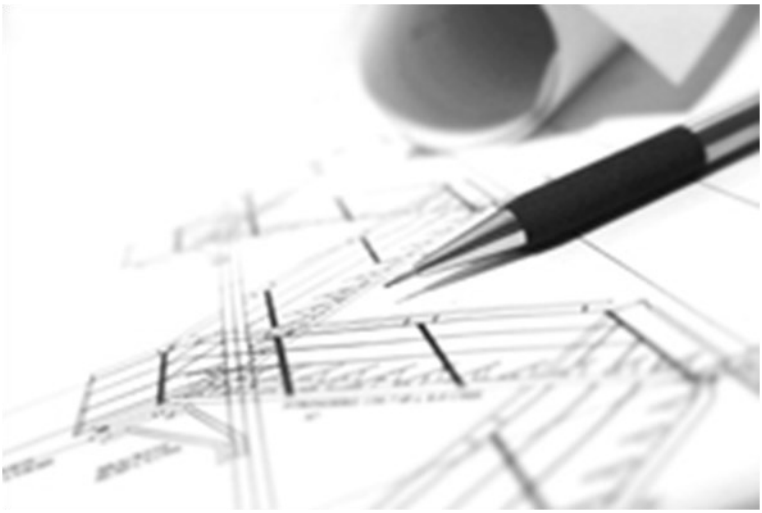
Coltness High School

Technical Department

Graphic Communication

National 5 Theory



Contents

In this booklet you will have access to information which is suitable for your exam. You must study this information in order to gain a deeper understanding of Graphic communication.

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A to Z Desktop Publishing Terms

Glossary of Common CAG Terms

This is a guide to CAG terms likely to be encountered in the course.

CAD Computer-aided drawing.

DTP Desk-top publishing.

CAG Computer Aided Graphics. A term used which encompasses CAD, DTP and modeling.

2D Two-dimensional drawing in which an item is depicted as a flat object. Example: first and third angle orthographic drawings.

2½D Two-and-a-half-dimensional drawing in which three surfaces of the drawn item can be viewed. For example, isometric, oblique.

3D Three-dimensional drawing or model in which the complete object can be displayed, normally in colour, and manipulated to show views from any chosen direction.

Alignment positioning of text in a column or on a page. This can be in the form Left aligned, right, center or justified.

Animation "Bring to life". The manipulation of electronic images by means of a computer to create moving images, similar to creating a film, the computer is giving the illusion of moving parts.

A to Z Desktop Publishing Terms

Airbrush A device, which uses compressed air to propel ink or paint through a variable fine nozzle to create artwork.

Alignment To arrange text and objects so that they line up with each other horizontally or vertically.

Ampersand The symbol “&”, which means “and”.

Application A word to describe a computer software package which performs a specific task.

Ascender The part of a letterform which sits above the main body of the text, for example b, d, h, k, l.

Asymmetrical Letters or objects set in no apparent order or pattern.

Banner Main headline across the top of a page

Box A rectangular box around text or a graphic

Baseline The imaginary line that runs along the base of the body of letters in a line of text.

Body (text) The main text part of a document usually smaller than 14 Points in size.

Bleed This is to extend an artwork graphic beyond the trimmed edge of the page.

A to Z Desktop Publishing Terms

Caption This is the descriptive text which accompanies a graphic

Centre-Aligned Text which is aligned around it's centre point.

Crop To trim excess parts of a screen graphic.

Colour Gradient This where a colour starts off dark and gradiates to a light colour OR gradiates from one colour to an other; e.g. say blue to yellow.

Desk-Top Publishing Is the creation of a whole publication on computer, preparing it for printing without the normal processes of typing, typesetting, cutting & pasting and laying out. This booklet is produced using DTP.

Drop Capital This is a large starting letter which is bigger than the rest of the text. It falls below the baseline.

Flush Left/Right Describes text, which is perfectly aligned on one side.

Font Collective name for every letter, number, symbol, accent, ligature, fraction and punctuation mark for a typeface at a particular size.

Footer The space at the bottom of the page where the page number and any other text is placed

A to Z Desktop Publishing Terms

Gutter	The space between columns.
Graphic	An illustration imported into a DTP item
Hardcopy	A paper printout from the computer
Headline	The title of the DTP items text. Positioned at the top of the page
Indent	The beginning of a line of text further in from the left hand margin.
Justified Text	Text which has word spacing added so that it aligns to both edges of columns or margins.
Margin	The unprinted space on the sides, top and bottom of a document.
Sans Serif	Meaning “without serifs”. Any typeface which does not have bars across the ends of letter strokes.
Serif	Any typeface which has bars crossing the ends of strokes such as this one.
Type Sizes	The standard ‘point’ system used to describe type sizes is based on 72 points to an inch. (12 points is, therefore, 1/6” high.)
Widow	One or two words at the end of a paragraph that spill onto the top of the next column or page. To be avoided.
White Space	Empty spaces on a page, graphic designers use this in publications to create balance on a layout as well as resting the readers eye.

Elements of Design

Elements of Design

When creating a publication we must consider the Design elements and principles in order to create a layout which is pleasing to the eye and attractive. The following describes the design elements and principles which are use in Desktop Publishing.

