

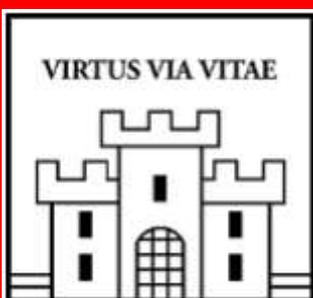
Forfar Academy

Technical Department

Higher/Advanced Higher Graphic Communication

Study notes for

Knowledge & Interpretation



Introduction

The Higher course consists of:-

External assessment by examination paper **50%**

External moderation of Reception Desk Assignment **50%**

The examination paper is 2 hours long and consists of one part:-

Graphics knowledge (*Content of this booklet*)

The graphics knowledge consists of a total of **70** marks.

The Reception Desk Assignment also consists of **70** marks

The following information contained within this booklet contains all the information required to fulfil this aspect of the course.

It is therefore imperative that candidates are fully conversant with the information contained within this booklet.

For the Higher Exam it is suggested that candidates spend approximately 1.5mins per mark allocated. If this is done this will leave approximately 25 minutes left for perusing over the examination paper.

Types of line used



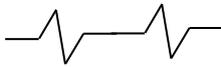
Continuous thick

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.



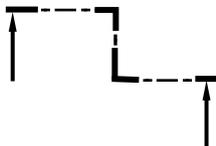
Chain thin double dash

Used for ghost outlines and bend lines.



Continuous thin irregular

Used as the limit to an interrupted view when an axis is not present.



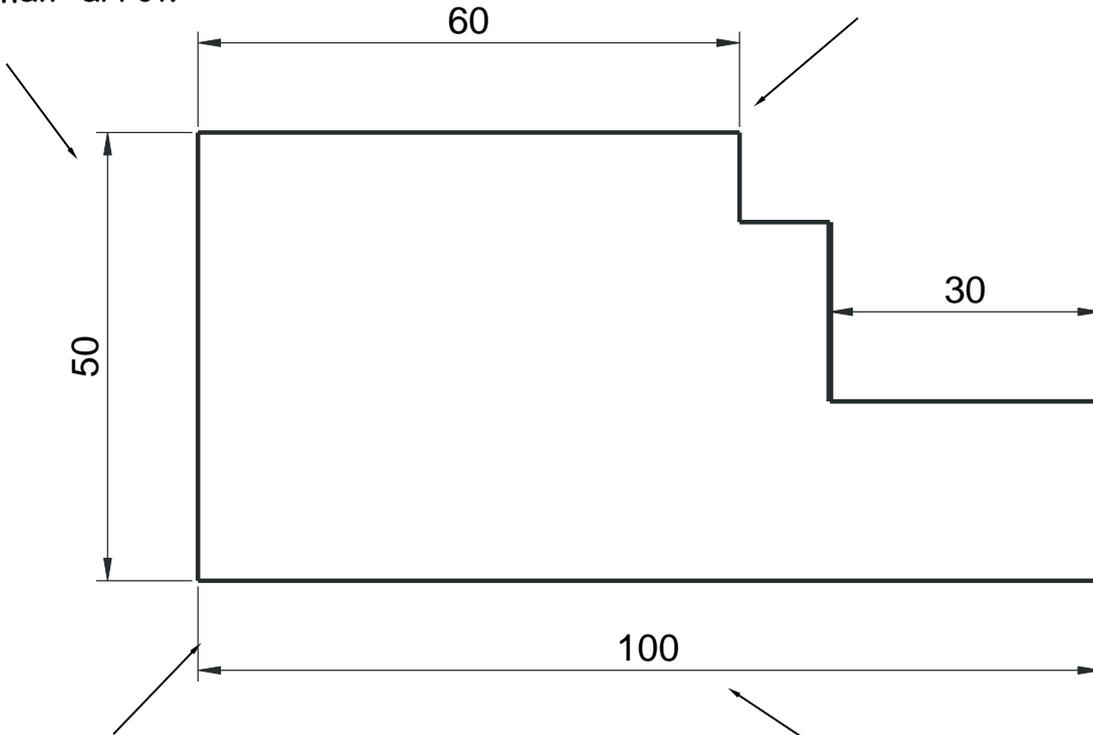
Chain thin thick at both ends and changes in direction

Used on Cutting planes.

Dimensioning

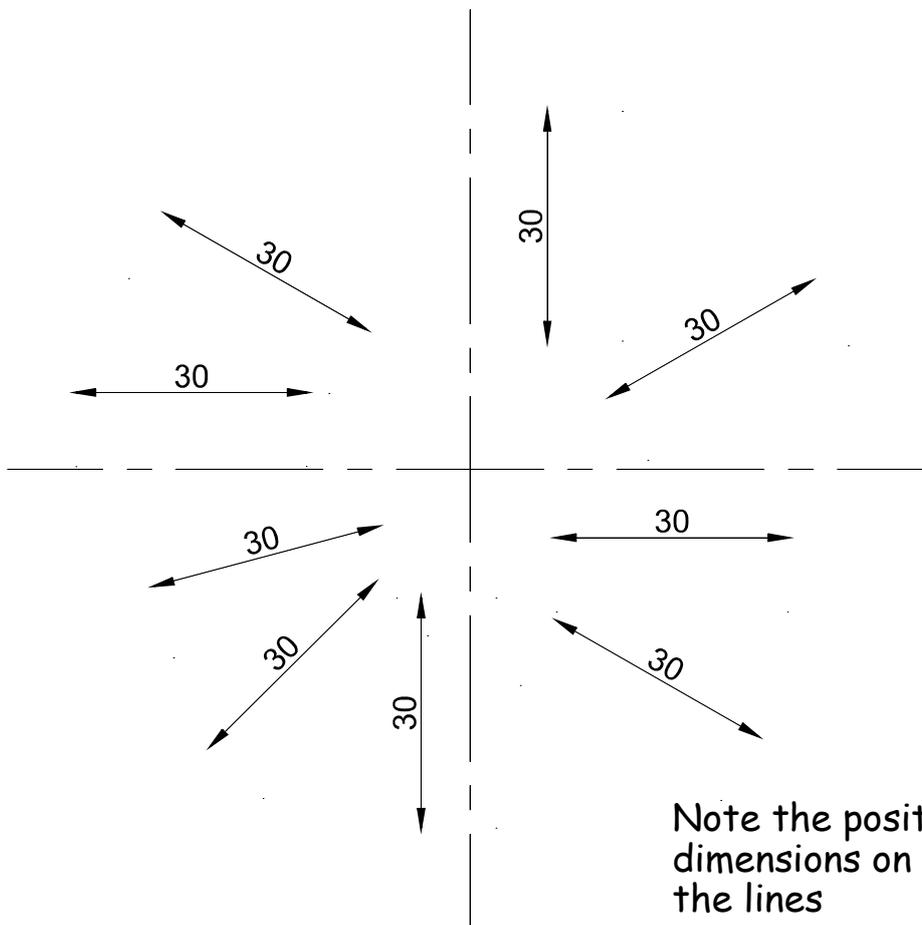
Small gap between Leader and line of drawing

Small arrow

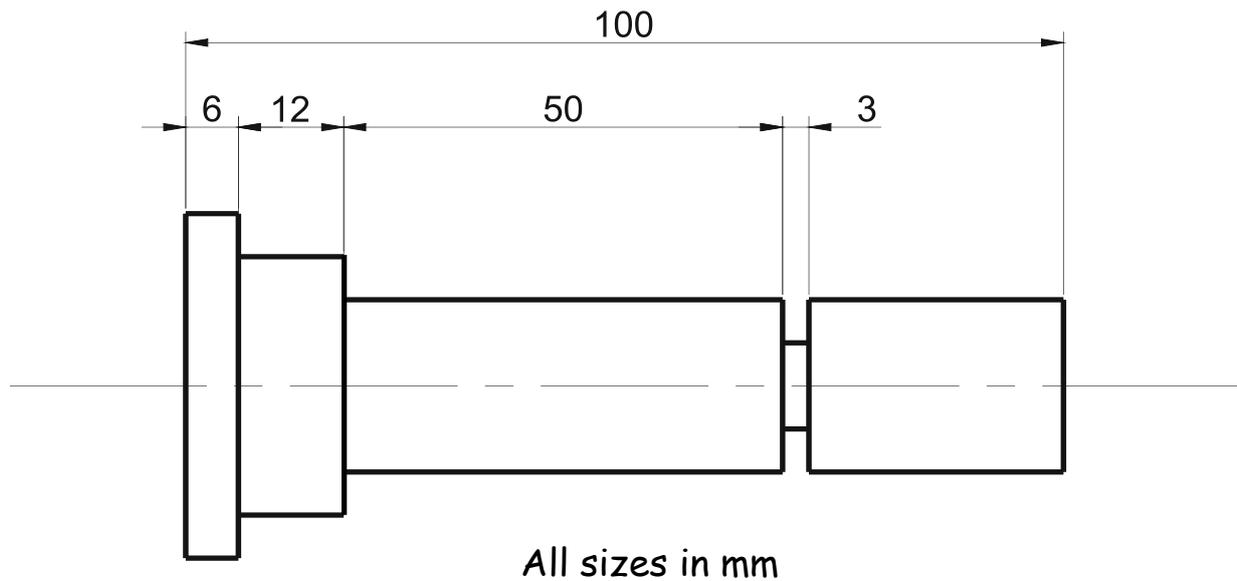


Short extension (Leader)

Dimension



Note the position of the dimensions on each of the lines

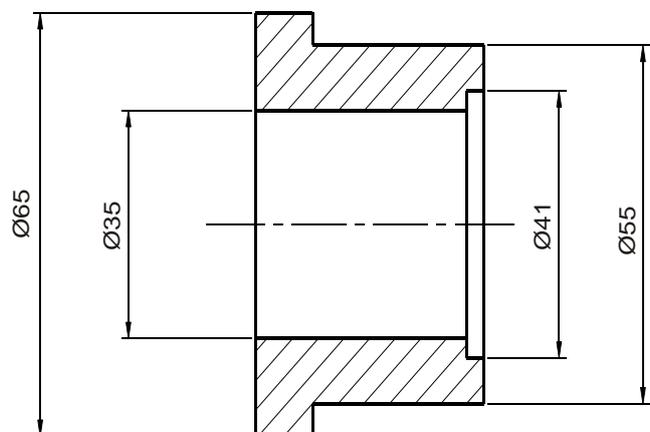


Notice on the above drawing that the largest dimension is placed on the outside of the smaller dimensions. Where there is a limited space for dimensioning, the dimension can be placed above, or in line with, the extension of one of the dimension lines. E.g. the 3mm dimension uses the 50mm dimension leader. 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)**.

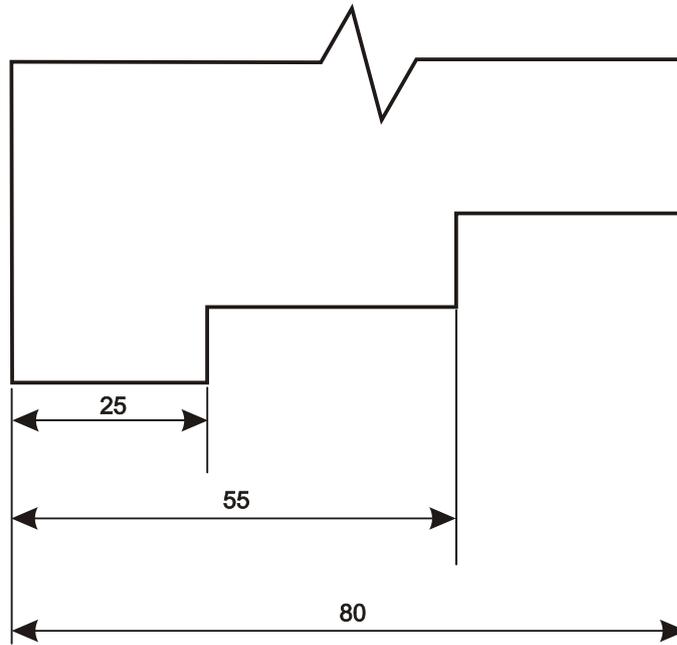
The sectioned drawing opposite shows some possibilities for putting a diameter on a drawing. This is by no means the only method.

If the section shown was **Square**, then the following symbol would be used.

□ 45

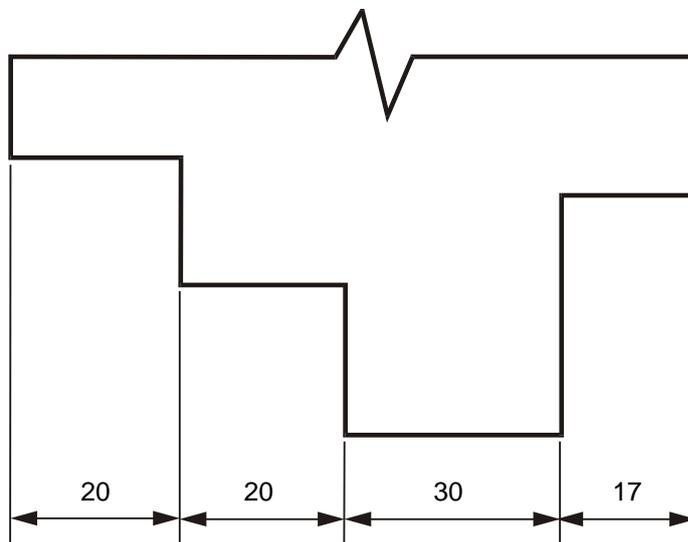


Dimensioning methods



Parallel dimensioning

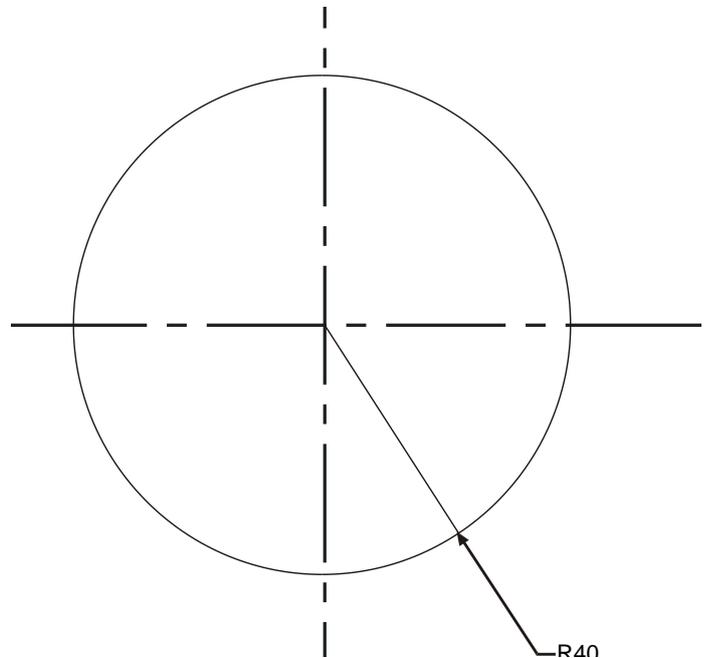
Parallel dimensioning shows dimensions taken from a common datum.



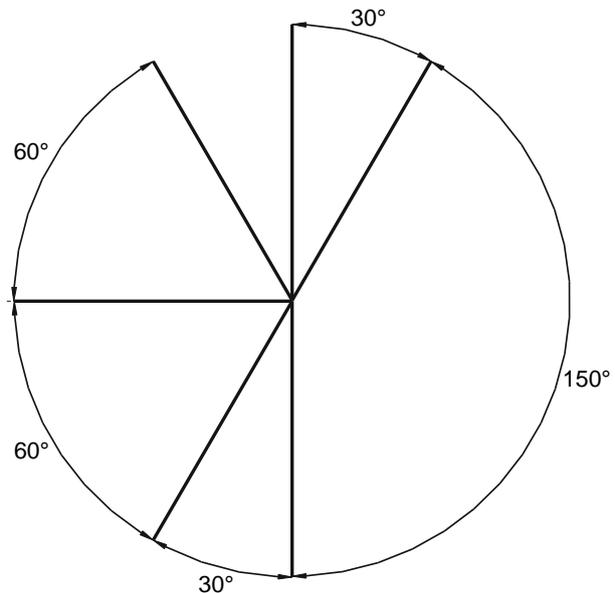
Chain Dimensioning

Chain dimensioning should only be used when the accumulation of tolerances will not affect the part.

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, that which touches the arc. The symbol R is placed in front of the dimension.



Angular Dimensions



Dimensional Tolerances

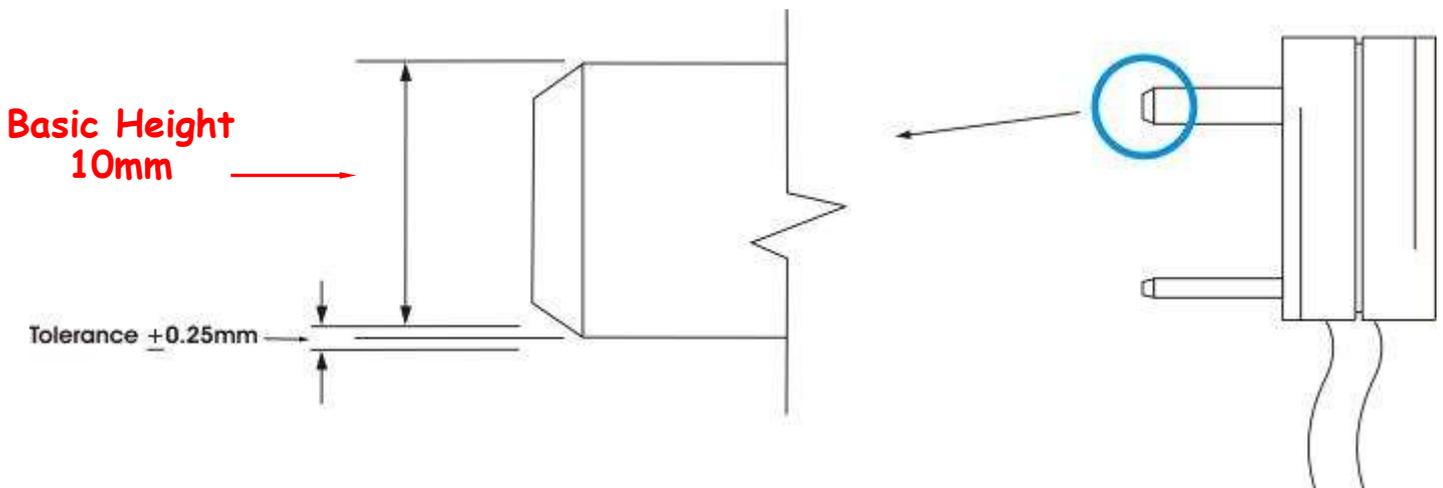
When products are manufactured, they, in many cases have to be able to be assembled to other components which make up the complete product. It is very difficult to ensure that the components are the exact size every time, therefore to allow for slight mistakes in manufacturing we use a system called Tolerance. This allows the components to be made within certain sizes which in turn allows for slight mistakes allowing the components to still fit. In the first example given overleaf the component has a tolerance of 0.25mm either way. This means the component can be made within the sizes 19.75mm to 20.25mm. The tolerances vary depending what is being made.

In the example shown opposite (*button for TV remote*) the button has been made with a tolerance of $\pm 0.5\text{mm}$. This means that in the manufacturing process it will have a full 1mm allowance. This does not seem a lot but in manufacturing terms is a substantial allowance.



For example, the height of a pin of an electrical plug, has shown below, is 10mm. The company has determined that the size could vary between 9.75mm and 10.25mm and still be able to fit in the slots in the socket. In this case a tolerance of 0.5mm could be applied to this dimension without affecting the function of the part. This size is normally stated as $\pm 0.25\text{mm}$.

\pm

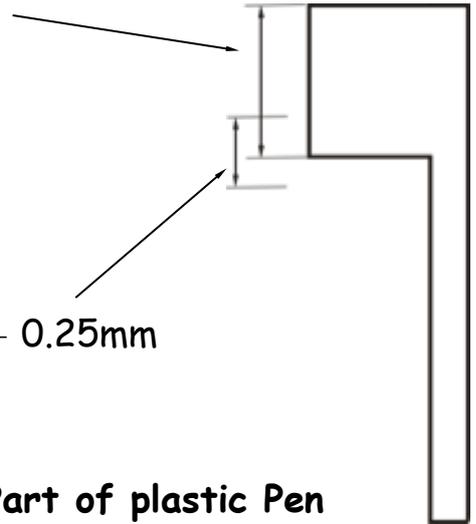


When manufacturing or constructing an item it is virtually impossible to achieve precisely the required size of the item. The error permissible in manufacture is called tolerance - this is normally given on the drawing of the item. Tolerances which affect the size of an object or feature on it are referred to as dimensional tolerances. They are also used to tolerance the size of locating features on an item in relation to another. For example, the required length (or basic length) of part of a plastic pen clip shown below is 10mm. This size could vary, between 9.5mm and 10.5mm and still fit in the slot provided for it on the pen.

tolerance of 1mm, normally stated as $\pm 0.5\text{mm}$ could therefore be applied to the dimension without affecting the function of the part. The length of the part of the clip could then be manufactured to any size between 9.5mm and 10.5mm and still be acceptable.

Basic Length

Tolerance $\pm 0.25\text{mm}$

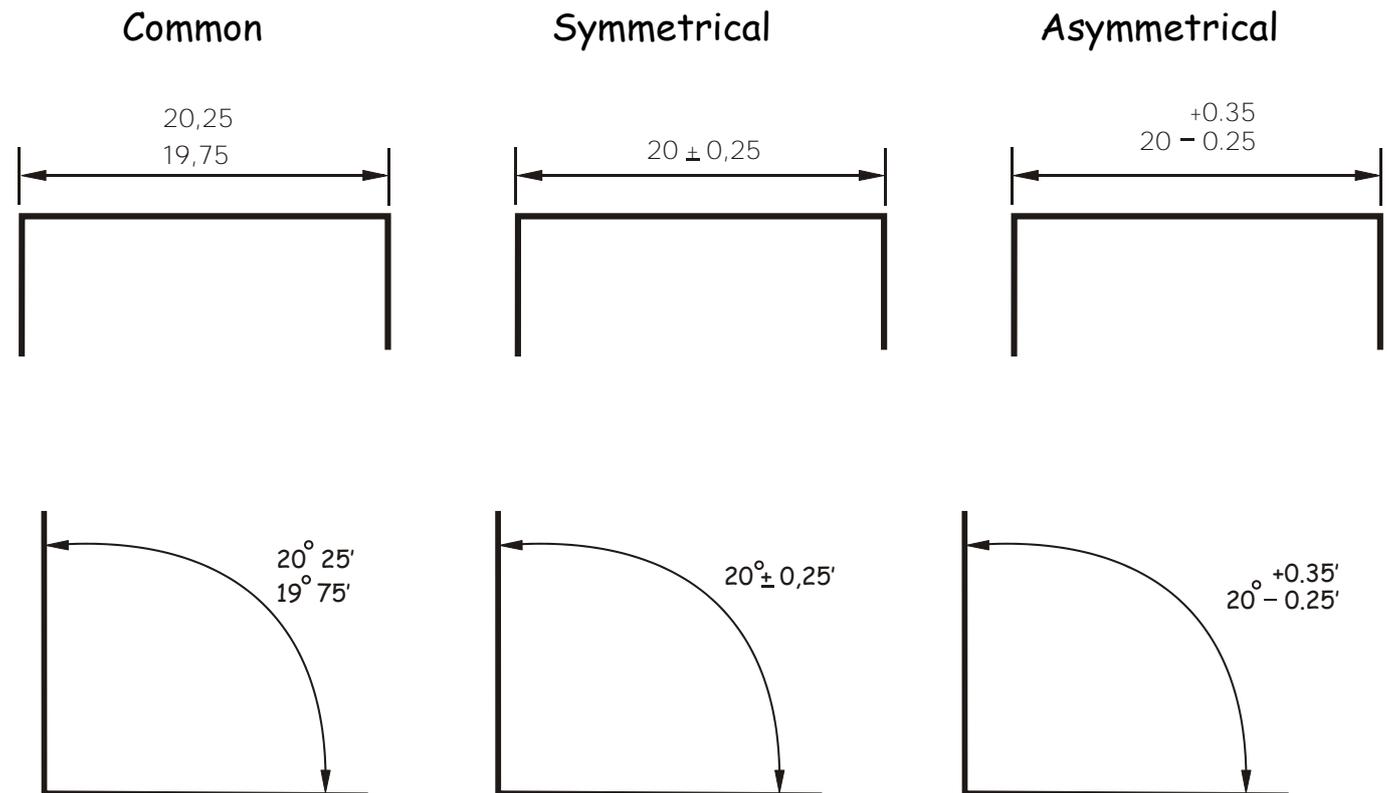


Types of Tolerance

Functional & non functional dimensions

The remote button and the electrical pin of the plug shown on the previous page are examples of a **functional dimension** as they are directly affected by the size of both components. If either was out with the tolerance allowed they would not fit.

Whereas a **non functional dimension** would be the height of the inside button or the length of the pin would not affect the fit of the two components.



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 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**.

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.

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.

The size of scale used is mainly dependant on two factors. These factors are the;

Size of paper available

And the size of the object being drawn.

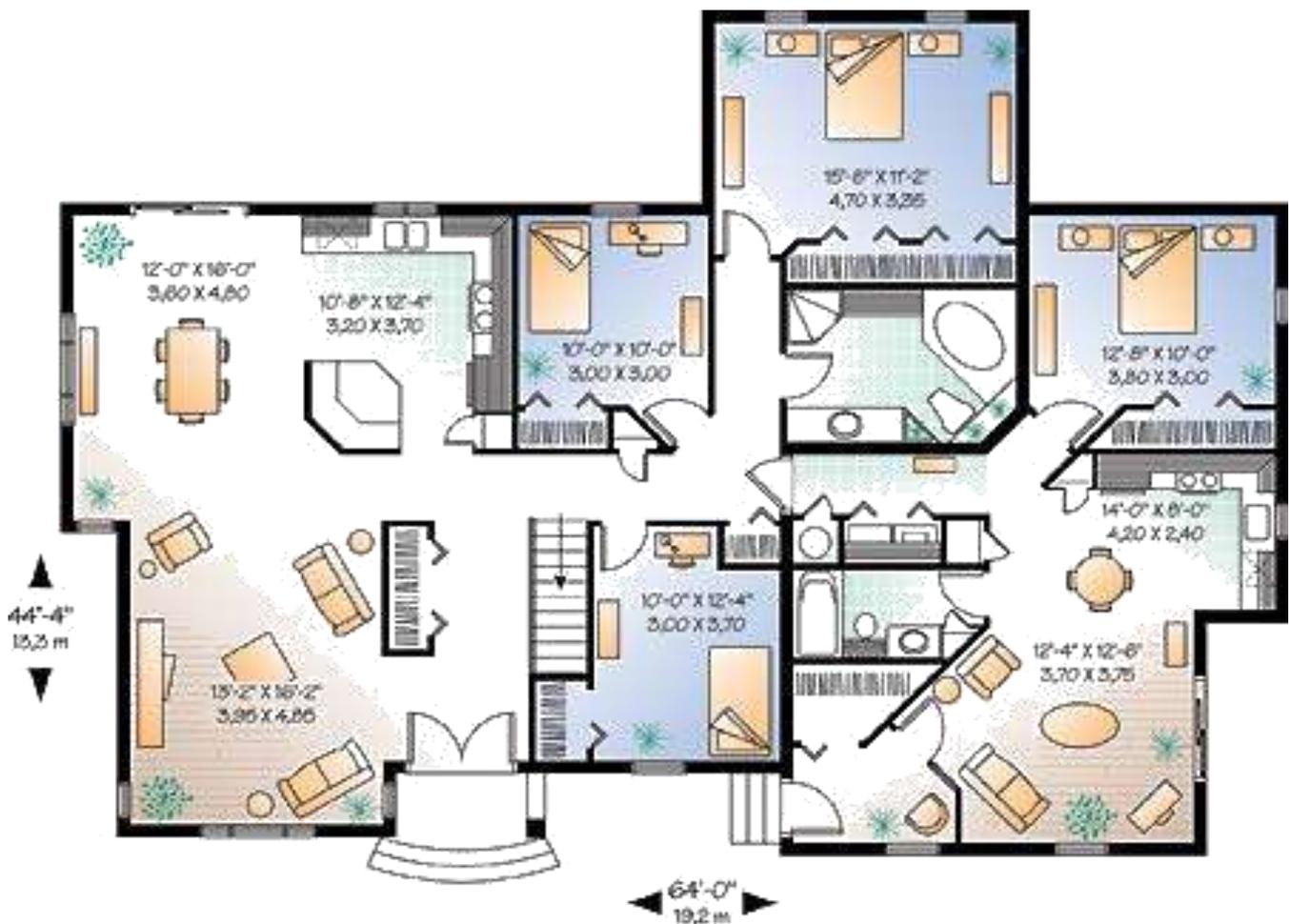
The amount of detail required

E.g. If house was being drawn on a piece of A4 paper opposed to a sheet of A2 paper, the scale used will obviously have to be different or it won't fit onto the page.

Floor Plans

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. These are as follows:-

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



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.

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.

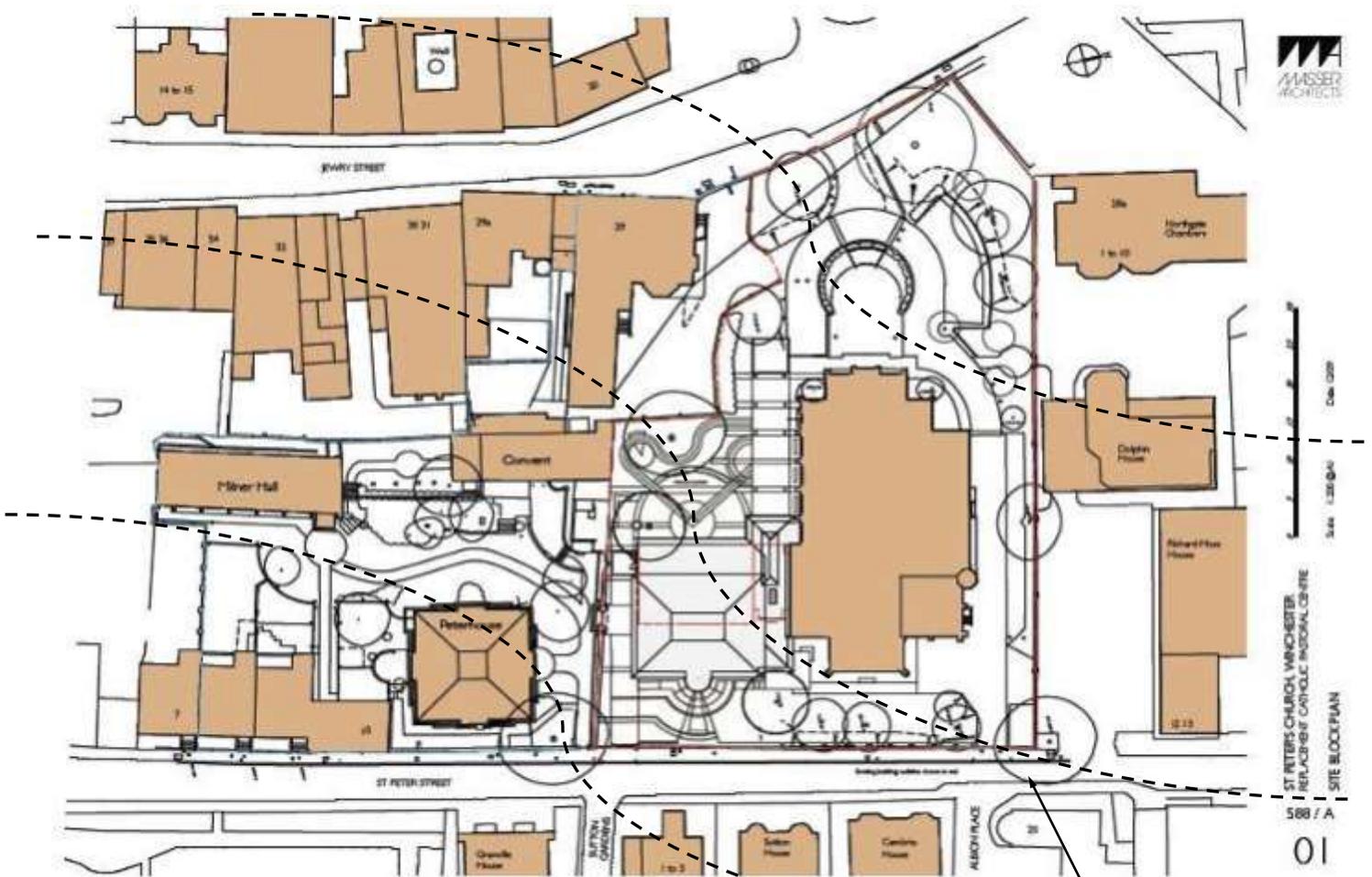
The buildings are shown as outlines and boundaries are marked slightly darker. The scale and the north point are both indicated on the drawing. The site is numbered (usually as plots). Waste pipe runs, manholes and trees are also indicated. Important dimensions are shown.



Block Plans

A **Block Plan** or **Site Location Drawing** shows where the site is located within the local area. It shows roads, outlines of buildings and site boundaries (Garden boundaries).

