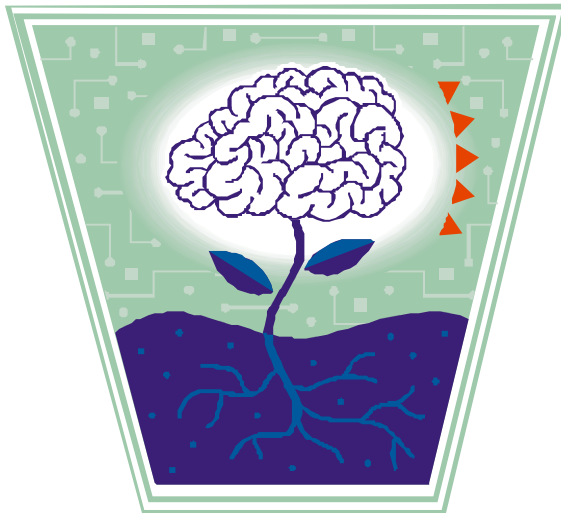


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# Turnbull High School

Technical Department



Curriculum for Excellence

BGE & National 4/5  
Graphic Communication


Knowledge & Interpretation

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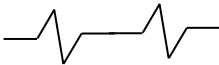





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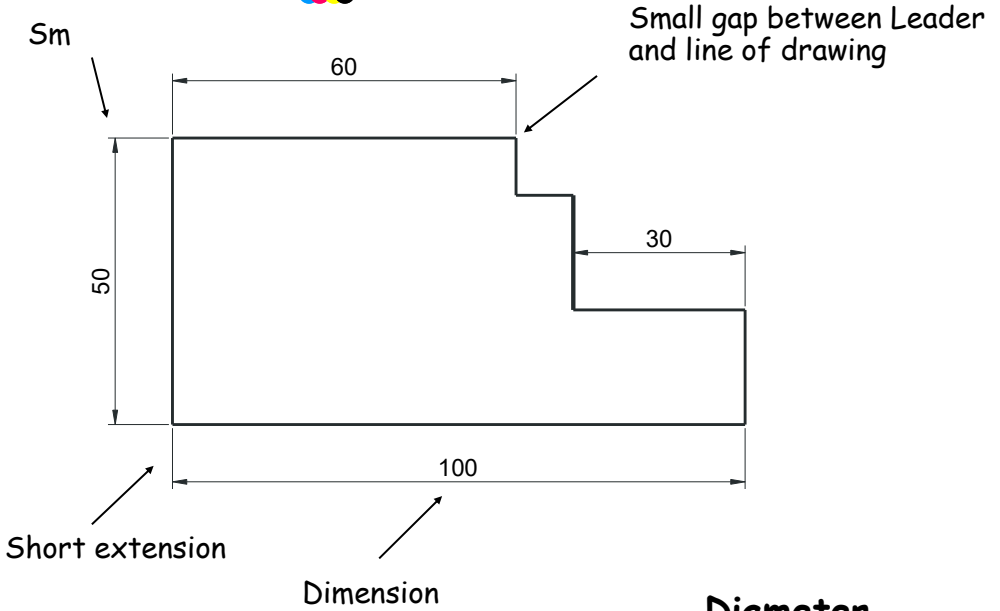
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# Types of line used

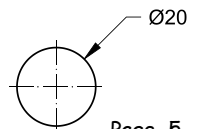
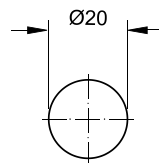
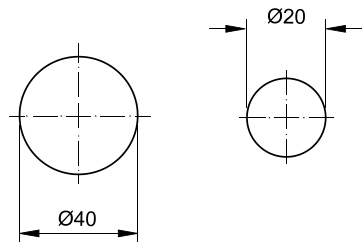
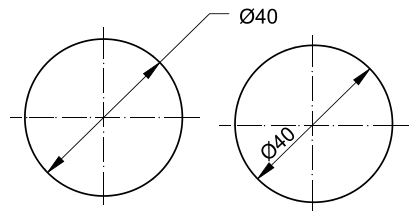
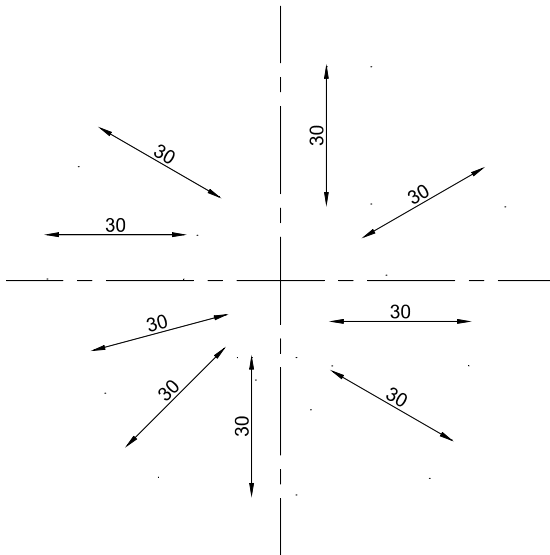


	Continuous thick	Used for visible outlines and edges.
	Continuous thin	Used for projection, dimensioning, leader lines, hatching and short centre lines.
	Continuous thin straight with zigzags	Used for limits of partial or interrupted views and sections if the limit is not an axis.
	Dashed thin line.	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
	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



## Diameter



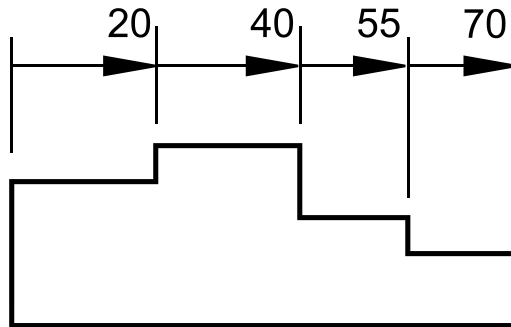
Note the position of the dimensions on each of the lines

# Dimensioning — Continued



All sizes in mm

Running

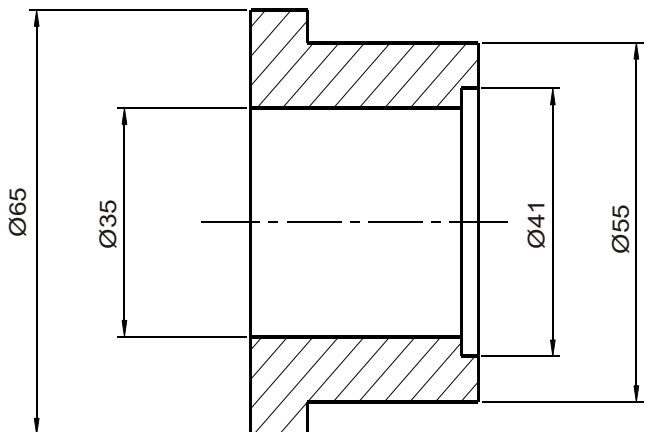


Notice on the above drawing that the largest dimension is placed on the outside of the smaller dimensions. Where there is a limited space for dimensioning, the dimension can be placed above, or in line with, the extension of one of the dimension lines. E.g. the 3mm dimension uses the 50mm dimension leader.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

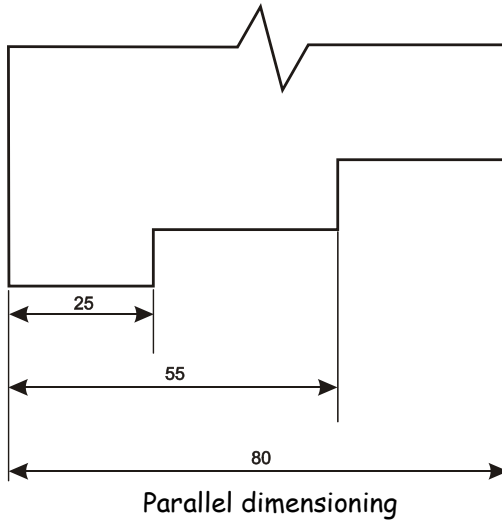
The sectioned drawing opposite shows some possibilities for putting a diameter on a drawing. This is by no means the only method.