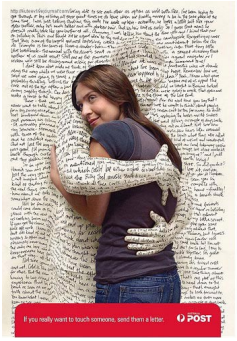
Lines

Lines can be used for direction and movement. We use lines to direct the eye to where we want. Vertical lines give elegance and elongation to the page, while horizontal lines create a more relaxed feel; curved lines suggest an organic theme. Repetition of lines, or other elements, can be used to also create patterns.

Shape

A shape is exactly what it sounds like: circles, squares, rectangles, and triangles are all design building blocks. Repeating shapes or grouping them in an organized method works to create patterns, too.

Texture



Texture is the surface quality of a shape - rough, smooth, soft hard glossy etc

Principles of Design

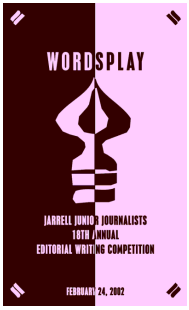
Colour

Colour is used to attract attention. It can be subtle or bold.
Colour can be found in the paper, the text, or the graphic elements and photos. A monochromatic colour scheme uses a single colour, perhaps in various tints, while other layouts utilize combinations of two, three, or more colours.

Principles of Design

Principles of design should always be incorporated in any graphic design project to assist its communicating and graphic interest, however in the planning of a basic design, the designer must produce a job to suit the class of work, the copy, and the tastes of the customer.

Balance



Symmetrical

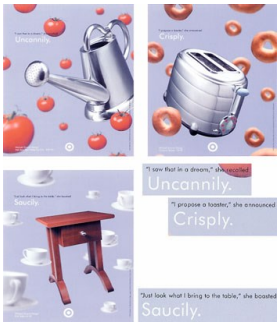
Asymmetrical

Balance is presented when design elements are equally distributed. There are two types of balance: symmetrical and asymmetrical. Symmetrical means elements are distributed equally on both sides of a composition. Where as asymmetrical means elements are deliberately off balance to suggest movement.

Principles of Design

Unity

Unity is shown when all aspects of the design relate to one another. The project should show an element of completeness.



Alignment

Alignment is presented in a project when there is an aspect of consistency. This can be seen through using the same text, colour , shapes and graphics.

Contrast

Contrast refers to the relationship between the elements of design. The greater the difference between the two elements, the greater the contrast, as in the case of size- big versus little. Contrast refers to colours, shape and text.

Repetition

Repetition strengthens a design by tying together individual elements. It helps to create association and consistency. Repetition can create rhythm (a feeling of organized movement).

Elements of Design

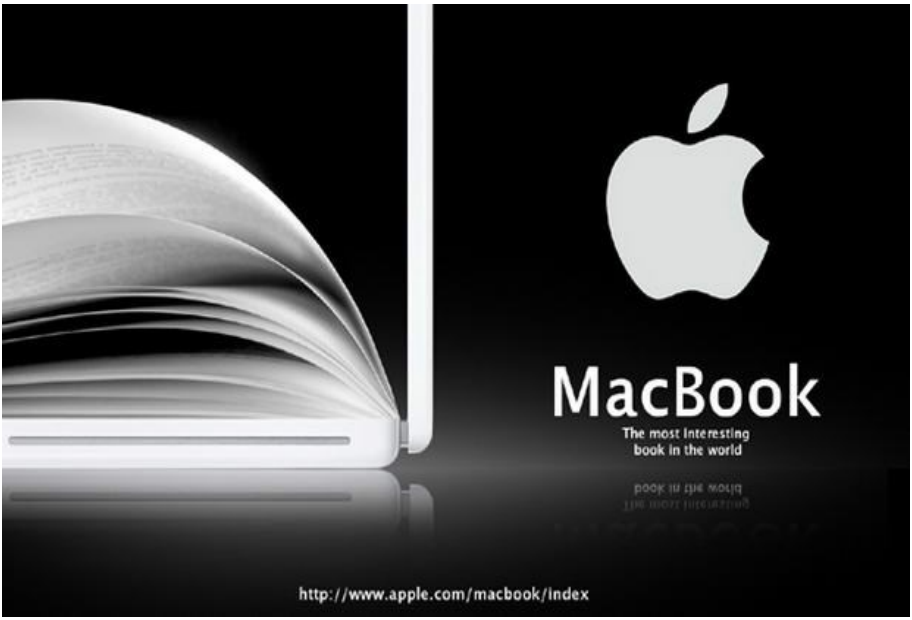
Principles of Design

White Space

White space is the absence of text of graphic. This allows the publication to be easy to follow, highlight a certain element or help rest the eye.

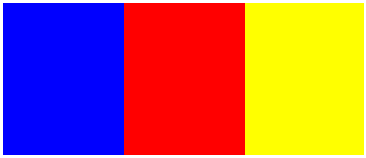
Example

The advertisement below shows a good concept of all elements and principles. It use Contrast, Shape, Alignments, Repetition, White space, Balance , Unity , Line and Colour.