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

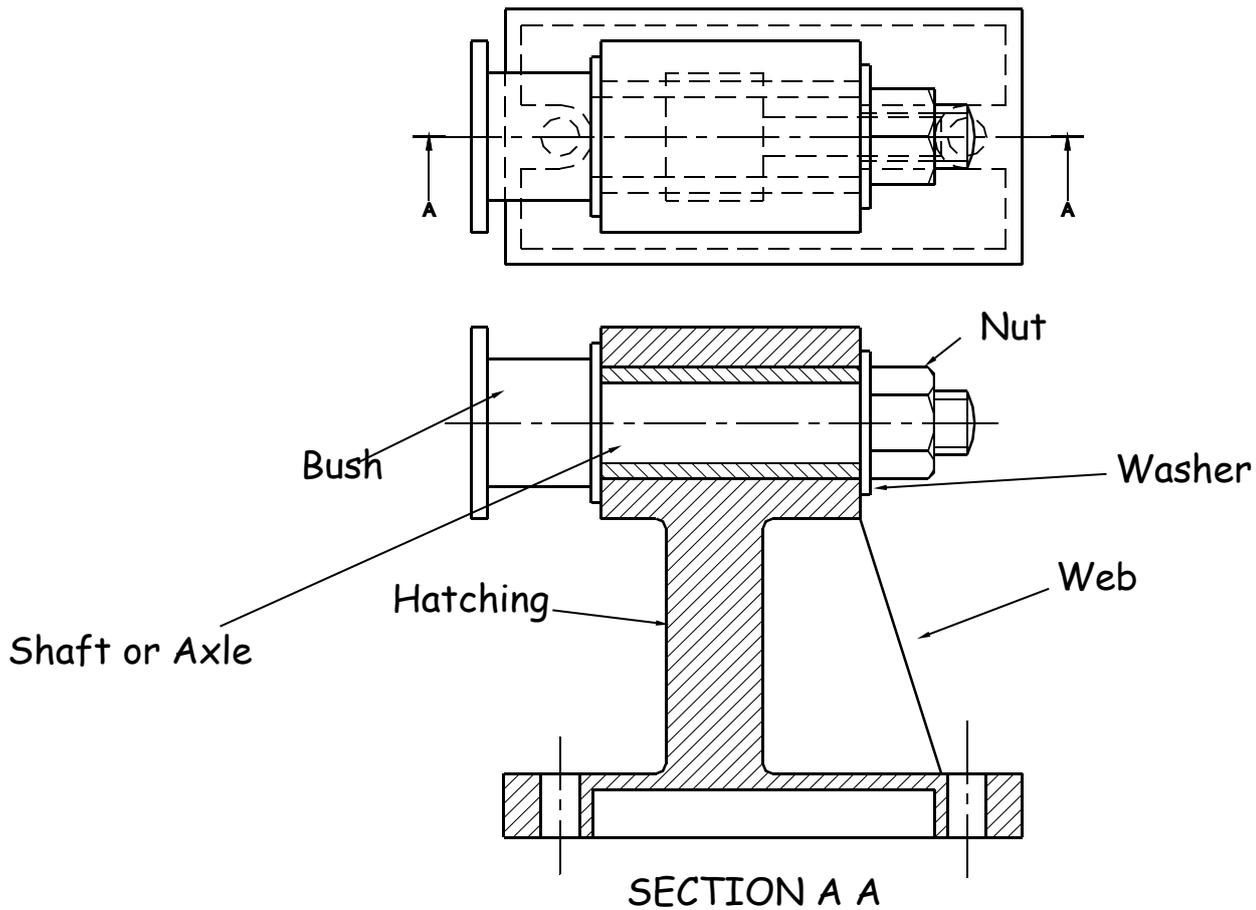


SCALE 1:1250

Ground contour lines

North Point indicator and scale.

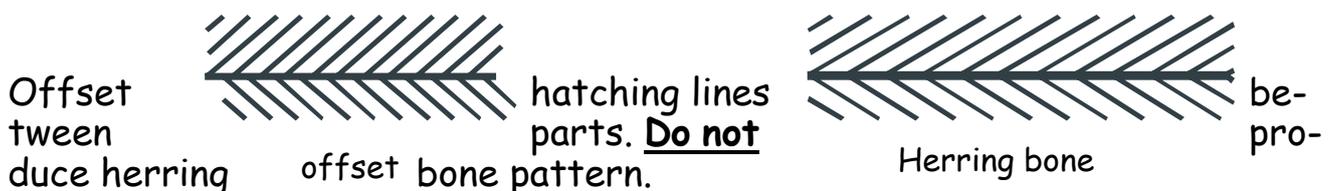
Sectioned Drawings



Sectional views are drawn to show more clearly what hidden parts would look like.

The cutting plane is shown as a chain dotted line thickened at the ends and labelled with a letter.

Where parts are cut by the cutting plane they are hatched using a thin line drawn at 45° . These lines should be equally spaced at 4mm. Adjacent parts are hatched in the opposite direction.

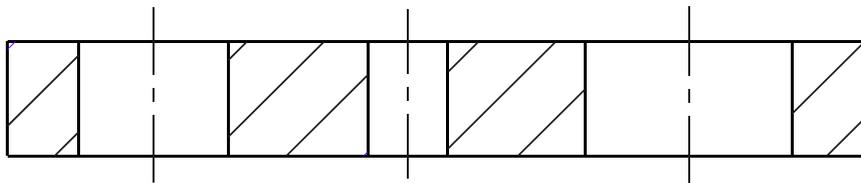
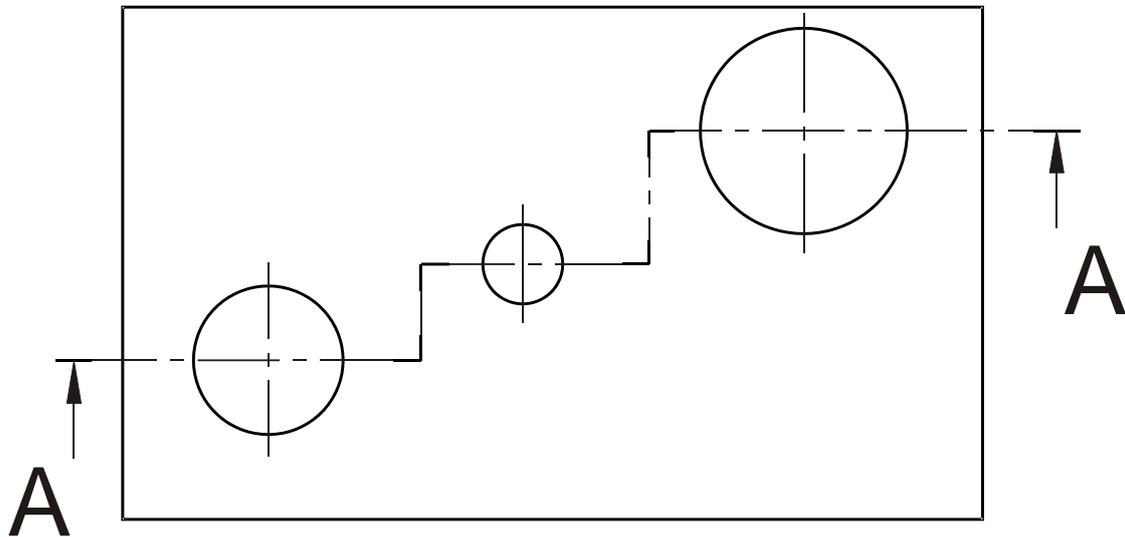


The following parts are **not** normally sectioned:-

Shafts, ribs, webs, spokes of wheels, nuts and bolts, washers and keys.

Stepped Sections

(Sectional views in more than one plane)



SECTION A A

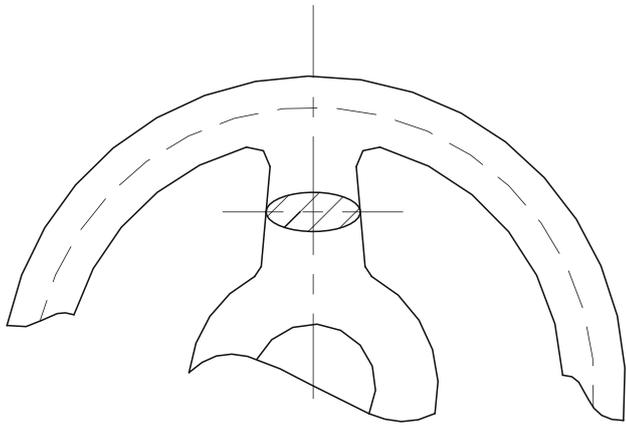
It is convention to draw these views as if the cutting planes were one continuous plane.

Moving a CAD drawing to a DTP package

The Cad file is exported out as a WMF (Windows Meta File) Imported into an illustration package and then exported out as a JPG file. In the DTP it imported into the file currently in use.

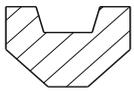
Types of DTP Software packages

MS Publisher, Photoshop, Serif Page Plus, Quark Publishing.

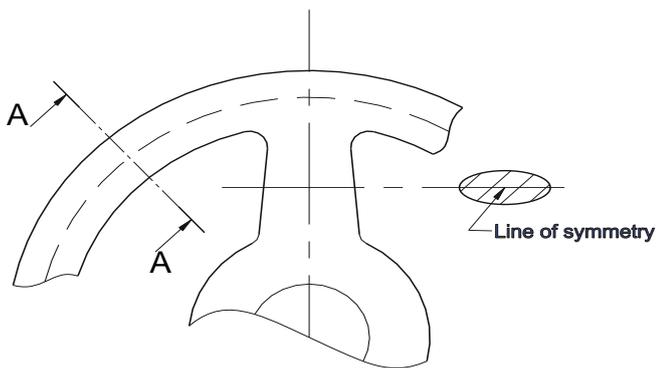


Revolved Section

This type of section, as the name implies, has been turned through 90 degrees to show the reader what the section looks like.

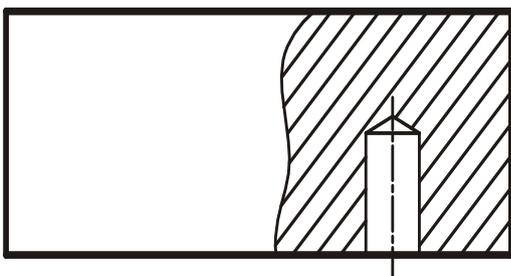


A-A



Removed Sections

A removed section shows the cut section out with the actual drawing as shown in section A-A. The groove shown on top of the cut section A-A is the top of a pulley wheel which would accommodate a belt.

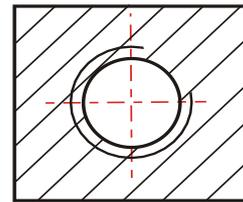
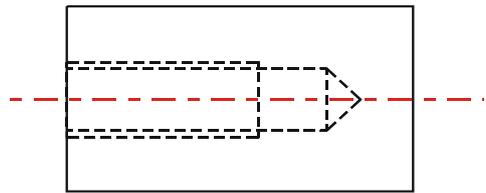
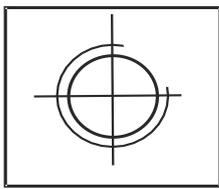
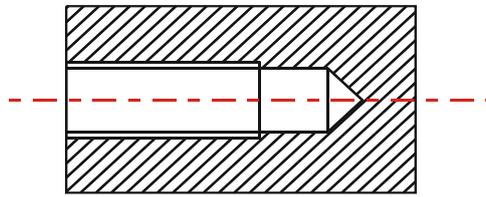
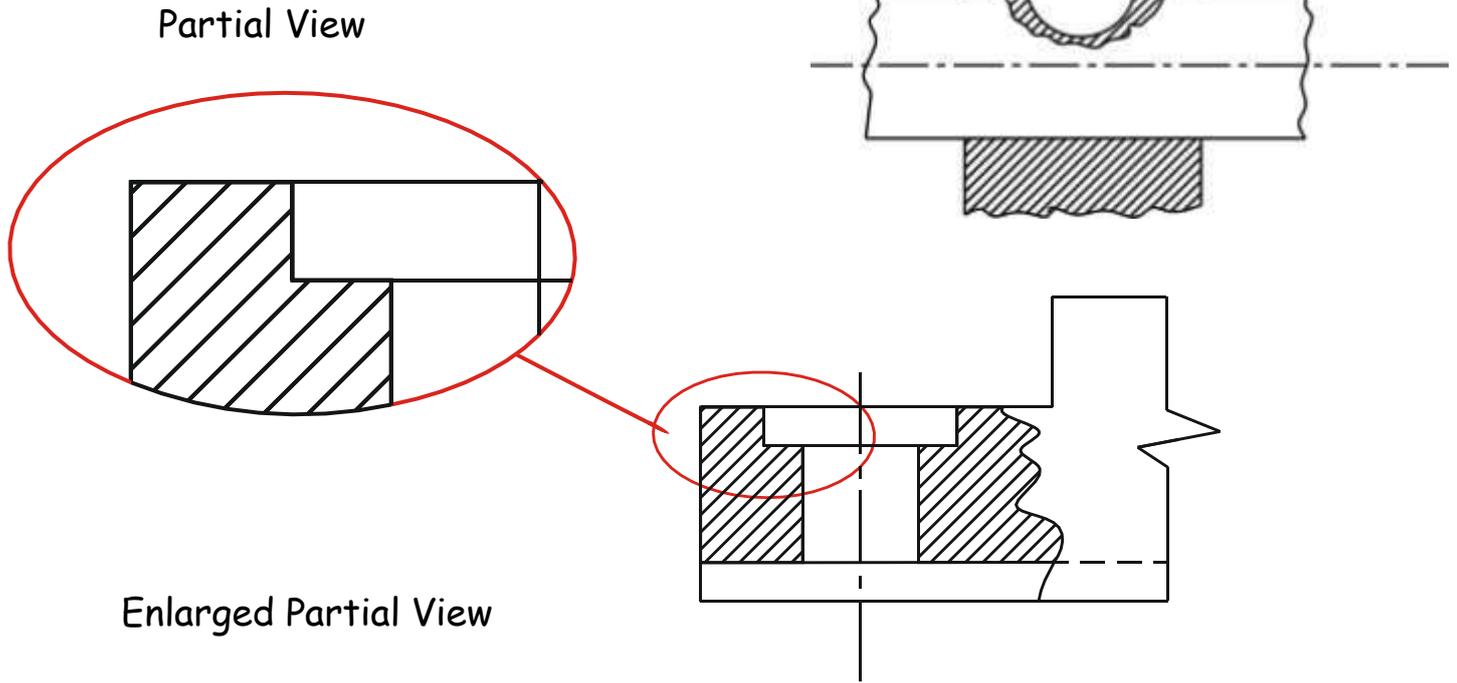


Part Section

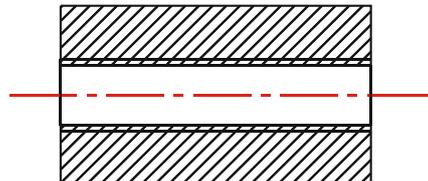
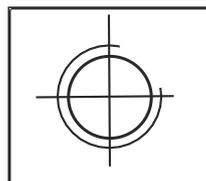
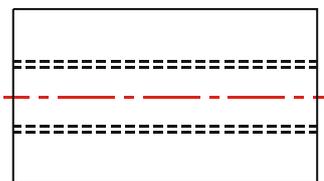
This type of cut section only shows part of the component sectioned. It would most likely be carried out to show hidden detail such as this blind hole.

Sections Continued

Woodruff Key

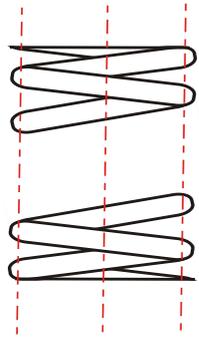


Internal threads (Blind hole)

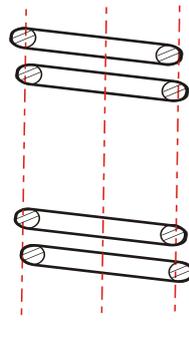


Internal threads (Through hole)

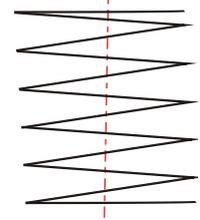
Springs



View



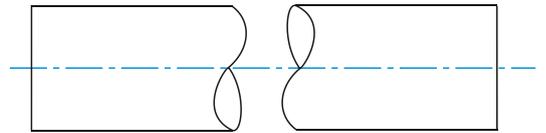
Section



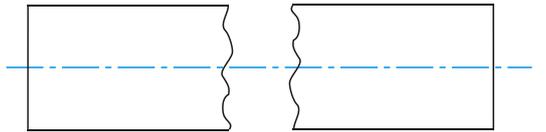
Simplified View

Nuts, Bolts & Shafts

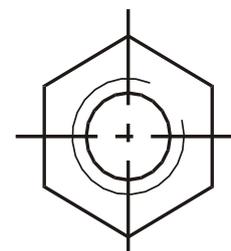
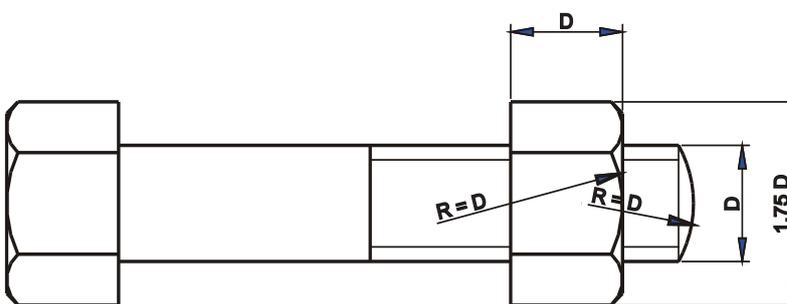
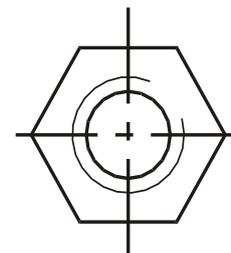
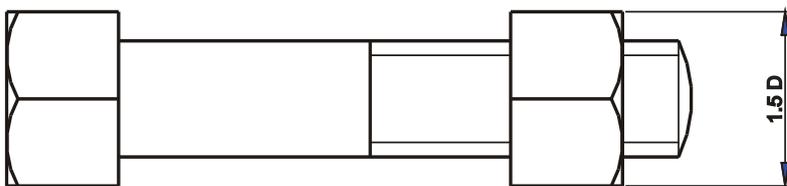
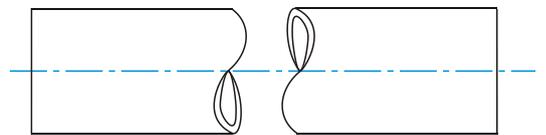
Conventional break lines for a solid shaft

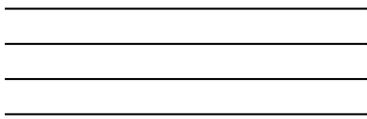
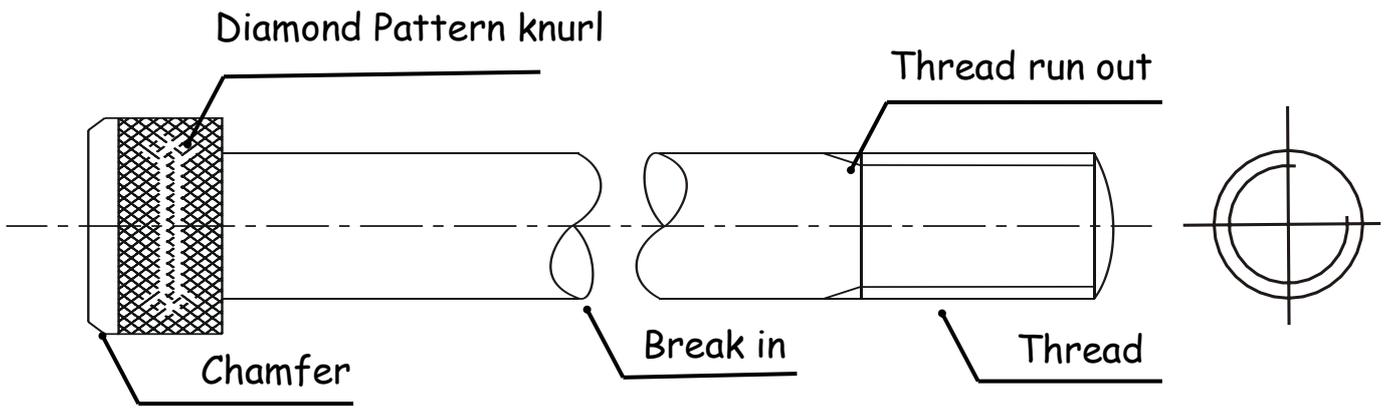


General break lines (continuous irregular used)

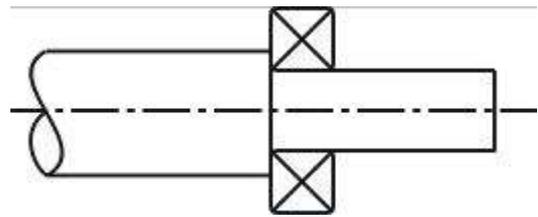


Conventional break lines for a hollow shaft





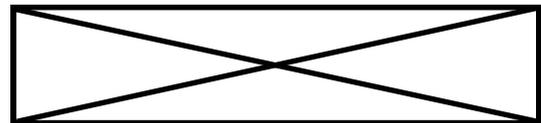
Straight knurl



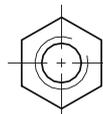
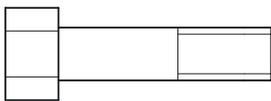
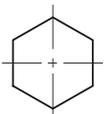
Roller Bearing

Conventional sizes to draw a nut and bolt are shown. Use these sizes if you have to draw the nut or bolt accurately otherwise use the simplified convention shown below.

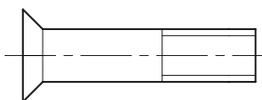
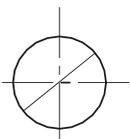
Flat Surface



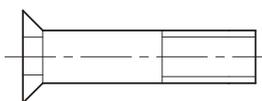
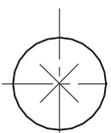
Simplified Fasteners, etc



Hexagon head screw



Countersunk screw, slot



Countersunk screw, cross slot

Construction Symbols



In-line valve (any type)



Softwood, machined



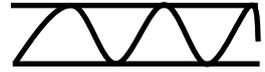
Radiator



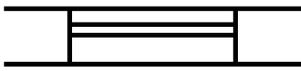
Wood, any type, sawn



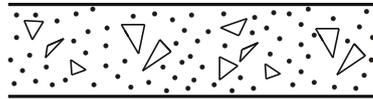
Brickwork



Insulation



Window



Concrete



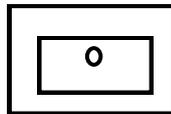
Switch



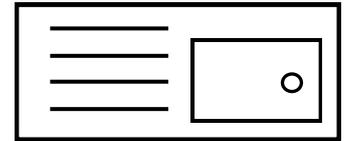
Lamp



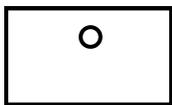
Socket



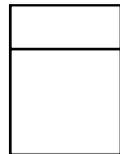
Wash basin



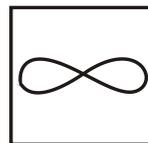
Sink top



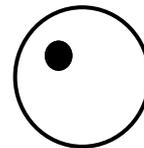
Sink, any type



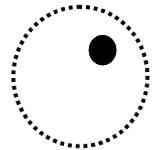
WC



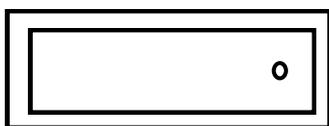
Fan



Existing Tree



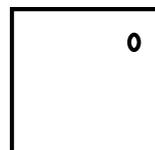
Existing tree to be removed



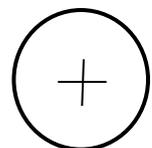
Bath



Door

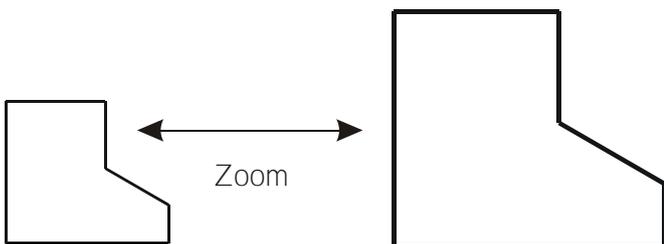
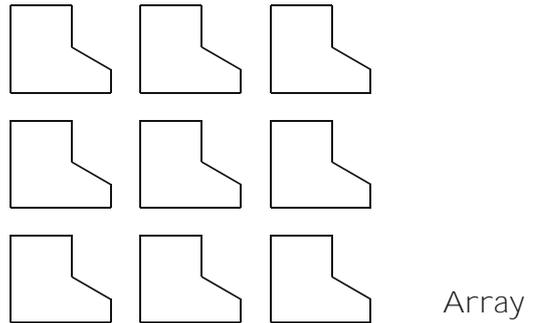
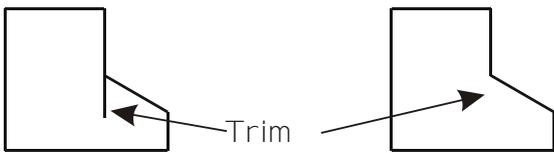
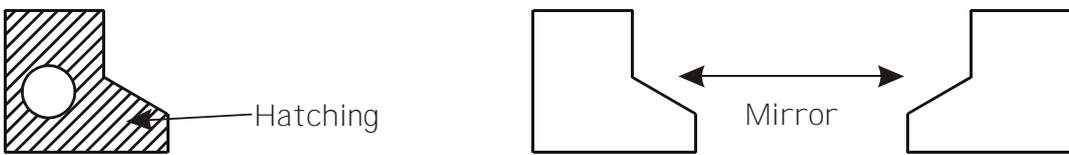
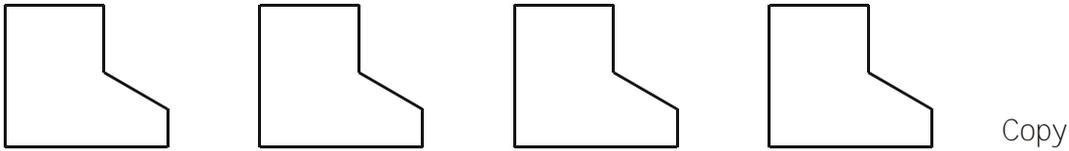


Shower tray



Proposed tree

Common CAD Commands



Copy means to copy an object to the clipboard.
Paste means to paste the contents of the clipboard onto the page.
Undo means to reverse the last command.
Move means to move an object to a new position on the page.
Erase means to remove part of a drawing.

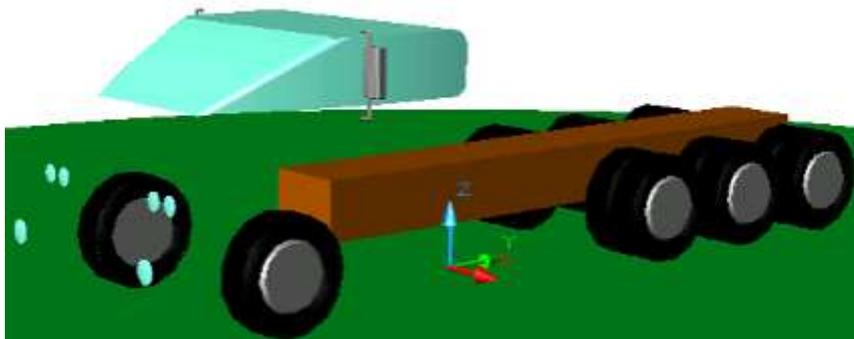
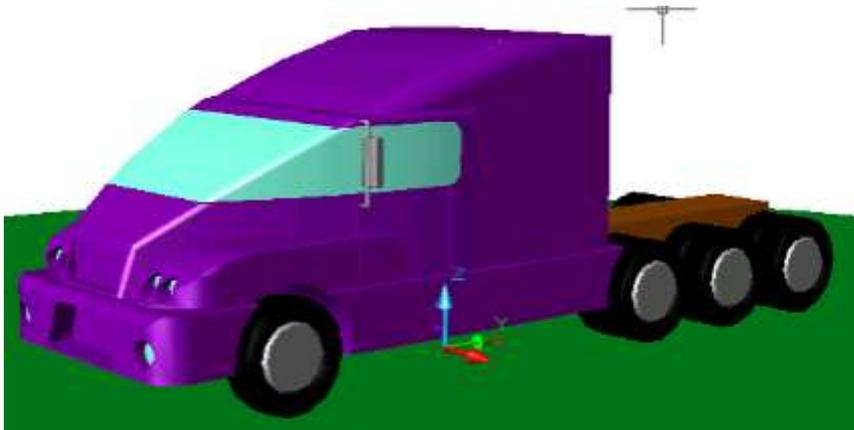
Layering

All Technical/Engineering Drawings should be set out with :-

- Internal lines
- Outlines
- Hidden lines
- Dimension lines
- Text
- Centre Lines
- Construction Lines

In Industry the chances are they will use many more layers than that shown.

The 7 layers listed above is like having 7 pieces of clear paper sitting on top of each other which can be switched on or off as required. The example below shows a truck with its body on in the first drawing and off in the second. This is achieved by simply turning the layer which the body is drawn on, off.



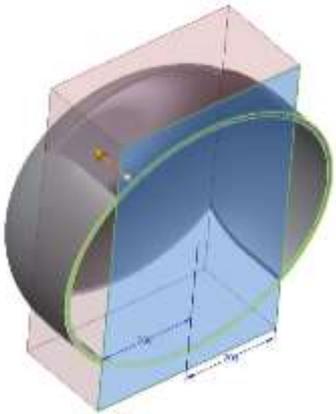
Advantages of CAG over manual drawing techniques.

- Drawings are produced quicker and very accurately.
- Drawings are easier to edit/change.
- Libraries of various parts can be created.
- Lead time can be reduced.
- Quality of drawings are improved.
- Convenience of use (Lap top).
- Standardisation.
- Drawings can be easily scaled up or down.
- Use of layers allows different parts to be drawn separately.
- Easier to store drawings.
- Easier to send drawings to another location quickly.
- True 3D modelling made easy.
- New designs from existing designs.

Disadvantages of CAG over manual drawing techniques.

- 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.

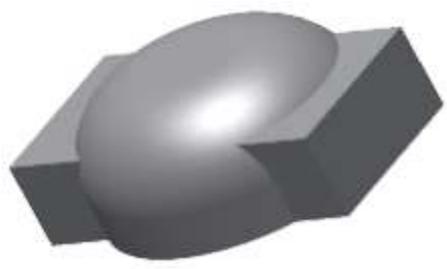
3D Modelling Techniques



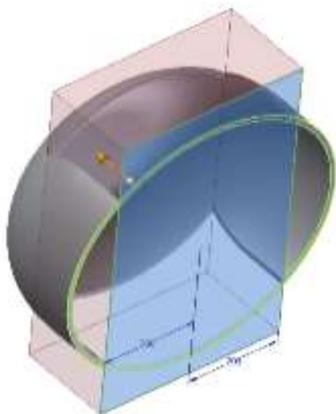
Sketch



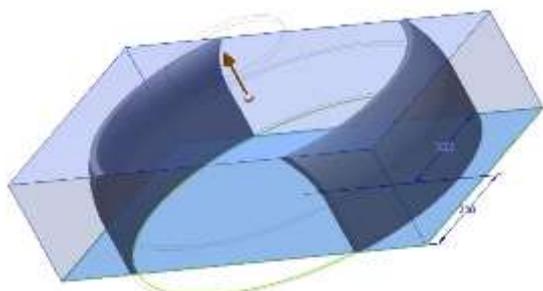
Union



Completed Union



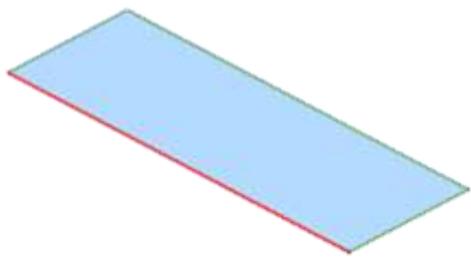
Sketch



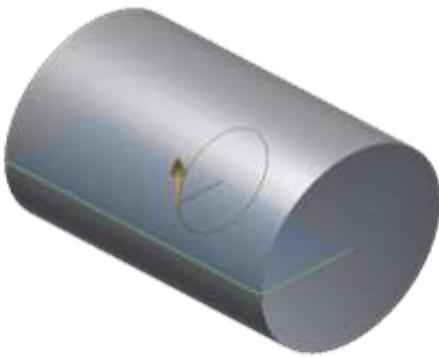
Intersection



Completed Intersection



Sketch



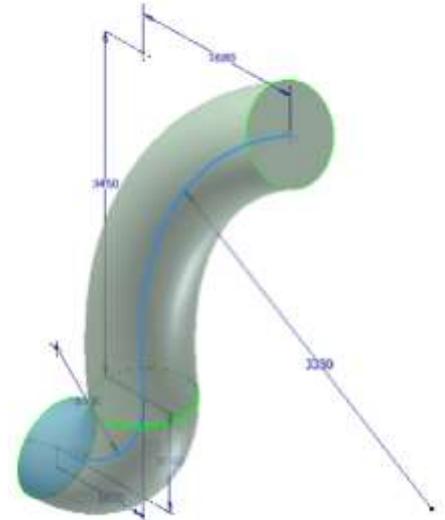
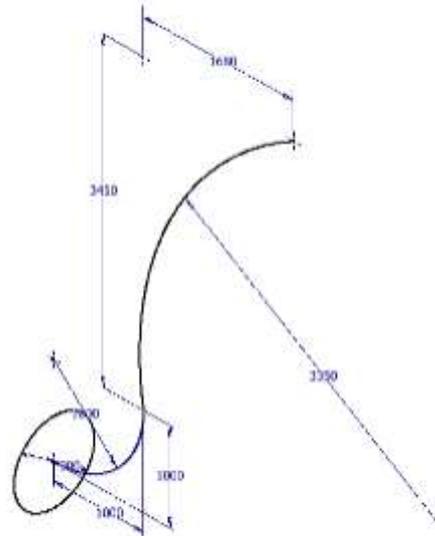
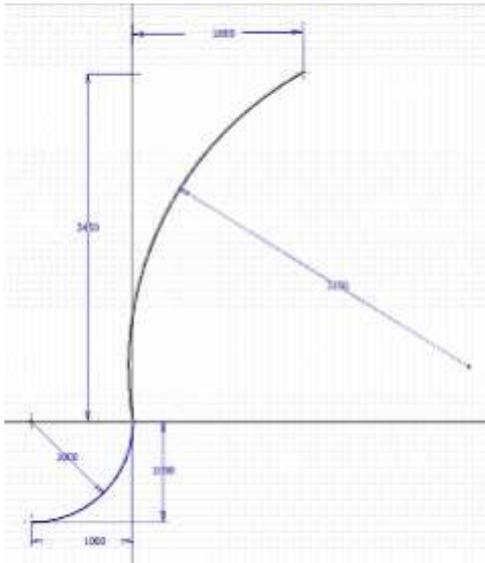
Revolve



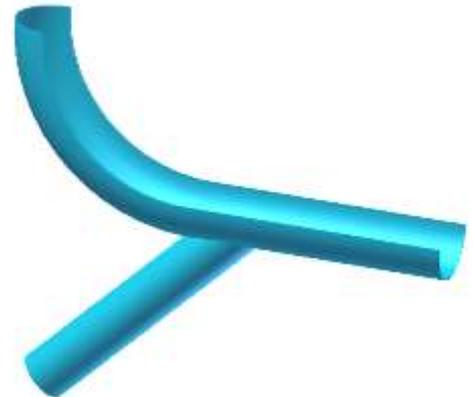
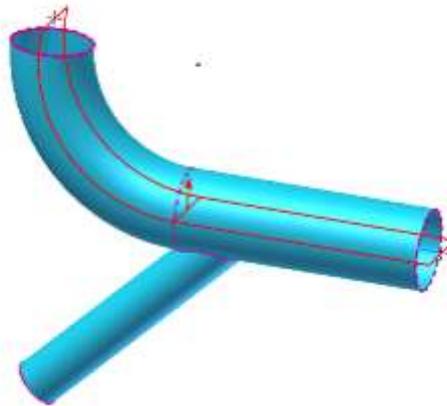
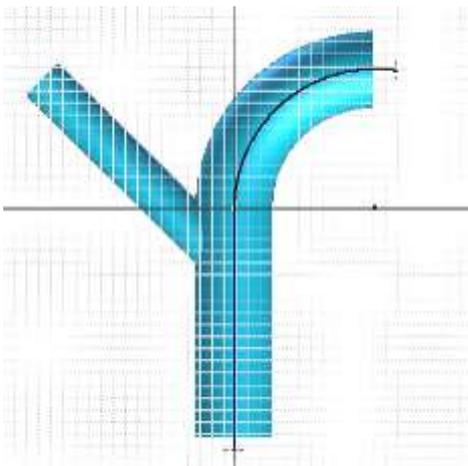
Completed Revolve with Chamfer

3D Modelling techniques (continued)

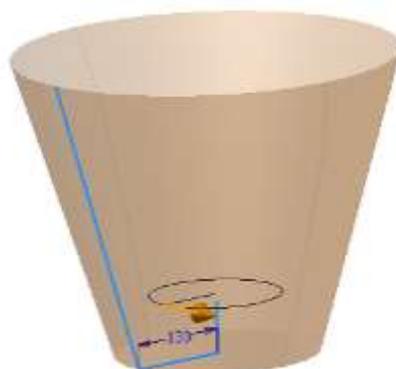
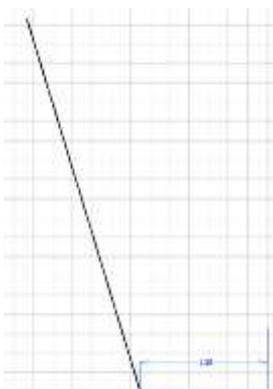
Extrusion along a path



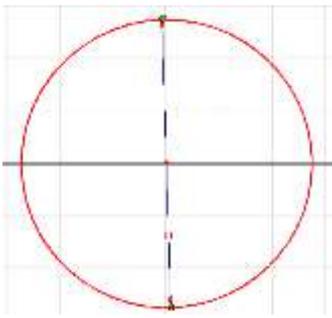
Split



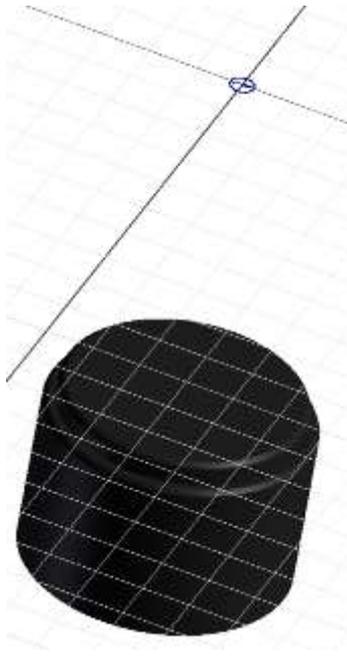
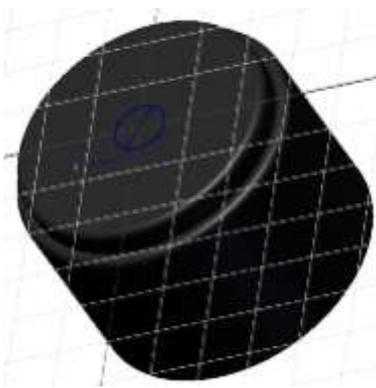
Surface Revolution



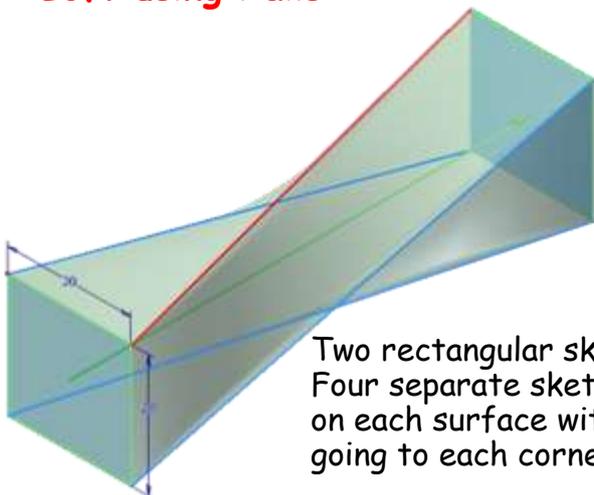
Basic Extrusion



Extrusion between two entities - Loft



Loft using Rails

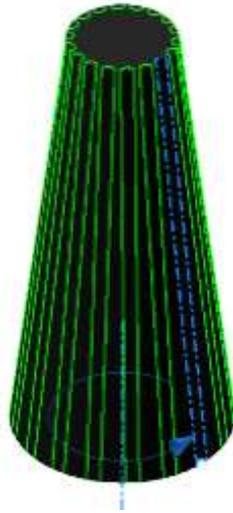


Two rectangular sketches are drawn. Four separate sketches are now drawn on each surface with a diagonal line going to each corner as shown.



