the layout of the rooms inside the building and the position of the doors, windows and important fittings like a bath, sink and toilet.

Architects drawings usually have several **layers** to show different types of fixtures and fittings. Such as plumbing, electrical wiring etc....



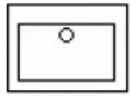
Drawn by: David Sommerville
Earnock High School

Common BSI Symbols

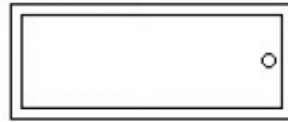


BSI Symbols - Continued

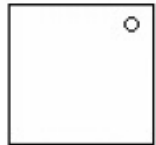
Wash Basin



Bath



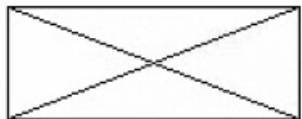
Shower Tray



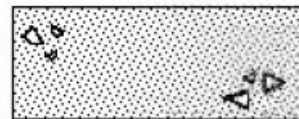
Radiator



Sawn Timber



Concrete



Insulation



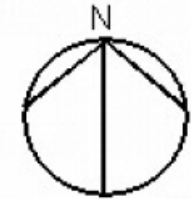
Brickwork



Hatching



North Symbol



Hazard/Warning
(Black border & Yellow background)



Safe Conditions
(White writing & Green background)

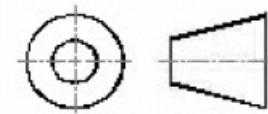


Mandatory
(Blue background & White writing)



Prohibitory
(Red border and slash & White background)

3rd Angle Projection
Symbol



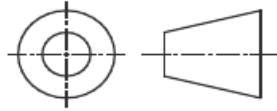
Kite mark
British Standards Institute

Orthographics

Orthographic projection is used in engineering and architecture to show the 3 main views of an object, (Elevation, Plan, End elevation).

Third Angle Projection Symbol

The use of the third angle projection symbol informs the reader of the drawing it has been carried out in this projection. All **orthographic** drawings should show this symbol. This standard is recognised throughout the world.



Types of line used

Outlines

Continuous thick lines used for visible outlines and edges.



Construction Lines

Continuous thin lines used for projection and dimension leader lines.



Hidden detail

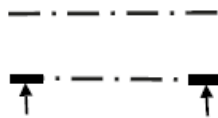
Dashed thin lines used to show hidden outlines and edges.



Chain Lines

There are two types and uses,

1. Used for centrelines and lines of symmetry
2. Chain lines with thickened ends used to show sectional cutting planes.



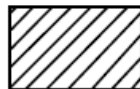
Fold Lines

Chain lines with a double dash used to show folds or bends.



Hatching

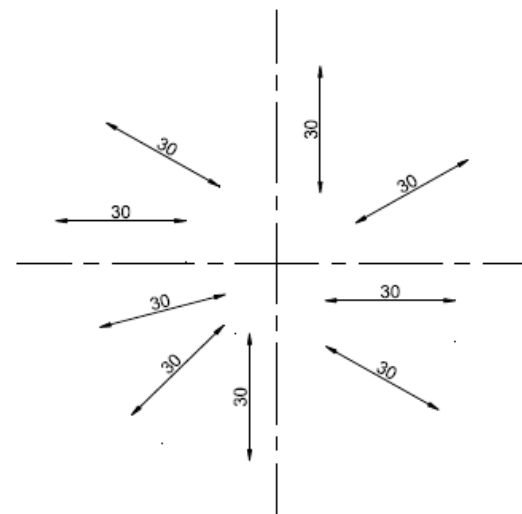
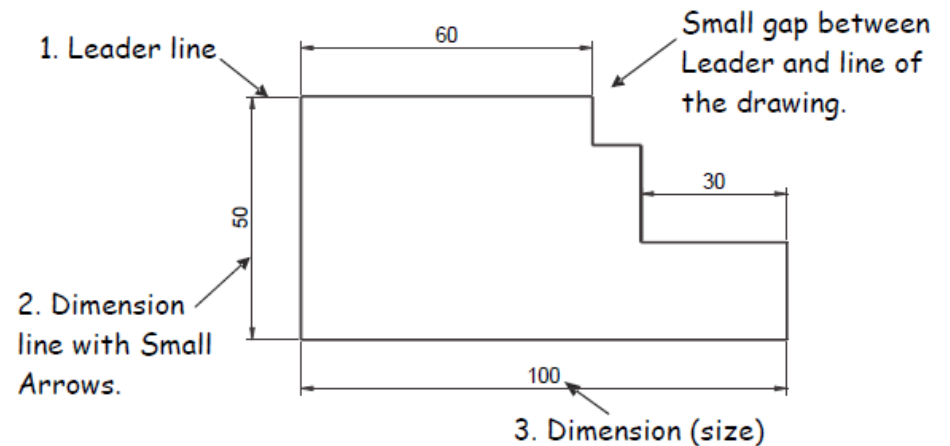
45° lines that show a part has been sectioned (cut through). **See sectioning.**