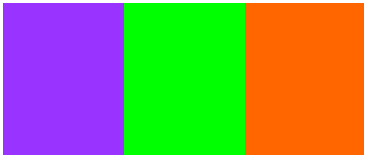


Colour Theory

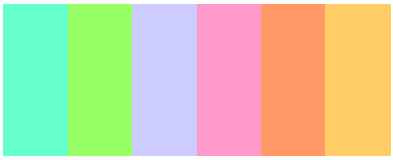
Primary Colour is a colour that cannot be achieved by mixing other colours.



Secondary Colour is a colour that is two primary colours mixed together



Tertiary Colour is a colour that's mixed with a secondary and primary colour.



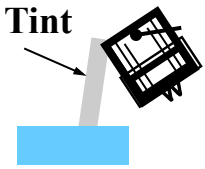
Tone

Tones are **weak** and **strong** examples of the same colour. The tonality of a colour can be controlled by adding **black, white, grey** or **another colour.**

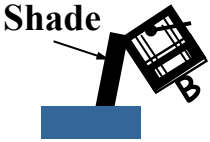
Neutrals

Black, white and **grey** are called **neutrals** because there is no colour quality found in them.

Tint is a lighter tone of a colour. To achieve this a quantity of white is added to the colour.



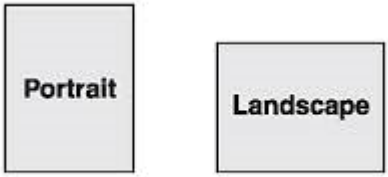
Shade is a darker tone of a colour. To achieve this a quantity of black is added to the colour.



DTP Features

Transparency– Colour becomes see through

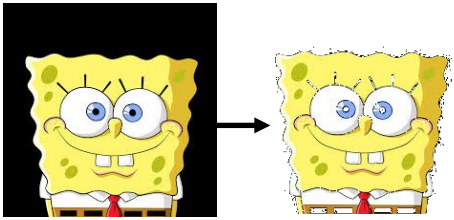
Paper Orientation



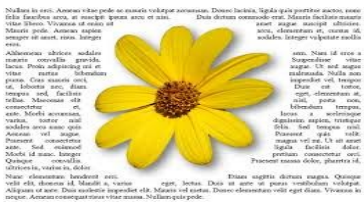
Rule– Line between two columns of text

Caption.-Text explaining image

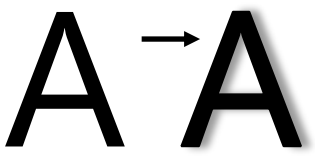
Crop– Background is taken away from main image



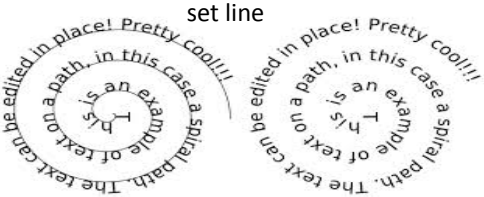
Text wrap.-Text fits tightly around the shape of the image.



Drop Shadow– Small shadow on image



Text along a path– Text appears to sit on set line



Elements of Design

Colour theory

Header– Text at the Top of each page

Column– Block of text

Justification-Text is justified to Left, Right or Centred

Margin– Gap Between edge if page and beginning of article

Text box– Box with text

Gutter– Gap between two columns of text

Bleed– Colour goes to edge or paper

Colour Fill-Block of colour

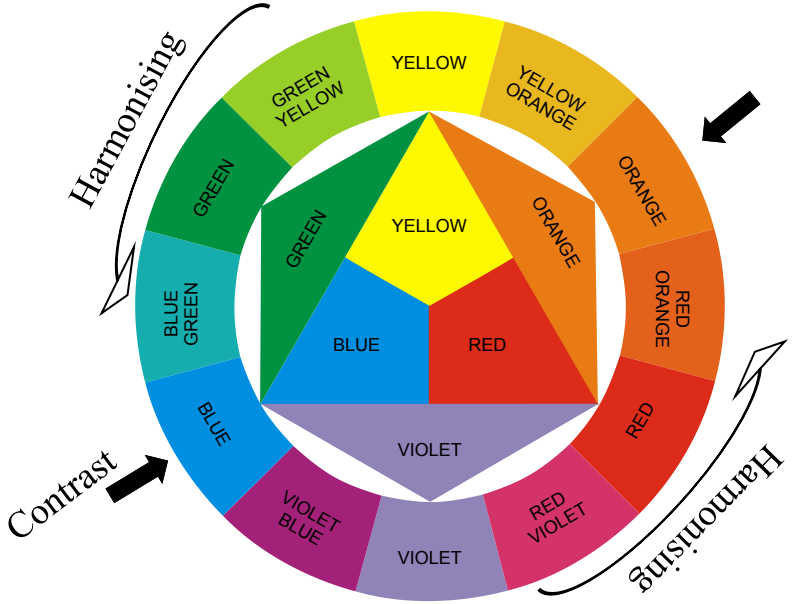
Reverse– White coloured text on a black or colours background

Footer– Small note at the bottom of each page

Colour Theory

Colour Wheel

The colour wheel represents all colours in a basic format that is easy to understand and follow.