The Loft is now drawn using the four rails as the paths.

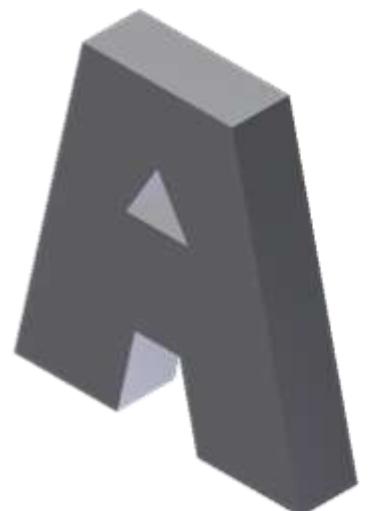
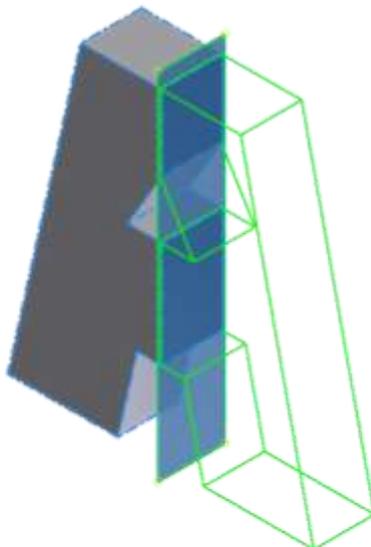
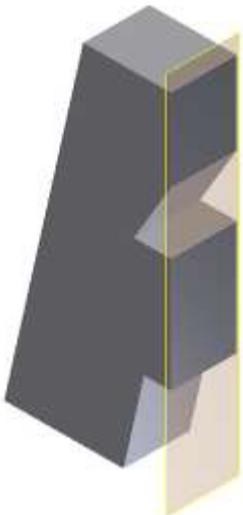
Circular Array



Rectangular Array



Mirror



The 3 P's

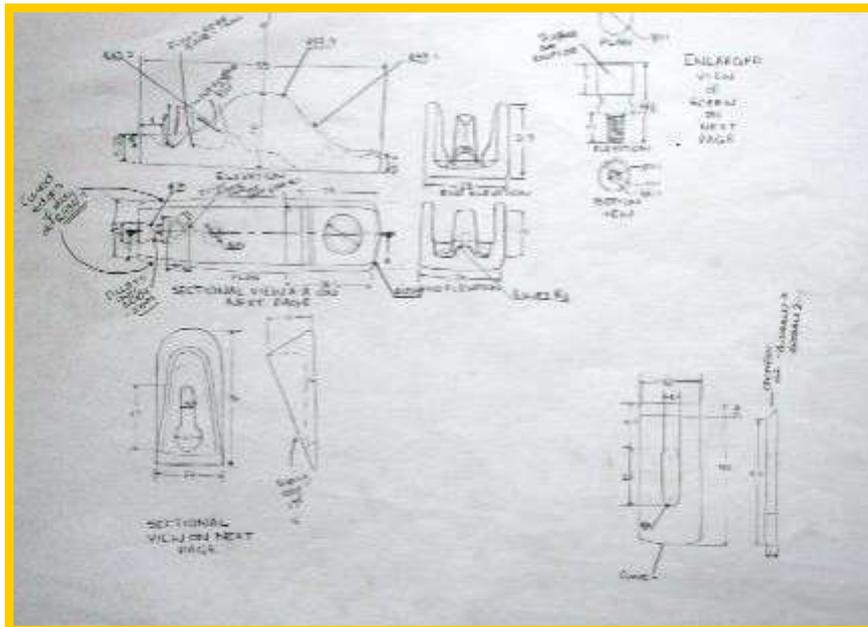
In your thematic presentation you will approach the theme just as a professional designer would, in the world of industry. This is tackled using the **3 P's**.

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.

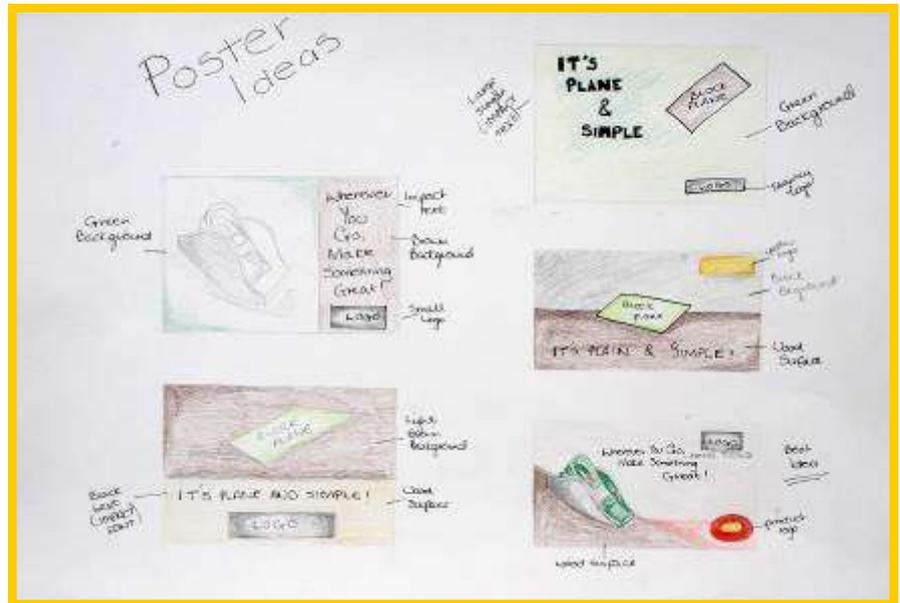
Preliminary Graphics



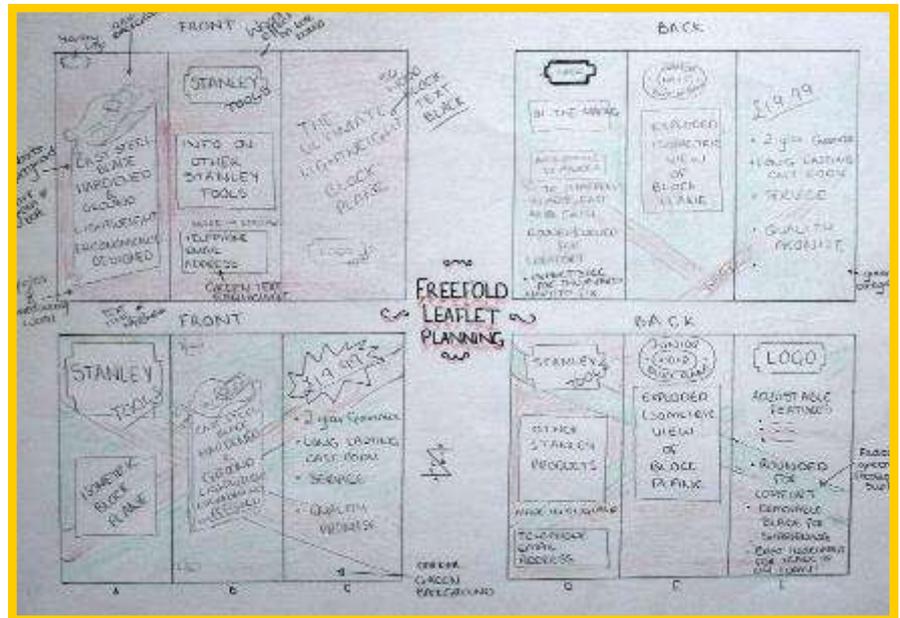
Orthographic freehand sketching

Drawn by Emma Napier 2008

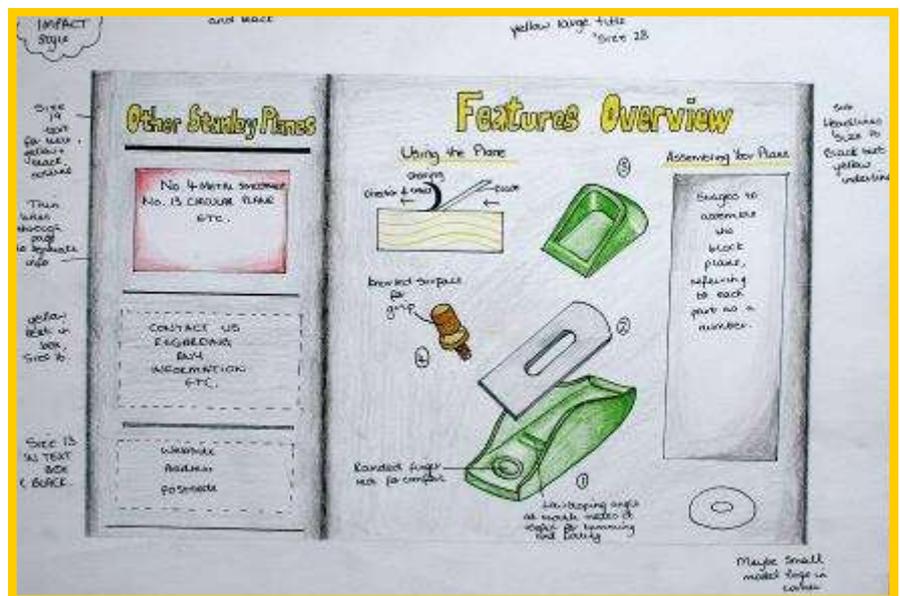
Pictorial freehand sketching



Planning for three fold leaflet

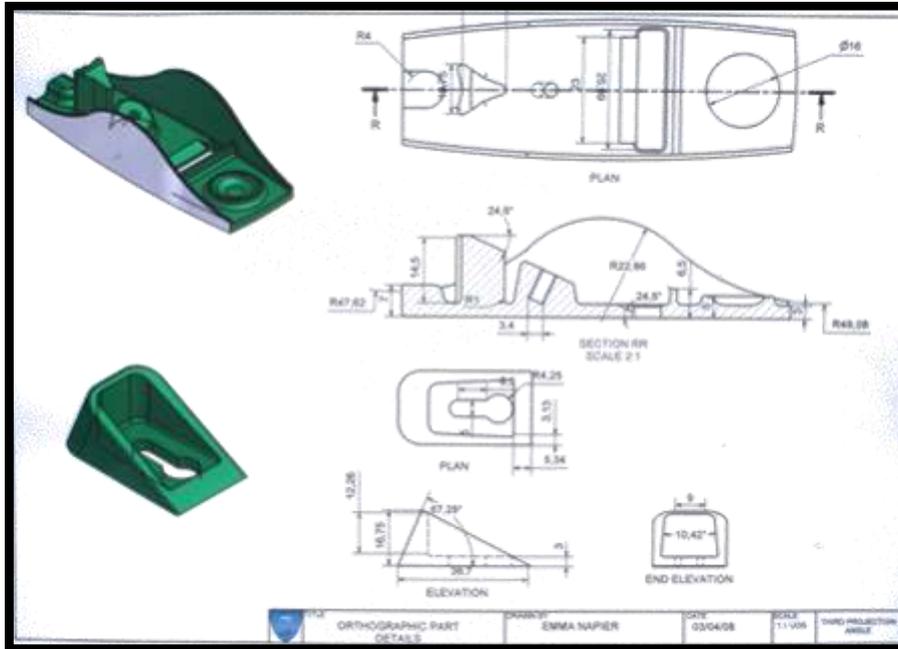


Full size Working Rough for the three fold leaflet

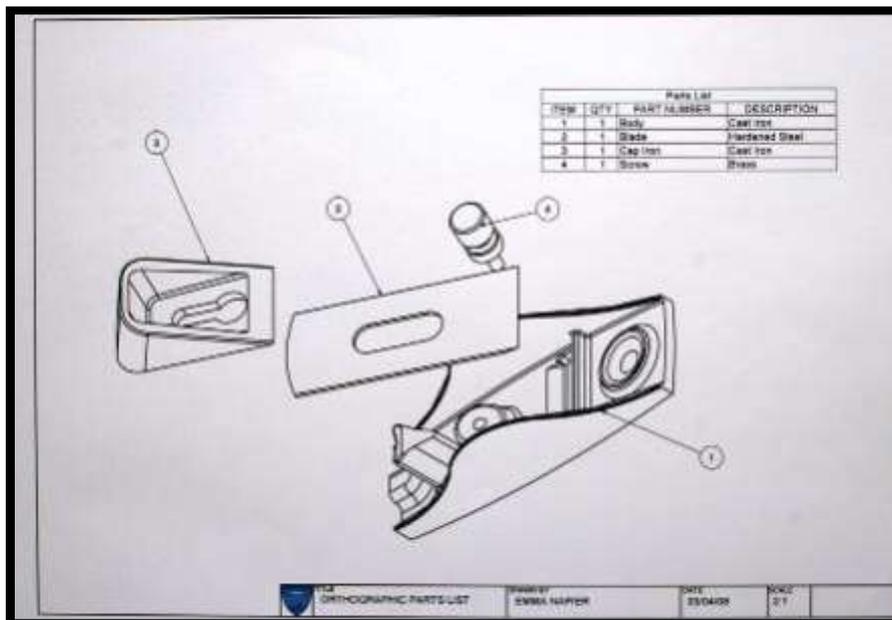


Production Drawings

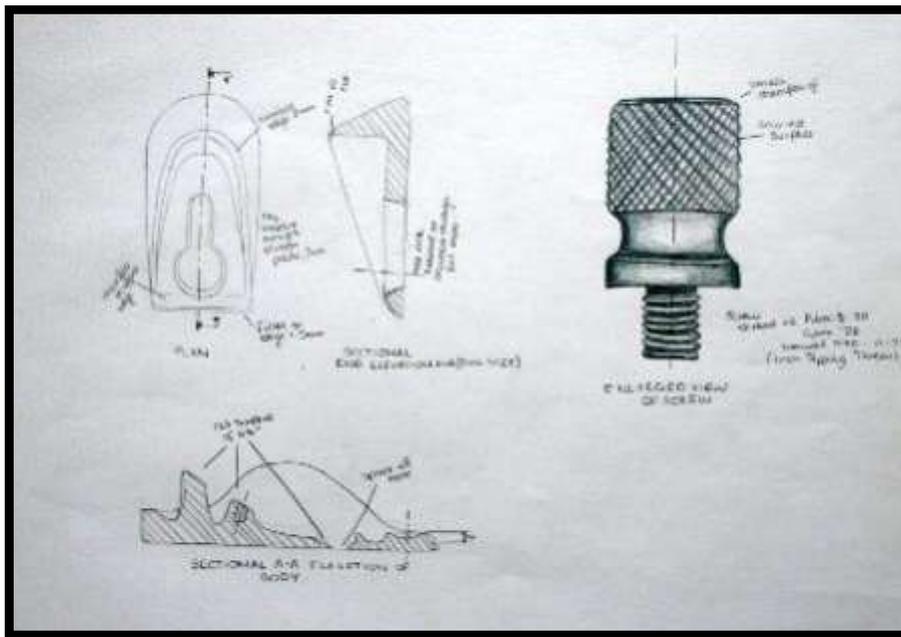
The production drawings as stated overleaf show all manufacturing sizes to enable manufacture of the product being designed.



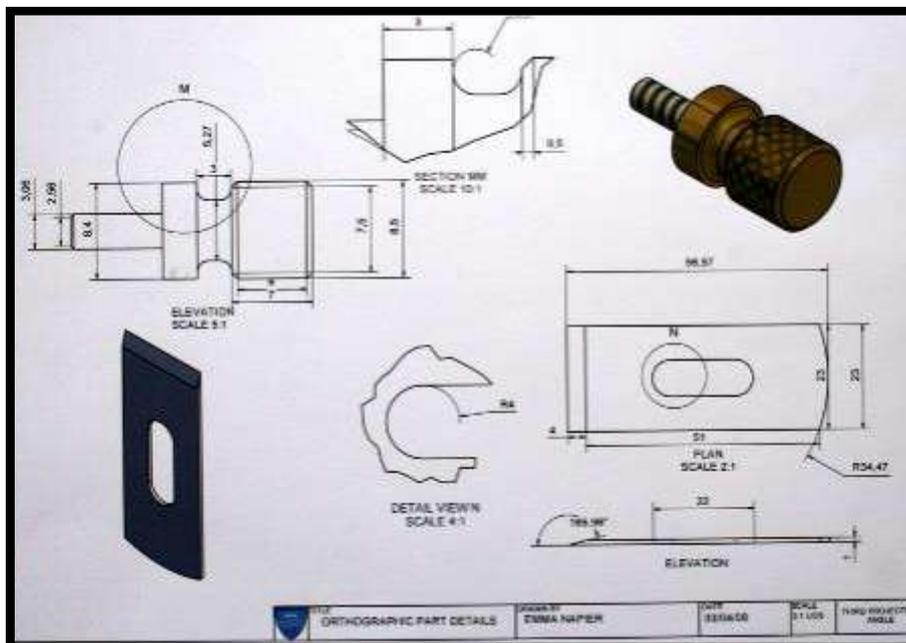
Computer Aided Drawing (Section)



Computer Aided Drawing (Exploded Isometric)



Detailed freehand drawing showing sizes



CAD - Detailed orthographic drawing showing various components

Drawn by Emma Napier 2008

Promotional Graphics

The sole purpose of a promotional graphic is to try advertise and tempt potential buyers to buy the product being sold.

This can be done in a number of ways including, flyers, posters, etc



Shown above and to the side are both sides of a three fold leaflet.

The preliminary sketches of the leaflet can be seen on page 25.

In the examples shown the background fill colour is not an ideal choice as it does not make the product being sold stand out. (It does not contrast well against background)



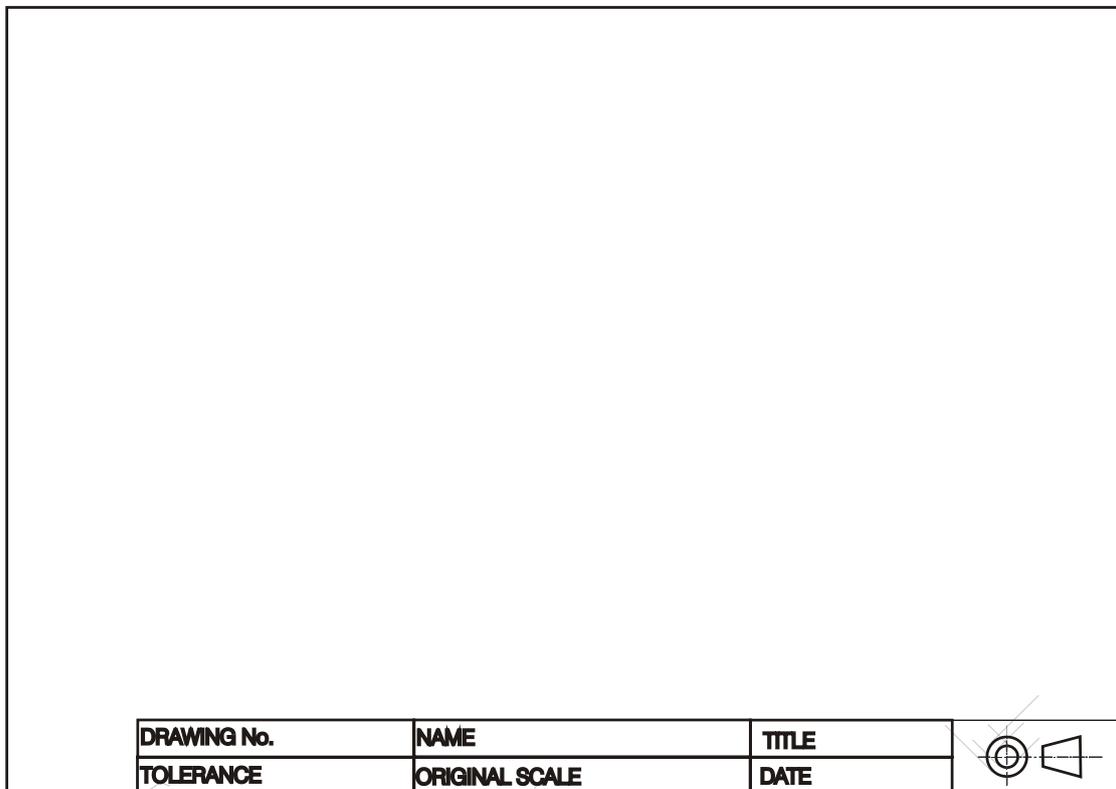
Drawn by Emma Napier 2008

Title Blocks

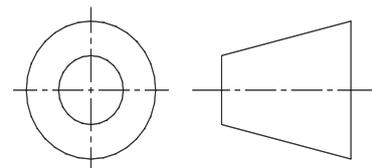
Title blocks are very important when producing CAD drawings as they inform the reader of many aspects of the drawing. A Title Block must always have the following information on display when producing CAD drawings.

Drawing No. **Name** **Title of Drawing**
Original Scale **Date** **Tolerance**

It must also show the third angle projection symbol or whatever method has been used to draw.



Third Angle Projection Symbol



The use of the third angle projection symbol informs the reader of the drawing that it has been carried out using this projection.

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.

Auto Tracing This where the application software automatically traces round the outline of an object.

Automatic Dimensioning Any system of generating dimension lines in specific locations.

Acetate A clear, cellulose sheet which can be used to overlay artwork on which other artwork or remarks can be placed.

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.
Bevel	The effect of sloping edges on a two-dimensional object to make it resemble a three-dimensional object.
Bezier (curve)	The mathematical method of drawing curves and for representing text used in computer drawing applications.
Binary	The basis on which computers work. Anything which is made up of two parts for example 1&0, On & Off.
Binding	The process of glueing and covering the pages of a document or book.
Bit Depth	Describes the amount of options (colours) assigned to each dot in a bitmap image.
Bitmap	Describes a computer image made up of screen dots (pixels).

- Bitmapped Font** A computer typeface made up of dots which show on the screen as jagged edges.
- Black Letter** Also known as Gothic or Old English, a style of handwriting made with broad-nibbed pens.
- Body (text)** The main text part of a document usually smaller than 14 Points in size.
- Boot Disk** A disk, which can be used to start up a computer
- Booting up** The process of starting a computer up.
- BPI (Bits Per Inch).** The intensity of dots used on a computer to describe an image.
- Bromide** A photographic paper used to create high quality proofs.
- Buffer** An area in computer memory used to store specific information when required, commonly used for printing data.
- Bullet** An ornamental dot or other shape used to mark an item in a list or to add emphasis to a piece of text.
- Byte** A group of eight bits, which also represents one character on a computer.
- Back-up** A term used to describe the processes of making a second copy of drawing files, CAG programs, etc. in case the working copies are damaged.
- Calligraphy** The art of handwriting
- Colour gradient** One colour merging with a different colour
- Capitals** Often shortened to Caps and also known as Uppercase.
- Caps Lock** The button on a keyboard which allows every letter typed to appear as capitals.
- CD ROM** Abbreviation for Compact Disk Read Only Memory.

- Centre-Aligned** Text which is aligned around its centre point.
- Chapter Head** The title heading that appears on every page of or opening page of a book.
- Character Count** The amount of letters, numbers, punctuation marks etc in a piece of text.
- Character Set** The complete collection of all possible characters for a font.
- Clip Art** Pictures which come with computer software
- Composition** To process of arranging elements such as text and graphics in the most suitable and economical way.
- Condensed Type** A narrower, more compact version of a typeface.
- Copy** The name given to the main text in a publication. Also the command for making a duplicate of selected text or objects.
- Copy fitting** The process of calculating the amount of space that text will take up in a publication and adjusting it to fit.
- Cursor** The pointer or other graphic symbol which shows the current position on the screen.
- Caption** The text which explains an image.
- CAE** Computer-aided engineering.
- Column Rules** vertical lines between columns
- Central Processing Unit (CPU)** At the heart of the computer, it controls all other units.
- Colour fill** Single colour within an enclosed area
- Centre spread** Two adjacent pages which can be found in the middle of a magazine.

Column guides non printable guides found in DTP software to allow planning of work

Crop to trim excess parts of a screen graphic.

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

CGA Colour graphics adaptor. A colour adaptor which provides low resolution up to four colours. (320 h x 200 v pixels at 4 colours)

Desk-Top Publishing (DTP) 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.

DPI Dots per inch. A measurement of resolution of output devices. The more dots per inch the greater the clarity of the graphic.

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

Default The values that are set when no other option is given.

Descender Any part of a letterform which sits below the baseline.

Digital Image Any image that has been converted into bits for use on a computer.

Dingbat A font made up entirely of decorative symbols or images.

Disk, diskette A flat magnetised plate used for storing computer data.

Disk Drive A device used to spin a disk at high speed over a read / write head.

- Display type** The name given to text which is used for headlines or for catching attention.
- Download** Transferring information from one computer source to another.
- DPI** Dots Per Inch - the term used to describe the resolution of an image, sometimes used to refer to screen images too.
- 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.
- Dump** A colloquialism for transferring what is in the computer's memory to disc or printer or some other output device.
- DXF** Drawing Exchange Format. A system controlling the format of data interchanged between CAG systems. Drawing files held in DXF format will have the suffix DXF.
- EGA** Enhanced graphics adapter. A colour adaptor allowing a variety of high resolution modes (320 h x 200 v at 64 colours to 640 h x 350 v at 16 colours).
- Extrusion** A command whereby an existing 2D (x,y) shape is translated into a 3D shape by addition of the Z depth or length.
- Ellipsis** Three dots in a row used in punctuation to show the deliberate omission of further characters
- Extended type** A wider, expanded version of a typeface.
- Facing Pages** Pages which seem to be facing each other in a publication.
- File** A file is the collection of data of which a drawing is comprised and which has been given a name (filename) by which it can be recognised when stored on disc.
- Flush Left/Right** describes text, which is perfectly aligned on one side.

Folio	Page number
Font	Collective name for every letter, number, symbol, accent, ligature, fraction and punctuation mark for a typeface at a particular size.
Galley	A proof of text before it is arranged on a page.
GUI	Graphic User Interface. The visual way that the user works with a computer, such as Windows™
Gutter	The space between columns.
Flat-bed plotter and	A flat table over which a pen moves in both the X Y planes.
Footer	The space at the bottom of the page where the page number and any other text is placed
Frame	a box used to hold an imported graphic or text so as to allow movement around the page.
Frame grab may	The screen image is captured and stored separately and then be manipulated by software.
Graphics Processor the	A special CPU that deals only with the handling of graphics and screen display. called digitisers.
Grid	All CAG systems provide 'transparent' grids; patterns which appear on the screen as construction aids but do not form part of a drawing.
Handles	The small rectangles that surround a selected shape. Text blocks in DTP software commonly have four handles.
Graphics Tablet	A flat-bed input device with a grid of fine wire below the surface. A puck, stylus or light pen will chase the cursor around the screen as it moves over the surface. 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. Graphic tables are also, and more frequently,

Gradient

Hairline The thinnest possible line.

Halftone The result of converting a continuous tone image, for example, a photograph into a series of black dots which imitate the tones.

Hanging Indent Describes when the first line of a paragraph aligns to the margin, but the following lines are indented.

Hanging Punctuation When items such as inverted commas are allowed to be positioned into the margins in order to keep the body of text aligned with the margins.

Hardcopy A paper printout from the computer

Hardware The mechanical and physical components of a computer system.

Headline The title or main introductory text in a publication.

Highlight in text Method of making the text stand out, eg colour flash, underlining, bold, italic

Highlight in I & P Technique to show light reflection on edges and surfaces and curves

Hyphenation The process of allowing a word which will not fit fully on a line to be split with a hyphen. In Desktop Publishing hyphenation can easily be controlled.

Hard Copy Simply means any copy of drawings produced as a plot, printout, or photograph, for example.

Hardware The physical parts of the computer. Example: the case, disc drives, motherboard, floppy discs, etc.

- Header Space** The space at the top of the page where the number and any other text is placed
- Hidden-line removal** A CAD command that removes background lines from 3D wire-frame images. Wire-frame perspective views show every line used to assemble a model. To be able to display and plot views as seen in real life means editing out all the lines and planes which would be concealed by other lines and planes. This is known as hidden-line removal and poses massive calculation problems for the computer.
- Housekeeping** Embraces all the routines which, although essential to smooth running, do not assist problem solving.
- Icon** A graphical screen image used to represent a file, programme or folder on a computer screen.
- Image Compression** The process of reducing a file's storage size without necessarily decreasing its quality.
- Imagesetter** A machine which produces high quality text and images on paper or film for commercial printing.
- Indent** Where one or several lines of text are positioned a specific distance from the margins or main text.
- Initialising** The process of preparing a disk for use on a computer. Also known as formatting.
- Import** To bring in a copy of a text file or graphics, for example from an external application to the page layout application.
- Input** A term used to describe information that is being sent to the computer.
- Inkjet Printer** Computer printer (usually colour), which works by firing tiny dots of charged ink at the paper.
- Input device** Any piece of hardware used to transfer data to a computer such as a mouse, keyboard or scanner.

Interface	The way that a computer communicates with a user or other device.
Italics	Slanted text which resembles handwriting. Often used for emphasis.
Joystick	An input device which normally moves in two axes. The output from the joystick can be used to control the screen cursor movement.
Kerning	The removal of excess space between letters to improve the visual impact of text. For example, in the large type used for headlines.
Landscape	Description of the shape of a document page that is wider than it is high. (See Portrait.)
Justified Text	Text which has word spacing added so that it aligns to both edges of columns or margins.
Kerning	The process of adjusting the space between letters. Especially important in headlines.
Kerning Pairs	Specific pairs of letters which, because of their shape, require to have spacing between them adjusted e.g. Po, Pi, Pe, Ko, Te. between lines of text
Landscape	Page orientation with the long edge at the bottom.
Leading	The addition of space between lines of text, so called, because in traditional typesetting, lead was used as a spacer.
Ligature	Where two or more characters are joined as one.
Line art	Art work which is made up entirely of black.
Lowercase	The small letters of the alphabet.

- Laser Printer** A non-contact printing device predominantly used 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.
- Layers** CAG software allows drawings to be built up as a series of layers, each layer dedicated to one aspect of the drawing, e.g. construction lines, text, dimensions, hatching, or electrical layout. Layers can be switched in and out and act like clear film overlays which are always in perfect alignment with each other.
- 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.
- Margin** The unprinted space on the sides, top and bottom of a document.
- Mb (Megabyte)** One million bytes, or 1,000 kilobytes.
- Menu** On-screen display of options.
- Modem** (Modulator / Demodulator). A device which connects data into signals, which can be sent along a phone line and back again.
- Monospaced Font** A font in which all of the characters take up the same width.
- Mouse** A device for recording and plotting the movement of the cursor on a computer monitor as well as for undertaking on-screen commands.
- Make-up** An assembly of all the elements of a document. DTP allows this to be done accurately and creatively and makes it easy to modify.

Maths Co-processor Known also as a maths chip, it processes numbers very rapidly using floating-point notation, 100 or more times faster than a standard CPU.