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

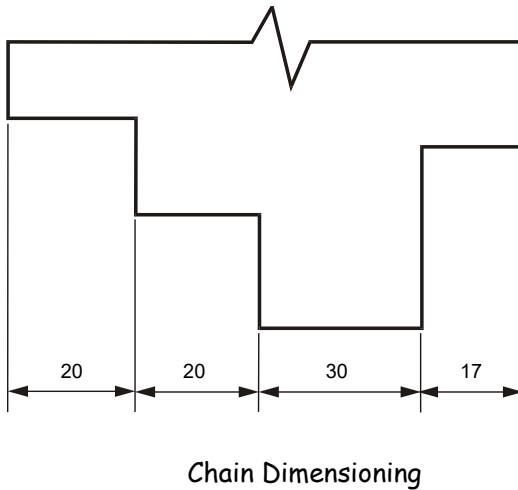
□ 45



# Dimensioning methods

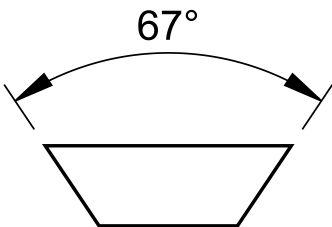
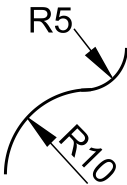
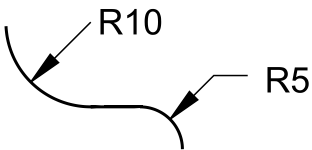
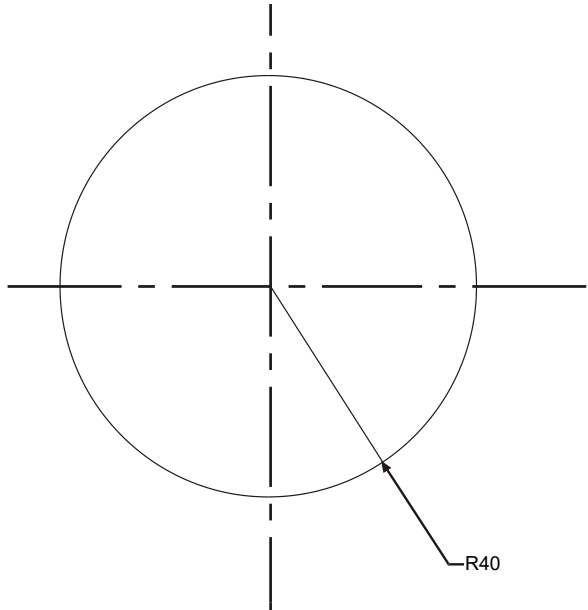


Parallel dimensioning shows dimensions taken from a common datum.

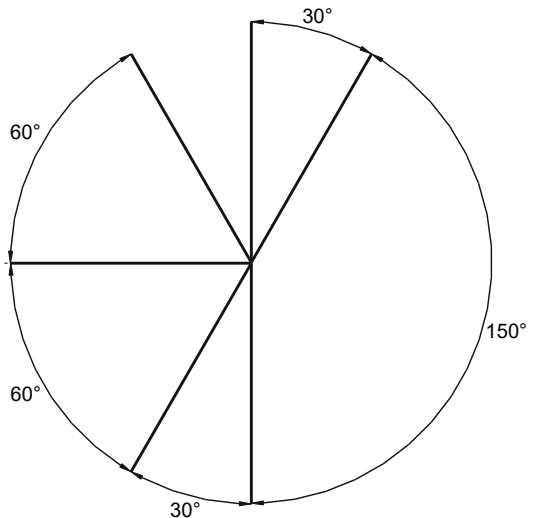


Chain dimensioning should only be used when the accumulation of tolerances will not affect the part.

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

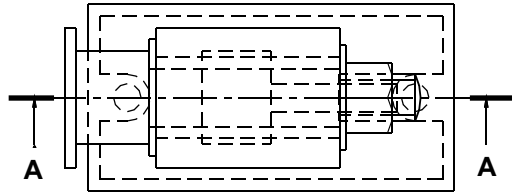




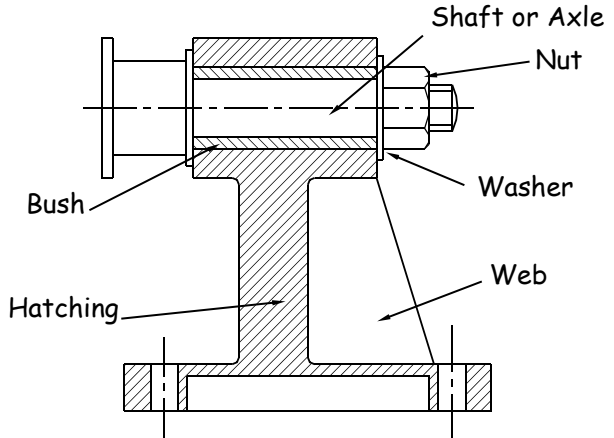
# Sectioned Drawings



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.

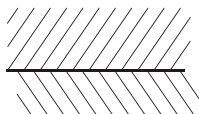


SECTION A A

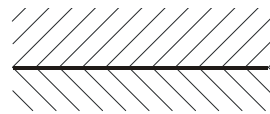
Where parts are cut by the cutting plane they are hatched using a thin line drawn at  $45^\circ$ . These lines should be equally spaced at 4mm. Adjacent parts are hatched in the opposite direction.

**Offset hatching lines between parts.**

Do not produce herring bone pattern.



offset



Herring bone

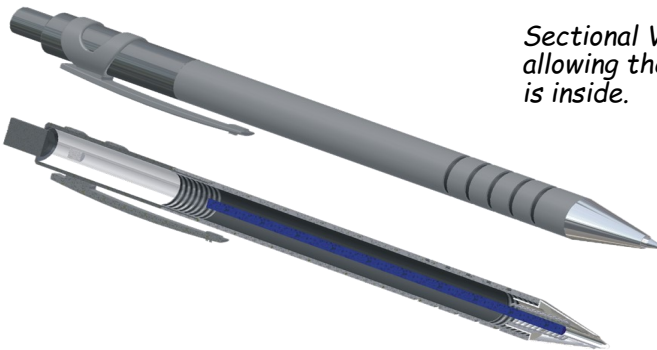
The following parts are **not** normally sectioned:- Shafts, ribs, webs, spokes of wheels, nuts and bolts, washers and keys.

## Sectional Views



In Orthographic drawings, the hidden detail is represented by broken lines, which, if too numerous can make the drawing very complicated and difficult to follow. As was explained on the previous page we therefore need to overcome this problem by using **Sectional Views** to give a clearer "Picture" of what an object actually looks like.

When showing a sectional view it is usually cut parallel to the horizontal or the vertical as shown on the opposite page. The section cut is then removed to reveal what the inside of the object looks like.



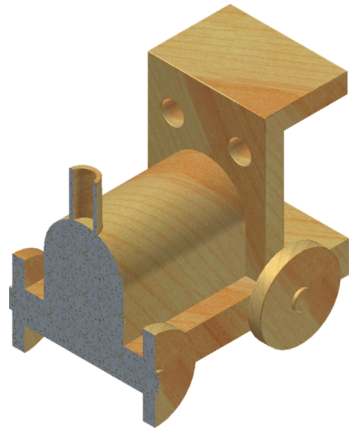
*Sectional View through a Pen, allowing the viewer to see what is inside.*

The example above is a solid model but if showing on an orthographic drawing we would show the cuts as slanted lines drawn at 45 degrees to the horizontal and usually 4mm apart. These lines are usually drawn slightly lighter than the outlines and are known as **Section Lines** or **Cross Hatching** and the views as **Sectional Views**.

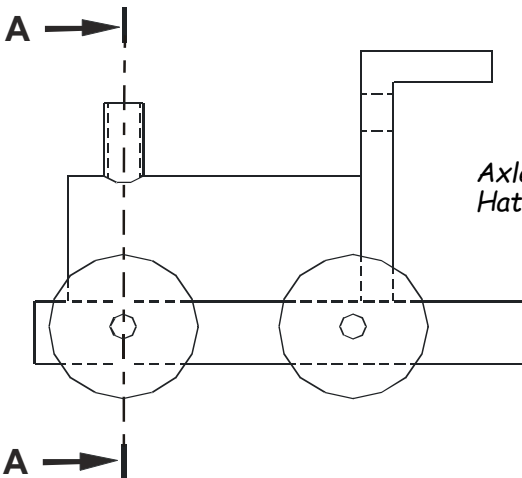
The sectional view shows not only the outline of the cut surface but details or parts which are visible behind it. Note; the cutting plane is shown by a thin chain line thickened at each end and labelled by letters; **AA**, **YY**, **XX**, etc

The following drawings below are isometric views of a train. In the first example the front of the train has been cut away as indicated by **Section AA**.

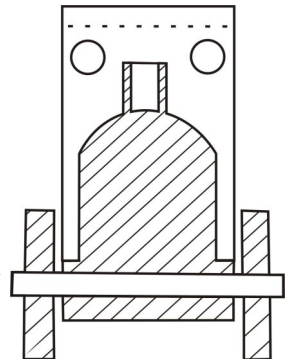
These two views if shown in an orthographic drawing will be shown with lines drawn at 45 degrees as has been explained. Note only the solid parts will be hatched, the inside of the funnel will not be hatched, only the thickness of the wall.