Harmonising

Harmonising colours are colours in which people feel comfortable looking at. The colours match and do not irritate the eye when together. Colours on the same side of the colours wheel are in **harmony.**

Contrast

Contrasting colours are colours that do not relate to each other and tend to clash when next to each other. Colours on opposite sides of the colour wheel usually **contrast.**

Colour Theory

Colour Moods

Colours convey different moods and can manipulate a Person's perception of an item of graphic depending on what colours are used.

Reds

Hot, bold, exciting, vibrant, festive, active, passionate, aggressive, fire, danger.

Yellows

Bright, happy, sunny, warm, glowing, lively, holidays, easily seen.

Greens

Restful, fresh, cool, smoothing, natural, informal, calm, quiet, go, re-cycle, surgeons gown.

Blues

Cool, sophisticated, heavenly, elegant, classy, formal, reliable, royalty.

Colour Theory

Whites

Pure, elegant, sophisticated, clean, happy, light.

Greys

Old age, neutral, dignified, dull, metal, sedate.

Blacks

Dramatic, death, evil, sorrow, subdued, sad, unhappiness, solemn.

Neutrals

Calm, restful, natural, safe, wood, earth, unobtrusive.

Colour Theory

Advancing Colours

Advancing colours tend to be colours which stand out or appear closer to you. We call these advancing colours. These colours tend to be bright and warm. Colours such as **Reds**, **Yellows**, **Oranges**

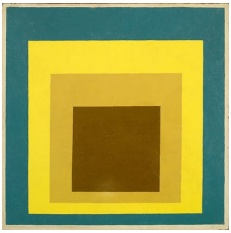
Receding Colours

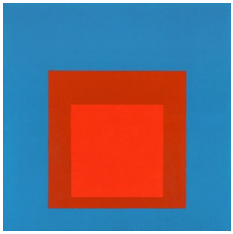
Receding colours tend to be colours which are subtle and appear further away from you. We call these receding colours. These colours tend to be cool and calming. Colours such as **Blues**, **Greens**, **Violets**

The same effect can be achieved with neutral colours.

Note

Make sure to have a receding colour in the background to avoid the background taking over your item or graphic. Only use advancing colours to grab the viewers attention.





Signs & Symbols

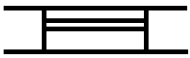
Construction Symbols

The symbols below show items in building drawings.

In-line valve (any type)

Softwood, machined

Wood, any type, sawn



Window

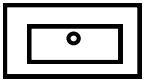
Brickwork

Insulation

Switch

Lamp

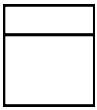
Socket



Wash

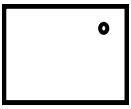
Sink top

Sink, any type

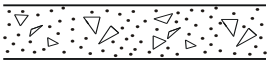


WC

Bath



Shower tray



Concrete

Radiator

Door

Scale

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 we have to **SCALE UP** the drawing to be able to draw them.

1:1

When we carryout a drawing using the actual dimensions, this is called '**full size'**, or the drawing has been drawn to a scale of **1:1.** For every 1mm drawn, 1mm is represented.

1:2

When we carryout a drawing and reduce all the sizes by a factor of 2, i.e. all dimensions are divided by 2, this is scaling down the drawing. This makes the drawing half its original size. What the 1 & 2 represent are, for every 1mm drawn on paper the actual size of the real object is 2mm.

2:1

We can also increase the size of an object by any factor. In the example shown opposite the sizes have been increased by a factor of 2. This will make the drawing twice its original size. The 2 is stating that for every 1mm actual size of the object, 2mm have been drawn. If we increased the object by **10** the scale would be **10:1.** If we reduced the objects dimensions by twenty the scale would be **1:20.**

The scale to be used by a designer is dictated by the size of paper being used and/or the size of the object being drawn.

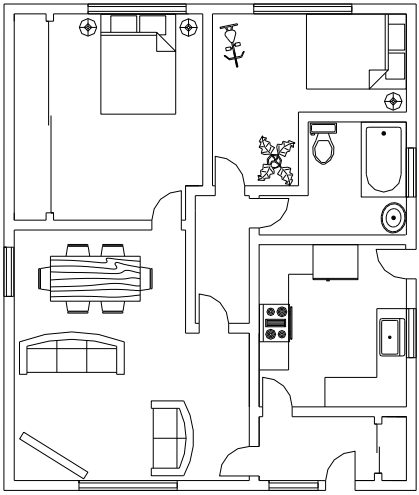
Scale

Scales are commonly used in building drawings. When drawing floor plans, site plans and location plans scale is very important.

Type of Drawing	Floor Plans	Site Plans	Location Plans
Preferred Scales	1:50 or 1:100	1:200 or 1:500	1:1250 or 1:2500

Floor Plans

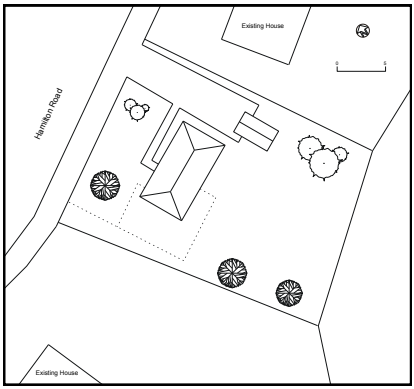
Floorplans show internal views of a house using symbols to represent household items .