Dimensioning Lines

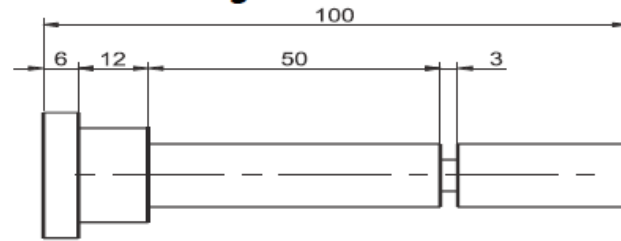
There are three parts to dimensioning lines.

1. Leader Lines, showing the beginning and end of the measured area. They do not touch the measured part.
2. Dimension line, start and finish with arrows touching the **leader lines**.
3. The Dimension. This is the measured size which sits on top of the **dimension line** in the centre.



Note the position of the dimensions on each of the lines is always on top and centred.

Dimensioning — Continued

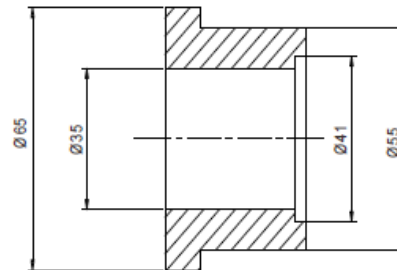


All sizes in mm

Notice on the above drawing that the largest dimension is placed on the outside of the smaller dimensions. It is also important when dimensioning not to include the units of measurement. As can be seen from the drawing above, state on the drawing the unit of measurement. i.e. (All sizes in mm).

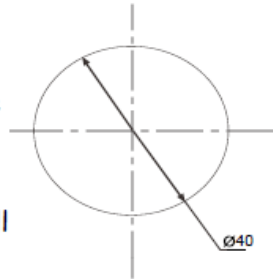
The sectioned drawing opposite is of a round item. It shows some possibilities for putting a diameter on a drawing.

If the item shown was **Square**, then the following symbol would be used $\square 65$ replacing the diameter symbol.



Diameter (dimensioning a circle)

Diameters should also be dimensioned by a dimension line that passes through, or is in line with, the centre of the circle. The dimension line should have two arrow heads, which touch the circle. The symbol Ø is placed in front of the dimension. Small circles may be dimensioned similar to a radii with one arrow head touching the outside of the circle.



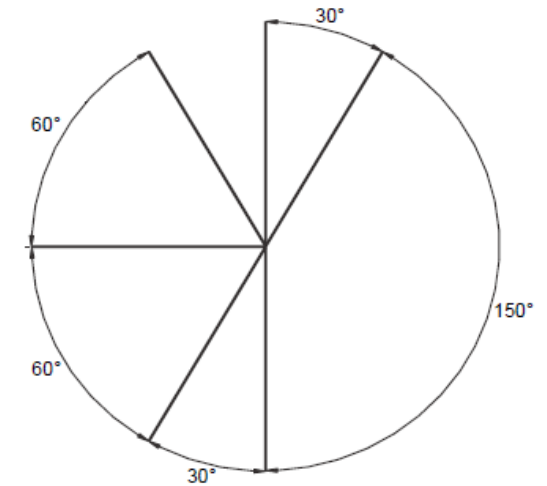
Radius (dimensioning an arc)

Radii should be dimensioned by a dimension line that passes through, or is in line with, the centre of the arc. The dimension lines should have one arrow head only, which touches the arc. The symbol R is placed in front of the dimension.



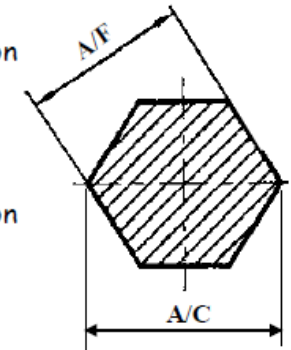
Angular Dimensions

Leader lines show the extent of the angle. The dimension line follows a curve with arrow heads touching the leader lines. The angular distance is placed outside of the dimension line.