*Neither Drawing to Scale*

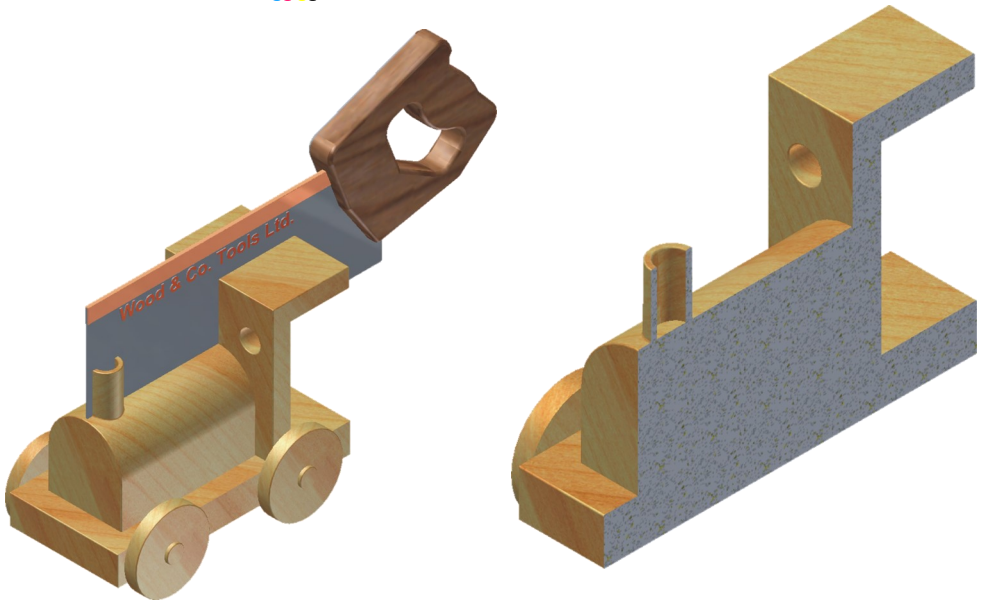


*Axle not Hatched*



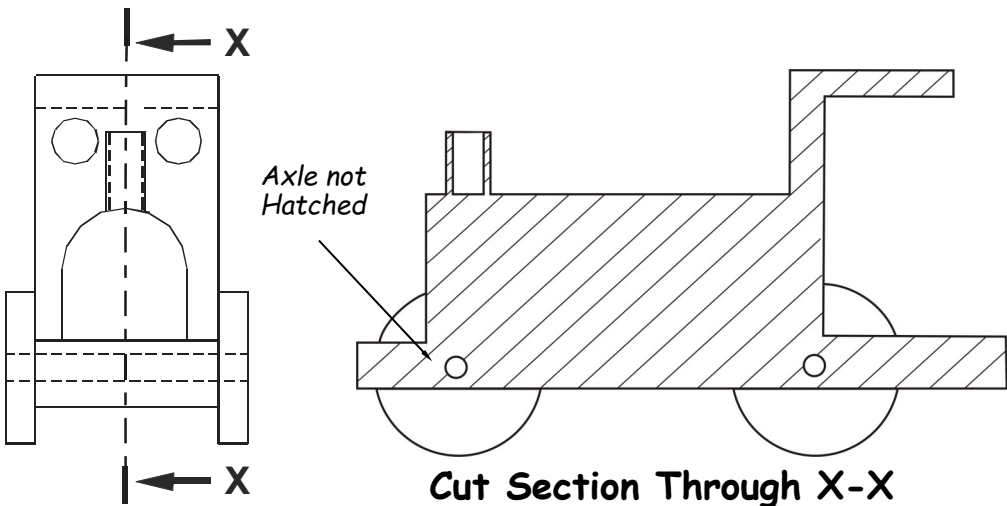
**Cut Section through A-A**

# Sectional Views

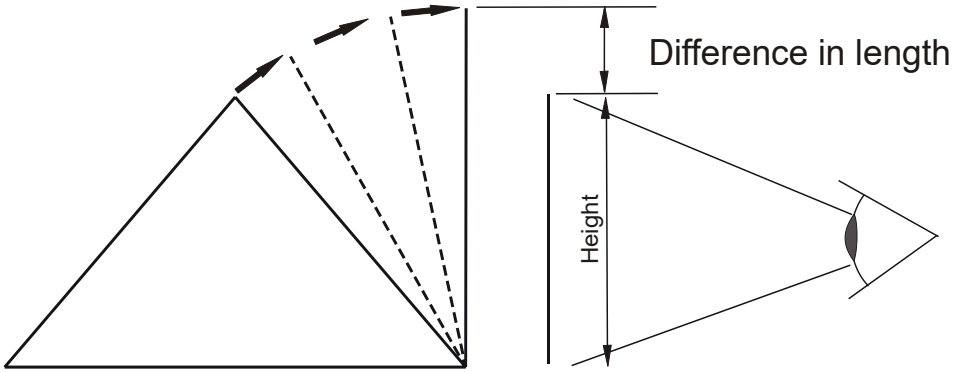


This second view shows the length of the train cut, indicated by **Section XX**.

*Neither Drawing to Scale*



# Understanding TRUE SHAPES

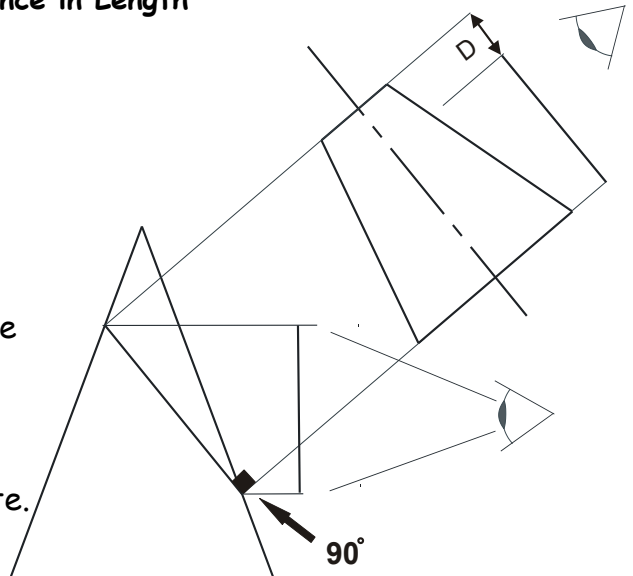


As can be seen from the diagram above, if we look directly at a shape such as a cone or pyramid we only see the height of it. The true lengths of the slopes themselves have to be taken directly from the actual slope.

**D = Difference in Length**

## True Shape

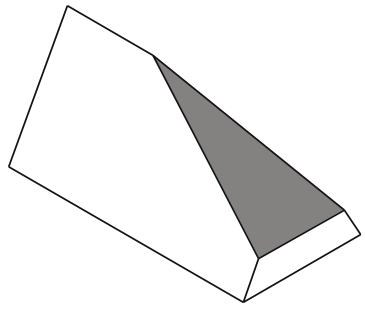
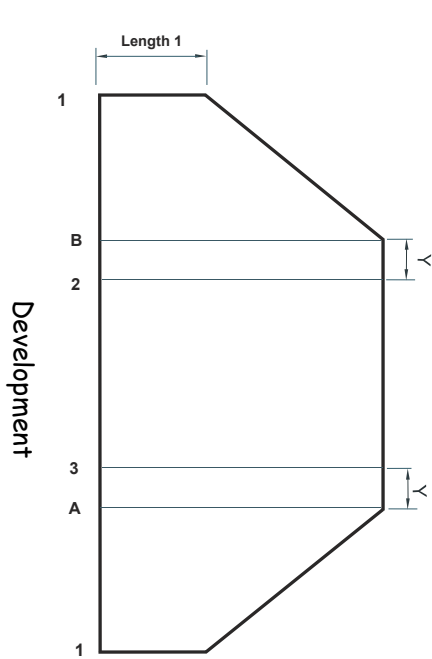
It can be seen from the diagram opposite, if we view the cut surface straight on as shown we cannot see the actual true length of that surface, therefore we have to view it at 90 degrees to the cut surface as shown Opposite.