Scale

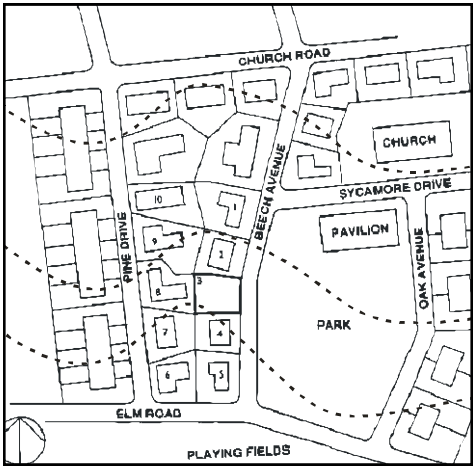
Site Plans

Site plan represents the location boundary or plot of land. It shows one or more buildings within this plot.



Block Plans

Block plan or location plan shows the surrounding area of the street in which the house is located.



SCALE 1:1250

North Symbol

This symbol represents north

The 3 P's

The 3 P's

In your thematic presentation you will approach the theme just as a professional designer would, in the world of industry. This is tackled using the **3 P's.**

The first of the P's is the **Preliminary Sketches** usually carried out using freehand. These sketches consist of various drawings including all planning towards production and promotional drawings.

The second of the P's is the **Production Drawings** which consist of all drawings enabling the manufacture of the product being designed. The drawings will be in the form of CAD drawings including orthographic, sectioned, exploded isometric, etc.

The third of the P's is the **Promotional Graphics** and consists of all CAG drawings which promote all aspects of the product being designed. This will include posters, fliers, booklets, etc.

Environmental Issues

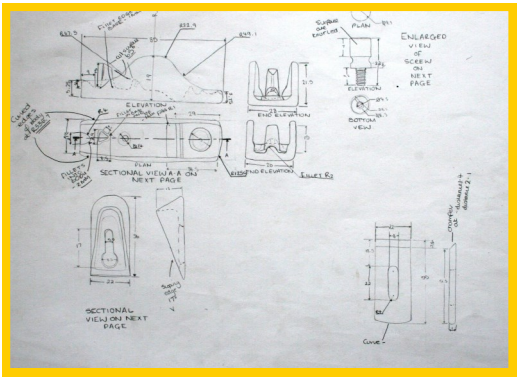
When creating DTP items graphic designers must consider how to distribute the information in an environmental way. At present we are wasting many resources with a frivolous lifestyle or culture, in order to reserve our planet. Ways in which this can be achieved are:

- Using recycled paper
- Publish online
- Use environmentally-friendly inks
- Print in regional offices to minimise carbon footprint of transportation
- Switch off computer