Modeling/Model A CAG model is more than just a three-dimensional screen representation of an object: it is something which the computer can recognise as having three-dimensional 'shape' and which it can interrogate as such. Any screen display or plot is restricted to two-dimensional limitations, however, the shape exists in computer memory as if it were a solid model.

Montage A collection of separate graphics which when combined make up a new picture

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

Orphan A line of text that begins a paragraph but has been left at the bottom of the previous column or page. To be avoided in page layout.

Optical Scanning 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.

Oblique Text which is slanted, but not italic.

OCR (Optical Character Recognition) The ability to scan pages of text and digitally re-create them as editable text.

Pen plotter A drawing device that uses a pen. Any plotter using detachable pens is a pen plotter. There are two main types, flat-bed and drum.

Peripherals External equipment that can be added or connected to the computer. Examples: printers, graphics tablet.

- Pixel** Picture element. Video and screen displays are made up of tiny dots called pixels. These dots are arranged in a grid and can be set to give typical grid densities of 320 h x 200 v, 640 h x 200 v and 640 h x 400 v dots per grid.
- Portrait** Description of the shape of a document page which is higher than it is wide. (See Landscape.)
- Proof** A test print of a document used for checking for mistakes prior to printing react to a persons input. i.e. A flight simulator, or a games consol.
- Paragraph Rules Lines** used to separate paragraphs of text.
- Paste-up** The act of placing text, graphic and picture items on a page.
- Pixel** (Picture Element) The smallest dot element on a computer screen.
- Point** The traditional unit of type measurement equal to $\frac{1}{72}$ inch or 12 Picas.
- Portrait** Page orientation where short sizes are at the bottom.
- RAM** Random Access Memory. Memory chips which are used temporarily when the computer is running. The more RAM available, the more programmes can be running at the same time.
- Registration** The correct alignment of one image on top of another in printing.
- Reverse** Used to describe placing white text on a black or dark background.
- ROM** Read-Only Memory. Its contents are fixed during manufacture and cannot be changed. It is used to store the permanent programs which form the basic intelligence of the computer.

- Runaround** Technique of setting text to follow the contour of an image or object.
- Rough** Manually produced design layout sketch
- Real time** The term used to describe an event that is executed immediately, rather than an event that will be carried out after a time delay.
- Register Mark** Printers cross-hairs (thin lines) placed outside the page area in order to check that the printed colours are accurate
- Resolution** The sharpness of definition of a digitised image depending on the number of pixels displayed on screen. Normally defined by the number of pixels shown on screen horizontally and vertically, e.g. 320 h x 200 v.
- Rubber Banding** CAG systems provide for a visible flexible connection between the screen cursor and the position from which it last moved. As the cursor moves away from it, the connecting line seems to stretch.
- Screen Dump** When a screen image is sent to a printer to obtain a hard copy, the resulting copy is a screen dump.
- Simulation** This is very similar to animation but with simulation the graphics can be interacted by the user.
- Spine** Bound edge of a publication
- Sans Serif** Meaning "without serifs". Any typeface which does not have bars across the ends of letter strokes.
- Scalable Typeface** Typeface which will enlarge to any size without loss of quality.
- Scroll Bar** The bar at the edge of a window by which the contents can be moved up or down, right or left.

- Serif** Any typeface which has bars crossing the ends of strokes such as this one.
- Small caps** Capitals which match the x-height of a typeface.
- Spread** Two facing pages.
- Snap** A CAG command that locks or 'Snaps' the cursor to the nearest 'snapable' point. This might be points on a screen-displayed grid, or any point naturally arising as a 'lockable' point (a line-end or vertex). Such 'lockable' points can often be forced into a drawing by special commands. The 'snap' facility is a powerful tool for precision work.
- Software** The programs which the computer executes. In addition all data files can be classed as software.
- Solid modeling** The creation of a three-dimensional image on screen, thereafter capable of manipulation to show other views and
- .
- Surface Modeling** A three-dimensional model in which the surface is defined by connecting elements.
- Tab** A keyboard character which causes the cursor to jump to the next point on a page, or to a specific point on a page set by the user.
- Template** A dummy publication that acts as a model, providing the structure and general layout for another similar publication.
- Tonal scale** A colour gradually becoming lighter or darker
- Tracking** The average amount of space between characters in a word.
- True Type** A font format, which generates a font at any size and at high quality depending on the printer.
- Uppercase** The capital letters of a typeface.
- Utilities** Software programmes for undertaking jobs such as file maintenance, virus scanning, backups and file recovery.

- Vector Graphic** A graphic produced using a drawing programme in which the image is described using points, lines and curves. Vectors are generally able to be scaled without apparent loss of quality.
- Thumb Nails** Design sketches of page layouts
- 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.)
- VDU** Visual Display Unit: an alternative way of describing the monitor. **VGA** Video graphics array (adaptor). A colour adaptor allowing high resolution and a range of colours. (320 h x 200 v at 256 colours to 640 h x 480 v at 16 colours.)
- 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.
- Window** A window is a rectangular box that can be used to define a space around an object or set of lines. At its simplest, a window can be a frame drawn around a selected area of the screen, to isolate the area within the 'window'.
- Wire-frame model** A three-dimensional image made up as a series of connected lines between all edges and line end-points.
- Weight** Describes the thickness of the strokes of a typeface.
- White Space** The blank areas on a page which are not occupied by text, illustrations or colours.
- Widow** A word or line belonging to a preceding paragraph, which is added to a new page or column.
- Window** The graphic device on screen which organises and allows access to files, folders and applications.
- WYSIWYG** "What You See Is What You Get". The ability of computer monitors to simulate exactly the result of using software on screen.

Building Blocks

Lines

Lines can be long or short, straight or curved. Lines can be horizontal, vertical, or diagonal. They create patterns. Lines can be solid, dashed, thick, thin, or of variable width.

Sometimes a designer uses a line alone to divide or unite elements on a page. Lines can denote direction of movement (as in diagonal lines and arrows) or provide an anchor to hold elements on a page (such as lines at the top, bottom, or sides of a page).

You can use lines in conjunction with other elements. One well-known example, the AT&T logo, is a pattern of thick and thin lines arranged in a circular shape.

Go through your own magazines with an eye on lines. I want you to find as many different examples of lines of all kinds used in these pieces. Are the lines used prominently? Are they part of a logo or used in other ways to divide the page or add decoration?

Shapes

Circle, square, and triangle are the three basic shapes. Perhaps the most familiar shape to desktop publishing is the square (and rectangle). Paper is rectangular. Most text blocks are square or rectangular. While you may encounter printed projects cut into other shapes, most circles, triangles, and freeform shapes in desktop published materials are found on the page within the graphics or in the way the elements are placed on the page.

Go through your own magazines looking for a variety of shapes. No doubt you can find many examples of squares and rectangles but keep an eye out for other shapes. Are the examples you find actual graphic elements or can you find examples of lines or text arranged in geometric shapes?

Mass

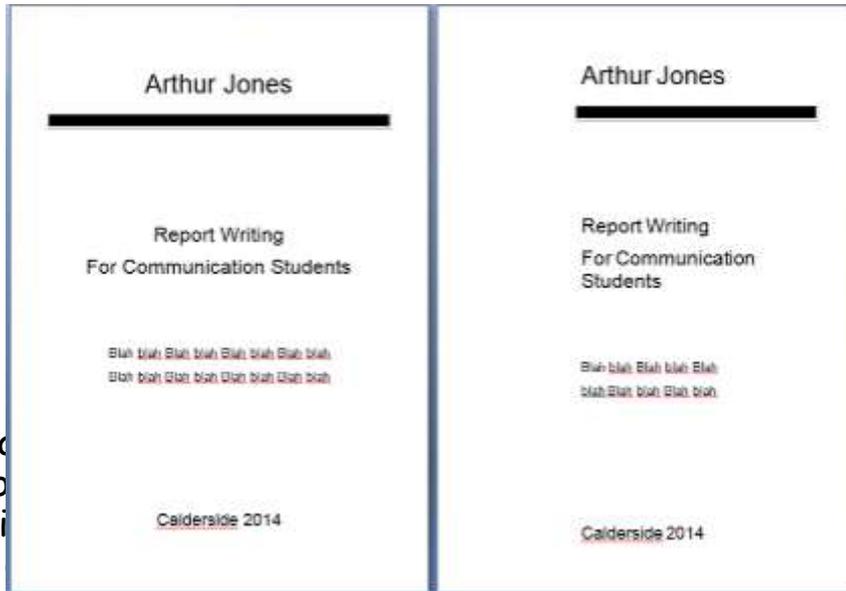
Mass is size. There is physical size and visual size. Size can be relative. A physically small brochure can have a great deal of mass through the use of heavy text and graphic elements. A physically large brochure can appear smaller, lighter by using text and graphics sparingly.

While the paper projects you create have a certain size because of the size and weight of the paper, visual mass -- how light or heavy it appears -- is also an element of the design.

Go through your own magazines and look at each piece and analyze mass in terms of physical size of the piece and the visual mass. Does it have a heavy, imposing look due to the size or weight of the paper or the density of text and graphics? Is it small and compact or light and airy? Hold the items in your hand to see if they feel light or heavy. Compare the physical size to the visual mass of each piece.

Texture

The CUTYOS standard layouts work well and are especially suitable for posters, but sticking rigidly to symmetry can produce rather characterless layout. Of the two report covers below, it seems to me that the asymmetrical layout of the report on the right has a lot more going for it:

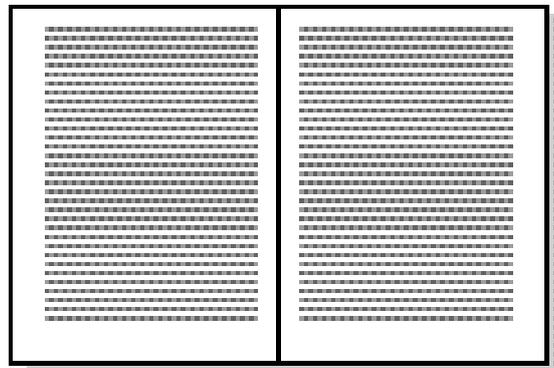


So it's always a good idea to avoid the auto layout of the software. They certainly produce unexciting

design. Also, be wary of using DTP software, as it can get you into rather

Single column

The big advantage of a single column layout is that it's easy in fact that you can use a DTP system. It's also therefore very economical. Problems are that it's not very comfortable (always awkward to split this up comfortably). Generally, it works best on A4 (210 x 297mm).



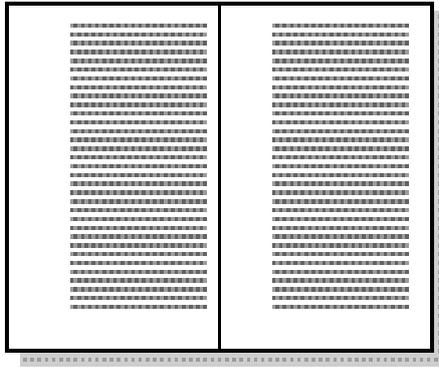
it's easy to use - so it's a good choice for a beginner rather than an experienced user and is

not too long to be read (usually 10-12 lines) and it's not easy to create illustrations.

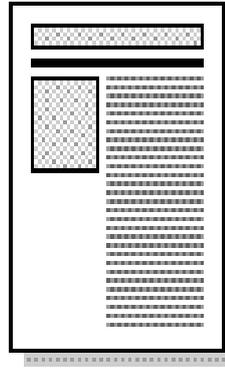
rather than A4 (210

While still keeping the economy and ease of development of a single column layout, you can make things livelier and more interesting by going for a single

column which narrower than



is a the the small or little



good deal page.

very wide heads and illustrations, containing examples etc. bit of

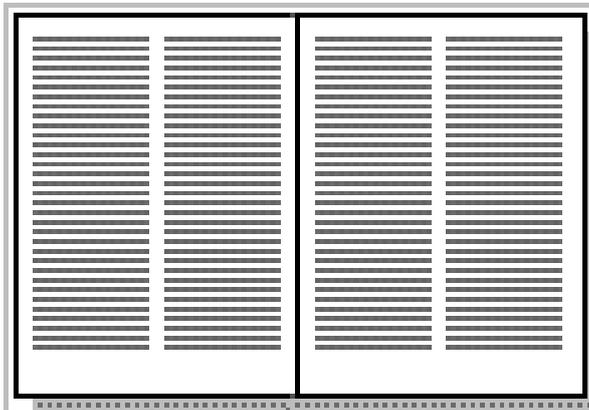
You can use margin for subheads, panels explanations and, with a

imagination you can get something a bit more lively - the bottom example above, for example, is one of the standard templates that comes with the dtp software *Corel Ventura*.

Two columns

A two-column layout is often just as efficient as a single column layout. If you use just one column on a page, then its width is limited by the maximum length of a line to 2.5 alphabets. By using two, narrower, columns you can put more text on a page.

Like a single column, limiting and doesn't scope for developing though grids like



though, it can be normally allow much a lively design, this will help:

For desktop publishing, actual texture is the feel of the paper. Is it smooth to the touch or rough? Textures can also be visual. On the Web, especially, backgrounds that simulate familiar fabrics, stone, and other textures are common.

Certain printing and finishing techniques such as thermography and embossing can add both actual and visual textures to a printed piece.

Go through your own magazines looking for as many different types of actual and visual textures as you can find. Can you tell by looking whether a paper will be soft and smooth or rougher? Are the visual textures used in place of actual papers of that texture or do they relate in some way to the purpose of the printed piece (such as a stone texture for a tile company)? See and feel the difference in textures on embossed pieces or other types of raised printing.

Colour

Colour is everywhere. Every single piece in your Class Samples, even if it is black and white, exhibits the element of colour. Colour is used to attract attention. It can be subtle or bold.

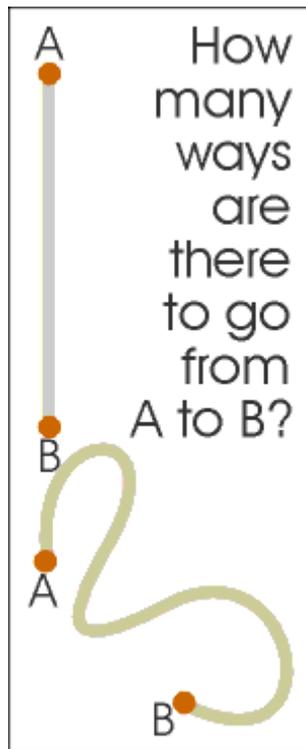
Colour can be found in the paper, the text, or the graphic elements and photos. A monochromatic colour scheme uses a single colour, perhaps in various tints, while other layouts utilize combinations of two, three, or more colours.

1. Colour can be used to elicit specific emotions and reactions. Red is typically thought of as an attention-grabbing, hot colour. Blues are more calming or convey stability. Some colour combinations are used to create a specific identity (corporate colours, school colours) or may be used in conjunction with texture to simulate the look of other objects (the look of plain paper wrapping or neon lights, for example).

Lines

Appearance

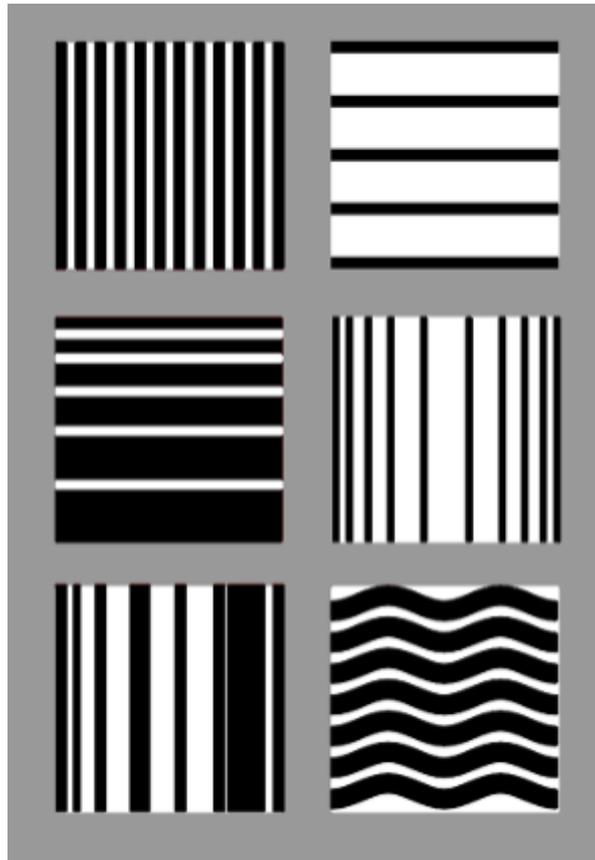
A line is a mark connecting two points. How we get from point A to point B gives the line its distinctive character and appearance. Lines can be long or short, straight or curved. Lines can be horizontal, vertical, or diagonal. Lines can be solid, dashed, thick, thin, or of variable width. The endings of lines can be ragged, blunt, or curved.



Patterns

Lines are often found in pairs or groups. Lines of the same general appearance or lines that are quite different can form a variety of patterns that create textures, suggest movement, or lead the eye — the same as single lines.

If you aren't creating original illustrations or doing logo design, your main concern with this part of the study of lines is being able to recognize these patterns in the illustrations you may select for your work and understand how these patterns may or may not project the image you want for your project. These bits of line patterns illustrate static, dynamic, and random use of lines.



Upper Left: Uniform vertical black and white lines alternate at even intervals. Static. Orderly. Conservative.

Upper Right: Uniform horizontal black lines are widely, but evenly spaced. Static. Stable. Orderly.

Middle Left: Uneven spacing of otherwise uniform lines creates the impression of movement. Dynamic. Orderly progression.

Middle Right: In this example the progression moves in from either side giving the illusion of roundness. Dynamic. Orderly progression. Dimension.

Lower Left: Varying line widths and distances create a random pattern. Dynamic. Chaotic. Disorderly.

Lower Right: While the uniform size and spacing of the lines in the upper examples are static, make the lines into curves and you get movement although it is a controlled movement. Dynamic. Orderly flow.
patterns using only black or white lines that illustrate static, dynamic, or random line patterns.

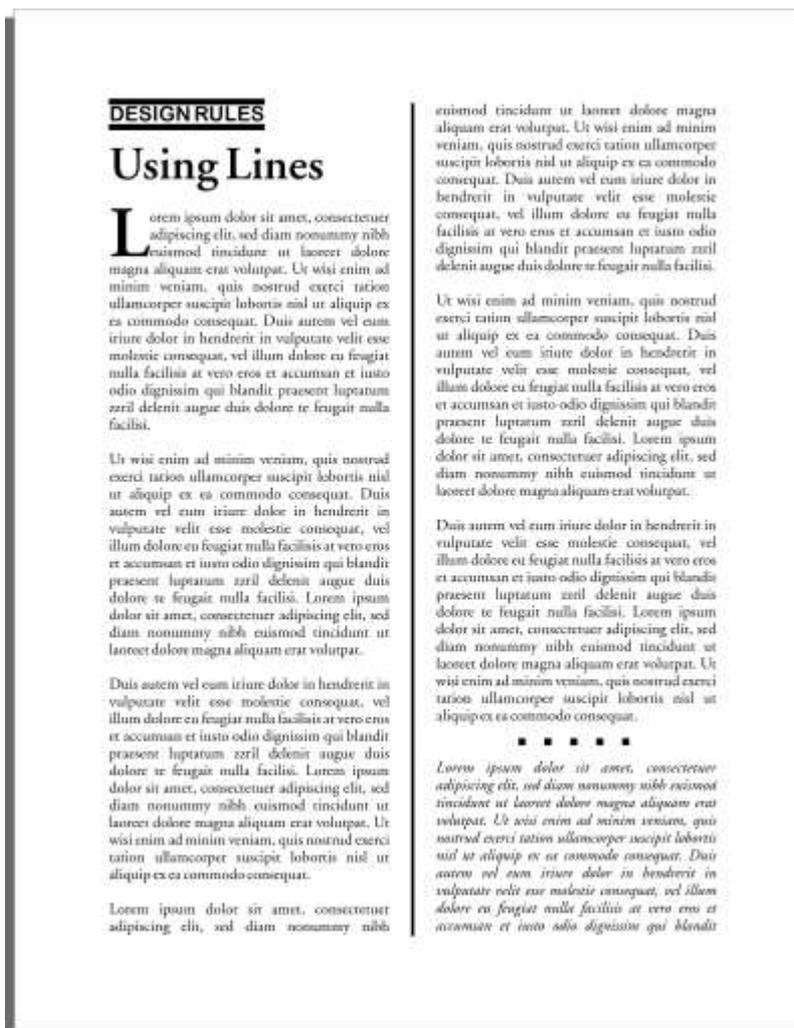
Using Lines

Some ways that you might use lines in your design are to:

- Organize, connect, separate
- Create movement

- Provide texture
- Convey a mood or emotion
- Define shapes
- Provide emphasis
- Provide a framework
-

The examples below demonstrate a few of the ways lines might be used in page layout or illustration. You can probably find examples all around you as well.



In the example on the opposite page, a solid line separates columns of text, a pair of lines set apart a phrase, and a short dotted line separates a section of text from other parts of the page.

A few simple lines added to a piece of clip art gives a sense of movement to the airplane. Short, choppy, vertical lines create a grooved texture along the edge of the timepiece sketch.

Dashed lines suggest a coupon, whether there is one or not. It causes many of us to take a second look at this ad because the familiar dashed line makes us think "I can save money!"



Balance

Rule of Thirds, Visual

Underlying most of the pages are three related

Thirds

The rule of thirds says made more interesting by into thirds vertically or most important elements

Centre, Grids

layouts on the previous aspects of page layout.

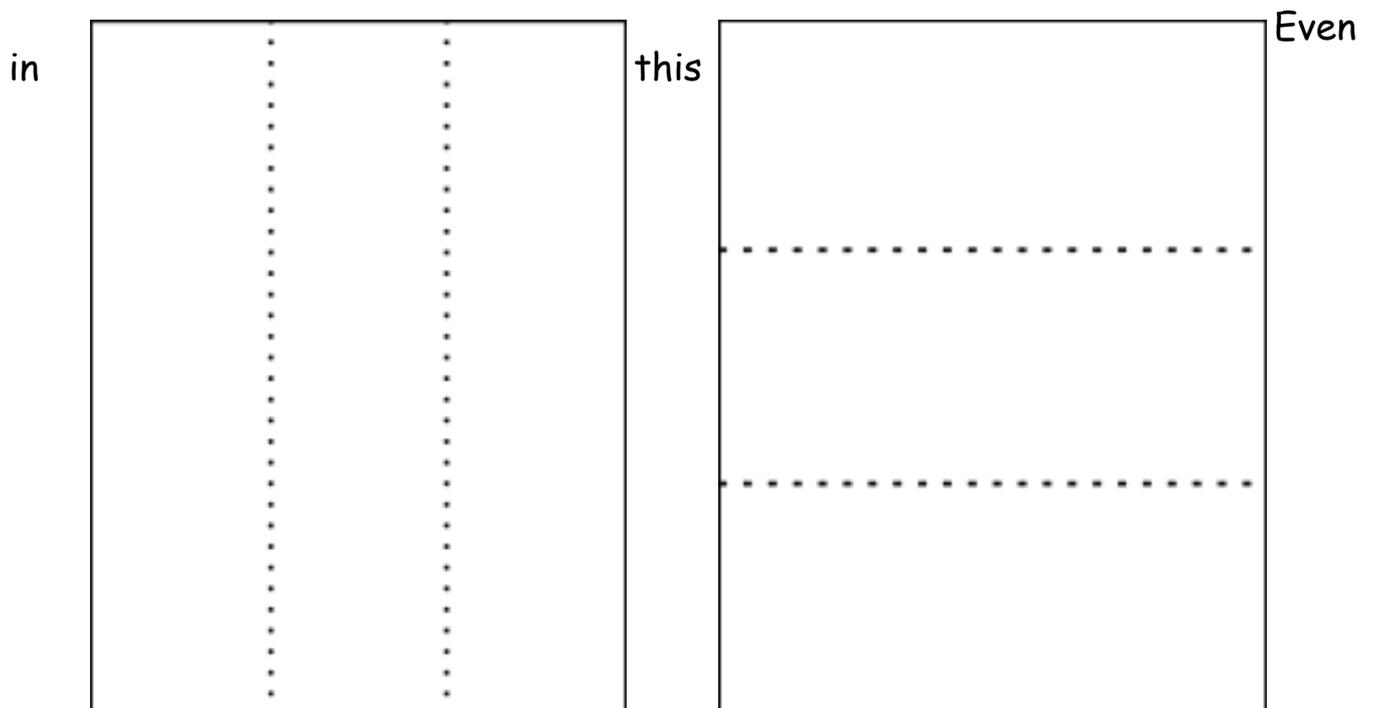
that most designs can be visually dividing the page horizontally and placing our within those thirds.

50% OFF

All Christmas Decorations

Baileys Big After Holidays Blow-out all merchandise reduced 20-50%

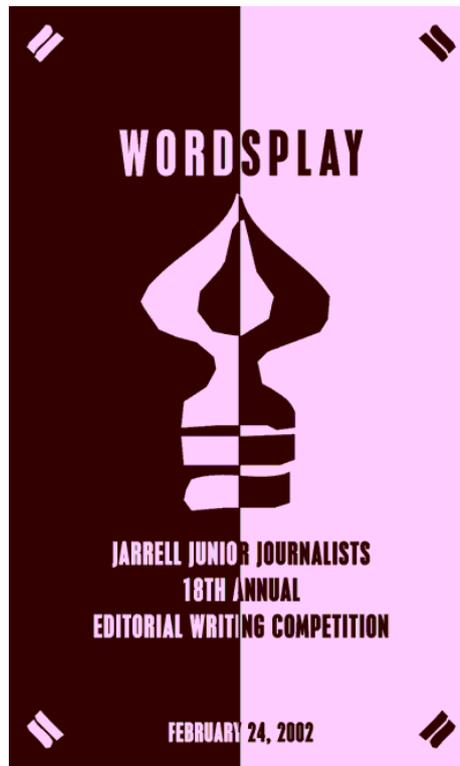
Look at these previous balance examples and see how the rule of thirds is utilized. On the following page the first example a vertically symmetrical layout the headline appears in the upper third of the page, the logo in the middle third, and the supporting descriptive text in the lower third.



example below the unbalanced asymmetrical design uses the rule of thirds with most of the 'action' in the upper 2/3rd of the layout.

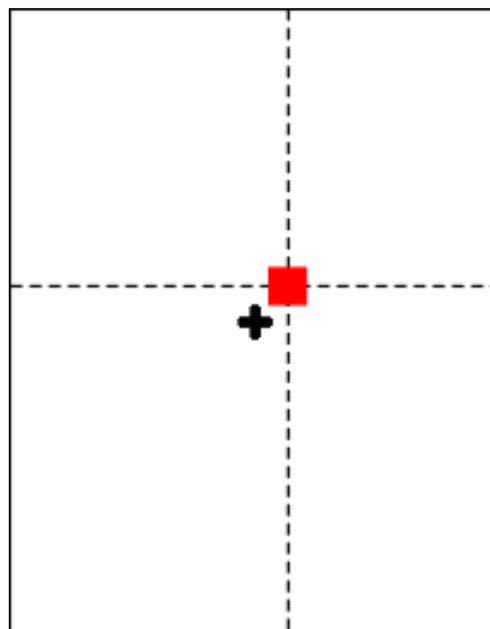
Visual Centre

Placing important point of the design of a piece is another centre is slightly to the actual centre of a page.



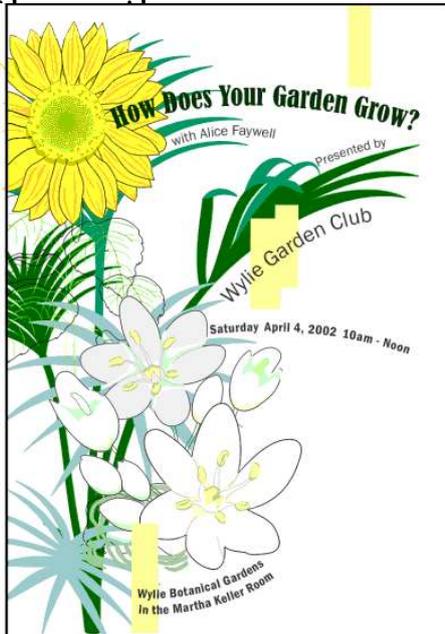
elements or the focal within the visual centre design trick. The visual right of and above the

See how the focal or these designs actually of the page.

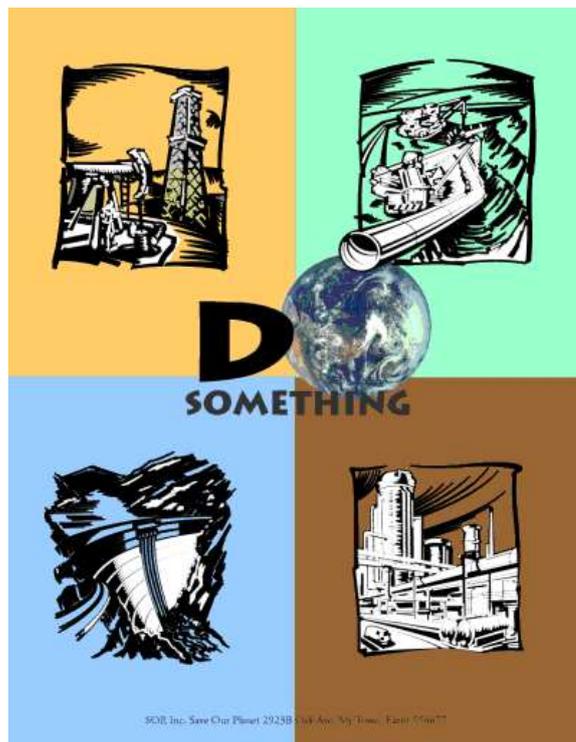


centre point of each of falls in the visual centre

Below: It's easy to see the actual centre, it's where the four box corners meet. But the focus is on the



In the example of the calendar below, the months emanate from the year located front and (visual) centre.



Grids

Roughly dividing a page into thirds or finding the visual centre are relatively easy and you don't usually have to be exact to achieve your goals. However, constructing the underlying structure of a piece is a bit more complicated — but essential for most designs. Most balanced designs (and even unbalanced ones) rely on a grid. This invisible structure (visible while working in your page layout program) helps ensure that you place all the elements in the right location to achieve balance as well as to help with continuity and consistency of design.

Grids can be used by the designer.

Sometimes

The example is a simple three-column grid and that it dictates the width of the same page.



and the

width also varies in

	<p>laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum irure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et justo odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugiat nulla facilisis.</p> <p>Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum irure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et justo odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugiat nulla facilisis. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.</p> <p>Duis autem vel eum irure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et justo odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugiat nulla facilisis. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.</p>	<p>volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat.</p> <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim.</p> <p>Tulip Illustration</p> <p>Veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum irure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et justo odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugiat nulla facilisis.</p> <p>Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum irure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et justo odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugiat nulla facilisis. Lorem ipsum dolor sit amet,</p>
<p>How doth the little</p> <p>crocodile improve his</p> <p>shining tail, And poor</p> <p>the waters of the Nile</p> <p>on every golden scale!</p>		

Below: A 5x5 grid keeps this design in line. The grid is obvious along the bottom (each square equals one grid square in this layout) but it is invisibly keeping all those random letters in order in the middle.



Shapes

Squares

The square denotes honesty and stability. Squares are familiar, trusted shapes. Because the vast majority of the text we read is set in squares and rectangles, it has become familiar, safe, and comfortable.

Squares and rectangles are probably the most common geometric shapes we encounter. A few books, especially those for kids, may be cut in irregular shapes but adult (i.e. 'serious') correspondence comes in squares -- both the physical shape of the books, magazines, newspapers, and the rectangular columns of set text.

Some designers might equate square with boring. It's true that other, unexpected shapes, can grab attention better than the simple square but don't forget the importance of comfort and familiarity. Imagine how difficult it becomes to file everyday correspondence if letterhead came in a variety of triangles or freeform shapes. Try reading an entire book with all the text set in circles. Squares and rectangles definitely have a place in design.

Some ways you can use squares and rectangles:

- To symbolize honesty, stability, equality, comfort, or familiarity. It could also symbolize rigidity or uniformity.
- Related to the first bullet item, use repeating squares to suggest familiar themes (checkerboard pattern to represent a game board, the checkered flag at the end of a race, a tablecloth).
- To highlight, organize, or set apart information using a solid or outlined box.
- Use a square unexpectedly. Set a block of text in a solid or outlined but tiled box — with or without also tilting the text.

Circles

Circles suggest infinity. They are also protective (think of protective encircling arms). They can also denote free movement such as a rolling ball or a more controlled movement such as a spinning globe. The sense of movement is often enhanced through shading or the use of lines.

Outside of logo designs, circles are less common elements of design which makes them good for grabbing attention, providing emphasis, and breaking up familiar rectangular blocks of text. You could set text in circles or simply use a circle as the background for more traditional blocks of text.

Some ways you can use circles:

- To symbolize infinity and protectiveness. Circles could also suggest something well-rounded or complete. Similar to protectiveness, circles could also imply security.
- Related to the first bullet item, use circles to suggest familiar themes (bullet holes, a stack of cannonballs, a bunch of grapes -- or just about any round fruit or vegetable, a target, the earth).
- To highlight, organize, or set apart information using a solid or outlined circle. Try a freeform circle that looks like it was drawn with a marker or pen to highlight important text.
- Replace the letter O or other 'round' letters in text with a circular shape that suggests that letter. Try an orange in the word Orange or a basketball, baseball, or soccer ball to replace an O or other letter in the nameplate of a sports newsletter.

Triangles

Triangles suggest action. They are dynamic. Triangles may convey either conflict or strength. Triangles can direct movement (up, down, left, right — depending on which way they 'point') but rather than moving themselves, they point the way for the reader.

Triangles are suggestive of many different shapes and ideas. They can represent a religious Trinity, a pyramid, a flag or pennant, an arrow, a beacon.

Some ways you can use triangles:

- To symbolize action or conflict. In a logo, a triangle might be better suited to a growing, dynamic high tech company than the more stable, familiar square, for example.
- Related to the first bullet item, use triangles to suggest familiar themes (flag, pyramid, arrow or pointer). A single or a series of triangles can point the eye to important information or act as an arrow to get readers to turn the page.
- To highlight, organize, or set apart information using a solid or outlined

triangle. Use a triangle to suggest progression. Place it behind a 'Top 10' list or the steps to accomplish a specific task.

- Replace the letter A or V in text with a triangular shape that suggests that letter. Try a wedge of pie for the letter A in the phrase Amy's Desserts.

Mass and Size

Defining Mass

As stated in the introduction, mass equals size. Each piece you create has a physical mass. The physical mass or size is the actual dimensions of the piece — height, width, thickness/weight (of paper), and depth (3D objects).

Additionally, each element within the design (graphics, photos, lines, text blocks) have their own mass relative to the whole piece. For example, a photo that is physically 3 inches by 5 inches can appear smaller or larger depending on the physical size of the paper it is printed on and the size and proximity (closeness) of other items on the page.