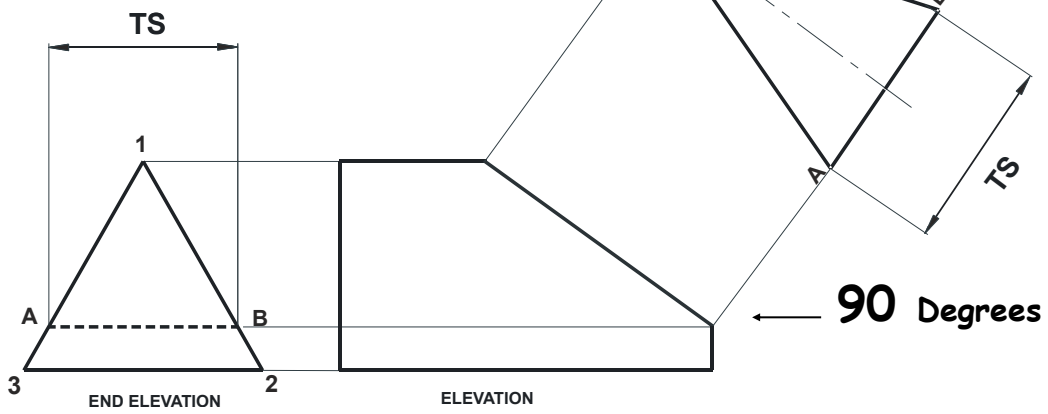
# True Shape/Development - Triangular Prism



As has been explained the angle to which the TRUE SHAPE is drawn, is at right angles to the cut surface. This will produce the actual length of the cut surface. The widths of the actual cut are taken directly from, in this case the End Elevation as shown with size **TS**.



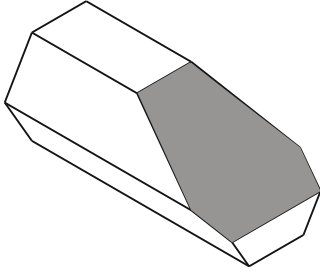
The Development shown opposite is the surface of the three sides of the triangular prism opened out flat.



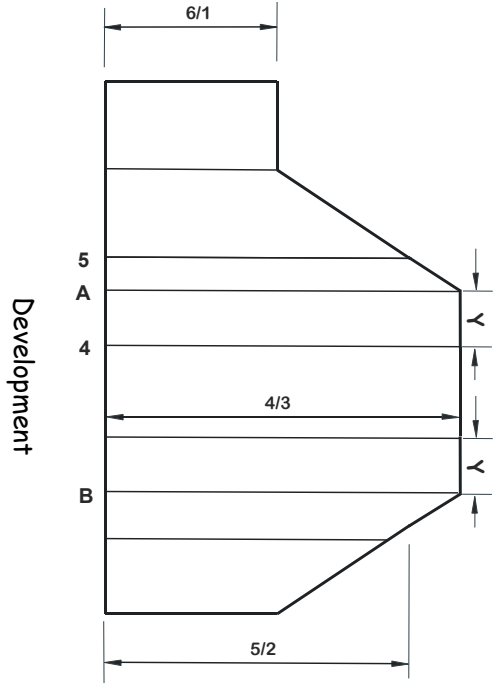
# True Shape/Development - Hexagonal Prism



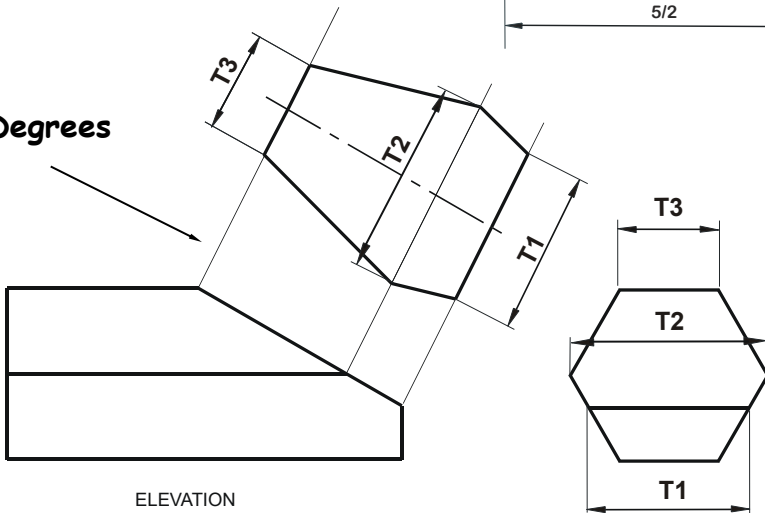
With this True Shape the widths of the actual cut are taken directly from the End Elevation as shown with sizes T1, T2 & T3. These are then Placed above the cut at 90 Degrees to show the true shape of the cut.



The Development shown opposite is the surface of the six sides of the hexagonal prism opened out flat.



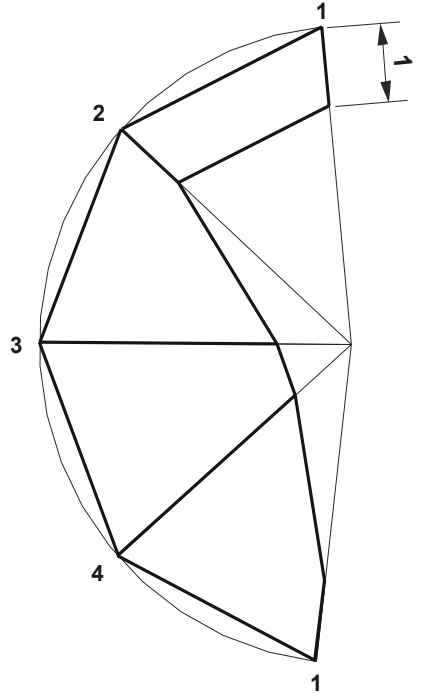
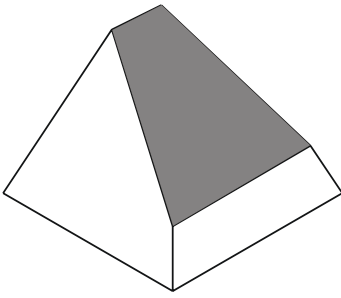
**90 Degrees**



# True Shape/Developments - Square Based Pyramid

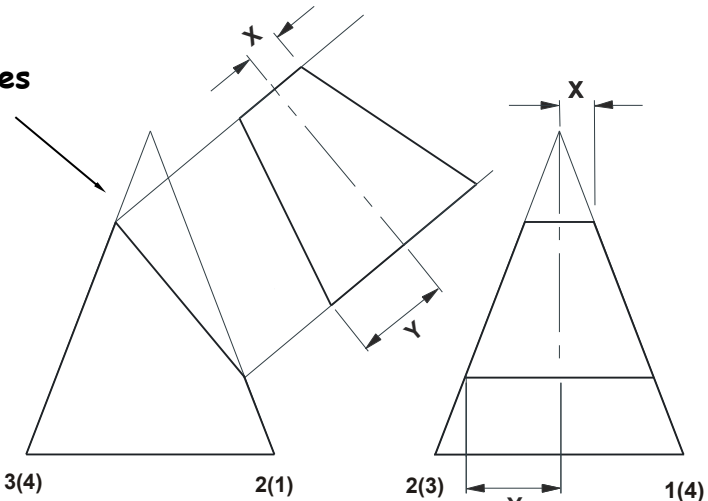


This example the widths of the actual cut are taken directly from the Elevation as shown with sizes X & Y.



The Development shown opposite is the surface of the four sides of the pyramid opened out flat.