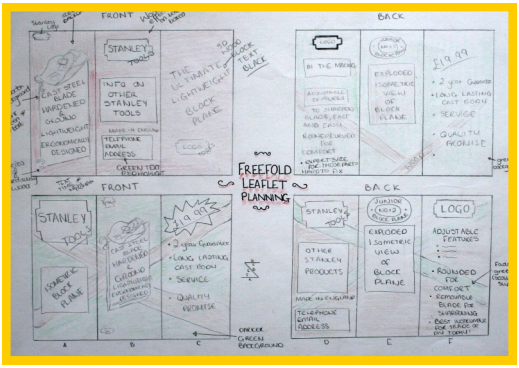
The 3 P's

Preliminary Sketches

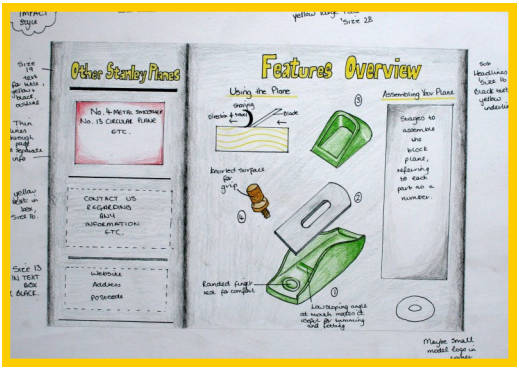
Orthographic Sketches



Planning of promotional item

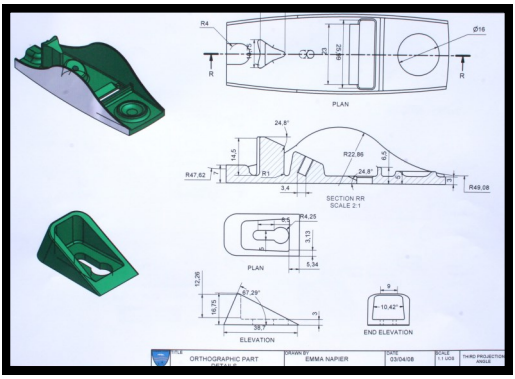


Manual 3 fold Leaflet

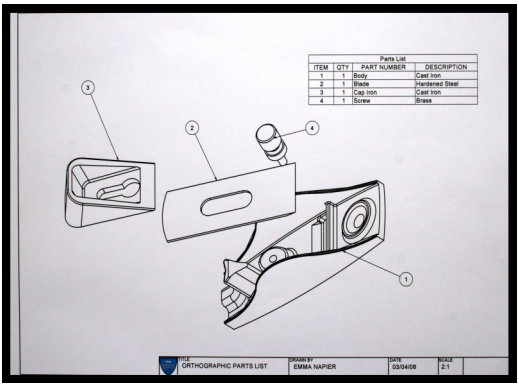


The 3 P's

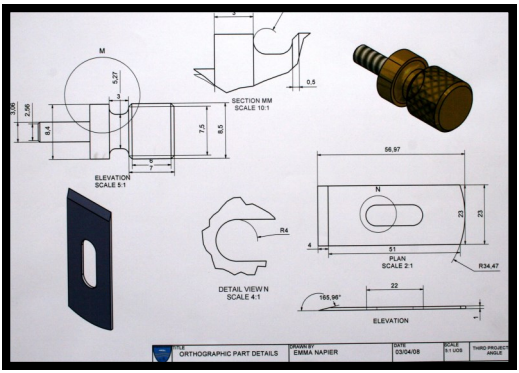
Production Drawings



Computer Aided Drawing (Section Orthographic)



Computer Aided Drawing (Exploded Isometric)

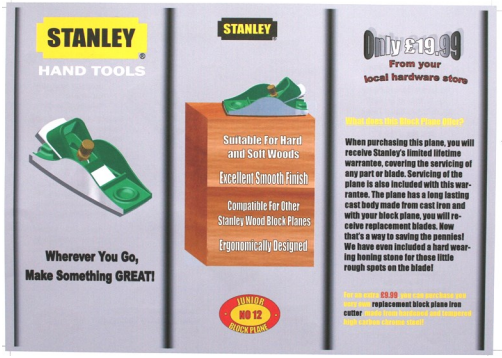


CAD Detailed Orthographic

The 3 P's

Production Drawings

Computer Aided Drawing (Section Orthographic)



Computer Aided Drawing (Exploded Isometric)

CAD Detailed Orthographic

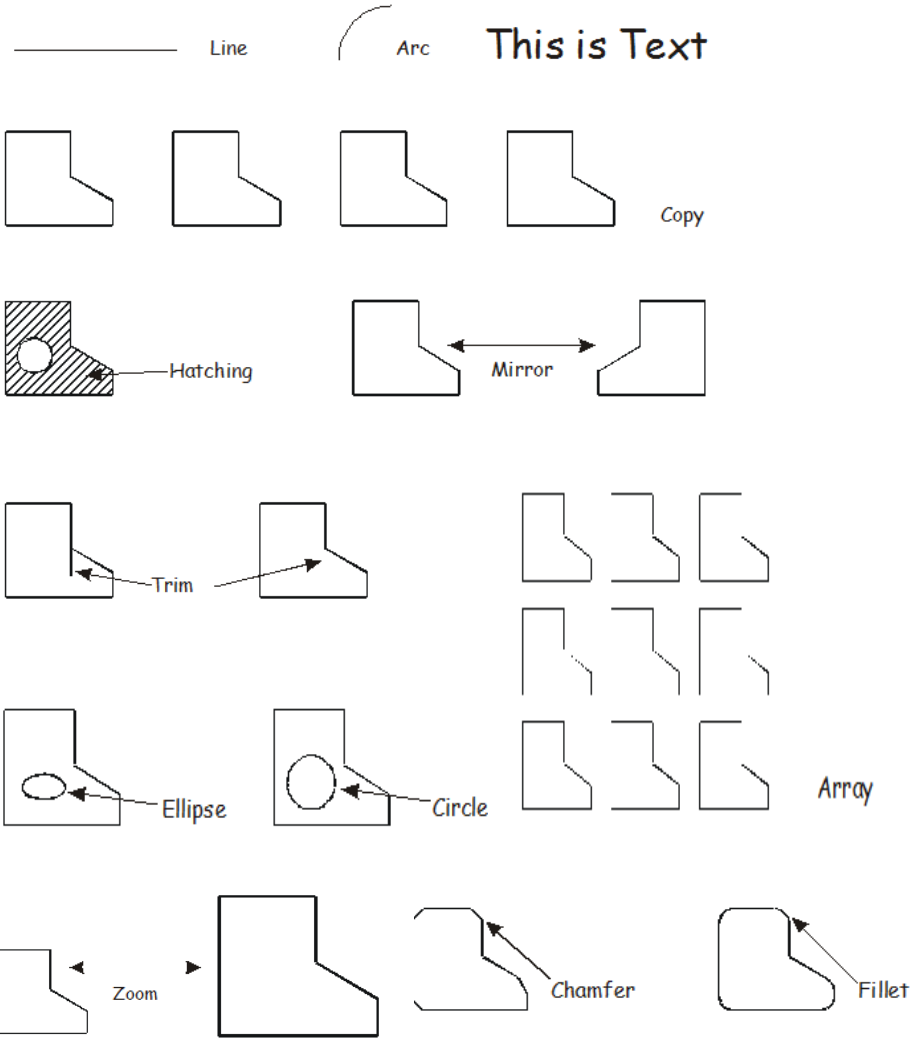
CAD Line Types

Types of line used

Continuous thick	Used for visible outlines and edges.
Continuous thin	Used for projection, dimensioning, leader lines, hatching and short centre lines.
Continuous thin straight with zigzags	Used for limits of partial or interrupted views and sections if the limit is not an axis.
Dashed thin line.	Used for hidden outlines and edges.
Chain thin.	Used for centre lines, lines of symmetry.
Chain thin double dash	Used for ghost outlines and bend lines.
Continuous thin irregular	Used as the limit to an interrupted view when an axis is not present.
Chain thin thick at both ends and changes	Used on Cutting planes.