Some ways to use mass within your designs:

- **to accommodate information, content** Example: To present all the desired or needed information comfortably a designer may create a bi-fold rather than the usual single business card.
- **to accommodate normal size restraints or expectations** Example: The postal service has limitations on the height and width of different types of envelopes. If a designer ignores those requirements it could incur additional mailing costs for the client.
- **to convey a mood or provide emphasis** Example: A place that is physically large (such as an amusement park) or a business that offers a huge assortment of products may use brochures or other marketing pieces that are larger (physical dimensions) or heavier (weight) than normal to carry out the 'bigger' or 'more' theme.
- **to create contrast** Example: A designer might design a full-page magazine ad using a single small image in the middle of the page with lots of white space. The contrast between the size of the page and the size of the content (image) draws attention to the image and can create a specific mood (depending on other elements) such as conservative, elegant, lonely, or open.

Measuring the Size of Your Design

What is large? What is small? In graphic design and desktop publishing there are many ways to specify size. This part of the class on mass focuses on the mechanics of size and common measurement systems used in desktop

publishing..

What you learn here is critical to DTP.

To keep from getting lost, bookmark this page now. You can come back to this page if you get 'lost' in the many pages and supplemental materials covering size and measurements.

Auxillary Materials: [Size Matters](#)

This multiple page complex covers the following topics:

Type Sizes

Using Picas in Page Layout,

Paper Sizes ,

Image Sizes

Conversion Tools.

In addition to the main coverage of each topic you'll find that many pages have a Glossary section with related terms, or How-to pages related to that topic. These pages are not included in the 'page count' for those topics but are important supplemental information. Review them.

It will take several days or even longer to absorb all this information.

Texture

Paper Textures & Finishes

Paper is often something we take for granted. It's just 'there.' Sometimes we have no choice about the type of paper on which our designs are printed. Normally we can't dictate the paper used for ads in newspapers or magazines. Even when we do have a choice, we're limited by budget, printing requirements, or other factors. However, paper can be an important textural element in our desktop published documents.

Some papers just 'feel' better than others. Grab up some paper from around you. Get a newspaper, a magazine, some paper from your printer, and a few different samples from your Class Samples. Close your eyes and touch the different surfaces. Can you identify the general type of paper (newsprint, etc.) simply by touch? Probably so. But also consider how they feel to your touch — smooth, rough, slightly patterned, fuzzy, bumpy, slick, shiny, dull, warm or cold.

Familiarize yourself with some of the various surfaces and finishes used in paper. Some may be familiar to you already. Others will be new.

- Antique Finish
- Cast-Coated Paper
- Cockle Finish
- Dull Finish
- Eggshell Finish
- English Finish
- Felt Finish
- Glazed Finish
- Granite Finish
- Laid Finish
- Linen Finish
- Machine Finish
- Machine Glazed
- Matte Finish
- Mottled Finish
- Natural Finish
- Onionskin Paper
- Parchment Paper

Design Concept & Texture

Varying paper surfaces can dramatically or subtly alter the mood you want your designs to convey. An exercise from *Using Design Basics To Get Creative Results* by Bryan L. Peterson uses the example of a piece of jewellery placed against two totally different surfaces — a shiny tile of black Formica vs. a piece of cement.

Translate this same concept to paper and imagine a photograph of a well-preserved vintage automobile printed on extremely smooth, glossy paper or printed on a rough, peppy surface. Neither one is necessarily better or worse. It depends on the mood you want to convey. Increased contrast between the image (and it's visual texture) and the actual surface of the paper can create interest in your design.

When selecting paper, choose a texture that is related to the concept of your design and doesn't overwhelm or get in the way of the message. While you can make a bold statement with texture, sometimes a subtle texture that stays 'in the background' is most appropriate. Make sure that your texture works with your choice of type and images so that text does not become unreadable or images unrecognizable.

It may be necessary to use a bolder typeface if your paper is rough or strongly patterned.

Here is an example of paper texture from an assignment.

Unexpected contrast: In a brochure promoting a computer-related service: "The grey colour also evokes a high-tech, sterile mood, although I might expect a glossier surface to go along with that, rather than the sensual feel of the textured stock." — Student ID S011203

My comments: "...the softer texture may indeed have been meant to soften and humanize the high-tech image."

Visual Textures

Everything around us has a texture. Sometimes we can simulate those textures with paper, but more often the textures we create in our designs are visual rather than tactile. However, those visual textures can be just as provocative or full of meaning as actual textures we can touch.

It's extremely easy to find or create visual textures for your designs. There are four basic ways to incorporate visual texture.

Objects within a photograph

Textures: fairly smooth surface of the chalk; rough surface of the cement

Textures: smooth glass bottles; fabric of the potholders

Textures: worn wooden mallet; grass

Images created with photo-editing software

These textures may mimic actual textures or be imagined textures

Texture: mimics drapes or folds in a satiny fabric

Texture: simulates a rough, rocky surface

Texture: random soft circles create an imaginary

texture

Digitized images of actual textures (from scans, digital photos)

Texture: a straw mat

Texture: piece of door mat made from old tires

Texture: tree bark

Symbolic textures created with lines or shapes

These patterns suggest various textures and are similar to the use of symbols or icons to represent ideas or objects.

Texture: wavy lines could symbolize water, waves, rolling terrain

Texture: overlapping circles give the look of fish scales

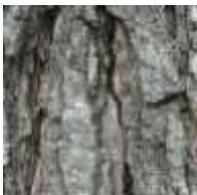
Texture: a grid of lines could simulate plaid or linen fabrics, wire mesh, or other textures

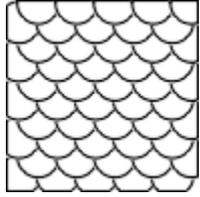
You can enhance or alter the appearance of visual textures depending on the actual texture of the paper used. Keep this interaction in mind when using texture. While you can easily simulate a rough texture on smooth paper, using a 'slick' visual texture on some rough papers changes the visual appearance.

As with paper textures, choose textures that relate to the concept of the piece and are appropriate to the design. Just as some paper textures can interfere with the readability of text, so can visual textures used as backgrounds.

Use caution when placing text over heavy or busy visual textures. Go through your Class Samples with an eye on visual texture.







Colour

Value

Value is present in all design. It is the lightness or darkness of an object, regardless of colour. Value is relative to the background colour and other items on the page.

Use value to:

- **Increase/Decrease Contrast**

The greater the difference in value between an object and its background, the greater the contrast



Choose the value that creates the amount of contrast and effect that you want for your design. In the above examples, the lighter value recedes into the light background. The design with the greatest contrast makes the darker object more dominant.

- **Create Movement**

Objects of the same value create a static design with all objects equal in visual importance. Introducing varying values gives the page a more dynamic appearance and creates a 'pecking order' among the objects. Some stand out while others recede.



Mix elements of different values to add visual movement to your design or to create a hierarchy of importance.

• Lead the Eye

By creating a pattern of dark to light values, even when the objects are equal in shape and size, it leads the eye in the direction of dark to light.



In the above example, the first set of all dark lines are static. The middle example leads the eye in a downward direction (dark to light).

Reversing the values of the lines leads the eye upward.

Use colour to change the effect of value:

Colour has the power to override the effects of value. In a high contrast black & white design, introducing a single, small bit of colour will change the focus and balance of the design.



The eye is drawn to that spot of colour even if other elements are designed to draw the eye in some other direction or the objects are otherwise equal.

That's the power of colour.

Layout : grids and columns

Grids

Most designers will set up a page grid before they start whacking elements down on a page. Of course, if you're using a computer, it's quite easy to stick stuff on a page and move it around in a fairly random fashion until you've got something you like the look of. Generally speaking, though, that approach is likely to result in some pretty awful pages and, over a lengthy document, may well result in a total hotchpotch which simply confuses the reader.

To determine the grid appropriate for your design is no easy business, but it's worth investing some time in it. Here are a few pointers you might find useful:

- **Number of lines per page** - it's normally helpful if the number of lines you can fit on each page in your chosen font is divisible by the number of grid sections you intend to have. It's well worth devoting some time to flowing some text ('printer's Latin' for example) on to a page and getting a printout in various column widths and different font sizes (if you're working in a college, it's worth asking whether they already have something of that sort). You can easily be surprised - for example:

This is 12pt face.

As you can easily see by comparing it with the text alongside both 10pt and 12pt have their baseline on a 12pt body.

This is 12pt face.

As you can easily see by comparing it with the text alongside both 10pt and 12pt have their baseline on a 12pt body.

- You can use the same exercise to work out how many words in a given font can be fitted into a column centimetre of a given column width.
- **Complexity of content** - if your content is to include relatively little artwork, few panels containing comments, quotations and so on, then you may not need a grid at all. If it is to be fairly complex, then it's a good idea to have a number of panels in your grid, even if your basic page is to be a single column of text.

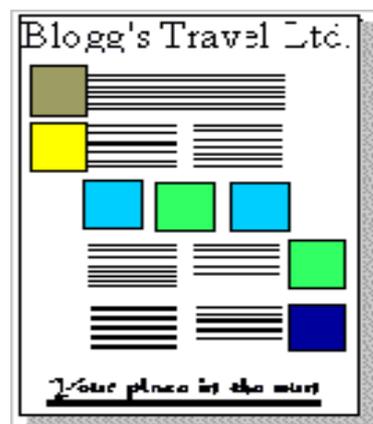
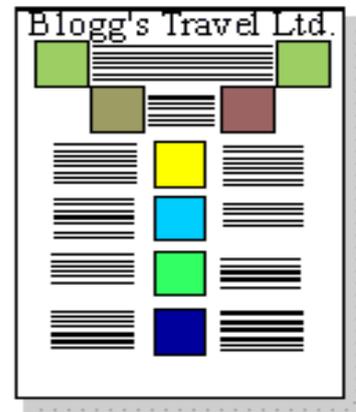
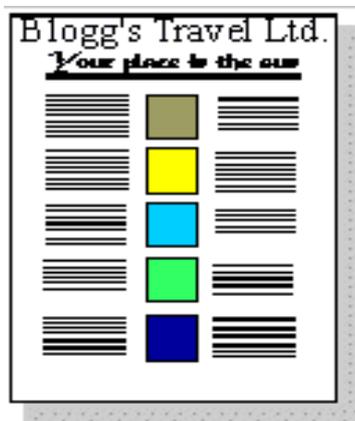
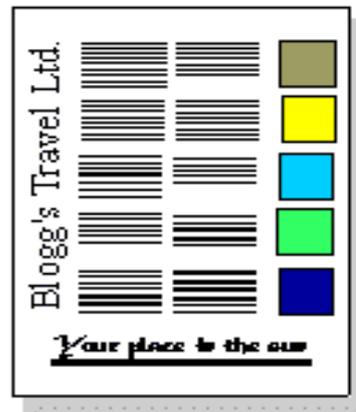
- **Margins** - a function of how much you need to fit on to each page, which of course will vary from one production to another, but the following general rules are often followed:
- **Foredge** (also known as outside margin): should be an average of head (top margin) and foot (bottom margin)
- **Foot** (also known as bottom margin): should always be bigger than the head (top margin), probably at least 50% bigger (this is due to the so-called optical centre - due to an optical illusion, we tend to see the centre of a page as being slightly higher than the actual centre. Thus, if elements are situated exactly equally on either side of the optical centre, we tend to see them as too low down. For that reason, when setting up a page, we normally set up the bottom margin around 50% bigger than the top margin)
- **Back** (also known as inside or gutter margin): the two back margins taken together should be roughly as wide as the foredge (when setting up the back margin, you should bear in mind how your work is to be bound - some bindings 'eat up' a large amount of paper)

Master pages - most desktop publishing systems will provide you with master pages. It's on those pages that you should set up your grid once you've decided what it should be.

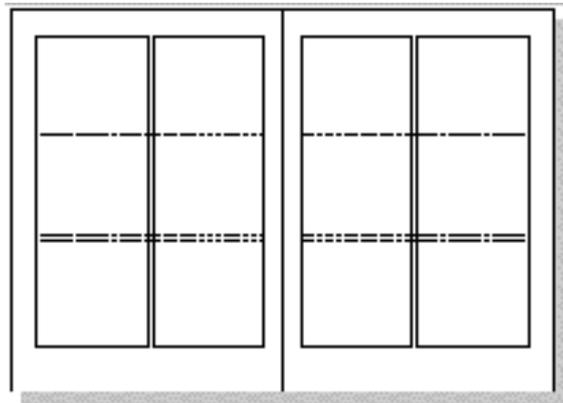
Symmetry versus Asymmetry

It's certainly a good idea to work to grids, but following them slavishly can result in pretty dull design. Similarly, It's not a bad idea to start off with an idea of a symmetrical design, but producing symmetrical pages all the time can end up boring.

You'll sometimes come across the CUTYOS rule for organizing elements on a page. Designs following those rules are produced in the shapes of those letters and look like this:



You can add some column layout by of the columns and for headings a bit odd, though, if there, though you can by having a running

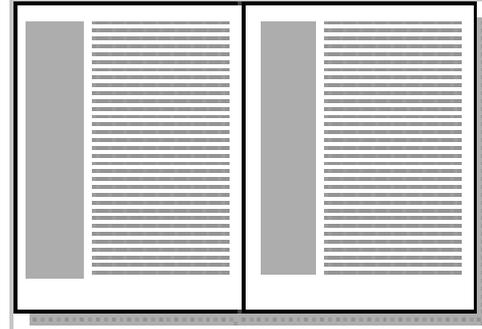
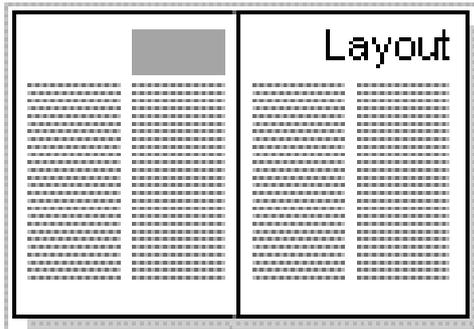


interest to a two-reducing the height reserving the space graphics. It can look there's nothing militate against that head on every page.

You can also add

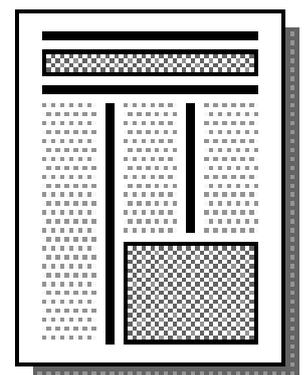
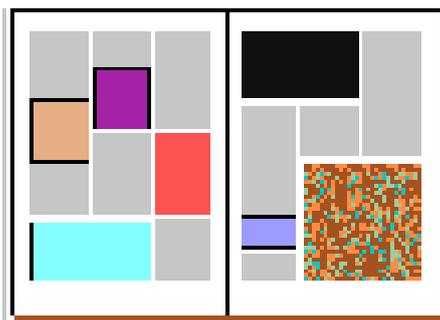
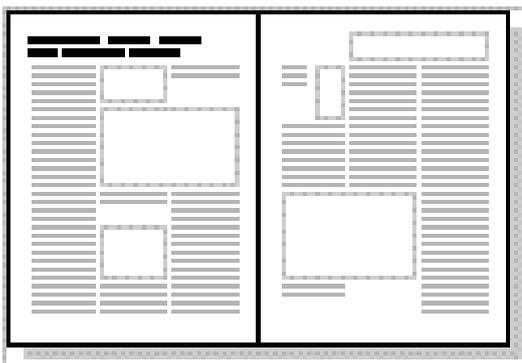
columns

interest by using two of



differing widths. The problem is that this only really works if the two columns are somehow different in content, for example if the narrow column is providing a running commentary on the wider one.

Three columns

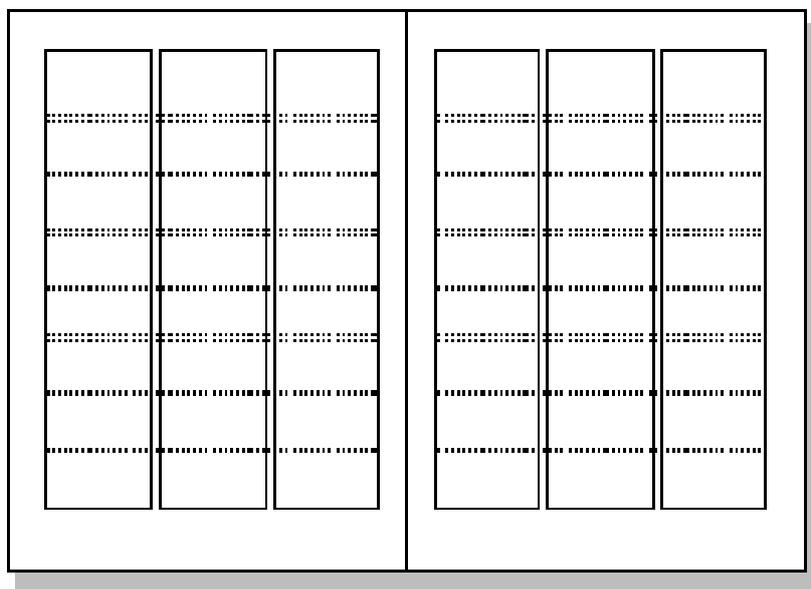


A three column page is excellent for the production of a lively, interesting layout. It is particularly useful where a lot of artwork has to be combined with text.

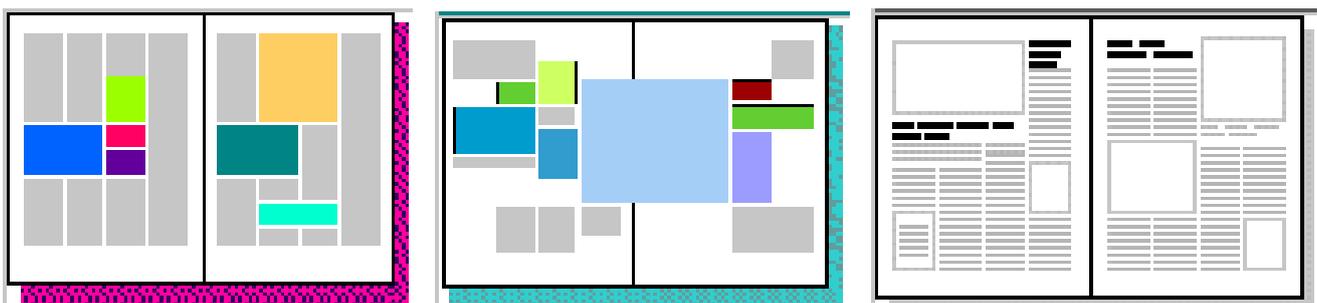
The relatively narrow columns will probably force you to use a fairly small font and layout can start to get confusing if you're not careful. The use of a fair amount of white space often helps to make the overall layout comprehensible.

Like the two-column layout, this one can quite usefully be mixed with headings spanning the whole page. For example, the bottom example above is one of the standard layouts offered by *Corel Ventura*.

This is a fairly typical grid you might use for three columns:

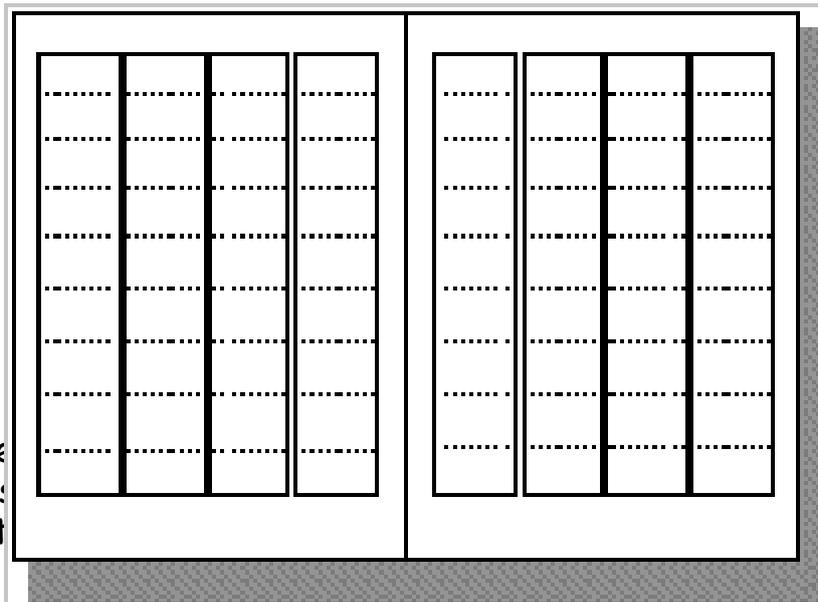


Four columns



A four column layout can readily be lively and interesting, but it can all too easily turn out to be hopelessly confusing. It works well with lists of things, so it could be good for, say, an index or an encyclopedia.

Here's an example of a fairly typical grid:



The pages above
A4 paper because
fairly small font
which will make

use on
I have to use a
henation

Nevertheless, if you have the patience to work with it, it can produce interesting designs, especially if, as with three columns, you're willing to use plenty of white space. It can also be readily combined with two-column layout, a combination which works quite well for magazines.

Grids 1: Order out of Chaos

What is a Grid and Why Do I Need One?

Think of the grid as a plan -- a plan for your page layout

Many of the pages that you see everyday have a grid. You may not see it but it is there, holding up the design, establishing structure, guiding the page elements.

A grid is an invisible structure used to guide the placement of elements on your page.

Grids don't appear on the printed piece but their influence may be evident in the widths of column texts, the uniformity of space around photographs, or the consistent placement of repeating elements from page to page in a magazine.

They are a series of guidelines that determine the margins of the piece, space between page elements (headlines, body text, photographs, etc.), and let you know where to put things on the blank page.

While it is invisible in the final printed piece, you'll need to be able to see it during page construction.

Before deciding when, why, and how to use a grid you need to know the elements of the grid and how to create it.

While it is invisible in the final printed piece, you'll need to be able to see it during page construction.

In your page layout, you've probably set margins. These margins often show up as light solid or dashed lines on the screen.

These top, bottom, left, and right margins create a box in the middle of your page. Stop there and you have a single unit grid.

Further divide the page into uniform parts and you've created a multiple unit grid. You can create a visible grid to aid in page layout using the guidelines feature of your page layout software or by drawing lines or boxes that you place on a non-printing layer of your publication. Often you can "pull" a guideline from the rulers on the sides of page and place them where you want them.

Margins

Margins define the outside boundary of your page. They frame the content of your pages. Margins may not be equal all around (but are normally consistent from page to page or panel to panel). In most programs you would set the margins when you define the page dimensions (format). You can also adjust the margins "on the fly" by moving the guides on screen (in some programs).

Alleys

When you divide the interior space of your page into uniform parts the white space between units are alleys. Depending on how you've set up your grid the alleys may run horizontally, vertically, or both directions on your page. In some designs this would translate to the white space or "gutter" between columns of text.

Gutter

In a two page or two panel spread, the gutter is the inside margin. It's the space on either side of the fold. In some page layout programs the space between two columns of text is sometimes called the "gutter" as well.

Grid Units

Grid units are the primary locations on your page where you will place text and images. They determine **placement** not necessarily **size**. That is, if you have a graphic image that is larger than your grid unit, it doesn't mean you can't use it. You would use your grid units to help resize the photograph, ideally to fill 1, 2, 3 or more grid units and then to place

Layouts for DTP & Printing

A printed product or job must be well planned. The combination of ideas used in planning and designing the product is called a layout. It can be defined as the arrangement of all the units or elements into a printed, usable format. These units or elements include the heading, sub-heading, text matter, illustrations, and photographs. The preparation of a complete set of layouts will require: thumbnail sketches, rough layout, and a comprehensive layout. A definite plan, predetermined, is very necessary.

Values of good planning

Graphic planning allows the designer to review and revise his or her thoughts. Printed work is often completed in less time and each person who performs a mechanical function leading to the final product knows their job.

Spelling, wording, and the placement of material must be accurate, otherwise the final product will have little value. The specifications of the client for their printed material must be accurately met. This will result in a high-quality final product and the client, commercial printing plant management, and the skilled workers will be satisfied that their work has fulfilled a particular requirement.

Pre-layout planning

A pre-layout planning form should be completed to help formulate the ideas of the person who is going to originate the printed job. Each of the 12 questions that follow should be recorded for reference during the layout preparation:

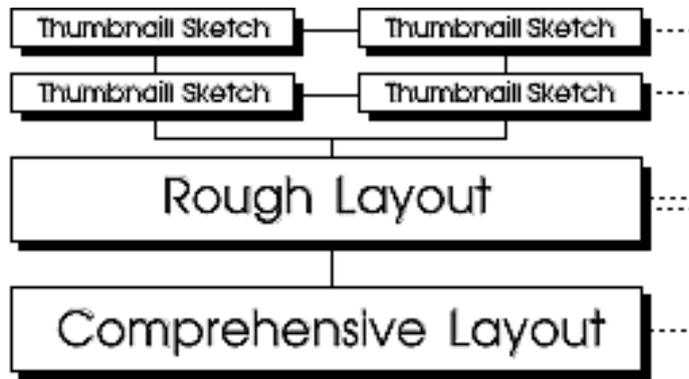
1. *Objective of the product.* What is the purpose of the finished product? Is it to sell? Inform? Reference?
2. *Target group.* Will the printed material be for personal use, for scientists, for teenagers, or for some other group? The design approach would be different for each.
3. *Personality of the product.* Should it be sophisticated, gaudy, dignified, humorous, or have some other quality? The type of paper, typography, and illustrations depend on these decisions.
4. *Style of the finished product.* Will it contain photographs? Will it be strictly typographic, or will it contain cartoons, illustrations, or a combination of both?
5. *Layout format.* Will the product be a booklet, folder, bulletin, brochure, pamphlet, or an entire book?
6. *Approximate trimmed dimensions.* What will be the physical size of the printed product? This will affect which standard paper size can be used.

7. *Approximate number of pages.* Will there be one sheet printed on only one side or on both sides? Will a sheet be printed on both sides and folded? Will there be several pages?
8. *Approximate number of copies.* The number of copies desired often determines the printing process used.
9. *Finishing and Binding requirements.* Will the printed sheets from the press or duplicator need to be trimmed, folded, scored, or bound together by one of several methods?
10. *Layout required.* Does the customer require thumbnail sketches, a rough layout, and a comprehensive layout?
11. *Estimated hours for completion.* How long will it take to complete the entire job? The answer to this question will depend on the answers to the ten previous questions, and will assist in making a cost estimate.
12. *Approximate date of completion.* This involves consideration of the time available per day, and the number of hours or days required.

Layout Procedure

The sequence followed for preparing graphic layout materials is drawing thumbnail sketches, rough layout, and comprehensive layout. Several *thumbnail sketches* are usually prepared. The selection is made by the person who is ordering.

The *rough layout* is made up of the thumbnail sketch chosen. This layout is generally the same size as the final product and contains all of the copy and illustrations. Alterations can be easily made between the thumbnail sketch to the rough layout, and again between the rough and the comprehensive layout.



The *compre-*
based upon the

ments of the thumbnail sketch and the rough layout. This is a precision layout which permits the customer to see what the final product will look like. The overlay sheet generally attached to the base sheet is used to indicate how the final product should be produced.

Design and Layout considerations

hensive layout is
general arrange-

Copy analysis is the first essential when designing a job. Thorough knowledge of the job is needed; then the operation will simply become one of mixing brains with type and/or illustrations.

Thoroughly understand the meaning of the copy before attempting actual work. Study the copy; analyse it. It is time well spent.

To hit upon the correct formula, there are certain considerations that must be kept in mind. They are in the following brief points:

1. Planning is important.
2. Design and layout are essential to obtain a quality finished product.
3. Make it readable. A printed product is designed to give information.
4. A layout is a blue-print, a master plan.
5. Compose the final product in the appropriate media; then arrange to compose it with the actual type, illustrations, and photographs.
6. Simplicity is important.
7. Knowledge of type and typography is necessary.
8. The printers' point system must be understood.
9. Basic design principles must be understood.
1. Knowledge of colour and its effect on people are important.

Thumbnail Sketches

Thumbnail sketches are simple idea sketches which will help the designer to obtain an attractive and acceptable final result. The client can see the ideas and then choose the layout which he or she prefers.

Thumbnail sketches serve these three primary purposes; they:

1. Graphically preserve ideas;
2. Visually portray ideas; and
3. Compare two or more ideas visually.

Preparation of these sketches should begin immediately after the desired product has been selected and after completion of the pre-layout planning sheet. Copy selection precedes thumbnails; therefore, one of the responsibilities of the designer is to obtain all the copy that will appear on the final product. The originator of the planned printed product should have this information readily available.

Design Elements and Principles

The principles and elements of good design and page layout include proportion, balance, rhythm, emphasis, colour, lines, shapes, and textures. Additional components may be considered graphic design principles or ways to achieve a well-designed page layout including alignment, white space, contrast, and repetition.

Elements of Design

From an online design class, definitions and graphic depiction of lines, shapes, texture, and other design components.

Element of Design: Lines

From our online Design Basics Course, these lessons define and explore the appearance, patterns, and uses of lines in desktop publishing and graphic design projects.

Element of Design: Shape

From our online Design Basics Course, these lessons define geometric, natural, and abstract shapes with emphasis on the meanings and use of basic geometric shapes of square, circle, triangle.

Principles of Design

From notes for a design class, definitions and graphic depiction of balance, contrast, proportion, and other layout considerations.

Alignment - Principle of Design

Alignment is a design principle for page layout and good formatting. See an example including aligning objects on the page and type alignment.

Balance - Principle of Design

Balance, a design principle for page layout, defined and illustrated. Types of balance and how to achieve a balanced page.

Consistency - Principle of Design

Definitions and examples of how to achieve consistency and unity in design and its importance.

Contrast - Principle of Design

How to achieve contrast in your design and page layout and why it's important.

Grids for Desktop Publishing

Learn what a grid is, formats for grids, and how to put together basic and complex grids, leading grids, and layouts. Use grids to provide page-to-page consistency, unify and align page elements, and provide design continuity across related documents.

Proximity - Principle of Design

Grouping like objects and separating unlike elements is using proximity in design to show relationships and importance.

White Space - Principle of Design

Put white space into your design to give it some breathing room and make it less cramped, confusing, or overwhelming.

Frames: You've Been Framed

Effective use of boxes & borders in your desktop documents and Web pages.

Page Layout Principles

From a DTP class, guidelines on white space, consistency, grids, and other principles of good page layout and design.

Principles of Design

Visually, there is very little originality in design — it is usually a rearrangement of an idea observed and recorded previously. No matter how simple the design may be, there are certain principles that must be applied.

Appreciation of their importance will be slowly gained by observation and practice together with good judgement. This will produce satisfactory results without the need for any mathematical calculations.

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.

To develop a *sense of design* use the three 'eyes':

1. **Visual-eyes:** Examine closely all types of printed material, i.e. physically see/look at what everyone else is/has done. (What catches or eludes your attention, and why?)
2. **Critic-eyes:** Separate the good from the bad. (What provokes the ad? What motivates you? Those things that don't catch your eye — why?)
3. **Analy-eyes:** Select the element that makes it a good design.

There are three essential qualities needed to become a competent designer:

Vision. — To be able to detect an idea and then to toss it around in your head (objects, tones, shapes, colours — everything around you).

Imagination. — To be able to use an idea effectively, i.e. brainstorm the idea and bring it to a state where it can work.

Judgement. — To be able to assess the idea's value and correct place and use, i.e. limitations always arise after you come up with an idea.

The Principles of Design are qualities or characteristics inherent in any art form, such as balance, harmony, contrast, variety, and action. These principles must be used in any design if it is to be in any way effective. Not all of them, however, will be used in the one design.

Whatever principles the designer may adopt, the ultimate result must be a design that can be easily read and clearly understood. Careful control of the principles of design is necessary to successfully project an intended image.

Balance

This is the result of an arrangement of one or more elements in the design so that visually, they equal each other. Every object in nature has structural balance, from the symmetry of a flower petal to the chambers of a snail's shell.

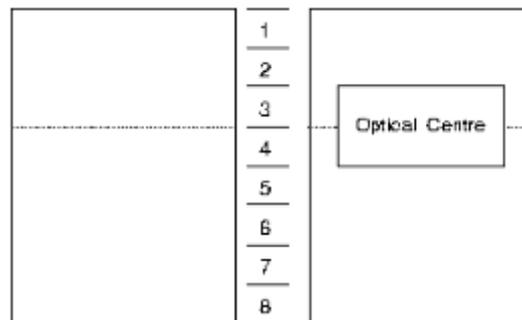
The balance needed every time we perform any form of physical movement is automatically maintained by a built-in equilibrium that we take for granted.

Man-made structures, even if not formally equal on all sides, must maintain a balance in relation to a perpendicular surface. Doubtless the Leaning Tower of Pisa will someday fall when a greater portion of its weight shifts off balance. Sound must also be balanced, both in its production and in its reproduction.

Achieving a physical balance is simple: the weight of one object must be counter-balanced by the weight of another on the opposite end of a fulcrum. If, however, the objects are of different materials, the masses may not appear to be balanced. Because steel is heavier than wood, for example, a large piece of wood is needed to balance a small piece of steel.

Physical balance can be measured by use of a balance scale; there is no agreed scientific method, however, for determining the weights of shapes in the arts. Instead, balance is determined by weighing the objects visually.

For graphic design, the visual centre of any typical A4 page of the business world is not the actual physical centre but what is termed the Optical Centre. This visual point of balance can be determined mathematically as being located three-eighths from the top of the page, five-eighths from the bottom.



Mathematical Balance.

For a single sheet design, type and images are easily positioned vertically to ensure an even amount of space on either side of the design to achieve balance. When positioned evenly across the horizontal axis, the elements appear, to the eye, to actually sit lower down on the page.

Regardless of the design style of work that is to be produced, Optical Centre must always be carefully considered during the initial design stages for a printed piece to work successfully.

One of the most fundamental differences in a design is whether balance is symmetrical (centred) or asymmetrical (off-centre). The choice between them profoundly affects the layout and feeling of a design.

The selection of which is the more desirable should be based on which of the two is going to achieve the result you need to get a particular sort of information over to a particular readership.