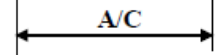
Across the Flats (A/F)

The distance across the flat sides of a hexagon or an octagon.



Across the Corners (A/C)

The distance between the corners of a hexagon or an octagon.



ASSY

An Abbreviation of the word Assembly.

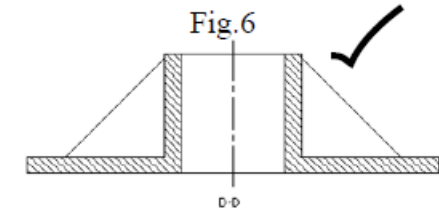
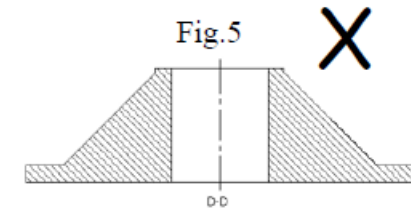
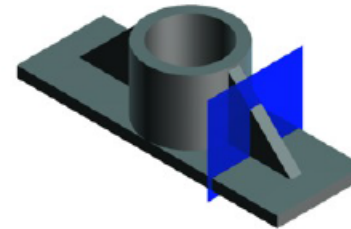
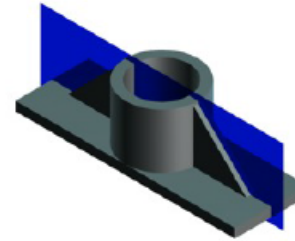
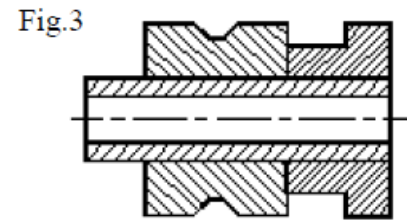
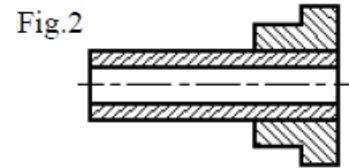
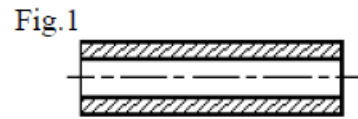
CL or CL

An Abbreviation of Centre Line.

Sectioned views

BSI hatching sectioned or "cut" objects is always at 45° and evenly spaced (fig.1)

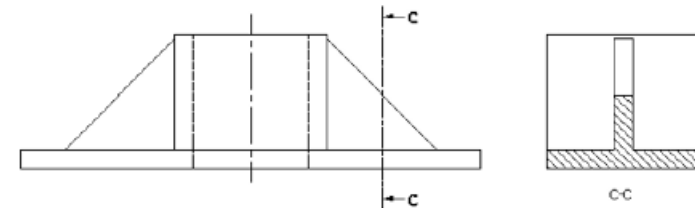
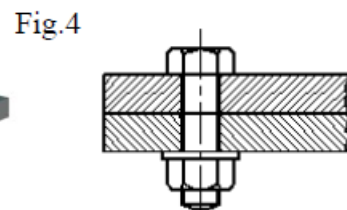
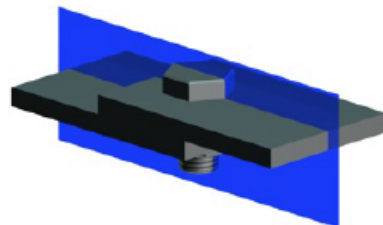
Hatching an object with more than one part is achieved by firstly changing the direction of the 45° lines (Fig.2) or if three or more parts are included the spacing between the 45° lines can be altered (fig.3).



BSI conventions state that some specific engineering parts included on an assembly Do Not Show hatching detail.

Parts that should not be hatched are; Nuts & Bolts (fig.4), Studs, Screws, Shafts or Axles, Keys, Pins, Gear teeth, Roller bearings, Ball bearings, Webs (fig.5 & 6).

There are some exceptions to this rule. Nuts & Bolts, Studs, Screws, Shafts or Axles, Keys, Pins, Gear teeth, and Webs are hatched when cut across their axis. Fig.7 shows a strengthened boss with the web cut across its axis.



Scales

Scaling drawings allow us to draw exceptionally large objects such as houses on any size of paper available to us. To enable this to happen we have to scale every size (dimension) by the same factor.

i.e. taking the example of the house, every dimension would have to be divided by say 100. By doing this we are scaling **DOWN** the size of the house.