Cad Commands

When using a Graphics computer program we use the following commands when drawing or modelling.



Advantages of CAD

Advantage of 2D CAD

- Improved speed of drawing
- Ease of modification and correction
- Improved quality and accuracy of output
- Linking of manufacturing machinery in CAD/CAM production processes
- Ensuring drawing standards are consistent
- Setting drawings to given scale

Advantages of 3D Cad Modelling

- Improved speed of drawing
- Ease of modification and correction
- Improved quality and accuracy of output
- Models takes up less storage space
- A wide range of surface finishes can be applied

Benefits of DTP Software

- Work time is reduced greatly
- Text and Graphics can be imported and modified easily
- Layouts and files can be sent long distances for approval
- Modifications can be made easily
- DTP users can work from home

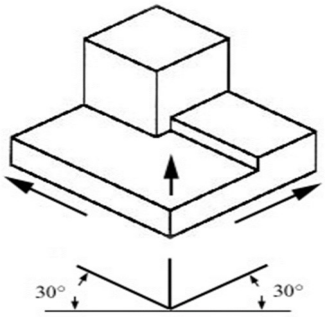
Drawing Styles

Pictorial Drawing

Pictorial drawings are drawings which show a model in 3D. You should see three sides of the model on this drawing.

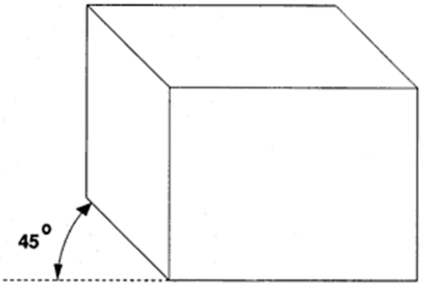
Isometric

Isometric show model in 3D. All lines should be drawn at 30 Degrees except vertical lines



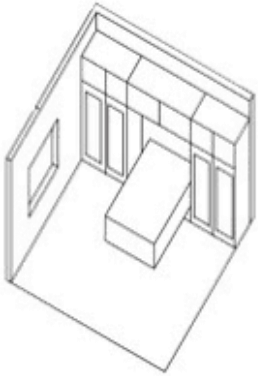
Oblique

Oblique shows the front view of the model which is then projected back at 45 Degrees. All width lines should be halved in size



Planometric

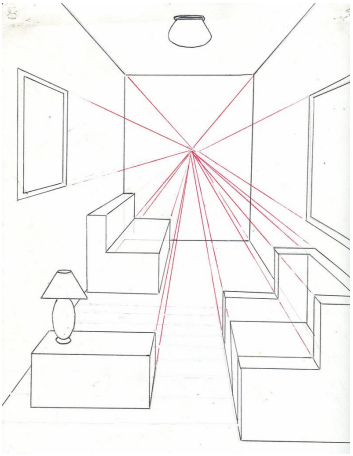
Planometric is the plan drawing at a specific angle and is projected up to the appropriate height



Drawing Styles

1 Point Perspective

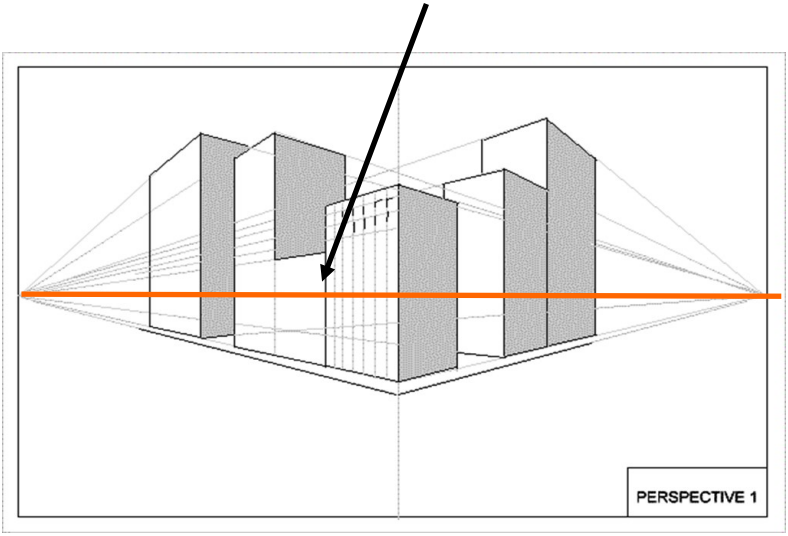
1 Point perspective shows the front of the object square on with the edges projected back to one vanishing point



2 Point Perspective

2 Point Perspective is drawn with the front edge of the model with each side being projected back to two vanishing points.