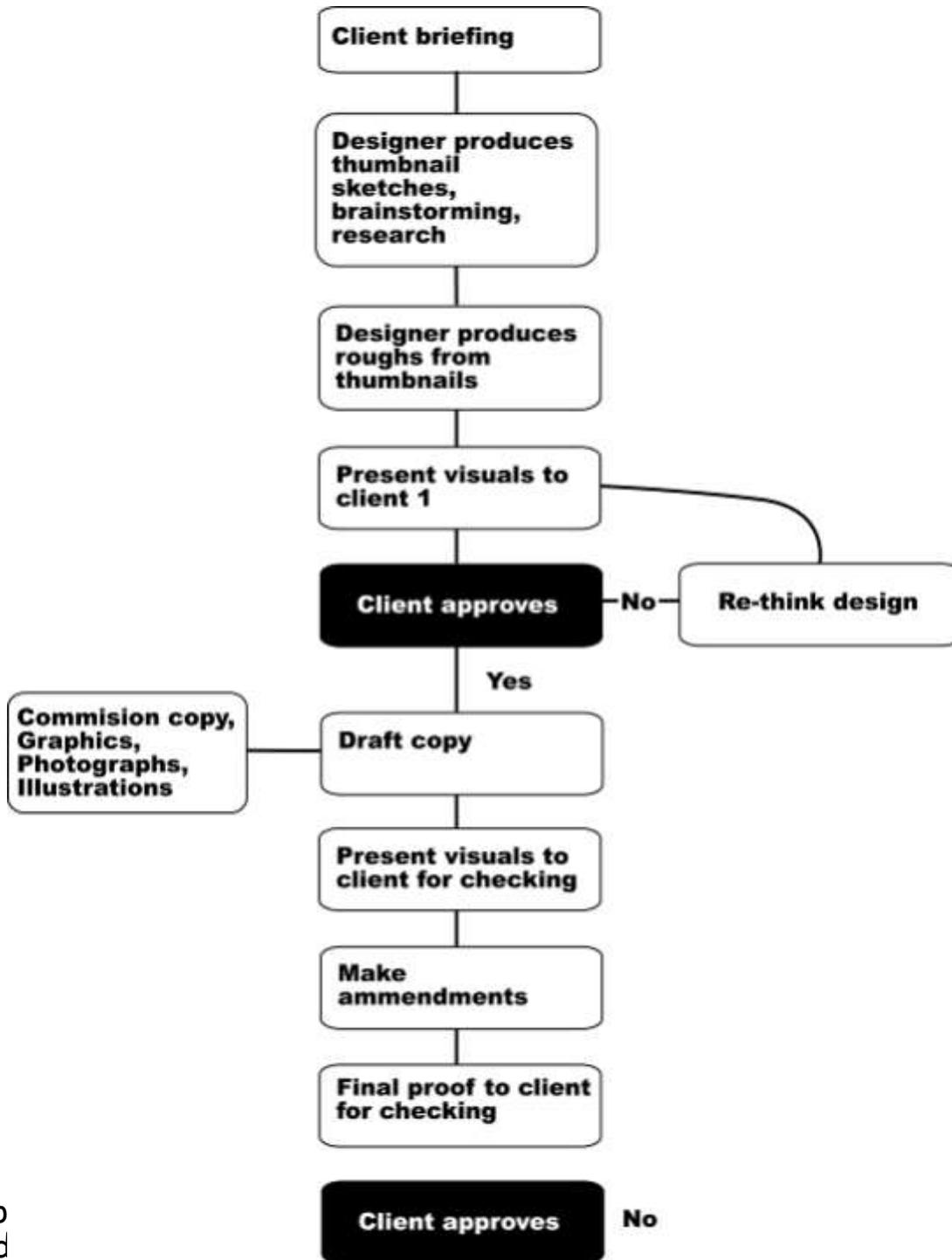
Symmetrical Balance

Symmetrical (or formal) balance has elements of equal weight as well as tone placed on both sides of an imaginary vertical line on the page and gives the feeling of permanence and stability.

Any symmetrical layout is likely to produce a more static, restful design. However, because a centred layout is so static, it is very easy to make it pleasantly innocuous but boring.

The Design Process

The diagram below illustrates the stages of designing a professional publication



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stage.

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Grids 2: Consistency and Unity

How does a grid tie elements together?

For the most part, people prefer organized visual information.

Newsletters, magazines, brochures, annual reports, and books often have many visual elements: columns of text, headlines, photos, illustrations, pull-quotes, etc. Grids allow the designer to build page-to-page consistency into these documents.

Readers expect to find page numbers in the same location on each page.

When all the text in a given article -- even when it spans several pages -- has a consistent look, including column width, it enhances readability. Readers often expect to find sidebars, informational text, and other oft-repeated elements in the same place from page to page.

A grid, used consistently on all pages of a multi-page document, makes it easier for the designer to provide the consistent look that readers often expect.

A carefully conceived grid system also allows the designer to introduce variations without forsaking readability or consistency. It also speeds layout because it takes the guesswork and "look back to see what we did before" out of where to place elements from one page to the next.

The following pages are examples of how you might combine text and graphics in a 7-unit vertical grid (such as for a newsletter). Notice how page 1 (Figure 1) and 2 have a consistent (reversed) layout. Text columns are two-grid units wide. One grid unit provides an extra wide column of space separating the main text from the sidebar elements. Page 3 (right hand page of the 2 page spread, Figure 2) is quite different from the first two pages but if you look at the underlying grid structure (Figure 3) you'll see that all three pages use the same grid system.

FIGURE 1: left-hand page of newsletter with 7-unit vertical grid



FIGURE 2: two page spread of newsletter with 7-unit vertical grid

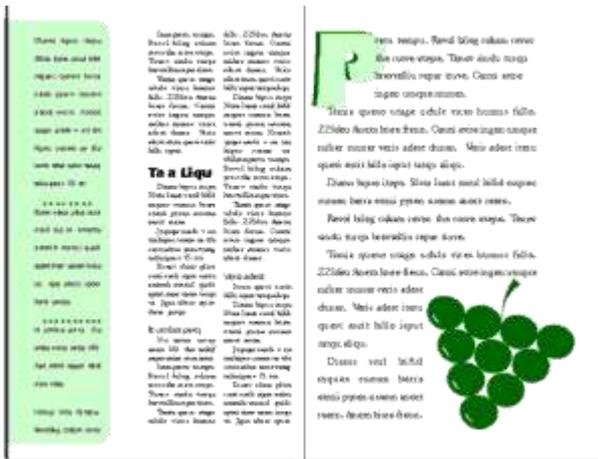
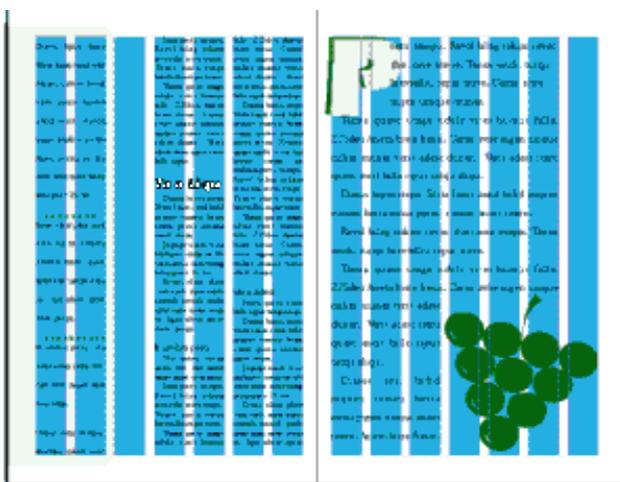


FIGURE 3: two page spread showing the underlying 7-unit vertical grid (blue)

Grids can unify a series of dissimilar documents

There are many ways to establish visual unity throughout a series of related pieces. You probably use your logo on all your marketing pieces. You may have colour-coded brochures for different aspects of your business. Grids are another way to bring unity and cohesiveness to a collection of brochures, sales sheets, display ads, spec sheets, and other elements of your marketing arsenal.



In a series of single, but related pieces (such as a series of posters or information sheets for a single ad campaign or single product line) a common grid can help unify the separate pieces. Let your grid help you place repeating elements in the same place from piece to piece. Let your grid provide a consistent guide for mixing graphics and text.

The informational sheets in Figure 4 have a common style for the headline treatments but don't all use the same number or size of graphics. The 3 unit grid (Figure 5) helps to unify these pieces. This is a fairly simple, straightforward example.

FIGURE 4: 3 informational sheets that share a common 3 unit grid





FIGURE 5: A unify a series of in-containing varied el-

three-unit grid helps formation sheets ements.

One grid, many designs

Grids have been accused of creating boring, static designs. It's not the fault of the grid. Used properly, grids can offer a variety of creative design options. Figure 6, below, shows how a 4x4 (16 unit) grid system takes on different lives using the same four graphic images and varying amounts of text.

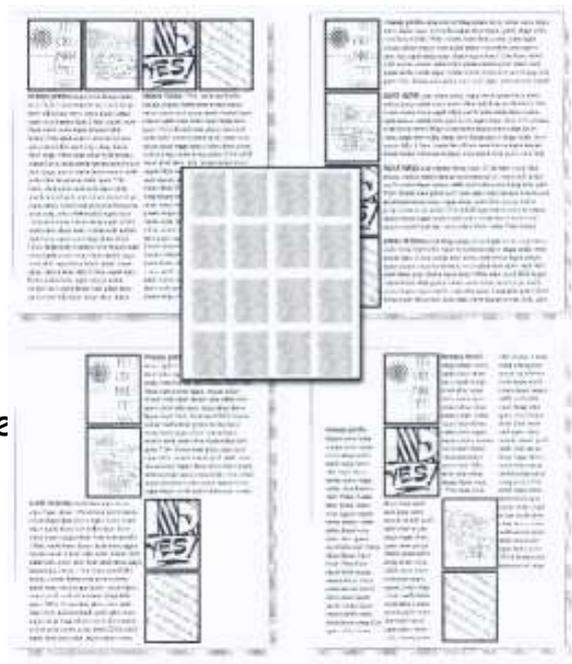


FIGURE 6: Just a fe "boring" grid.

using the same

Grids 3: Flexible Options

Are grids too rigid?

Choose a grid based on the content and adjust content based on the grid

The right grid offers the designer flexibility without overwhelming them with possibilities. The right grid also enhances organization and makes it easy for the viewer or reader to understand the content.

There are no right or wrong grids, simply grids that are more suitable for different content and design objectives. Of course that doesn't help you much when you're staring at a blank page and a deadline. Here are some "thinking points" to help you plan your grid and your design.

- **Content or Page Elements.**

Is the publication heavy on text or heavy on graphics? Will there be many headlines, rules, illustrations, pull-quotes?

- **Text.**

Look at both amount of text and how it is broken down -- long articles, lots of short articles, a mix of long and short articles. How many subheads? Will you use eyebrows, decks, initial caps, and other visual cues?

- **Photos and Illustrations.**

Are there similarities in the type of illustrations or size of photos? Can photos be grouped by size or type? Are there a lot of rectangular elements or many irregularly shaped elements?

- **Complexity.**

Generally the larger the number of grid units (and the smaller the individual units) the more design options are available. However, too many options can destroy the underlying unity that the grid provides.

So, which grid is best? Here are some guidelines (remember, I said *guidelines* not rules).

- Lots of text with few graphics -- such as a book with long chapters and few or no illustrations -- can use a simpler grid. 1 - 3 units, perhaps.
- A newsletter, brochure, or magazine with many photographs usually requires a grid with many smaller units to give more possibilities for placing and sizing the photographs.

- Newsletters, because they generally have more text, often use a columnar grid.
- 1, 2, and 3 column grids are common. Each can accommodate lots of text, especially long articles.
- 4 or more columns offer greater flexibility for publications with text, photos, and other graphic elements and a mix of long and short articles.
- Grids based on an even number of grid columns can suffer from too much symmetry if text and graphics are confined to individual or double grid columns throughout.
- Newsletters don't have to be tied to columnar grids. A newsletter consisting of mostly small articles or "news briefs" and photos could use a 6(2x3), 9(3x3), or 12(3x4) unit grid of rectangular or square units quite nicely.

Grids don't have to limit design

Grids can feel stifling. But they needn't be.

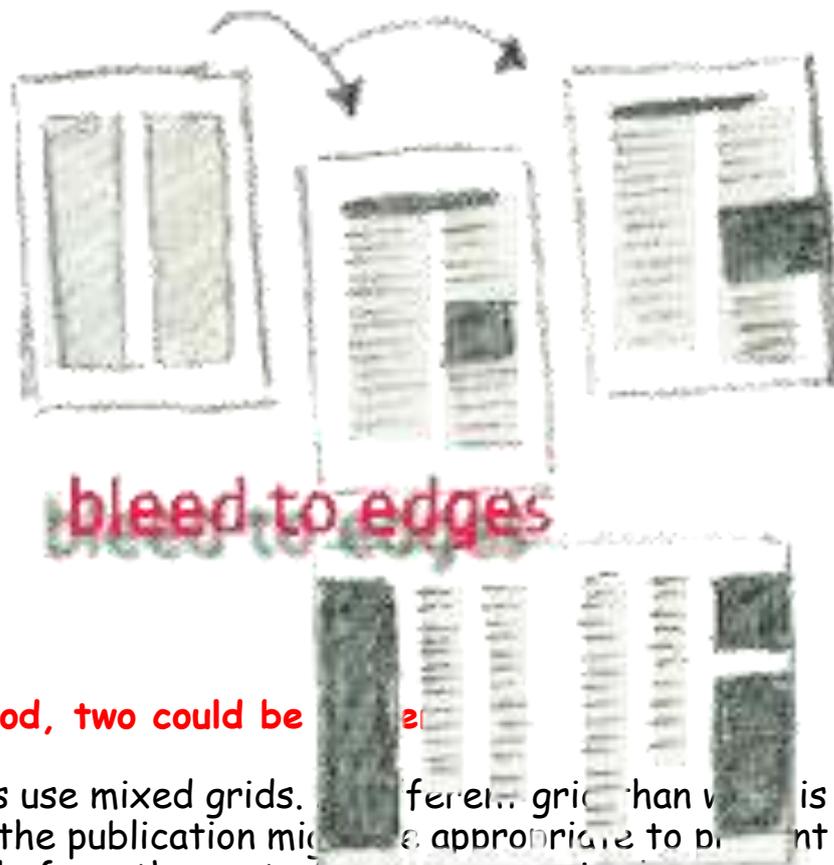
1. Layouts based on grids are not appropriate in all cases.
- 2.
3. Grids should fit the mix of elements rather than forcing elements to fit the grid.

Elements on your page do not have to be confined to individual grid units. In a five-column grid, 5 narrow columns of text can be hard to read. Try two columns of text, each spanning two grid units with an empty grid unit for accents, photos, breathing room, or adjacent caps.

Resize photos to fill 2-3 or more grid units. You don't have to always fill the entire grid unit either. Fill 2 1/2 grid units with a photo, leaving some extra white space.



Gutters and margins are not off-limits. Bleed photos off the edge of the page. You don't have to fill every little grid unit. The odd column in a 5 or 7 column newsletter grid can offer extra "thumb space" along the outer edges. There are many ways to add white space to your designs -- leaving some grid units open is one way.



If one grid is good, two could be better.

Some publications use mixed grids. A different grid than what is used through much of the publication might be appropriate to present content that varies greatly from the rest of the page. To mix grid systems within the same page.

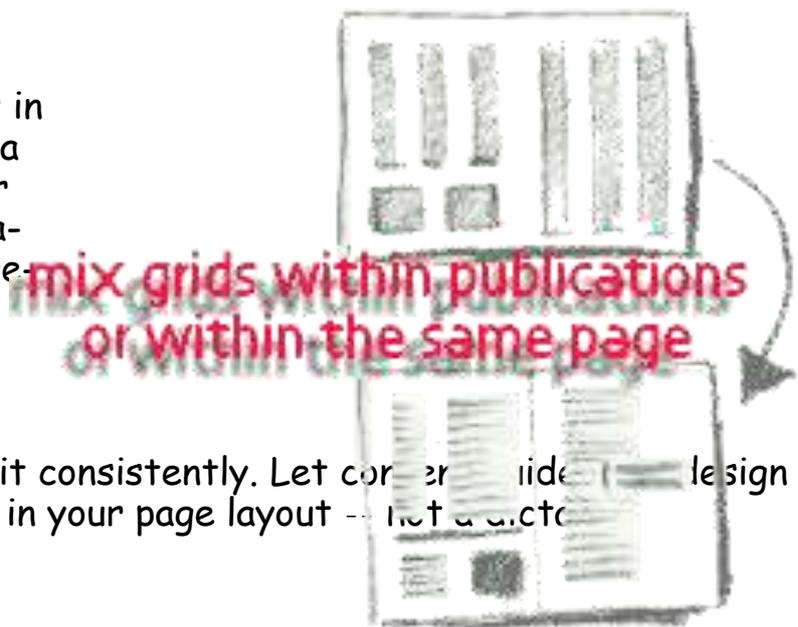
- A text heavy newsletter might group all photos and illustrations on a single page. The text pages can use a simple grid. The multiple photos might require a more complex arrangement.



- Use two different grids to differentiate sidebar or secondary items from primary articles.



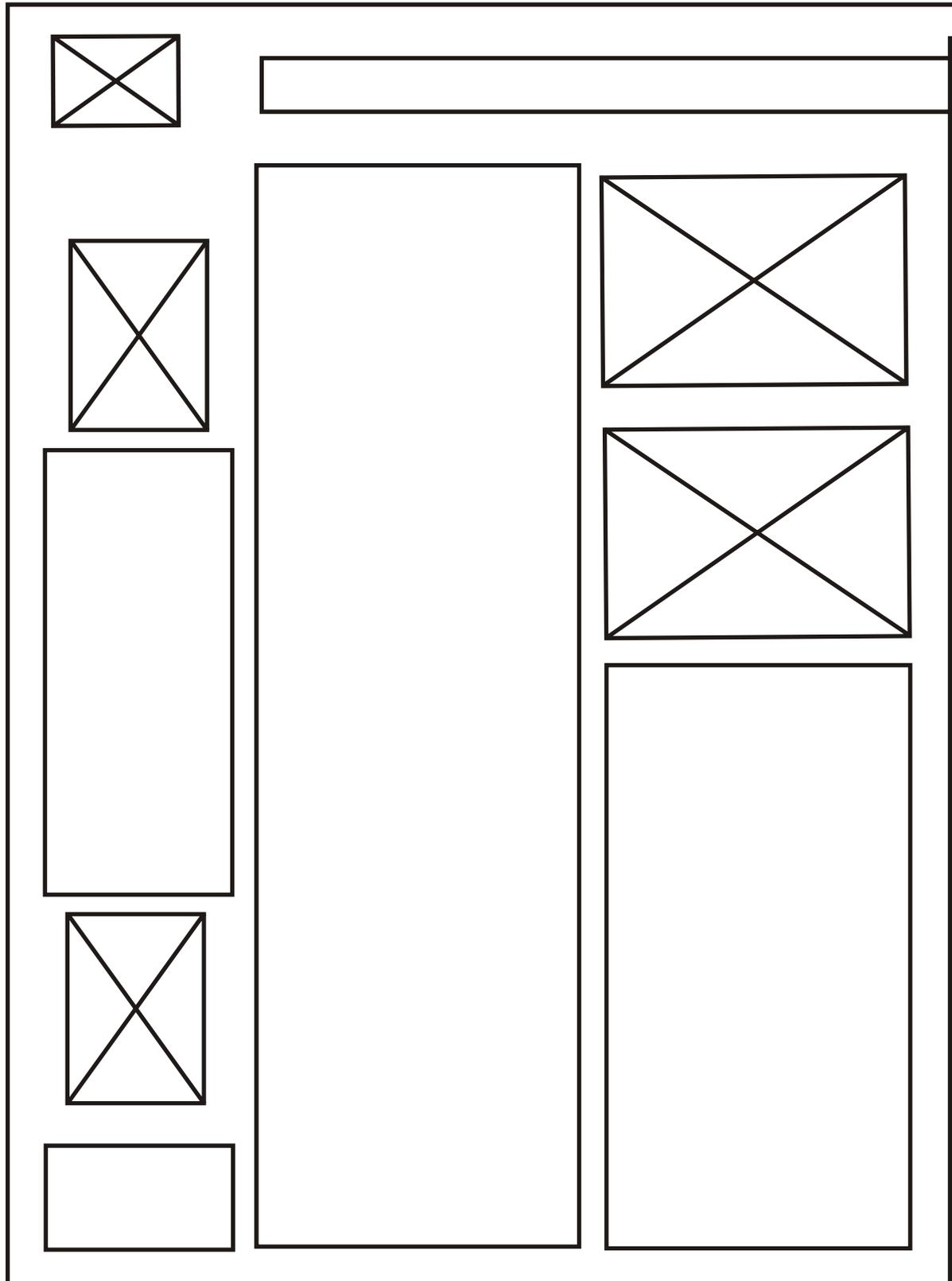
- Mix long and short articles in the same publication using a different grid for each. Or use different grids for feature material and regular recurring departments.



As with any grid system, use it consistently. Let corner guide the design and make your grid a partner in your page layout -- not a dictator.

Thumbnails and Roughs

Before a magazine can be produced a detailed layout of the proposed design must first be roughed out using thumbnails as shown below. The example shown uses a three column format.



The solution/final draft to the example below can be seen overleaf.

Typical magazine page layout

Bleed

Header

Headline

Column

Rule

Caption

Margin

Register Mark

The page layout includes a green header with a white cross icon and the title 'Medical Terms Explained'. The main content is divided into two columns. The left column features two expert profiles: Bob Green (RAO expert) and Rachel Carlin (Arthritis expert). The right column contains three articles: 'RAO what is it?', 'Good Management' for RAO, and 'Medication Matters'. A 'Gutter/Alley' is visible between the two columns. A 'Register Mark' is located at the bottom left, and the page number 'Page 8' is at the bottom center.

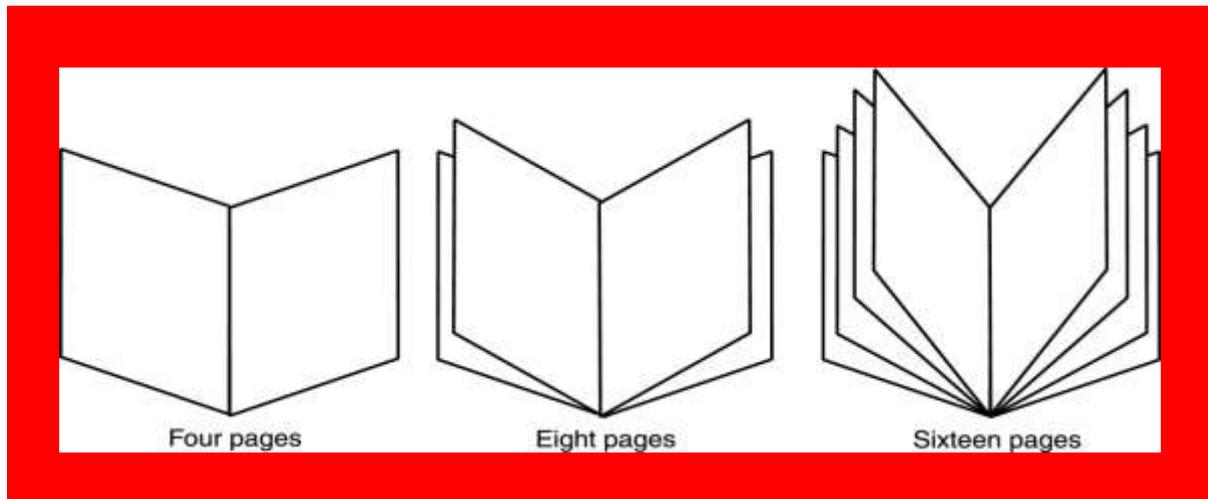
Page No./Folio

Colour fill

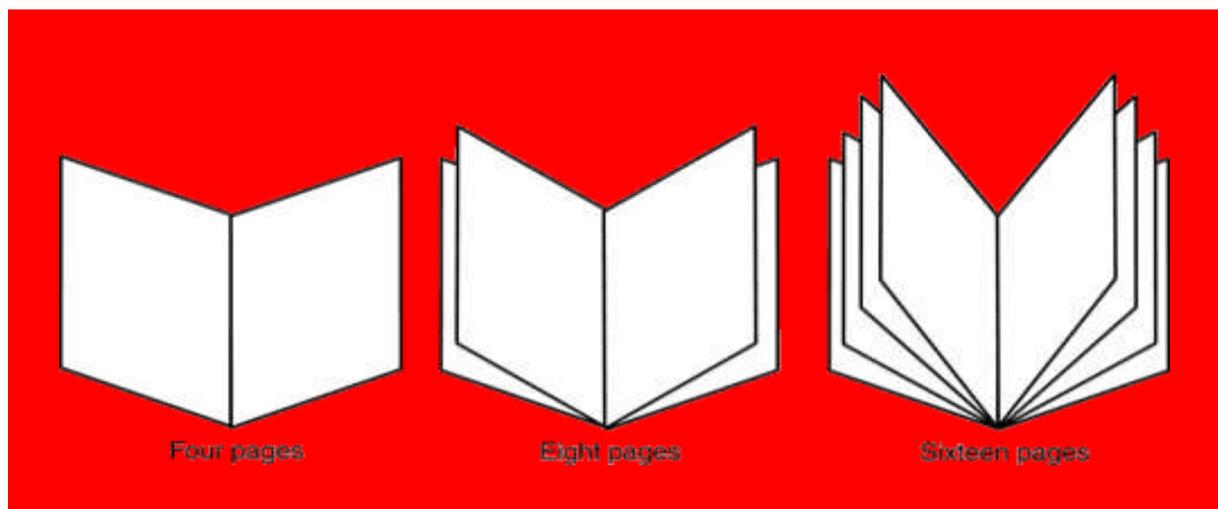
Gutter/Alley (white space)

The layout below has a white background which takes away from the main image. To take this white background away we simply apply the **Transparency** tool

Without Transparency tool applied



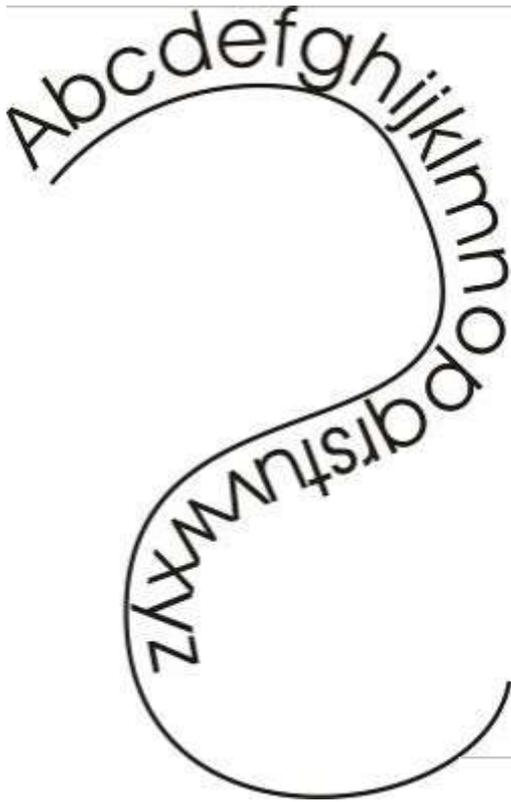
With Transparency tool applied



The above booklets shown are examples of multi page formats. Whereas the three and two fold leaflets are examples of a single page layout.

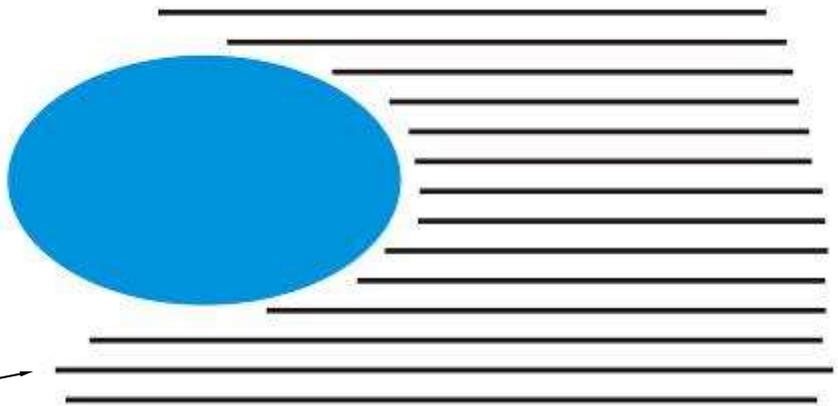
Flow Text along a path

Abcdefghijklmnopqrstuvwxyz



Flow Text along a path

Text Wrap round an object



Text

Drop Shadow

The Big Picture

Defining Principles of Design

Generally, all the principles of design apply to any piece you may create. How you apply those principles determines how effective your design is in conveying the desired message and how attractive it appears. There is seldom only one correct way to apply each principle.

Balance

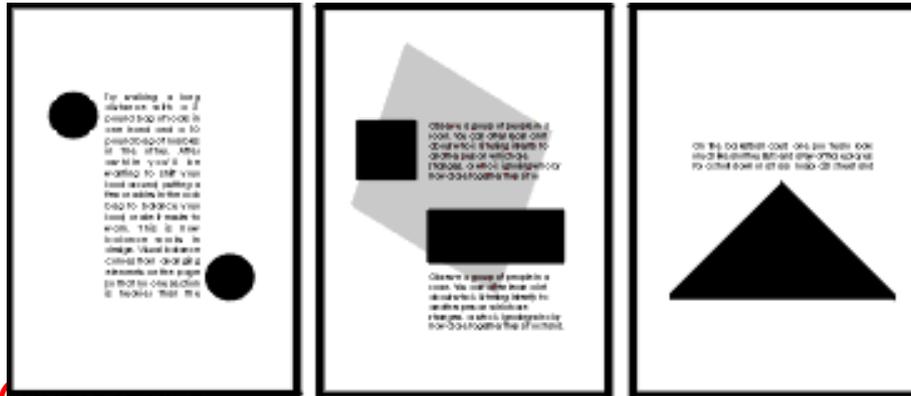
Try walking a long distance with a 2 kilo bag of rocks in one hand and a 10 kilo bag of marbles in the other. After awhile you'll be wanting to shift your load around, putting a few marbles in the rock bag to balance your load, make it easier to walk. This is how balance works in design. Visual balance comes from arranging elements on the page so that no one section is heavier than the other. Or, a designer may intentionally throw elements out of balance to create tension or a certain mood.

Proximity/Unity

Observe a group of people in a room. You can often learn a lot about who is listening intently to another person, which are strangers, or who is ignoring who by how close together they sit or stand. In design, proximity or closeness creates a bond between people and between elements on a page. How close together or far apart elements are placed suggests a relationship (or lack of) between otherwise disparate parts. Unity is also achieved by using a third element to connect distant parts.

Alignment

Can you imagine how difficult it would be to find your car in a crowded parking lot if everyone ignored the parking lot stripes and parked in every which direction and angle? Imagine trying to get out of there! Alignment brings order to chaos, in a parking lot and on a piece of paper. How you align type and graphics on a page and in relation to each other can make your layout easier or more difficult to read, foster familiarity, or bring excitement to a stale design.



Repetition/Consistency

What if Stop signs came in pink squares, yellow circles, or green triangles, depending on the changing whims of a town and a few of its residents? Imagine the ensuing traffic jams and accidents. Repeating design elements and consistent use of type and graphics styles within a document shows a reader where to go and helps them navigate your designs and layouts safely.

Contrast

On the basketball court, one pro team looks much like another. But send a few of those players for a stroll down most any major city street and something becomes apparent — those players are much taller than your average guy on the street. That's contrast. In design, big and small elements, black and white text, squares and circles, can all create contrast in design.

White Space

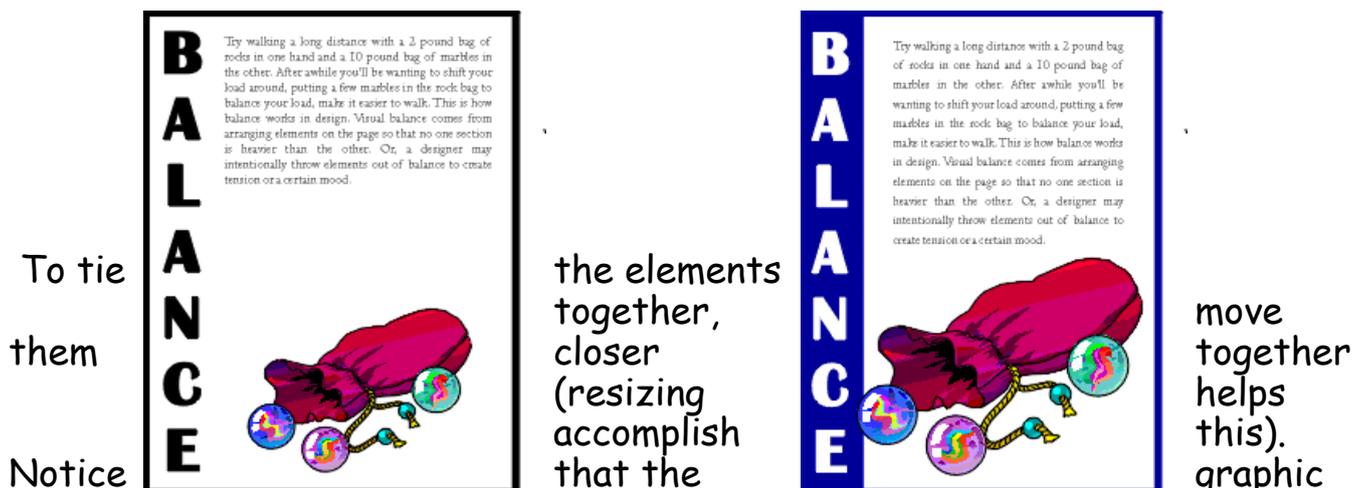
Did you ever participate in that crazy pastime of Fiat Panda stuffing? Were you ever the guy on the bottom struggling for a breath of fresh air or the last one in trying to find a place to stick your left elbow so the door will close? It wasn't comfortable, was it? Imagine trying to drive the car under those conditions. Designs that try to cram too much text and graphics onto the page are uncomfortable and may be impossible to read. White space gives your design breathing room.

The Big Picture Illustrating Principles of Design

The examples you'll find here demonstrate varying degrees of each of the six principles of design in a before and after format. View them individually and as a whole to see how different principles are applied. How might you do any of these differently?

Note: The text, not always readable in the examples, is the same as the definitions in Lesson 1.

You can create balance with the three elements (text block, graphic, vertical text) here but in the first example they appear to be just random elements with no **unity** or **balance**. In the second "Balance" example the text block and graphic are resized to bring them closer together and better balance each other.



(one of the marbles) slightly overlaps the box enclosing the vertical text, **unifying** the two elements. Reversing the word "balance" out of the blue box also adds more **contrast** to the composition. The increased leading in the text block redistributes the **white space** in a more balanced manner. The graphic anchors the bottom of the page, but the four text elements all float on the page with no apparent connection to each other (**proximity/unity**). The change in the headline (font change, reversed out of blue box) along with the subheading pulled in closer provides **balance** with the graphic on the bottom. The spacing between the two paragraphs of text is reduced slightly as well.

There is nothing inherently wrong with centred headlines, text, and graphics. They lend a formal tone to a layout. But, for this series of layouts something a bit more informal is called for. Also, large blocks of centred text are usually harder to read.

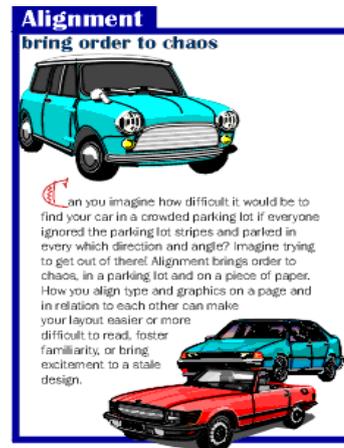
In the second "Alignment" example below, text **alignment** is left-aligned, ragged right, wrapped around the bottom graphic which is aligned more to

the right, opposite an added graphic that is aligned to the right to help **balance** the overall design.