We can also draw exceptionally small objects larger, examples of which are, the minute electronic chips which are now part of our every day life. They are so small we could not draw them as they are so we **SCALE UP** the drawing to be able to draw them.

1:1

When we create a drawing using the actual dimensions, this is called 'full size', or the drawing has been drawn to a scale of 1:1 (the drawing is exactly the same size as the item).

1:2

Scaling down is when we create a drawing and reduce all the sizes by a factor. I.e. A scale of 1:2, all dimensions are divided by 2. This makes the drawing half the original size of the item. If we reduced the items dimensions by twenty the scale would be 1:20 (divide all sizes by 20).

2:1

We can also increase the size of an object on a page by any factor. The scale 2:1 is stating that for every 1mm actual size of the object, 2mm have been drawn (the drawing is twice the size of the item). If we increased the item by 10 the scale would be 10:1 (multiply all sizes by 10).

With respect to Engineering drawings, there are recommended scales for reduction and enlargement. These are as follows:-

Reduction:- 1:2, 1:5, 1:10, 1:20, 1:50, 1:100, 1:500, and 1:1000

Enlargement:- 2:1, 5:1, 10:1, 20:1, and 50:1.

Advantages of CAD over manual drawing

- Drawings can be produced quicker and very accurately.
- Drawings are easier to edit/change.
- Repetitive elements, libraries of various parts can be created.
- Convenience of use (Lap top, tablet etc..).
- Standardisation. (see below)
- Drawings can be easily scaled up or down.
- Use of layers allows different parts to be drawn separately.
- Easier to store drawings (paperless office)
- Easier to send drawings to another location quickly.
- New designs from existing designs.

Limitations of CAD over manual drawing

- Overall cost of hardware.
- Overall cost of software.
- Continual need to upgrade systems to stay competitive.
- Risk of catching computer viruses.
- Staff training costs.
- System faults/crashes.
- Data loss security.

Advantages of computer aided modelling.

- An Accurate 3D image which can be rotated 360° in any direction.
- Allows the operator a view of an object from any angle.
- Animation can show the designer how the parts interact and can highlight any problems.
- Simulation programs are used in speciality areas such as pilot training.
- Computer generated imagery is used in the TV and Video industry.

Advantages of Standardisation

- Allows the creation of a library common parts recognised throughout an industry sector, such as BSI symbols.
- Allows users to recognise the industry standard throughout the world, such as BSI or paper size (A4,A3 etc..).

Common Computer Terms

Animation

Animation means "Bring to life". A computer manipulates electronic images to create moving images. The computer is giving the illusion of moving parts. This technique can then be used to show parts move together, like a car engine or a folding chair. Computer animation is also used for films such as 'Toy Story' and CGI film technology.

Central Processing Unit (CPU)

At the heart of the computer, it controls all processes that the computer runs.

Hard Drive

The main storage device in the computer which is not portable. Memory capacity is measured in terms of: Megabites (MB), Gigabites (GB) and Terabites (TB).

Hardware

The physical parts of the computer. Example: the case, disc drives, motherboard, Monitor, Printer, etc.

Modem

This is the device that allows the computer to connect to other computers either through a local intranet (direct cable links within the same area/office) or through the internet (via a router).

Screen Dump / Screen Capture

When a screen image is sent to a printer to obtain a hard copy, the resulting copy is a screen dump. Using the 'print screen' option on the keyboard an image of what is being viewed is copied onto the clipboard. This can be pasted into another program and saved as a screen capture.

Simulation

This is very similar to animation but with simulation the graphics react to a persons input. i.e. A flight simulator, or a games consol.

Input Devices

Hardware that inputs information into the computer.

Digital Camera Inputs photographs either directly via a USB cable or by transferring the storage card into a card reader attached to the computer.

Digitiser / Graphics Tablet A flat-bed input device with a puck, stylus or light pen attached. Useful for 'tracing over' existing drawings to convert them into computer-stored versions, and for making free-hand sketches dimensionally accurate. With overlaid menus they can be used to input symbols from icons.

Joystick An input device which normally moves in two axes. The output from the joystick can be used to control the screen cursor movement.

Keyboard Used for input commands to the CPU and for inputing text into programs.

Light pen A light sensitive device which can be used as an input device. The light pen is used by pointing it at a raster-type display. Not commonly used in desk-top CAG applications.

Mouse A mobile hand-held interaction device for controlling the cursor position.