The orange line shows the Horizon Line



Drawing Styles

Exploded Views

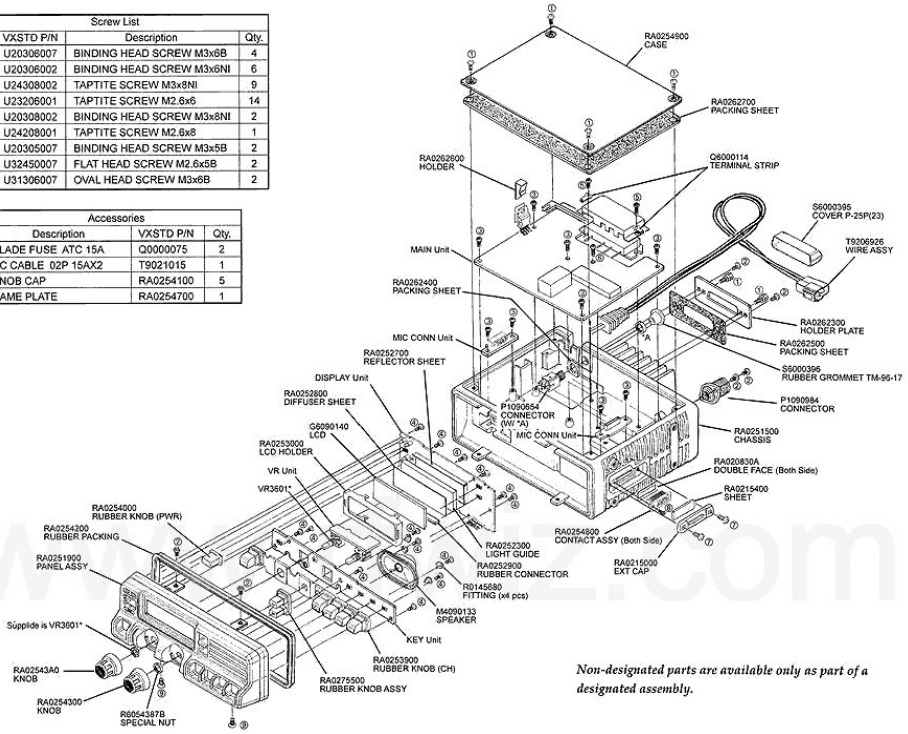
Exploded views are drawn to show each part of the assembly. This view helps to show how the object should be assembled.

Each exploded view is usually labelled to show what each part is and comes with a table describing each part.

These drawings are good to give out information on a product that has many parts.

Screw List			
REF.	VXSTD P/N	Description	Qty.
1	U20308007	BINDING HEAD SCREW M3x6B	4
2	U20306002	BINDING HEAD SCREW M3x6NI	6
3	U24308002	TAPTITE SCREW M3x8NI	9
4	U23206001	TAPTITE SCREW M2.6x6	14
5	U20308002	BINDING HEAD SCREW M3x8NI	2
6	U24208001	TAPTITE SCREW M2.6x8	1
7	U20305007	BINDING HEAD SCREW M3x5B	2
8	U32450007	FLAT HEAD SCREW M2.6x5B	2
9	U31306007	OVAL HEAD SCREW M3x6B	2

Accessories		
Description	VXSTD P/N	Qty.
BLADE FUSE ATC 15A	Q0000075	2
DC CABLE 02P 15AX2	T9021015	1
KNOB CAP	RA0254100	5
NAME PLATE	RA0254700	1



Non-designated parts are available only as part of a designated assembly.

Drawing Styles

Orthographic

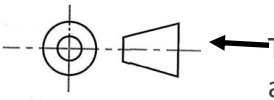
Orthographic Drawing is the process in drawing an object using straight lines.

This style of drawing shows each face of the object in 2D

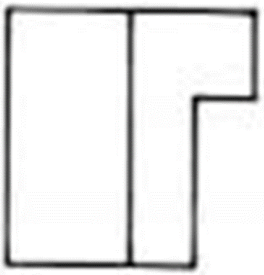
You must show the **Elevation, End Elevation** and **Plan** of the object

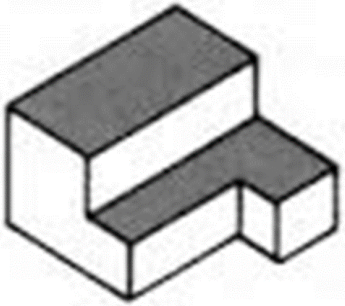
The Elevation (Front) should always be in the centre of the page

The End Elevations should be projected to either side of the Elevation
The Plan should always be directly above the Elevation.

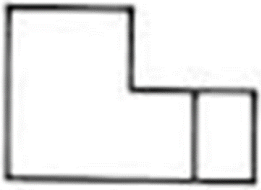


Third angle projection symbol. This should always be shown on an Orthographic Drawing

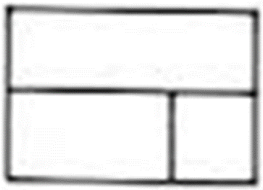




Plan



Elevation



End Elevation

Dimensioning

Dimensions

Dimensions on a **British Standard** drawing look like this.

Rules

- Always in millimetres so there is now need to write mm
- Number is always above the dimension line
- Dimension line should never touch drawing line
- Diameter symbol ∅ should be shown when dimensioning full circle
- Radius symbol **R** should always be shown on curved line
- Numbers should always be written on Left side of dimension line