Within the



second

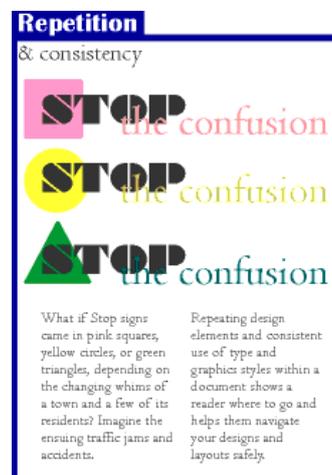


"Repetition" example, the headline is repeated three times using graphics that tie in with the copy in the text blocks. The **repetition** of the colours in the shapes and headline text that are in the copy help to reinforce the theme. Overlapping the graphic and text elements **unifies** the elements of the design.

Another **consistency** viewing all examples is blue the



aspect of that can be 6 of the the blue reversed typeface

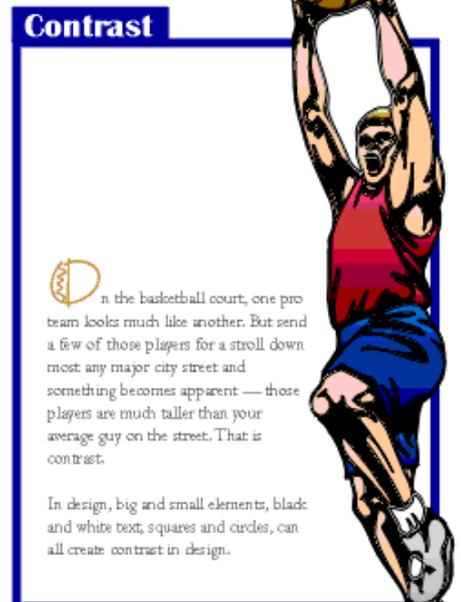
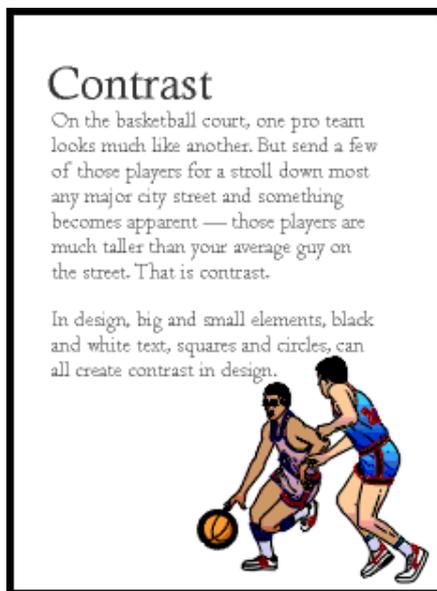


seen when "after" borders, boxes, and (Britannic

Bold) used for the names of all the principles of design. The drop cap used in three examples (Bermuda LP Squiggle) is another element of **consistency**.

In the first example there isn't enough **contrast** between the headline and text due in part to size but also because the two different serif faces used are too similar (not obvious from the small graphic, trust me, they are different typefaces).

That



oversized graphic provides real **contrast** and reinforces the copy (tall basketball players). Dropping the text down to the bottom portion of the page also reinforces the 'towering' aspect of the graphic. The reversed text in the blue box, the blue border, and the drop cap carries through the overall unifying elements found throughout the series. Additionally, the round shape of the drop cap and its colour echo the shape and colour of the basketball in the graphic. The drop cap and the reversed text on the left side plus the left-aligned text help to **balance** the large graphic element.

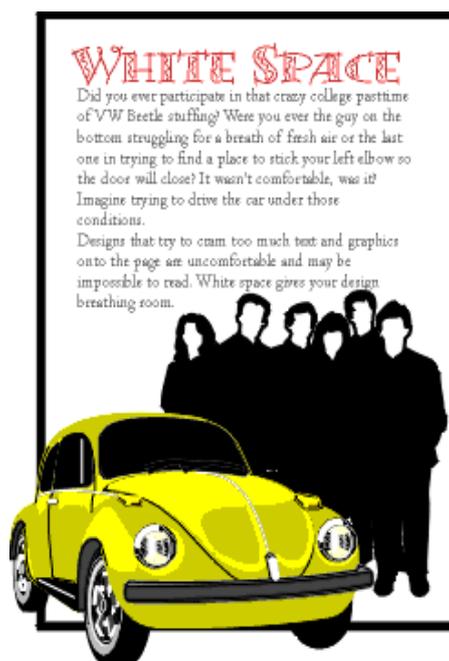
White space doesn't have to be white. The large block of black created by the graphic of people adds a large block of black **white space**. Multiplying the number of people and reducing the size of the car in the second "White Space" example provides additional **contrast** and reinforces the theme of the copy.

Additional leading, larger margins, deeper paragraph indents all add white space or breathing room to the design.

The oversized drop cap is another element of **contrast** and also helps to **balance** the page with the large, dark elements at the bottom of the page. The drop cap style, reversed title, and blue box are consistent with the rest of the series.

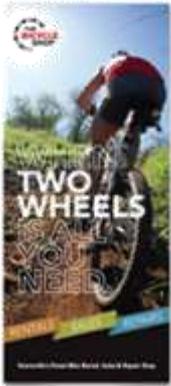
In the next series of lessons we will look at each principle of design in more detail and explore ways to incorporate each into your designs. We'll also touch on the ways that your software can simplify some related tasks, such as using style sheets to aid repetition and consistency or using leading and other spacing features to improve proximity, unity, and distribution of white space.

Typography & Page Layout



Typography & Page Layout Type Terms

Examples of Promotional Advertisements which use all the design elements and principles in their design.



A typeface may be named for its original designer (Baskerville, Bodoni, Garamond, Goudy); for its use (Times Roman was designed for the *London Times*; Century and Avant Garde were designed for *Century* and *Avant Garde* magazines); for its characteristics (Excelsior and Paragon were designed for high legibility); or for its designer's fancy (Perpetua, Souvenir, Centaur). Typefaces are also given generic names as well as brand names, e.g. different type-founder's call Times Roman different names, e.g. Times New Roman, Geneva, and English.

Typefounders' versions of the same typeface differ only slightly from each other. Even so you can, for example, seldom interchange one typefounder's 10-pt Baskerville with another's, to try to do so would result in a noticeable mis-match with the original setting.

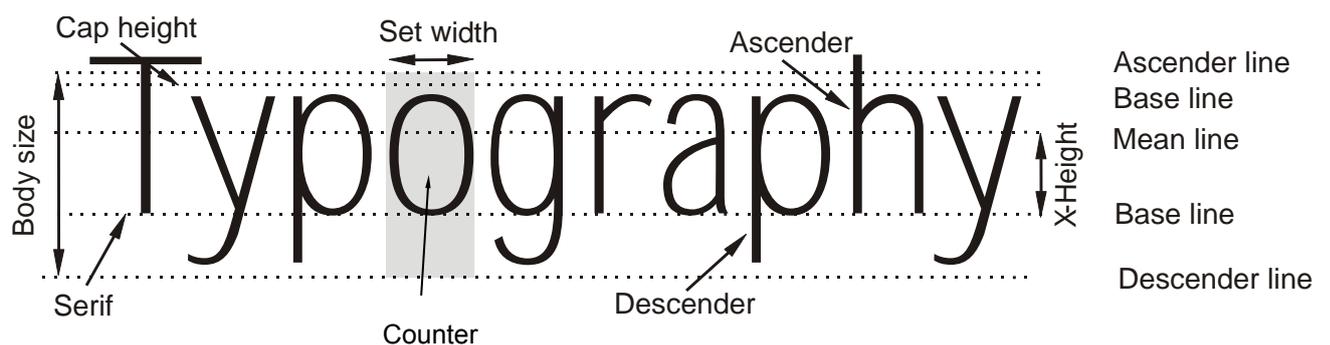
To identify type or recognise a wrong font, you must know what the variables are, because differences amongst the thousands of typefaces available today can be minute. Since an untrained eye cannot distinguish even gross differences, you should become familiar with the fundamental features of type that are labelled in the following diagram:

Serif and Sans Serif

Serif fonts tend to create a formal, serious look. The serif is a decorative feature at the ends of letters, numbers, etc. **See example below**

Sans Serif fonts lack the decorative features and are generally bland in appearance. The text used in this booklet is Comic Sans which is a Sans Serif font.

-
- **x-height** The height of the lower case letters such as 'x', 'a', 'e'.
- **Ascender** The stroke of a letter which rises above the Mean line as 'k', 'l', 'h'.
- **Descender** The stroke of a letter which hangs below the Base line such as 'p', 'y', 'g'.
- **Mean line** The imaginary line which determines the height of lowercase letters; ascenders rise above the mean line.
- **Base line** The imaginary line on which all characters rest; descenders hang below the base line.



Basic anatomy of type

- **Body size** Size of the type being used; measured from the end of the ascender to the end of the descender.
- **Serif** Small strokes and cross-lines at the ends of major lines.
- **Set width** Width, in units, allowed for each letter which varies between letters and typefaces.
- **Cap Line** The height of capital letters. Depending on type design, capitals may be taller/shorter or same height as ascenders.

Type Categories

All typefaces that are to be used in the appropriate print media must be purchased under a number of specific criteria. It is important to know whether a favoured type design has the necessary flexibility to be used for a wide range of design and publication needs.

To this end, you must be aware that not all typefaces that are used have the same number of variations, or for that matter are available on the output device that you wish to use.

Font

Many of the more popular typefaces used today are available in three different alternatives: *Commercial font*, *Expert font* and *Pi font*.

A *Commercial* type font contains the usual range of characters that are needed for most forms of typesetting, i.e. one complete assortment of alphabet letters comprised of capitals and lower case, numerals, punctuation, special characters, and symbols.

A type font is only available in one specific typeface design. Therefore, a typeface such as 10-pt Times Roman is considered to be *one font* and 10-pt Times Bold is *another*.

Commercial font

Purchasing the same font from two different type foundries may yield the addition or deletion of certain special characters.

In Desktop Publishing, extra care must be taken when working across two or more platforms because certain characters from the *same font and type foundry*, accessible on the PC platform, are not available to the AppleMac.

Currently, *Expert fonts* are limited to those fonts which are the most popular typefaces. These fonts contain special characters such as 'ligatures', 'small caps' and 'swash' letters that are not normally used, or needed, in the everyday world of commercial typesetting. For certain classes

Pi fonts usually contain a collection of special characters such as mathematical, monetary or decorative symbols, etc.



If you have a special need for certain characters, most manufacturers will make a pi font to fit your need using standard characters or even develop new one to suit you. *Symbol, Carta, and Zapf Dingbats* are examples of common pi fonts.

Series

Irrespective of the style of font you use, if the design is readily available in a range of sizes, e.g. 10-, 12-, 14-, 18-pt, etc. and has the same name, then it is regarded as being a *series*.

The actual range of sizes available in a font is dependent upon a number of interdependent factors such as:

- Application software, e.g. QuarkXPress vs Microsoft Word vs Freehand.
- Utility software, e.g. Adobe Type Manager.
- Font format, e.g. Type 1, Type 3, TrueType.

The type of output device being used, e.g. a *PostScript* laser printer has an infinitely larger series for its fonts than does a *non-PostScript* laser printer.

Even today, there are still a remaining few dedicated typesetting systems still in use that are restricted to size increments of 1-pt and also, cannot set type above 36pt.

Point Size

In the Technical Department we continually tell you that everything we measure is in millimetres, this true for everything except typeface.

Typeface is measured in **Points**.

Typeface is not normally presented smaller than **8 point**.

The size of text usually used by newspapers, books, magazines, etc. is between 10 and 14 point. The size of point being used here is 12 point. Headline text is generally sized at 16-36 point, anything over this size is usually found on posters etc. The heading at the top of this page is 18 point.

The text printed below is a typical page from a typeface catalogue. This unusual sentence contains all the letters of the alphabet. The typeface used here is **Times New Roman**.

12 the quick brown fox jumps over the lazy dog. 1234567890

18 the quick brown fox jumps over the lazy dog 1234

24 the quick brown fox jumps over the lazy

36 the quick brown fox jumps
over

48 the quick brown fox

The last variable in the flexibility (and popularity) of a typeface design is whether or not the design has a range of variants. If a number of fonts have the same name and general characteristics of face, e.g. Times Roman, Times Bold, Times Roman Italic, etc. then they are known as a *Family*.

Font Family

Helvetica
Helvetica Italic
Helvetica Bold
Helvetica Bold Italic
Helvetica Narrow
Helvetica Narrow Italic
Helvetica Narrow Bold
Helvetica Narrow Bold Italic
Helvetica Black
Helvetica Black Italic

The majority of fonts in common use have at least four variants, i.e. normal, italic, bold, and bold italic. The popular type design used above (Helvetica), has a family of over 50 variants, whereas many decorative and script style fonts such as Algerian, Arnold Boecklin Giddyup and Pepita, do not have a range of different variations and are usually restricted to a single font.

When nominating a typeface, the order of description can be thus:

- Type Size: **10 point**
- Type Body: **12 point**
- Type Family: **Helvetica**
- Type Weight: **Bold**
- Type Width: **Extended**
- Type Modification: **Outline**

Typesetting

Justification

Typing or setting text lines to the same length so that they line up on the left and the right is known as 'justification'. The information that you are now reading have been typeset using this method. The practice originated with Mediaeval scribes who ruled margins and text lines so as to speed writing and fit as many characters on a line as possible.

Later, metal type required even copy blocks to allow 'lock up' into page

form. The opposite of justified text is ragged text.

Justification is accomplished by filling a line until the last possible word or syllable fits and then dividing the remaining space by the number of word spaces. The result is placed at each word space.

Word spaces are variable in width, expanding or contracting as needed to space the line out to its justification width.

Margins are the imaginary vertical demarcations for text or tabular columns. Overall or primary margins are established by the line length function or the cumulative total of secondary margins (tab or text columns).

Space between lines

To improve the ease with which text can be read, i.e., legibility, the amount of extra space placed between each line in a setting must be varied according to the line length and character of the type face being used. For example, a light type with a small x-height, or a medium type with a large x-height, would need to be treated quite differently.

A suggestion in this matter is to have space equal to the depth of the lower case 't' between the lines. Most settings will always benefit with the addition of extra line space. A good rule-of-thumb is to add an extra 20% line space to the type face size being used.

Generally, the longer the line, the more space that is required. This is certainly the case when deciding the line spacing of sans serif type faces and for paragraphs set in a bold face. Capitals need more space between lines than lower case. The x-height, type face, weight, and leading make the type easy or

read;
decisions
face and line
very important
printing.

Space

To further
legibility, word
be controlled,
much or too

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form an agreeable whole;

9 on 9 point Palatino

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form an agreeable whole;

9 on 10 point Palatino

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form an agreeable whole;

9 on 12 point Palatino

very hard to
consequently,
regarding type
spacing are
in all forms of

between words

improve on
spacing can also
but again too
little space can

affect the ease with which the paragraph can be read. As you might expect, word spacing is affected by the style of type face chosen together with the particular situation for its use. Condensed type faces do not require as much space as expanded faces, and small type sizes read better with a little extra word spacing. As a general guide, the ideal word space represents the width of the lower case 'e' in the type face being used.

With the taste for narrow spacing still growing, some authorities suggest that the ideal word space is the width of the lower case 'i' in the type being used. For this width to be practical however, there is a need to reduce the set-width of the font being used.

Space between groups

In display composition, correct spacing between groups can affect the appearance and readability of type matter. In this situation, the wishes of the person designing the amount of space to be used. Variety is a very important principle in spacing, just as much as type face selection or type sizes. Uniform space in display setting leads to monotony and as a consequence, an uninteresting appearance.

Wordspacing must be controlled to ensure that there is neither too much, nor too little space. One result of bad word spacing is that the reader will quickly become tired and disinterested in the content and will find it difficult to concentrate.

Too little word space

Word spacing must be controlled to ensure that there is neither too much, nor too little space. One result of bad word spacing is that the reader will quickly become tired and disinterested in the content and will find it difficult to concentrate.

Too much word space

In spite of the necessity for variety in spacing between groups, it must be achieved only after due consideration of how varying amounts of space are to be placed.

Space is used thought or from another, amount of varied how isolated from another. The readability printed matter or marred by the space or groups.

Display

Display setting form of this is where groups is

example, if a job was set in solid composition, a comma would indicate a slight pause; a full point a longer pause; a fresh paragraph a new thought; a new chapter an entire change of thought.

In display composition punctuation marks are dropped at ends of lines only — but to serve the purpose, space is placed between lines or groups to the same replacement value of a comma, full point, etc.

Keep to a minimum the number of groups in a job, as the fewer groups in a job, the easier readability is achieved. Most jobs require no more than three groups.

To express these ideas in a simple way, we place space between lines or groups of equal in value to the degree of punctuation that would be otherwise used if the setting were solid, i.e. small space for comma, large space for full point, etc. The space is much more discernible than the punctuation mark.

In addition, in display we emphasise items according to their importance by

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make us the choice of discriminating buyers.

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- Repair and cleaning

We're so sure you'll love us that we offer a money-back guarantee if you're not completely satisfied.

Visit our two locations:

421 Bryson Road Melbourne	32 Simpson Street Malangaview
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GEMSTORE JEWELLERS OF CENTRAL PLAZA

'We take jewels seriously'

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make us the choice of discriminating buyers.

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421 Bryson Road Melbourne	32 Simpson Street Malangaview
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GEMSTORE JEWELLERS OF CENTRAL PLAZA

'We take jewels seriously'

to separate one section of copy therefore the space should be according to one thought is

of a piece of can be assisted the placing of between lines

is the highest punctuation, spacing of applied. For

the use of larger or bolder type faces. It is a good idea to refrain from excessive space which causes detachment of units, as too many points of interest in a printed piece cause difficulty in reading.

However carefully the arrangement of solidly set text matter may have been planned, with reference to type size and measure for example, and however carefully that matter is subsequently set, it can almost always be made even more readable by sensible leading.

The amount of leading in a given piece of text setting is usually decided by one or more of the following:

- The nature of the work;
- The design of the particular type face;
- The body size of the type;
- The x-height of the type;
- The weight and colour of the type; and,
- The measure to which the type is set.

Rules

The rule line (often, but not always, aligning at the baseline) is used extensively for horizontal ruling, including underscoring (which should be discouraged), vertical rules for design impact, to separate columns of text and for simple and convenient borders surrounding newspaper display advertisements.

Perhaps the thinnest possible line that can be printed is the Hairline. Care should be used in applying hairlines, and the printing requirements should be considered since such effects as reverse or overprint could present problems.

Aligning type with rules

When rules and type are used in combination in the same line it is important that the rule should line-up with the baseline of the type face.

Given Name _____

Given Name - - - - -

First line incorrect; second line correct.

Letter spacing

Since display faces can exaggerate mistakes brutally, the typesetter should be aware of the critical choices that must be made.

The first of these is letter spacing. Inconsistencies of letter spacing may go unnoticed in text types, but they are very obvious and disturbing in the display sizes.

Many situations result in letter combinations that do not look right together, particularly when using capital letters. One obvious way to overcome this problem is to *kern* certain letter combinations. Kerning is the adjustment of space between two letter combinations.

INVITATION
INVITATION
RAILWAY
RAILWAY

Letter spacing of italic

and roman.

Most program applications automatically take this into account. However, even this might not be sufficient and letter spacing will need to be done.

In setting lower case type, you will find that the letters are designed to fit together properly in any combination, giving the word a compact shape. When letter spacing is introduced, it weakens the shape of the word and reduces legibility. So avoid letter spacing lower case letters. Words set in all caps, on the other hand, often have inconsistent letter spacing which must be corrected.

Letter spacing should be

**CONDENSED LETTERS
ARE WEAKEND BY
LETTER SPACING**

used properly.

Avoid a large amount of letter spacing with condensed letters. These letter styles as are standard are specifically designed to be set close together and lowercase letters will appear strange and unappealing if set too far apart.

Since reducing the amount of space between the letters may not be desirable, we must consider the space between closer letters in order to make them consistent with the letters that are further apart.

The peculiarities of the capital letters make them broadly divisible into three groups with regard to the requirements of letter spacing. These groupings will assist you in deciding which letters may/may not require extra space.

AFLPTVWY
Group 1 — No additional spacing
 BCDEGJKOQRSXZ
Group 2 — Minimum additional spacing
 HIMNU
Group 3 — Maximum additional spacing

Grouping for spacing

of capital letters.

Remember, as you increase letter spacing, you may also have to increase the word spacing so words do not run together.

Vertical setting of lines

Occasionally, display lines are set vertically. If it is appropriate to treat an unimportant line or lines in this way (important lines should not be treated so) it makes for easier comprehension and a much cleaner and therefore stronger pattern if the line is set normally and then placed on one or other of its ends and not set with the letters the right way up, and one below the other, e.g. Hotel signs.

Apart from these advertising placed on one or other feet of the letters facing always occupy less depth, less width, than the setting way up one below the other.

V	S	O	H	s	a
E	E	F	E	e	f
R	T		R	t	
T	T	L	T	t	l
I	I	I	J	j	i
C	N	N	C	n	n
A	G	E	A	g	e
L		S	L		s

Advantages, the normal line set- of its ends, that is, with the left to right, will practically and where M's and W's occur, with letters placed the normal

Type arrangement

There are five basic ways that lines of type can be arranged for a given piece of composition they are: Justified, Range Left, Centred, Range Right, and Asymmetrical.

Justified

Justified is the most familiar method of type arrangement, especially for books, magazines, and newspapers. The lines of type are kept all the same length so that the lines are flush left and right. In order to make the lines equal, the word spacing is adjusted so that each line fills the entire measure.

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form.

Advantages

- This arrangement is best suited for sustained reading comfort.
- The pages assume a quiet look and do not distract the reader.
- It allows the reader to concentrate on the content rather than the design.

•

Disadvantages

- If the line measure is too narrow there could be a risk of poor word spacing.
- Words may be poorly hyphenated at the end of lines.

Range Left

This arrangement is the second most widely used method for composition; most poetry and typewritten copy appears this way. The type is set with even word spacing and each of the lines will vary in length.

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form.

Align left setting

Advantages

- The even word spacing creates a uniform overall texture.
- It is ideal for setting type in narrow columns.
- Hyphenation of words is at a minimum.
- The risk of *rivers of white* flowing down the page is eliminated.
- Lines can run either long or short, hyphenated words are virtually unnecessary.
- The ragged edge of the right adds visual interest to the page.

Disadvantages

- If lines are set the same approximate length it can be a disturbing factor in the design.

It is important that the ragged edge should create a pleasing silhouette, convex rather than concave.

Centred

In this arrangement, the lines of type are centred on the page. When using centred type the length of the lines must be varied enough to create an interesting silhouette. To control the shape, a minimum and maximum line length should be indicated.

Align centre setting

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form.

Advantages

- The even word spacing creates a uniform overall texture.
- Hyphenation of words is eliminated.
-

Disadvantages

- Reading centred lines is tiring, therefore it is better suited to small amounts of copy.

Range Right

In this instance the lines are aligned at the right so that the left side is ragged.

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form.

Advantages

- Since this form of type arrangement is infrequently used, it can create an interesting layout.
- The even word spacing creates a uniform overall texture.
- Ideal for setting type in narrow columns.
- Hyphenation of words is reduced to a minimum.
-

Disadvantages

- Visually, it is an interesting layout, however this setting demands more concentration on behalf of the reader.
- The reader is accustomed to reading from left to right, a ragged left edge increases reading difficulty.
- Reading lines set range right is tiring, therefore it is better suited to small amounts of copy.

Asymmetrical

In this arrangement, the lines have no predictable pattern in length or placement. The simplest method of controlling this effect is to have the copy set with specified line-breaks and then arrange the lines yourself in mechanicals. There are no rules and probably no two typesetters would break the lines in the same place.

Character in types has to do with the impression made by the individual forms, their proportions, and the intangible something in them that makes the letters of each word hang together to form an agreeable whole.
Asymmetrical setting

Advantages

- Since this arrangement is not frequently used, it can create an interesting layout.
- It maintains even word spacing.

Disadvantages

- Visually it is an interesting layout, however this arrangement demands more concentration on behalf of the reader.

Reading lines set asymmetrically is tiring, therefore it is better suited to small amounts of copy.

Classification of Type

An important factor in the composition of a piece of printing is the selection of the correct typefaces. Choosing the right typeface makes clear the sense of the message, and imparts that atmosphere or environment which enables it to be more easily understood.

The number of typefaces in use today runs into the thousands and as such presents difficulty in selecting the appropriate design for a particular job. Because there are so many type designs to choose from, it is easier to first choose a general type style or *classification* to suit your graphic design, and then, look for a particular typeface that relates to that classification. Although there are well over 32 unique type classifications, the simplest form, as follows, places type into seven *broad* classifications:

Roman (Serif)

Serif is an all-inclusive term for characters that have a line crossing the free end of a stroke. This style face, said to have been invented by the Romans, is also commonly referred to as 'roman'. It is the one most often used and also one of the most legible styles. The style is very comfortable and familiar to all readers and is therefore used in the bulk of reading material.

ABCDEF GILM
NOPQRSTVX

'Tranjan Letter' shapes based on
ancient Roman lettering

The Serif typeface is then further classified into Humanist, Garalde, Transitional and Didone, according to their stress and serif-form as follows:

ROMAN

Humanist Faces:

Stemple, Schneidler, Centaur, Italia, ITC Berkeley

Garalde Faces:

Bembo, Garamond, Plantin.

Transitional Faces:

Times New Roman, Lucida, Bas

Humanist

Garalde

Transitional

Didone

Didone Faces:

Bodoni, Walbaum, Americana.

Humanist (Venetian) faces are named after the first roman typefaces that appeared in Venice in 1470, Humanist typefaces were initially designed

to imitate the handwriting of Italian Renaissance scholars. These types that are characterised by their strong, bracketed serifs. The letters are in general wide and heavy in colour. Other characteristic letters are the wide lower case *e* with a diagonal bar to the eye. A noticeable feature of true Humanist types is the square full point.

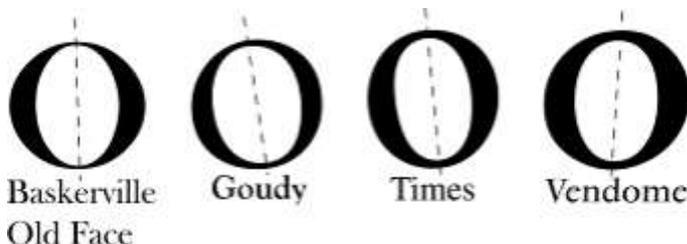
These types have a small x-height, moderate contrast between strokes, and an acute 'angle of stress' and do not lend themselves to modern design treatments of type such as reverse or stipple. The style prints best on a unsized stock in black or brown ink.

Garalde (Old Style) were designed centuries ago by such masters as the French printer Claude Garamond and the Venetian printer Aldus Manutius. Garalde typefaces include some of the most popular roman styles in use today.

These faces have rounded serifs and moderate contrast between strokes. The letters are open, rounded and very readable. The thick strokes of curved letters are off-balanced. The 'angle of stress' of these types is less acute than Humanist types.

Like Humanist, these types do not suffer reversal and stippling well, except in large sizes. Prints best on an unsized, off-white stock, in black ink.

'Angle of stress'



Kerning

Before text could be entered using a keyboard, designers made layouts by hand using rub-down lettering to represent finished text in client visuals. Anyone who has ever used these methods will understand just how difficult it can be to properly space letters together. Giving letters equal spacing simply does not look visually correct. This is because there are certain groups of letters that do not look comfortable next to each other. For this reason spacing needs to be added or taken away. Fortunately, because most DTP software programmes control letter spacing, this is only necessary for headline or large areas of text.

Yellow
Unkerned

Print

The choice

Quantity
Number of
Print Size

Medium to be printed on
Print quality required
Finishing required
Cost

Yellow
Kerned

Printing Methods

Offset Lithography

This is the most popular printing technique used for most printed matter we encounter such as leaflets, booklets, magazines, catalogues.

The separated image is exposed onto film through a halftone screen. The resulting "Lith" is then exposed onto a light-sensitive plate (sometimes made from zinc, aluminium and even special paper stock). When exposed to a strong light source, the transparent areas let light through the Lith onto

the plate. The chemicals on the plate react to the light so that when the plate is treated with further chemicals, the print areas become resistant to water. This is the basis of Lithography, the fact that oily substances repel water. When the plate is dampened and oily printing ink rolled across its surface, the ink will adhere only to the treated areas, i.e. the image areas. The term "Offset" refers to the fact that a large soft roller is rolled over the plate picking up the ink and offsetting it onto printing paper. For full colour

printing there will usually be four full printings, one for each of the process colours. However, these days printing presses are able to cope with up to five and perhaps six colours allowing for the use of special inks such as fluorescents, gold, silver and varnishes.

Offset lithography is the most cost-efficient and fastest method of printing hence the reason it is so widely used.

Screen Printing (Serigraphy)

This is one of the most ancient methods of printing attributed to the ancient Chinese and often called Silkscreen printing. This is because the meshes used in the printing were made of silk before synthetic fibres were introduced. Screenprinting was the preferred method for large-scale printing and for printing onto anything from t-shirts to circuit boards and glass. High speed, large format inkjet printing and other advances in print technology have made Screenprinting less competitive for certain types of work.

At its simplest, Screenprinting involves making a stencil which is adhered to a fine mesh screen attached to a frame. Using a squeegee, the ink is pushed through the stencil and onto the print surface. A halftone from a colour separation can be used as a stencil. This can be adhered by exposure onto a screen coated with light-sensitive emulsion or by exposing onto a light sensitive film, which is treated and then attached to the screen. The photo-sensitive emulsion reacts to light, i.e. where the light penetrates the stencil and hardens. Where the light does not penetrate, the emulsion will remain soft. When the screen is washed, the soft areas of the emulsion wash away leaving just the image area. The main advantage of Screenprinting is its adaptability. One screen can be used again and again, but also easily reconstituted. There are no limits on the amount of colours that may be used and light colours can be overprinted easily onto dark colours.

Flexography

The image to be printed is formed onto a rubber plate, which is then wrapped around a cylinder. It is a high speed, high output method of printing favoured by the packaging industry for use on non-porous materials, polythene bags, cellophane etc. Flexography also favours large-scale work with fast-drying inks. One of the main advantages of flexography is that changes can be made to the plate easily by making a patch, so that the whole plate does not have to be reproduced. One of the disadvantages of

flexography is that halftones and small text do not print particularly well as the ink tends to spread.

Gravure

This is known as an Intaglio method of printing just like etching. This means that the image is bitten into a plate, the ink pushed into the bitten areas, the surface wiped clean and the paper pressed onto the plate by a rubber roller. The paper lifts the ink from the bitten areas. The image is formed by engraving the screened image onto a metal cylinder. Gravure is a high speed, long-run process suited to halftones and newspapers, postage stamps etc. Its disadvantage is that plates are expensive to produce and therefore mistakes are costly. Also, the whole image needs to be screened, therefore text does not always reproduce too well.

Collotype

A very rare printing method these days, but is the only one to produce real continuous tone without using a halftone process. A negative is made of the image, which is then contact-printed onto an aluminium plate coated with light sensitive gelatine. The amount of hardening of the emulsion depends on the amount of light reaching the plate through the negative. It is a slower method of printing used for high quality reproduction work and for very short runs.

Photocopying

Photocopying is now the most common method of reproduction. We are so used to the process that we do not consider it to be a method of printing at all. There are many styles of photocopier available, but they mainly work along the principle of projecting bright light at an image. The light is reflected from mirrors onto an electrostatically charged drum. Toner attaches itself to the charged areas of the drum and the image is fused onto the paper using heat. In modern laser copiers a laser is used to draw the image onto the drum. The advantage of photocopiers is that the cost is small for fairly long runs and, without the need for processing, is very quick. The disadvantages of photocopying are that there are restrictions in printable size, the choice of paper stock is limited and the quality is variable.

The cost of colour photocopying machines is falling at such a rate and the quality is increasing so that copiers may soon compete with small colour offset lithography, at least for short runs. Technology is such that laser copiers now work straight from computer maximising quality and allow editing.

"Direct from PC" methods

Desktop Printers

The massive growth of home computing coupled with the ever-decreasing costs of software and hardware has meant that anyone is able to publish and print quality publications from the comfort of their own home. The cost and print quality of most desktop printers means that many small businesses are

able to publish and print their own literature without ever being involved with the printing industry. However, most desktop printers are designed for short-run work only and are not financially viable for producing large quantities.

The most common types of desktop printer available are the laser printer and the inkjet printer of which there are many variations.

Laser Printers

Lasers are the best printers available due to the quality at which they are able to print. The only disadvantage is that most affordable laser printers are black and white only (colour lasers at present are very expensive). Lasers work by using a laser to draw the image onto an electrically-charged rotating drum. The laser removes the charge from the white areas of the image leaving the image areas to attract toner which is then fused onto the paper by a heat process. Many laser printers have PostScript™ capability installed which allows for Postscript fonts and images to print at the best possible resolution. The quality of laser output is such that it can be used for producing halftones for newspapers, newsletters etc.

Inkjet Printers

Inkjets tend to be sold as colour printers and their cost is so competitive that are usually the choice of most home users. The inkjet works by firing minute drops of ink onto the paper through a print nozzle. The detail with which inkjets can do this increases all the time and almost photographic quality is the norm. The quality of colour is excellent, but the disadvantage is that inkjets are really only intended for very short print runs. The types of paper that can be used in inkjets is limited and best quality is only available on specially coated inkjet papers. Due to the time it takes to print and the cost of the ink cartridges, inkjets can really only be considered for colour proofing.

Other desktop printers

Bubblejet

Bubblejets work via a heating element, which causes droplets of ink contained in a series of fine nozzles to be propelled onto the paper. Print quality is not as good as inkjets.

Thermal Wax

These printers work by using a roll of colour ribbon containing each process colour. The paper is transported through the printer once for each colour. A print head, the whole width of the paper, containing many heating elements melts a dot of colour from the ribbon onto the paper repeating the process for each colour in the process. Although it produces glossy, bright colour, the disadvantage of thermal Wax printers is the cost of the colour ribbon which has to be replaced for each print and the paper which has to be specially coated for the best results.

Dye Sublimation

Dye Sublimation printers work by a process that determines the colour deposited by the amount of heat used on the inks. The result is high quality even from fairly low resolution images. The disadvantage lies in the high cost of consumables and the slow printing times.

There are new technologies being developed all the time for outputting images directly from a PC, though most print techniques such as large-format inkjet printing are designed for short run and one-off work. Many printers now use systems that allow for the printing plates to be created directly from the PC, speeding up the print process and allowing for last-minute editing.

Computer Graphics

There are many different types of computer graphics, each with its own specifications and uses. The trick is to use the correct one for the correct output. Some are specific to a particular software package and some are industry standards, which can be used across PC platforms as well as software.

There are two main types of computer graphics, the bitmap and the vector. Both are represented on screen as a bitmap, but a vector is like a mini-programme in itself. It uses the relationship between points and the paths between them to describe the image. Because the vector image is referenced, any changes to it are re-plotted each time. It can be scaled, skewed, stretched or otherwise manipulated without losing its quality on screen or in print. The same cannot be said of a bitmap, which, when scaled

or distorted in some way will lose its original map of bits. Pixels may have to be added, re-assigned or replaced by the editing programme, but not close enough to the original. For this reason bitmaps are better reproduced at the sizes they were intended to be.