**90 Degrees**



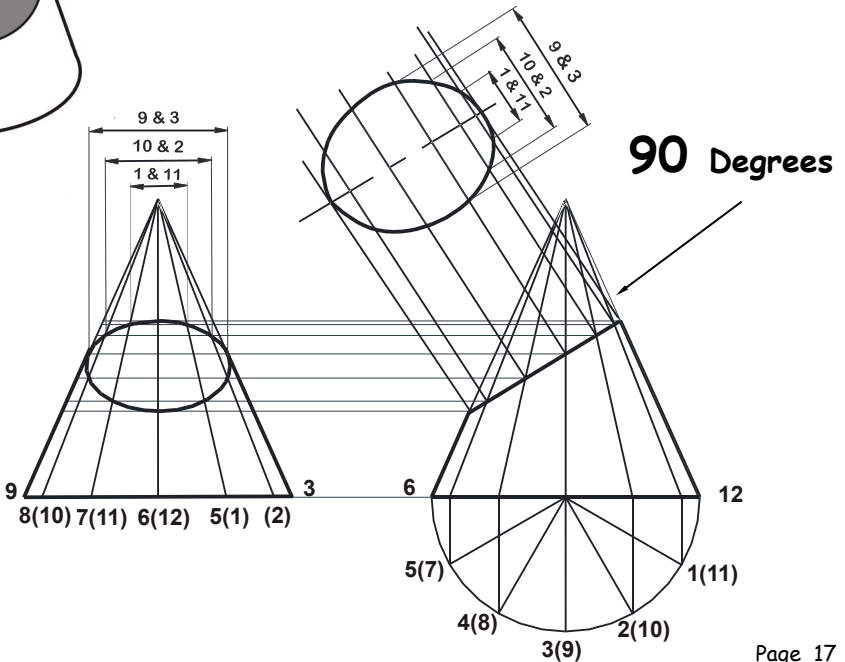
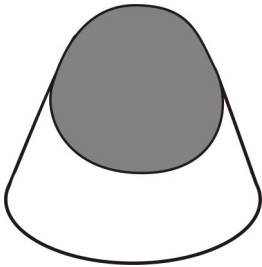
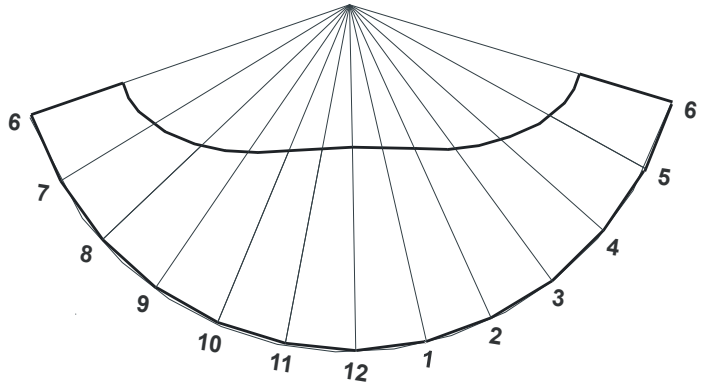


# True Shape/Developments - Cones



In this example the true shape has been derived as described. The widths of the actual cut are taken directly from the Elevation as shown with sizes 1/11, 2/10, 3/9 and so on. The true shape in this example can be completed by taking sizes 4/8 & 5/7.

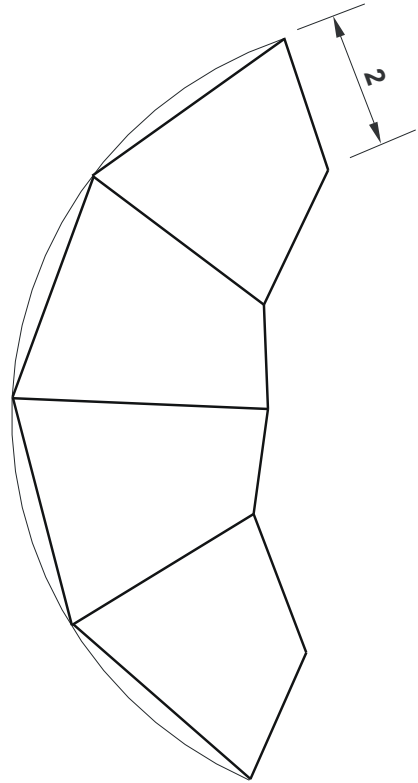
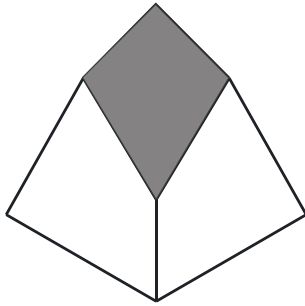
The Development shown opposite is the surface of the four sides of the pyramid opened out flat.



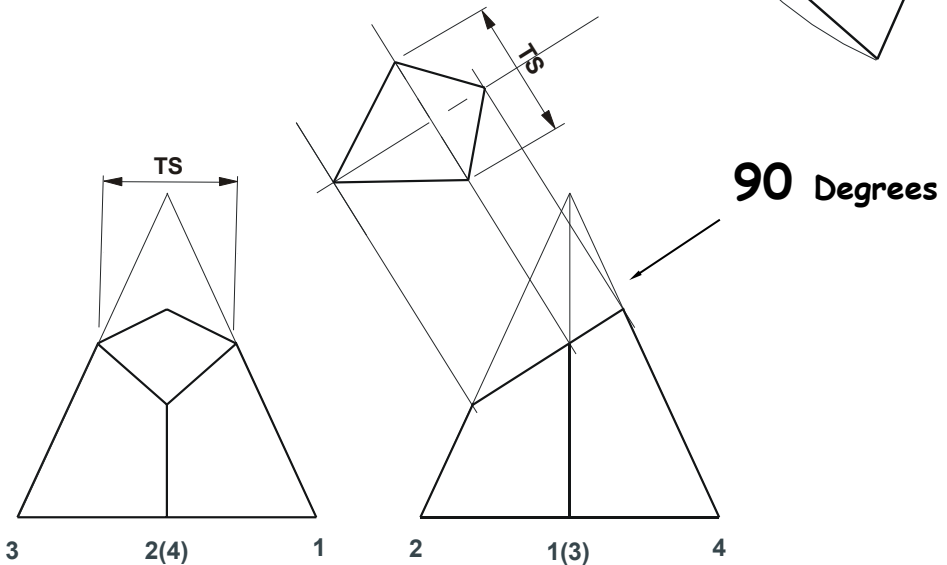
# True Shape/Developments - Square Based Pyramid



This example of a the width of the True Shape is taken using size TS.



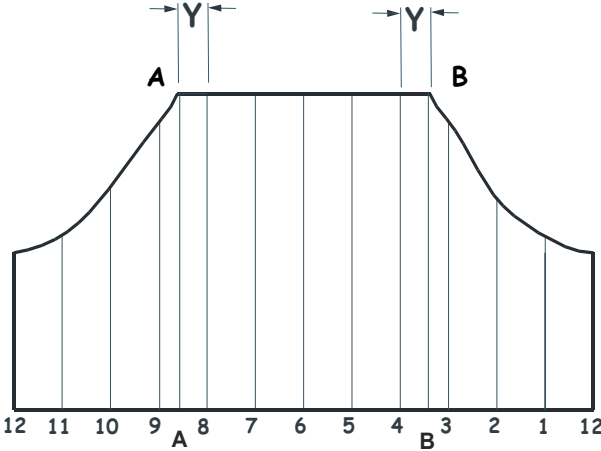
The Development shown opposite is the surface of the four sides of the pyramid opened out flat.



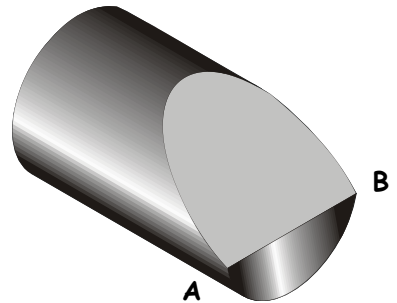
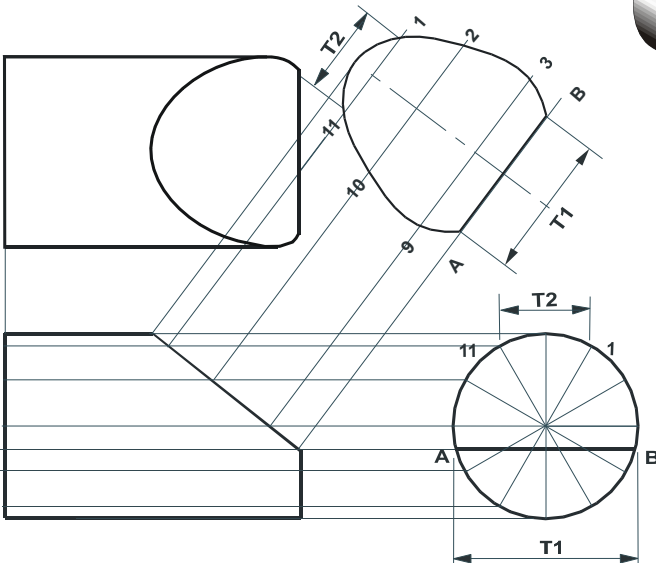
# True Shape/Developments - Cylinder



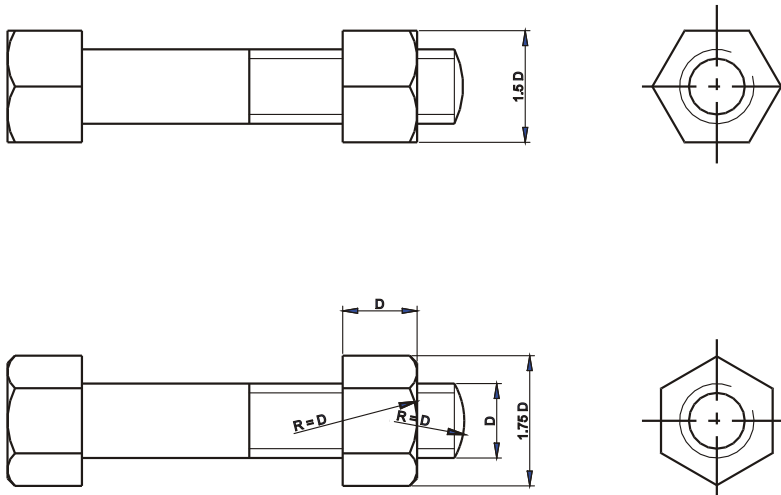
This example of a the width of the True Shape are taken using sizes T1 and T2 as well as various other points across the elevation.