Scanner These are usually flat-bed input devices however there are also hand held scanners. Optical Scanning is a process in which documents are scanned and the incident light from their contents generates signals which are received by the scanning device and transmitted to the computer.

Touch Screen Touch sensitive screen used often on portable devices such as mobile phones and hand held computers.

Output Devices

Hardware that outputs information from the computer.

Printers Printers An output device for obtaining hard copy of photographs, pictures, drawings and text.

- **Dot matrix printer** A contact printer that prints text characters and graphics images by using a series of dots to make up the text, lines and fills. Not suitable for documents which require good quality graphics such as pictures/photographs.

Cost - Low capital cost

Printing costs - Low for small batches, High for mass produced items.

Speed - Slow

Quality - Very poor graphics

Special Features - Printing triplicate forms

- **Ink-Jet Printer** A non-contact printing device that uses tiny droplets of ink. Slower and less expensive than a laser printer but with very similar quality results.

Cost - Low capital cost

Printing costs - Low for small batches, High for mass produced items.

Speed - Medium

Quality - Excellent

Special Features - Good home office applications when combined as a 3 in 1 unit (printer / scanner / photocopier)

- **Laser Printer** A non-contact printing device used mainly in DTP. Laser printers use a laser beam focused on an electrically charged drum which forces the ink to follow the light pattern and form the characters. It is a fast method of printing which also provides very clear images.

Cost - High capital cost

Printing costs - High for small batches, Low for mass produced items.

Speed - Very fast

Quality - Excellent

Special Features - Printing double sided items

Plotters Modern day printers far exceed the capability of plotters and therefore make plotters redundant. However, they can still be used for printing any drawings which are made up of lines such as orthographic CAD and circuit diagrams.

- **Drum Plotter** A pen-type plotter in which the paper is rotated on a drum under the pen while the pen also moves across the drum.
- **Flat bed plotter** takes up more desk space than the drum plotter. The pens only move in horizontal and vertical directions (X and Y axis).

Speakers These output any sound via the computers internal sound card. Modern multi-media computers are designed with powerful sound cards can output digital surround sound.

VDU / Monitor Visual Display Units (VDU) are mostly flat screen Liquid Crystal Display (LCD) monitors. The latest generation of VDUs are touch sensitive and also act as input devices.

Portable Storage Devices

These devices can be connected to any computer and carried around. Floppy discs and Zip discs are now very rare, however they may still be in use.

- **Floppy Disc** Only holds 1.44 MB of data. Can be used in most computer systems. Easily damaged.
- **Zip Disc** Similar to floppy disc. Greater storage capacity (100 to 250 MB). Needs a Zip drive attached to the computer.
- **CD** High capacity storage (800MB). Needs a CD writer.
- **USB Key (memory stick)** High capacity storage (1GB to 12GB).
- **DVD** High capacity portable storage (4.7GB or 8.5GB). Needs a DVD writer.
- **External HD (Hard Drive)** High capacity storage (50GB to 2TB). Expensive.

Common CAD and computer 2D Sketching commands

Library Items need only be drawn once, saved to a library file, then retrieved and positioned each time they are required on a drawing. This saves time and effort.

Layering This allows different types of information to be kept separate on a drawing for easier editing and printing.

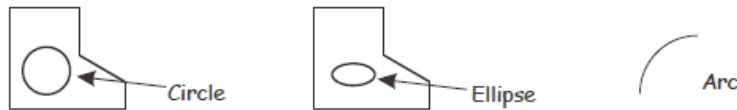
Grid This gives an on screen grid to make it easier to construct Orthographic or Isometric drawings and position objects.

Snap Allows the user to restrict the start & stop points of lines etc to a predefined grid. Allows the accurate positioning of objects on a CAD, CAG or DTP document.

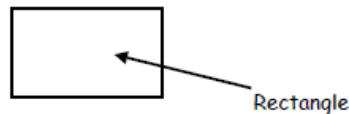
Line Allows the user to draw a line from one point to another.



Circle / Ellipse / Arc Allows the user to draw a circle or an arc.



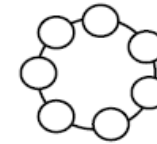
Square / Rectangle / Box Allows the user to draw a quick shape rectangle or square.



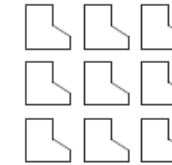
Scale Allows a user to accurately increase or decrease the size of an object keeping all parts in proportion.

Move means to move an object to a new position on the page.