A technique known as anti-aliasing softens the edges of a bitmap taking away the harsh jagged look. This works especially well with fonts:



Bitmap font

Anti-aliased bitmap font

The Anti-aliased font looks smooth simply because there have been very subtle shades of grey used at the edges of the letterform to give the appearance of a smooth edge. A vector or outline font, like a Postscript image, uses mathematical referencing to draw the letter at any size or distortion in any circumstance. This is the reason Postscript and TrueType fonts are the standards now. The other advantage of vector images is that the image itself is recorded as a vector file and not the background. So when a vector image is imported into another document it is independent of a background whereas a bitmap will always display a background colour.

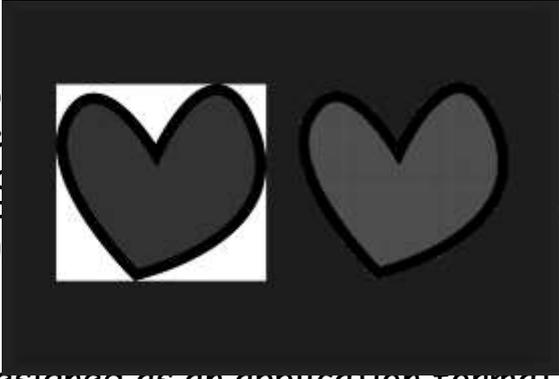
Bitmap on the left, vector on the right

Graphic File Formats

The development of Postscript technology meant that the drawing and illustration software packages were able to export vectors in Postscript format. This format is known as EPS (encapsulated Postscript) and now even paint programmes save in this format. Another good reason for using EPS files is that they will print at the highest quality of the output device they are printed from, more especially if it is a Postscript device such as a laser printer or image setter.

Most of the other file formats are bitmaps and their uses are described below:

BMP (bitmap) A graphic image consisting of the colours of dots or pixels. Also known as raster graphics. Common formats are GIF, JPEG, Photoshop, P, PNG, FAX formats and TGA. Used in Windows up to 24 Bit



PCX Originally designed as an application format for windows-based software. It is now used across many applications.

GIF Invented by CompuServe for efficient transmission of graphics, this format can only support 256 colours, or 8 bits. The newer revision, 89a, allows for multiple images in one file to simulate animation. Unisys owns the patent to a form of compression used in GIF files and occasionally decides to demand licensing fees.

Thus, you may want to use the newer and completely free PNG format instead of using GIF files. Used for screen display. It is completely device-independent. Used mainly on for Web images, it can be interlaced which allows the image detail to build up rather than having it wait to download. Uses small colour palette, hence small files.

JPEG (JPG) Joint Pictures Expert Group. The committee which set standards for a file format for graphics. The JPEG file format is a compressed format, with some loss of quality during compression. A popular web format due to the generally small size of pictures. File formats of .jpg, .jpeg and .jpe. Used for screen display, particularly of photographic images on the Web.

PNG Portable Network Graphic. A newer graphic format which is small in size. Usually .png extension.

PICT Originally a Macintosh format designed for printing.

ZIP Zip is a file format where the files are compressed (referred to as "zipped"). Using a file compression program (such as PKZip for DOS, or Winzip for Windows), a zip file could be created from one or more original files.

Windows XP includes "Compressed Folders", a built-in file compression and extraction utility. Nonetheless, Winzip and PKZip still prove popular additions to computers.

TIFF A Bitmap graphics file format. It was developed by Aldus in 1986 to provide a common format for scanners, and is mainly used for that purpose, desktop publishing, and as the data format for scanned faxes.

Most widely used image type for printing and for high resolution images. It is a good cross-platform format. Some applications allow for compression.

Typography Tips

Try to match the typeface to the style of the document. Think carefully about who is going to be viewing the document, who it is for and what it is intended to say. For example, an Old Style typeface may not be suitable for a magazine about cars unless it is about classic cars. Conversely a script typeface would not be suitable for a fire safety leaflet.

Try never to use more than two typefaces on a page. Better results can be achieved by varying the size and style of a typeface.

Be consistent. If using a certain typeface for headings and sub headings, make sure that they are at the same size, style and weight throughout the document.

Consider white space. Think of the opposite of the items in the document, the areas not covered with text or images. These can be just as important as the rest of the document adding balance or contrast where required.

Never make body text any larger than 14 Pts or any less than 8 Pts. The only exception to this is when producing a document for people with who have a visual impairment.

Leading in headlines may need to be reduced. Remember that as the size of the type increases, so does the automatic leading settings which can lead to quite large gaps between lines of type.

With body text, line spacing is very important too. Sans serif typefaces need more leading than sans serif because without serifs to lead the eye across the page, it easier for the reader to accidentally re-read the same line. Leading should normally be set at about 20% more than the type size.

Always set the type size before changing the leading.

In body text, the larger the x-height, the greater the leading should be.

When placing white text on a dark background, make it bold for legibility and check the kerning which is much more prominent.

Limit the use of styles like underline and outline. Instead use Bold for emphasis.

Never make the spacing between words greater than the leading. This is difficult to read, and can leave ugly rivers of white down the page.

Try never to use more than 64 characters per line (including spaces). Any more make large amounts of body text difficult to read.

Avoid headlines that are set entirely in capitals. These can be too imposing and more difficult to read. Also lines of capitals take up much more space on a page.

Avoid widows and Orphans. That is words, or lines, which are left alone at the top of a new page or column, or words, or lines, left at the end of a page or column which belong to a following paragraph.

Hyphenation cannot be avoided with body text, but should never happen with headings and sub-headings.

Justified text, although it looks neat can, especially if "force justified", cause unsightly, exaggerated word spacing often leaving single words stretched across a whole column. It can also leave rivers of white space down the page.

Print Preparation

The modern print process is still changing as regards reproduction technology, but the basic process is the same. The computer files may be sent to the printer or graphics bureau who may be asked to make up a high quality proof such as a Matchprint[®] or Cromalin[®] which are as near to the printed document as possible in terms of colours and resolution. These can be very expensive, but are cheaper in the long run than having to recreate an entire plate or worse still reprint an entire publication.

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.

Cyan

Magenta

Yellow

Key (black)



CMYK

CMYK

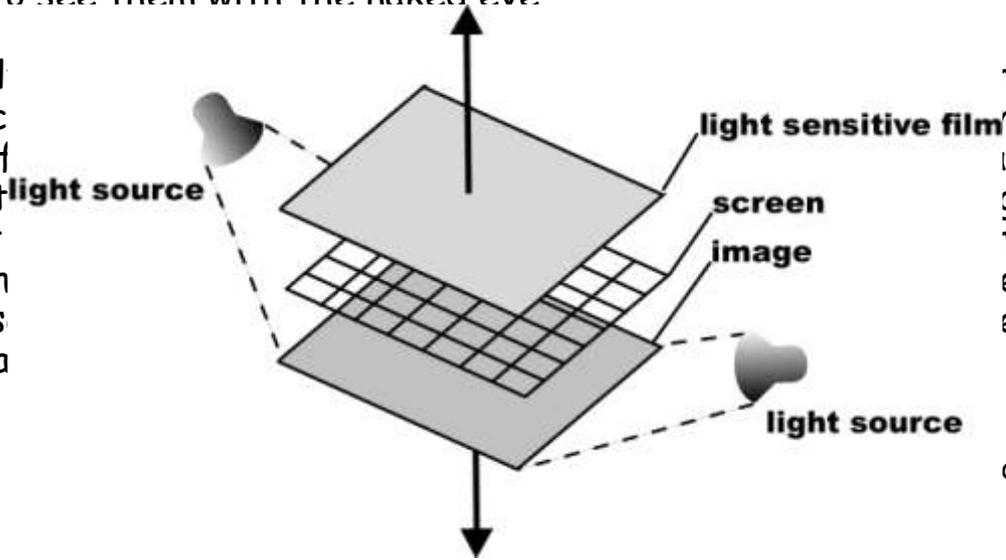


The original image is photographed through a "Color Camera". This works by photographing the image into three colours with a filter. Each separation is photographed through a filter which splits the image up into a series of dots. These dots vary in size and proximity depending on the depth of tone required.

Camera". This works by photographing the image into three colours with a filter. Each separation is photographed through a filter which splits the image up into a series of dots. These dots vary in size and proximity depending on the depth of tone required.

Looking closely at a newspaper picture reveals these dots, but in full colour printing the dots tend to be much closer together and smaller, so it is more difficult to see them with the naked eye.

The result is a halftone pattern which consists of dots of varying sizes. The direct effect of this is that the image must be broken up into a grid of dots. This process is known as dithering.

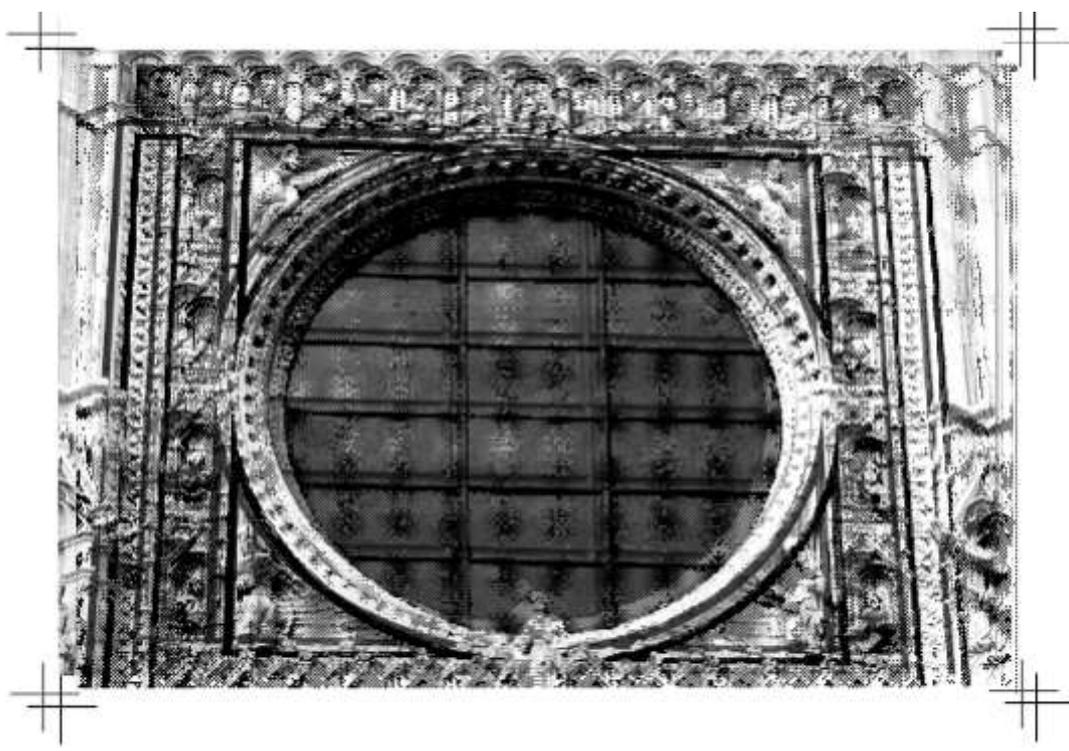
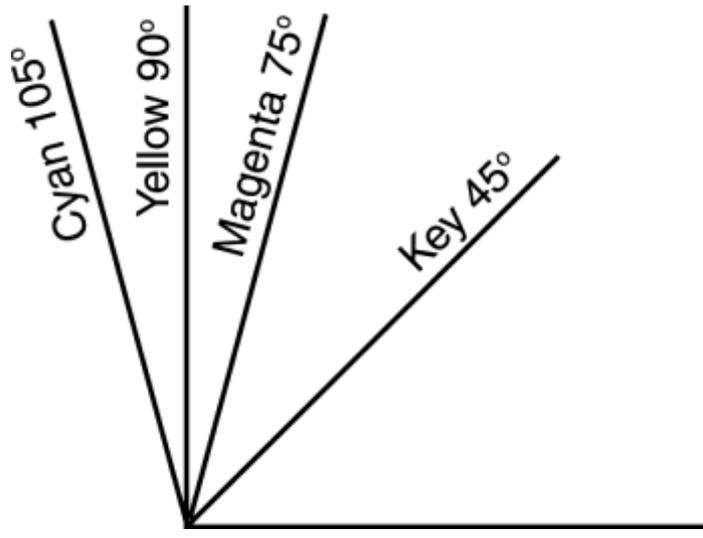


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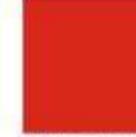
The print process involves printing each of these colours directly on top of each other. This is the process known as registration. It involves placing crosses (registration marks) at the corners of the image. When setting up the printing of a document these must be perfectly aligned to make sure the colours sit correctly on top of each other. Bad registration is sometimes seen on newspapers and on packaging.





The pantone colour guide below and overleaf can be used to analyse various colours found on publications. Use it to determine various colours of text, etc.

Default CMYK Palette

							
C:0 M:0 Y:0 K:100 Black	C:0 M:0 Y:0 K:90 90% Black	C:0 M:0 Y:0 K:80 80% Black	C:0 M:0 Y:0 K:70 70% Black	C:0 M:0 Y:0 K:60 60% Black	C:0 M:0 Y:0 K:50 50% Black	C:0 M:0 Y:0 K:40 40% Black	C:0 M:0 Y:0 K:30 30% Black
							
C:0 M:0 Y:0 K:20 20% Black	C:0 M:0 Y:0 K:10 10% Black	C:0 M:0 Y:0 K:0 White	C:100 M:100 Y:0 K:0 Blue	C:100 M:0 Y:0 K:0 Cyan	C:100 M:0 Y:100 K:0 Green	C:0 M:0 Y:100 K:0 Yellow	C:0 M:100 Y:100 K:0 Red
							
C:0 M:100 Y:0 K:0 Magenta	C:20 M:80 Y:0 K:0 Purple	C:0 M:80 Y:100 K:0 Orange	C:0 M:40 Y:20 K:0 Pink	C:0 M:20 Y:20 K:60 Dark Brown	C:20 M:20 Y:0 K:0 Powder Blue	C:40 M:40 Y:0 K:0 Pastel Blue	C:60 M:40 Y:0 K:0 Baby Blue
							
C:85 M:80 Y:0 K:0 Electric Blue	C:40 M:40 Y:0 K:20 Twilight Blue	C:80 M:40 Y:0 K:40 Navy Blue	C:40 M:40 Y:0 K:80 Deep Navy Blue	C:40 M:20 Y:0 K:40 Desert Blue	C:100 M:20 Y:0 K:0 Sky Blue	C:40 M:0 Y:0 K:0 Isis Blue	C:20 M:0 Y:0 K:20 Light Blue/Clear
							
C:20 M:0 Y:0 K:40 Ocean Green	C:20 M:0 Y:0 K:80 Moss Green	C:20 M:0 Y:0 K:80 Dark Green	C:40 M:0 Y:20 K:80 Forest Green	C:60 M:0 Y:40 K:40 Grass Green	C:40 M:0 Y:20 K:40 Kentucky Green	C:80 M:0 Y:40 K:20 Light Green	C:80 M:0 Y:60 K:20 Spring Green
							
C:85 M:0 Y:20 K:0 Turquoise	C:80 M:0 Y:20 K:20 Sea Green	C:20 M:0 Y:20 K:20 Faded Green	C:20 M:0 Y:20 K:0 Ghost Green	C:40 M:0 Y:40 K:0 Mint Green	C:20 M:0 Y:20 K:40 Army Green	C:20 M:0 Y:40 K:40 Avocado Green	C:20 M:0 Y:60 K:20 Marian Green
							
C:20 M:0 Y:40 K:20 Dull Green	C:40 M:0 Y:100 K:0 Chartreuse	C:20 M:0 Y:80 K:0 Mead Green	C:0 M:0 Y:20 K:80 Murky Green	C:0 M:0 Y:20 K:80 Olive Drab	C:0 M:0 Y:20 K:40 Khaki	C:0 M:0 Y:40 K:40 Olive	C:0 M:0 Y:80 K:20 Barren Yellow
							
C:0 M:0 Y:60 K:0 Light Yellow	C:0 M:0 Y:40 K:0 Chalk	C:0 M:0 Y:20 K:0 Pale Yellow	C:0 M:20 Y:40 K:40 Brown	C:0 M:40 Y:80 K:20 Red Brown	C:0 M:20 Y:80 K:20 Gold	C:0 M:60 Y:00 K:0 Autumn Orange	C:0 M:40 Y:00 K:0 Light Orange

Default CMYK Palette

							
C:0 M:40 Y:90 K:0 Peach	C:0 M:20 Y:100 K:0 Deep Yellow	C:0 M:20 Y:40 K:0 Sand	C:0 M:20 Y:40 K:80 Walnut	C:0 M:90 Y:90 K:40 Ruby Red	C:0 M:80 Y:90 K:20 Black Red	C:0 M:80 Y:60 K:0 Tropical Pink	C:0 M:40 Y:40 K:0 Soft Pink
							
C:0 M:20 Y:20 K:0 Faded Pink	C:0 M:40 Y:20 K:40 Crimson	C:0 M:90 Y:40 K:20 Regal Red	C:0 M:90 Y:20 K:20 Deep Rose	C:0 M:100 Y:90 K:0 Neon Red	C:0 M:80 Y:40 K:0 Deep Pink	C:0 M:80 Y:40 K:0 Hot Pink	C:0 M:40 Y:20 K:20 Dusty Rose
							
C:0 M:40 Y:0 K:80 Plum	C:0 M:60 Y:0 K:40 Deep Violet	C:0 M:40 Y:0 K:0 Light Violet	C:0 M:40 Y:0 K:20 Violet	C:0 M:20 Y:0 K:40 Dusty Plum	C:0 M:20 Y:0 K:20 Pale Purple	C:20 M:80 Y:0 K:20 Majestic Purple	C:20 M:80 Y:0 K:0 Neon Purple
							
C:20 M:80 Y:0 K:0 Light Purple	C:20 M:40 Y:0 K:20 Twilight Violet	C:20 M:40 Y:0 K:0 Easter Purple	C:20 M:40 Y:0 K:80 Deep Purple	C:20 M:40 Y:0 K:40 Grape	C:40 M:80 Y:0 K:0 Blue Violet	C:40 M:100 Y:0 K:0 Blue Purple	C:40 M:90 Y:0 K:20 Deep River
							
C:80 M:80 Y:0 K:0 Deep Azure	C:40 M:80 Y:0 K:40 Storm Blue	C:80 M:80 Y:0 K:20 Deep Blue	C:100 M:100 Y:100 K:100 100%100%100%100%				

The Guide below is used for the analysis of type, line thickness and spacings..

Line Spacing (pt)

4	16
5	17
6	18
7	19
8	20
9	21
10	22
11	23
12	24
13	
14	
15	

Rule Weight

0.5
1
1.5
2
3
4
5
6
7
8
9
10
11
12
14
16
18
20
24

Shading

3%
10%
30%
50%
70%
90%
100%

Tint

100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%

Font Size (pt)

5 ^{pt}
6 ^{pt}
7 ^{Exp}
8 ^{Exp}
9 ^{Exp}
10 ^{Exp}
11 ^{Exp}
12 ^{Exp}
13 ^{Exp}
14 ^{Exp}
15 ^{Exp}
16 ^{Exp}
18 ^{Exp}
20 ^{Exp}
24 ^{Exp}
30 ^{Exp}
36 ^{Exp}
48 ^{Exp}
54 ^{Ex}
60 ^{Ex}
72 ^{Ex}

<http://www.microtype.com>
MicroType
 InDesign/FrameMaker/Acrobat
 Training & Consulting

Paper

The variety of paper available is enormous and has a huge effect on the quality of a finished presentation. The method of printing can often determine which papers will work well and which will not. Papers come in various finishes from rough to glossy and various weights and sizes. Here are just a few types of paper and a description of their uses:

Newsprint

This is the cheapest paper so-called because it used mainly in the newspaper industry. It is absorbent, but is slightly rough, tears easily and fades quickly.

Board Paper

This is standard commercial paper, which comes in a variety of weights and sizes.

Calendered paper

Smooth paper used mainly for magazines.

Art paper

Standard printing paper. It has a polished surface making it ideal for glossy magazines and covers.

Antique paper

Matt, rough paper useful for book printing.

Cartridge paper

Can be coated or uncoated, the coated type giving better print definition for halftones.

Paper Weight

This is measured in gsm (or grammes per square metre)
For example most writing paper is 80 - 100 gsm

Whereas thin paper such as newsprint is 30 - 60 gsm
is represented by the following sizes:

Size	MM
RA0	860 × 1220
RA1	610 × 860
RA2	430 × 610
SRA0	900 × 1280
SRA1	640 × 900
SRA2	450 × 640

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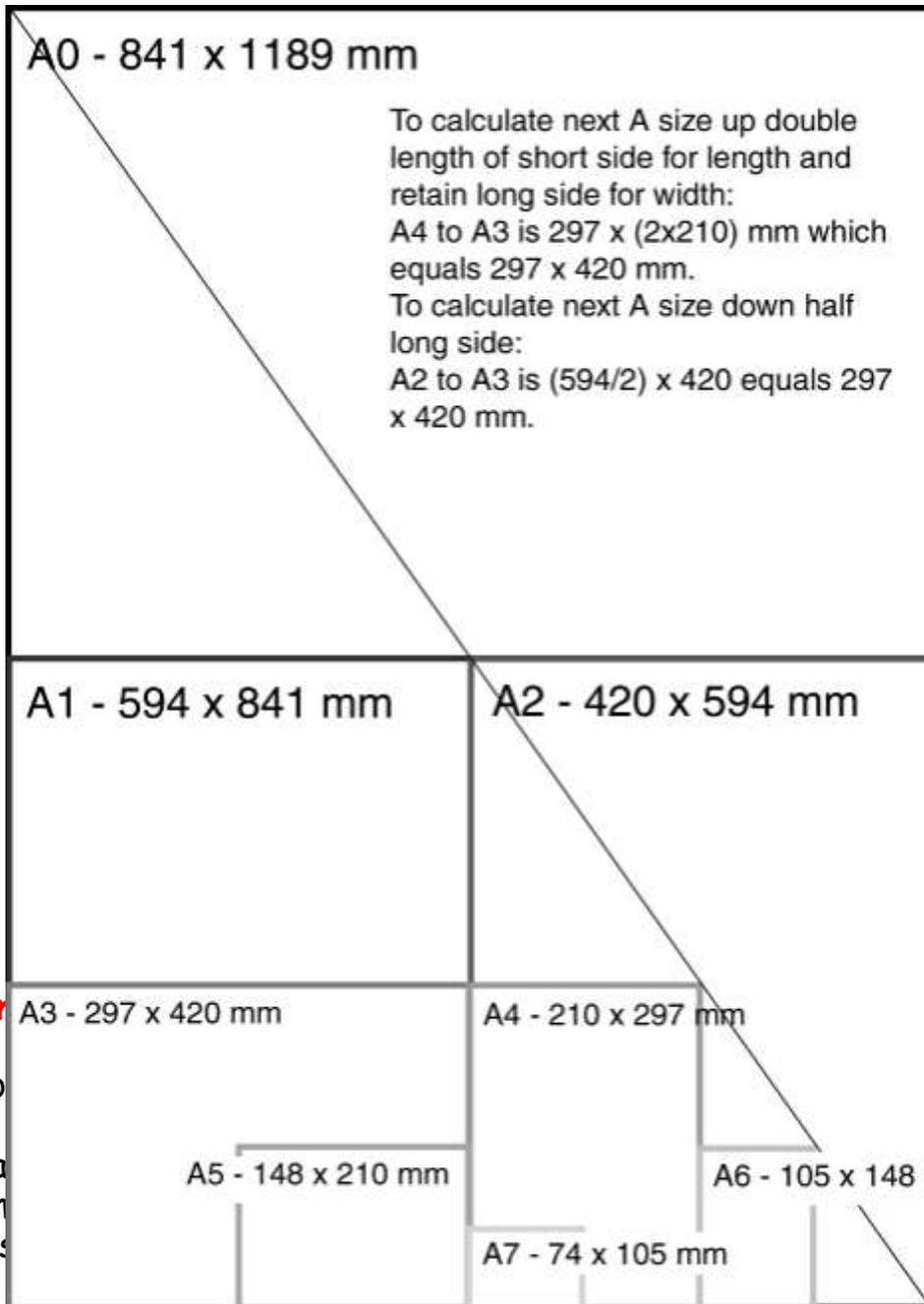
Opacity

Some papers are not suitable for heavy duty printing or double-sided printing because of "show-through". How transparent the paper is has to be taken into consideration before printing.

Paper size

The two main systems of paper sizes are the American and International Systems.

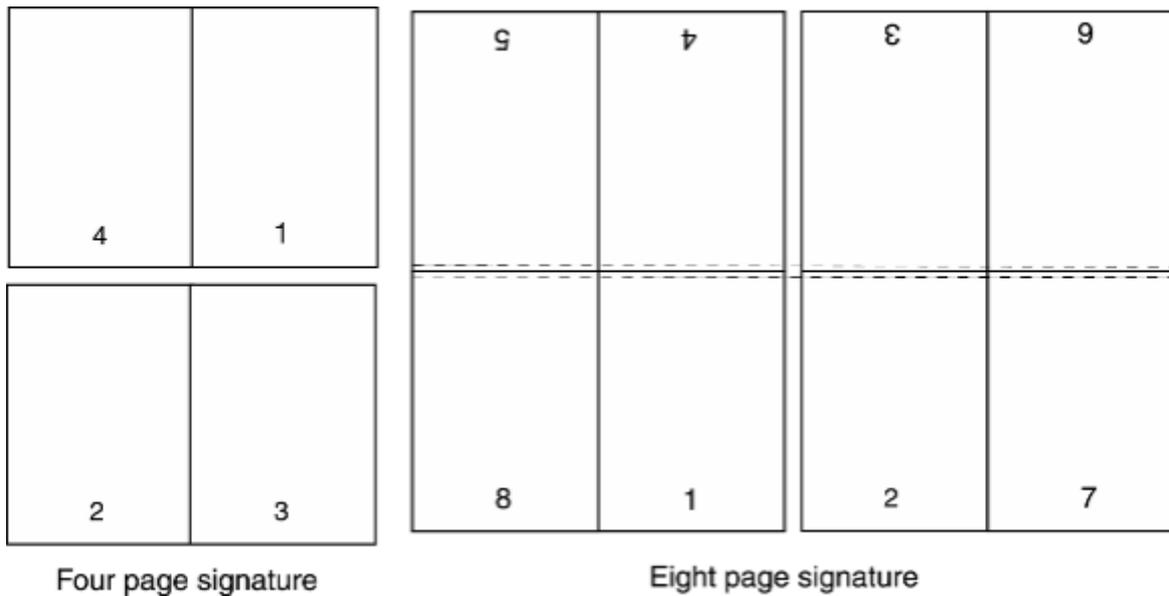
These sizes represent the finished, trimmed size of a document. For the purposes of printing bleeds, registration marks and trimming have to be allowed for, so there are extensions of the above paper sizes known as RA and SRA which allow for these.



Imposition

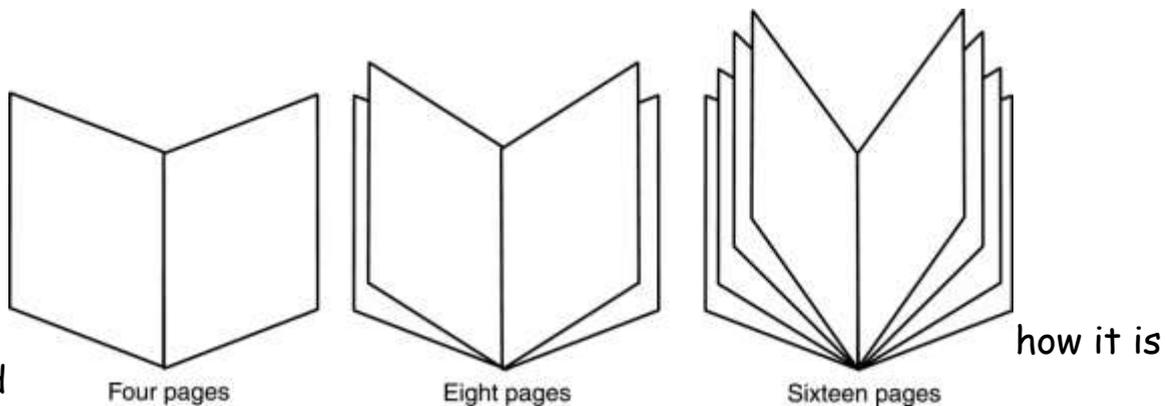
Imposition that they of paper a ink and tin of pages is

ch a way st amount in paper, nposition



Four page signature

Eight page signature



The way used and considerations for multi-page document design.

Four pages

Eight pages

Sixteen pages

how it is

When all of the imposition and printing are complete, the pages are then collated and bound. There are several methods for binding:

Mechanical binding methods

Ring Binding is one of the cheaper methods where binders are easily available in many forms with two or more rings. Their advantage is that they can hold a lot of paper and new sheets can easily be inserted. This method can be used without specialist equipment. The disadvantage is that the paper, unless supported, can tear and break free from the binder. Also, the inner margins must allow for holes to be punched.

Spiral Binding, again, is also one of the cheaper methods of binding where specialist equipment is not needed. The spirals can be made from metal or plastic and take various forms. Their advantage is that a document can be opened out flat and that they are fairly sturdy. The disadvantage is that they can be time-consuming to produce and that the metal spirals can sometimes fray if badly fitted. Also, the inner margins must allow for holes to be punched.

Saddle Stitch binding is a method where the pages are sewn along the centre-spread and then trimmed. One disadvantage is that an allowance has to be made in the design for "creep", where, with many pages the inner pages creep further out than the outer pages, which means that the whole document must be trimmed.

Side Stitching is used where the document is too thick to be Saddle-stitched. The stitches are made through the side of the document. A cover is then added. The disadvantages are that the publication will no longer open out flat and that extra space has to be allowed in the design to accommodate that taken up by the stitching itself.

Perfect binding is one of the more specialised forms of binding, far sturdier than the other methods above. The pages are gathered, roughened on the spine edge, then glued, sometimes with a strip of gauze for strength. Then the cover is glued on and the whole publication trimmed.

Edition binding is the most traditional and expensive form of binding. The pages are gathered, and end papers glued to first and last pages. These are then stitched and trimmed. A strip of gauze is glued to the spine end for strength, the spine added, and the cover glued to the end papers.

Paper Textures & Finishes

Paper is often something we take for granted. It's just 'there.' Sometimes we have no choice about the type of paper on which our designs are printed. Normally we can't dictate the paper used for ads in newspapers or magazines. Even when we do have a choice, we're limited by budget, printing requirements, or other factors. However, paper can be an important textural element in our desktop published documents.

Some papers just 'feel' better than others. Grab up some paper from around you. Get a newspaper, a magazine, some paper from your printer, and a few different samples from your Class Samples. Close your eyes and touch the different surfaces. Can you identify the general type of paper (newsprint, etc.) simply by touch? Probably so. But also consider how they feel to your touch — smooth, rough, slightly patterned, fuzzy, bumpy, slick, shiny, dull, warm or cold..

Antique Finish
Cockle Finish
Eggshell Finish
Felt Finish
Granite Finish
Linen Finish
Machine Glazed
Mottled Finish
Onionskin Paper
Supercalendered Paper
Wove Finish

Cast-Coated Paper
Dull Finish
English Finish
Glazed Finish
Laid Finish
Machine Finish
Matte Finish
Natural Finish
Parchment Paper
Vellum Finish

Design Concept & Texture

Varying paper surfaces can dramatically or subtly alter the mood you want your designs to convey. An exercise from *Using Design Basics To Get Creative Results* by Bryan L. Peterson uses the example of a piece of jewellery placed against two totally different surfaces — a shiny tile of black Formica vs. a piece of cement.

Graphic Communication and the effects of its use in every day living.

As much as graphic communication has excelled in recent years making all of our lives better, it does however leave a carbon footprint. A carbon

footprint is determined by the human effect on the environment through green house gasses, paper waste, and pollution of volatile organic compounds found in inks. The footprint is measured in units of how much carbon dioxide has been released into the atmosphere.

Virtually every product you will see on a shop shelf has a package which has been graphically designed and subsequently printed. The print industry through the use of ink and paper has a lot to answer for.

Water

In 1995, 92 percent of the global population had a sufficient supply of water. If the world continues to consume water at its current rate, it is projected that water sufficiency in 2050 will be only 58 percent. It is further predicted that nations will go to war over water supplies within the next two decades.

The print industry makes a negative contribution to this situation. Large quantities of water are used in most printing processes (even digital), the exception being waterless printing.

Printers can reduce water usage by recycling the water used on the printing presses.

At the other end of the process is the issue of water contamination. All printers are legally required to clean waste water before disposing it. Some company's don't do this as well as they should.

Energy & Emissions

In addition to the waste printers use up, they also use a significant amount of energy - from electricity to run the presses, to fuel for delivering the finished product.

The industry can adopt measures to reduce energy consumption, such as using voltage optimisers (*making the most of the voltage available*) on the presses, driving fuel-efficient delivery vehicles, and switching to green electricity suppliers.

But until measures like these are widespread, energy consumption will keep on creating carbon emissions.

Waste

As has been discussed the print industry generates relatively high levels of waste. As shown below, a lot this waste can be recycled or reused, but currently much of it ends up in landfill.

Examples of how waste ink can be reused.

Waste inks and varnishes can be used as low grade fuel or mixed with concrete and buried in 'special (or hazardous) waste landfill'. A large printer could be chucking out around 9000 tins worth of waste ink per year.

Ink tins are usually crushed and recycled.

Ink cartridges are often favoured over tins, but although these plastic cartridges waste less ink than tins, they're classed as hazardous waste and usually sent to 'special waste landfill'.

More environmentally aware printers will pay for them to be collected and recycled into drainpipes etc. A large litho printer could be generating around 800,000 of these cartridges per year.

Waste chemicals (solvents, developer, fixer).

In a year a large printer could chuck out around 65,000 litres of waste solvent and 85,000 litres of waste developer. Responsible printers will make sure they're either used as 3rd grade fuel or that they undergo 'bio-digestion' to make the chemicals safe before flushing them into the water course.

Wooden pallets are usually sent to landfill, but are occasionally recycled into chipboard.

Plastic wrapping will usually be sent to landfill. However, if recyclable, it can be washed, shredded and recycled into more plastic wrapping.

CDs and cases are usually sent to landfill, although they can also be ground up, washed in caustic solution to remove the ink and foil, and then re-used.

Digital

There are some huge environmental advantages to printing digitally:

You can run a print job as and when needed.

Re-printing costs no extra, so there is no need to print 5000 extra copies in case you run out.

Downsides:

Digital inks are currently difficult to remove in the recycling process .

The choice of paper can be limited to approved papers, which are rarely recycled or FSC certified. (Forest Stewardship Council)

Large amounts of energy are used in the manufacturing of the machines themselves.