The Development shown opposite is the surface of the cylinder opened out flat.

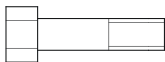


# Nuts and Bolts

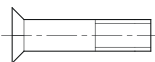


Conventional sizes to draw a nut and bolt are shown. Use these sizes if you have to draw the nut or bolt accurately otherwise use the simplified convention shown below.

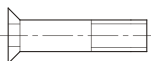
## Simplified Fasteners etc



Hexagon head screw



Countersunk screw, slot



Countersunk screw, cross slot

# Correct Use of Lettering



Accuracy of dimensioning is very important in technical drawings so as to communicate the correct information to the person reading the drawing. This can also be said for the lettering of drawings.

It is recommended that good practice is followed with regards to how a drawing is lettered, i.e. the information written down on the drawing. All lettering should be upper case, have a consistency in use, i.e. they are all the same type of font.

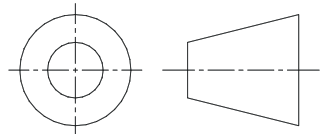
It is also recommended that lettering is not underlined. If special attention is required to a particular part of the drawing then **LARGER LETTERING** can be used.

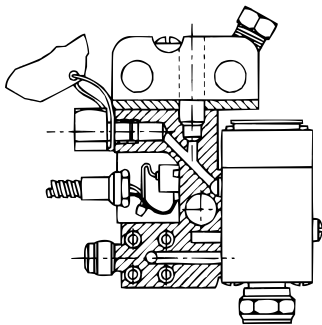
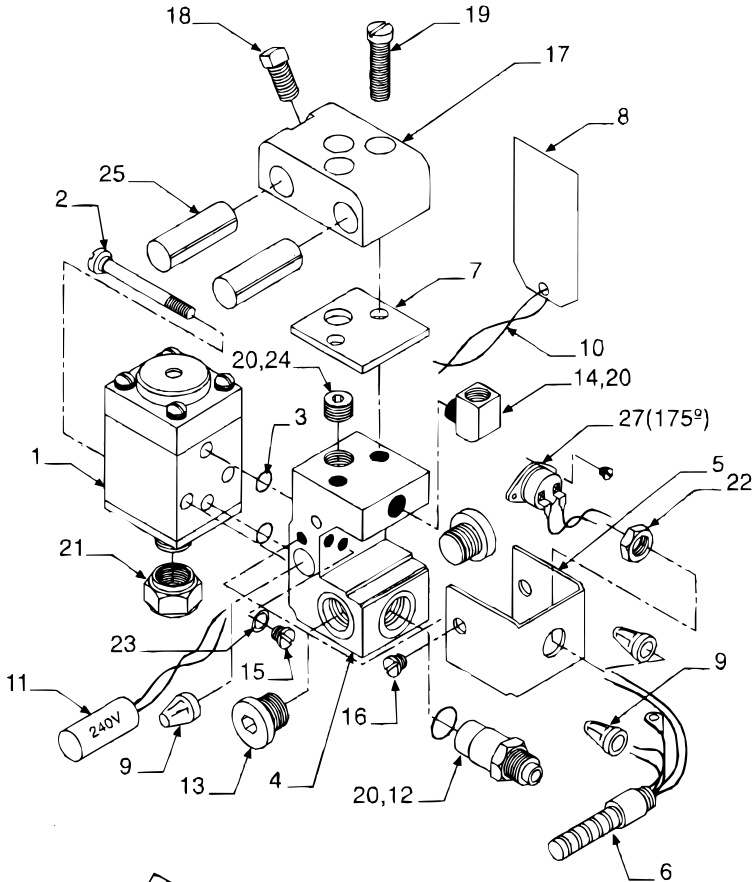
To ensure lettering is of a uniform height of 4mm, it is recommended that two lines parallel to one another are drawn 10mm below the view.



## Third Angle Projection Symbol

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





Above is an exploded view of a **Hot Melt Glue Gun**.  
On the page opposite, the table shows a list of all the component parts and their respective identification numbers which are used in the manufacture of the gun.

## Section

Item Number	Part Number	Part Description	Amount Required
1	153 011	Module Assembly	1
2	153030	Screw, Special	2
3	940 101	O-ring, Viton	
4	276 167	Body, Service Module	1
5	153 035	Cover, Service Module	1
6	242 077	Cordset, Standard Hose	1
6a	273 906	Cordset, Quick Disconnect	1
7	153 037	Insulator	1
8	-	Tag Set	3
9	933 056	Connector, Porcelain	1
10	939 110	Cable Tie	1
11	938 053	Cartridge, Heater 147 Watts	1
12	972 628	Connector, Assembly, Hose	1
-	945 032	O-ring, Viton	1
-	972 627	Connector	1
13	973 574	Plug	2
-	945 032	O-ring, Viton	1
14	973 125	Elbow, Street, Pipe	1
15	981 000	Screw, Fillister Head	3
16	981 141	Screw, Pan Head	2
17	153 041	Block, Mounting	1
18	981 405	Screw Square Head	1
19	981 244	Screw, Fillister Head	2
20	900 236	Paste, Teflon	
21	152 290	Nut, Nozzle Retaining	1
22	984 155	Nut, Panel Mounting	1
23	983 103	Lock washer, No. 5 (Ground Wire)	1
24	973 402	Plug, Pipe	1
25	152 683	Sleeve, Teflon	2
26	983 161	Lock washer	1
27	271 929	Thermostat	1

# Signs - General



Pupils should be aware of and recognise the following symbols and also how such symbols are combined with the appropriate safety sign category.



Hazard Warning



Male



Female



This Way Up



Fragile



Keep Dry



Kite Mark



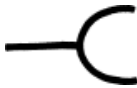
Safety Mark



# Symbols - Electrical



Pupils should be familiar with and be able to reproduce the following selected symbols. Pupils should also be aware of the need for standardising symbols within various industrial sectors and should be aware of the existence of the British Standards Institution and its work. The WEB address is [WWW.BSI.org.uk](http://WWW.BSI.org.uk)



**Power Socket Outlet**



**Primary or Secondary cell**



**Signal lamp (general)**



**Switch**



**Switch  
(General Symbol)**

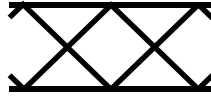


**Electric Clock**

# Symbols - Architectural



In-line valve (any type)



Blockwork



Radiator



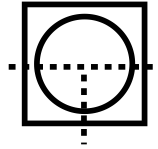
Wood, any type, sawn



Softwood, machined



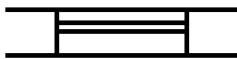
Brickwork



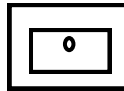
Drainage



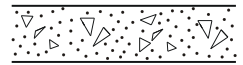
Insulation



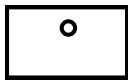
Window



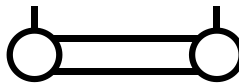
Wash basin



Concrete



Sink, any type



Towel Rail



Sink top



Bath



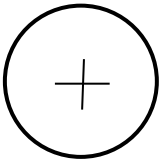
Door



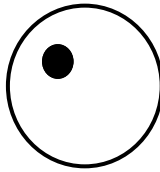
North Symbol



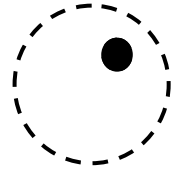
Shower tray



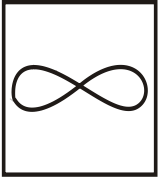
**Proposed Tree**



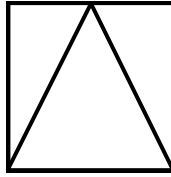
**Existing Tree**



**Existing tree to be removed**



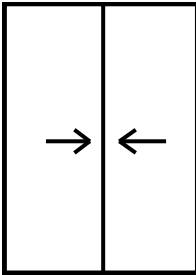
**Fan**



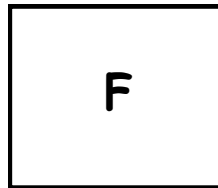
**Hinged Window at Top**



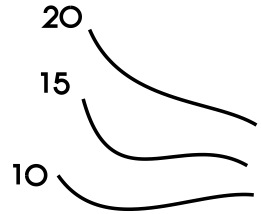
**Any type Window**



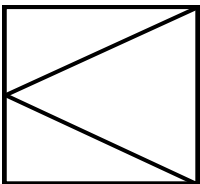
**Sliding horizontally**



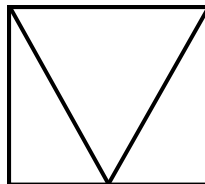
**Fixed Window**



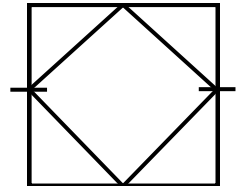
**Contours**



**Hinged Window at Side**



**Hinged Window at Bottom**



**Pivot-centre window**

# Glossary of Common CAG Terms

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This is a brief 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.