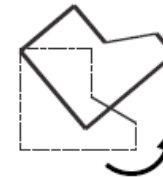
Circular / Ring / Polar Array or pattern This allows the user to draw a circular pattern of shapes or objects.



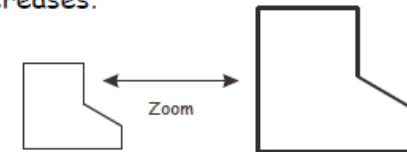
Box / Rectangular Array or pattern This allows the user to draw a pattern of shapes or objects in columns & rows.



Rotate Allows the user to rotate / turn an object about a specified point.



Zoom Allows a user to increase or decrease the screen view so that they can see more detail. All dimensions remain the same only the view increases or decreases.



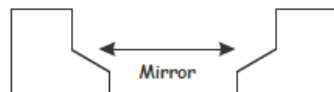
Text Allows the user to add text onto a drawing.

This is Text

Hatching Allows the user to hatch a surface/area that has been 'cut'.



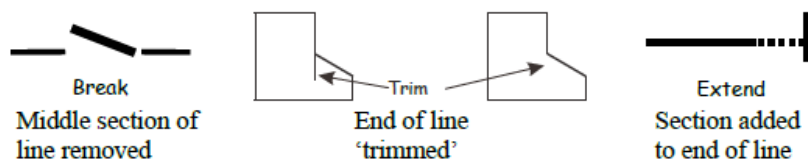
Mirror Image This flips an object about the horizontal or vertical axis.



Copy Allows the user to copy and position objects or parts of a drawing without having to redraw them.



Break / Trim / Extend Allows the user to remove a section of an object using break / trim or, extend a line so that it meets another object.



Fillet Fillet puts a radius on a corner (rounded).



Chamfer Chamfer cuts off a corner.



Constraint A constraint prevents an object or line from moving. This is used to ensure parallel or perpendicular (90°) lines in 2D computer sketching. It is also used to place parts in a 3D assembly model. Also see **Snap**

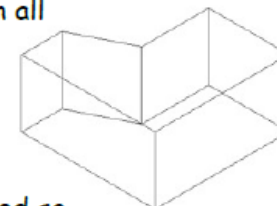
Erase Means removing part of a drawing.

Undo Means to reverse the last command.

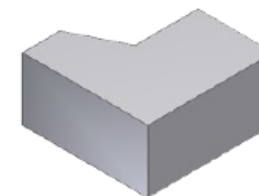
Common CAD and computer 3D modelling commands

There are 3 types of computer generated 3D model.

Wire-frame model A three-dimensional image made up as a series of connected lines between all edges and line end-points.



Solid model The wire-frame model is coloured so that it looks 'solid'. This is sometimes called base material and is usually a uniform brown or grey colour with no shadows or highlights.

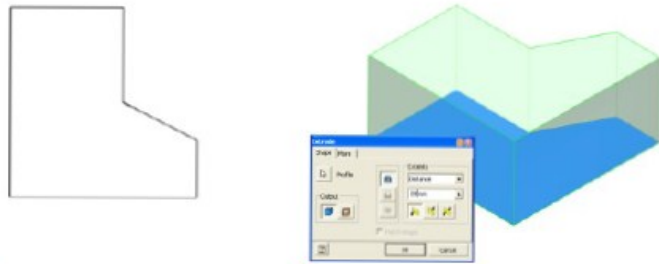


Rendered model The solid model is fully rendered to show material colour with highlights and shadows. This type of model should look like the real item.



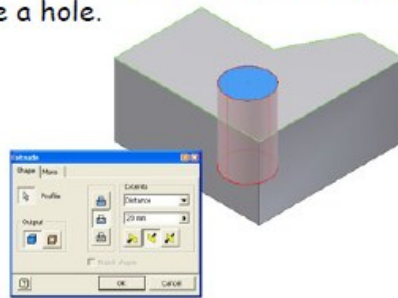
Extrusion

From drawing a 2D sketch, extrusion converts this into a 3D form.