**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.

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

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

**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.

**Central Processing Unit (CPU)** At the heart of the computer, it controls all other units.

**Database** A store of organised information. Any data which have been stored in a readily retrievable form can be regarded as forming a database.

**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.

**Digitiser** A means of transferring information into the computer by a hand-held device which makes an electronic 'tracing'. A mesh of wires under the digitiser surface detects the position of the hand-held device. (See Graphics Tablet.)

**Disc** A random-access magnetic storage device. Binary code data are held on both surfaces of what, in the case of floppy discs, is a flat circular plastic disc coated with magnetic material. Hard discs are generally similar but are metal rather than plastic, have higher 'bit-density', rotate much faster than floppies, and are held in airtight cases.

**Dot matrix printer** A contact printer that prints text characters and graphics images by using a series of dots to make up the text, lines and fills.

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

**Dump** A colloquialism for transferring what is in the computer's memory to disc or printer or some other output device.

**Extrusion** A command whereby an existing 2D (x,y) shape is translated into a 3D shape by addition of the Z depth or length.

**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.

**Flat-bed plotter** A flat table over which a pen moves in both the X and Y planes.

**Font** This is the American version of the English 'fount' meaning, in printing terms, a set of type in one size and style. CAG systems use it rather loosely to describe 'typestyles', the size of which can be changed by the operator.

**Format** In terms of DTP, the arrangement of text on a page defined by the alignment and text style. Formatting means applying a style or alignment to a document or paragraph.

**Frame grab** (Screen Dump) The screen image is captured and stored separately and may then be manipulated by software.

**Graphics processor** A special CPU that deals only with the handling of the graphics and screen display.

**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, 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.

**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.

**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

**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.

**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.

**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.)

**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.

**Linetype** There are a variety of linetypes: continuous, dotted, dashed and dot-dash.

**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.

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

**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. This is an **INPUT** device.

**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.

**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.)

**Printer** An output device for obtaining hard copy of drawings and text. Types in common use are impact (dot-matrix), laser and ink-jet.

**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.

**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.

**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.



**Screen Dump** When a screen image is sent to a printer to obtain a hard copy, the resulting copy is a screen dump.

**Scrolling** The vertical movement of the screen image.

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

**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 surfaces.

**Surface modeling** A three-dimensional model in which the surface is defined by connecting elements.

**Table Talker** A three sided advertisement usually found on a table.

**Template** A dummy publication that acts as a model, providing the structure and general layout for another similar publication.

**Text Flow along a path** Text which follow a predetermined path

**Text Wrap** Text which has been wrapped around and object on the page.

**Thumbnails** Simple sketched ideas jotted down to capture different designs

**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.

**Working Rough** A detailed sketch of a captured idea originally jotted down as a thumbnail sketch.

**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.)

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

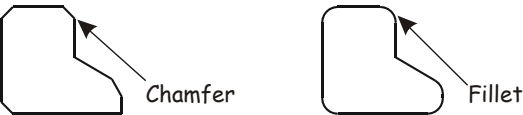
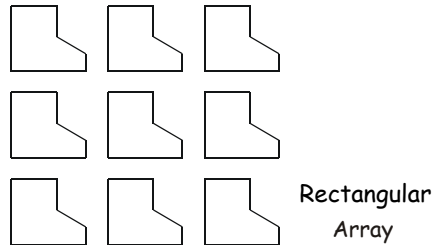
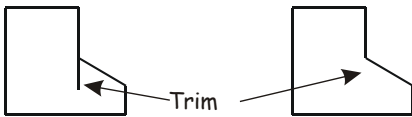
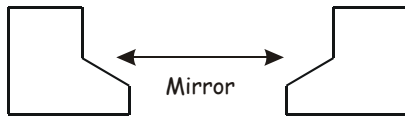
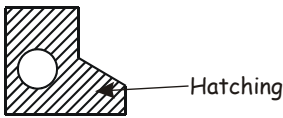
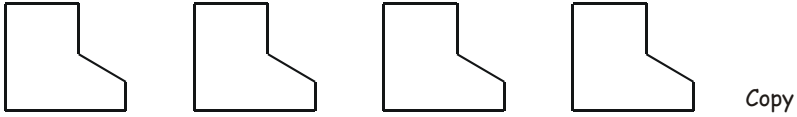
**VGA** Video graphics array (adaptor). A colour adaptor allowing high resolution and a range of colours. (320 h x 200 v at 256 colours to 640 h x 480 V at 16 colours.)

**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'.

# Common CAD Commands



This is Text



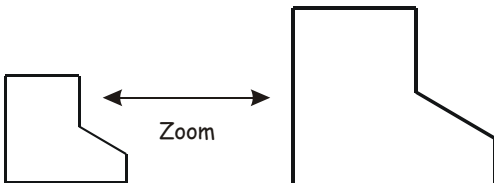
**Copy** means to copy an object to the clipboard.

**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.



# Advantages of CAG over manual drawing techniques

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- 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.

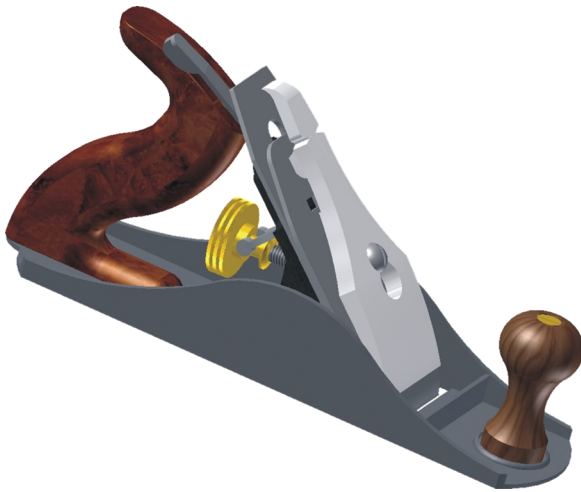
## Disadvantages of CAG over manual drawing techniques.

- 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.

# Solid Model



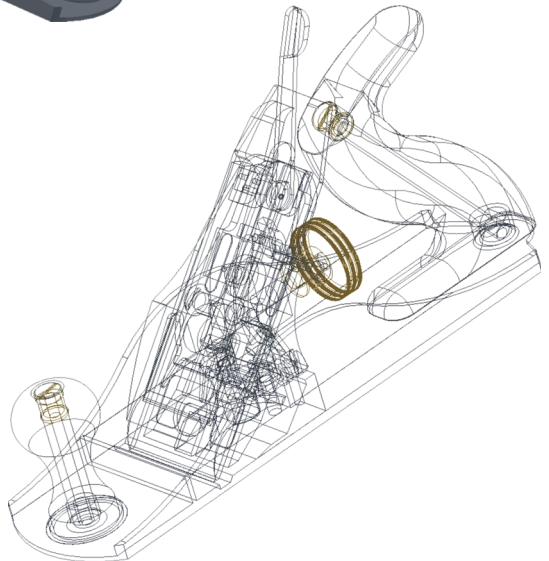
As can be seen from the solid model shown below, a solid model is the creation of a three dimensional image on screen, thereafter capable of being turned through 360 degrees, allowing viewing of all surfaces drawn. The advantage to designers is that a designed model can be seen without ever having to make the actual model thus making great savings on time and costs.