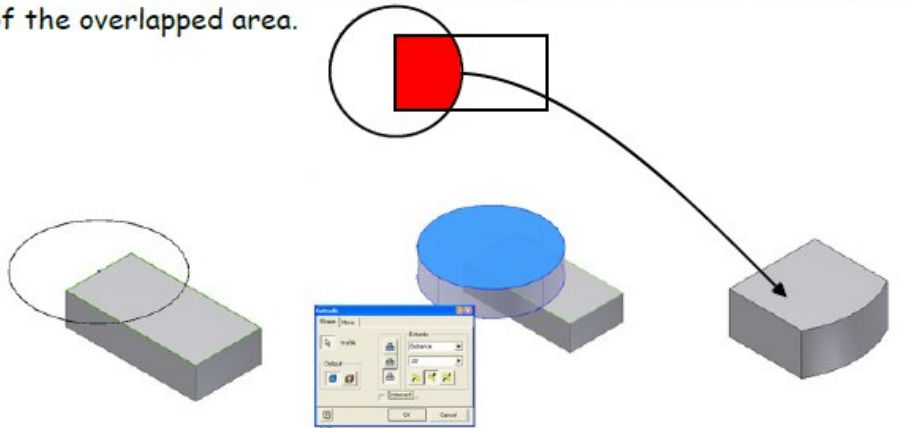
Subtraction

The sketched shape is 'cut away' from the object. In the example a circle has been subtracted to create a hole.



Union

When two overlapping 2D sketches can be used to create a 3D form of the overlapped area.



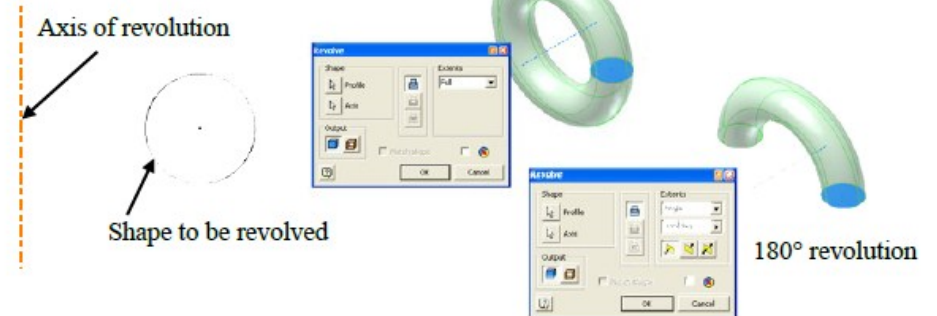
The rectangle has been *extruded*.

Next the circle is selected and *union* is chosen

A 3D form the shape of the overlapping area.

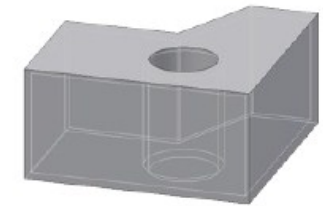
Revolve / Revolution

A Shape is revolved around an axis of revolution. In the example shown a circle is revolved around an axis to create a 'Taurus' (sometimes referred to as a ring or donut). The angle of revolution can also be set.



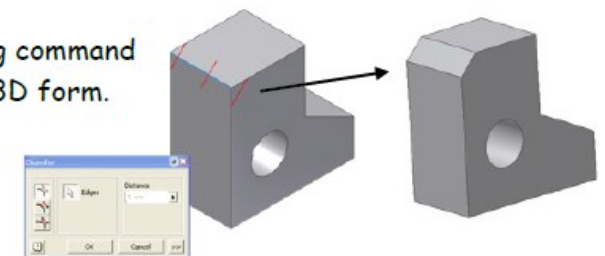
Shell

This alters the 3D form to make it hollow.



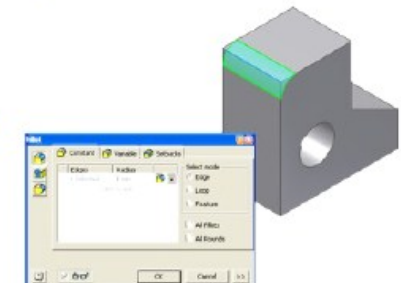
Chamfer

Similar to the 2D sketching command this cuts a corner off the 3D form.



Fillet

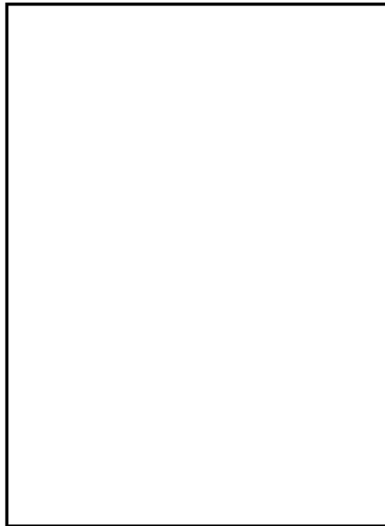
Similar to the 2D sketching command this rounds a corner on the 3D form.



Question 1

Publishing companies use many different styles of page layout when producing various articles for publication.

- a. Redraw the blank page below and add the following
 - i. A header with the wording "City Banking".
 - ii. A footer with the wording "May 2001"
 - iii. Three columns into which text is to be placed.

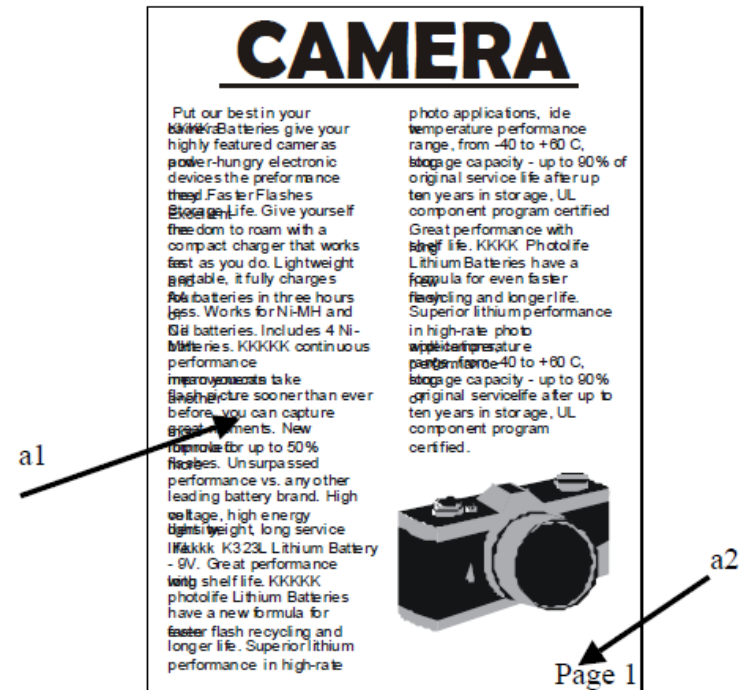


- b. A graduated colour fill is to be used for the background. Explain what is meant by a colour gradient.

(4 marks)

Question 2

A Desktop Published advertising leaflet for a camera is shown below.



- a) State the Desktop Publishing terms for the elements indicated in the leaflet.
- b) State the page orientation.
- c) Name and sketch another style of page orientation.

(4 marks)

Question 3

A modern desktop published document may contain many features. Describe with the aid of sketches each feature.

- a. Margin
- b. Gutter
- c. Footer
- d. Column

(4 marks)

Question 4

A Youth Club produces a monthly newsletter. Produce a sketch, approximately to scale, using the information given below to show the page layout of this months' newsletter.

- | | |
|----------------------|---------------------------|
| a) Paper Size | 150mm x 100mm (Landscape) |
| b) Left Margin | 25mm |
| c) Right Margin | 10mm |
| d) Header | Youth Club News |
| e) Footer | June 2005 |
| f) 3 Columns of Text | Equal Width |
| g) Gutter Width | 5mm |

(7 marks)

Question 5

A desktop published document contains a range of standard features.

- a. Identify the features described below.
 - i. A piece of text that appears at the top of every page
 - ii. Text or graphics printed at the bottom of every page.
- b. Sketch, a page showing landscape orientation

(3 marks)

Question 6

Using sketches where appropriate, explain what is meant by **each** of the following terms as used in computer graphics packages.

- a. Colour gradient
- b. Copy and Paste
- c. Zoom
- d. Font

(4 marks)

Question 7

Using sketches where appropriate, explain what is meant by **each** of the following terms as used in computer graphics packages.

- a Colour gradient
- b Copy and Paste
- c Zoom
- d Font

(4 marks)

Question 8

A high street estate agent is moving from a manual based office to a computer based one.

- a) State the **type** of software package required by the secretary in order to produce typed letters.
- b) State the **type** of software package required by the estate agent that would allow him to fully integrate text and pictures in a document.
- c) State the **type** of software package required by the estate agent to edit photographs before inserting them in a document.

(3 marks)

Question 9

An enterprise class produced a promotional flyer for their Christmas Fair, using a CAG package.



- a) State which two commands would be used to duplicate the decoration graphic from one part of the document to another
- i) and ii)
- b) State the type of fill used for the background
- c) State the command which allows all of the graphic items to be moved as one object
- d) Name the **type** of CAG package that would be used to produce a newsletter containing text and graphics
- e) State the importance of saving your work at regular intervals

(6 marks)