Drawn by: Sean Crosbie, 2012  
Advanced Higher Graphic Communication  
Calderside Academy

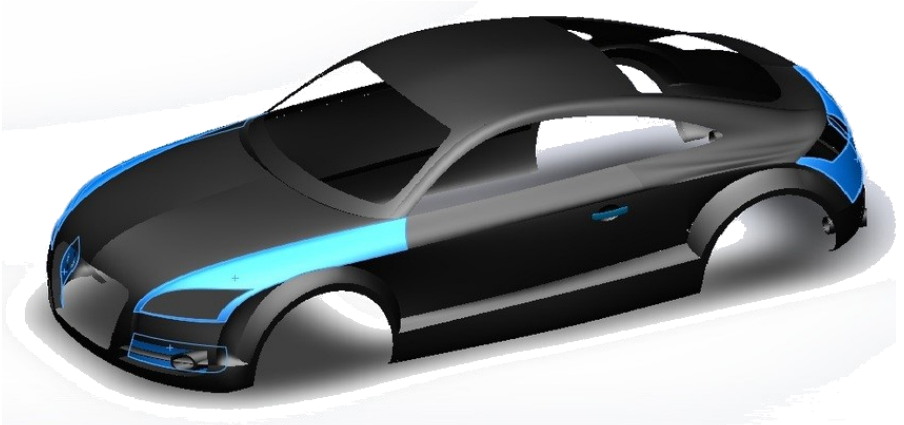
## Wire - Frame

As can be seen from the wire frame model shown below, a wire frame model is a three dimensional image made up of a series of connected lines between all edges and line end-points.

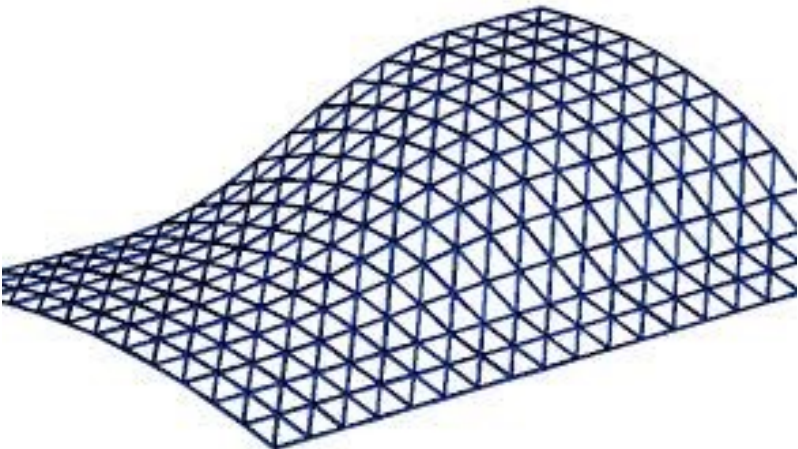


The advantage of a wire frame model is that it uses far less memory within the computer than the solid model.

## Surface Model



A surface model is exactly as it sounds. It is simply a model which has been created using a "skin" to create the desired model. It is ideal for the likes of creating car bodies.



# Desktop Publishing layering

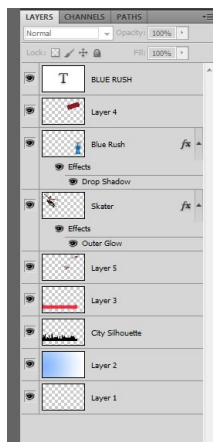


The use of layers in DTP software packages can aid the designer and enhance the quality of his/her graphic in many ways. Shown below is an example of layering.

Final document

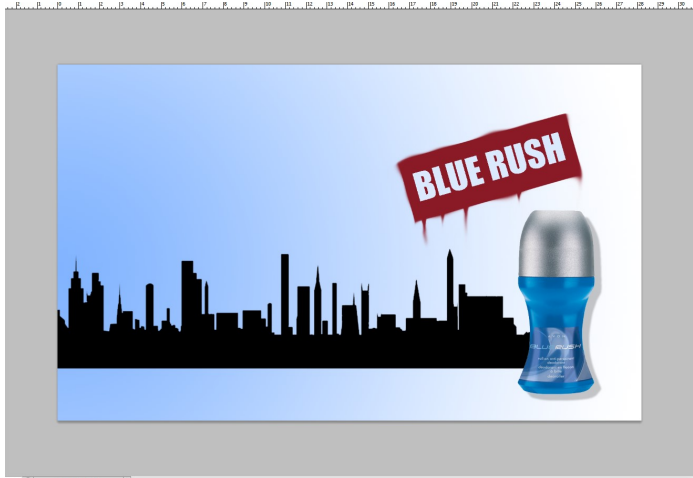


Layering tree

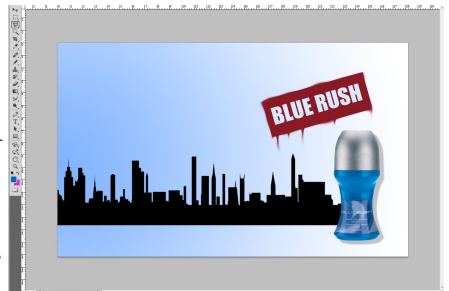


Layering allows graphics and text to be edited separately. They can be turned off and on to aid clarity as shown opposite. The visibility of the spray paint, image of skater and flow text have been turned off to allow easy editing of the silhouette.

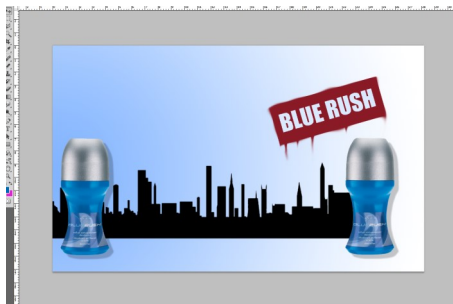




Layers can also be brought forward or backward as necessary (Example A). The city silhouette was initially positioned in front of the deodorant bottle. However, it was moved back to improve the clarity of the bottle. The designer can easily duplicate a layer to obtain an identical copy of a graphic or text. This saves time and effort (Example B - deodorant bottle).



Example A



Example B

# Graphs & Charts



Statistics are used in everyday life. Many people collect information and reproduce it in newspapers, magazines, etc. Information readily accessible, includes :- Football league tables, record sales, car sales figures, public spending, etc. These figures can be complex and difficult to understand.

Graphs and charts make these figures easier to understand without the need for long paragraphs of text.

There are three main types of charts :-

1. Pie Chart
2. Line Graphs
3. Bar Charts/Pictograms.

All graphs & charts should be CLEARLY labelled and easy to read. Having said this you can make the presentation more interesting in many ways e.g. adding a graphic that relates to the topic.

Line graphs usually contain horizontal & vertical axis.

Bar charts can contain both or 1 only depending on your graph

## Pie Chart

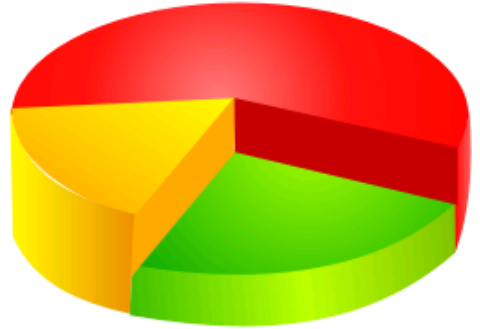
A pie chart is usually shown as a circle divided into a number of segments/slices that represent some part of a whole number. The total amount of segments should add up to a full circle.  
See example on next page

### When to use

- To display parts of a whole number

## When not to use

- To compare items.
- To show large numbers of component parts.
- When it contains some components that are small.



## Possible Enhancement

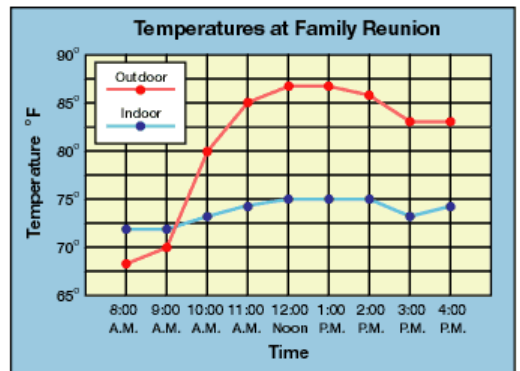
The pie chart could be made in the image of a pie, CD, etc. Parts could be exploded emphasising certain parts of the chart.



## Line Graphs

A **line graph** connects a series of plotted points which show trends or movements over a period of time. The shorter the time period the smoother and more accurate the graph.

### Double Line Graph



## When to Use

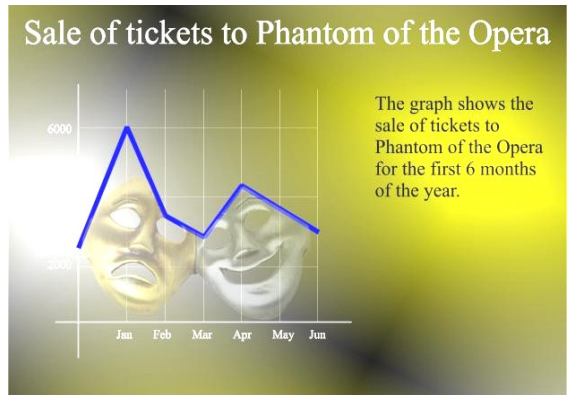
- When showing Trends.

## When not to Use

- When the emphasis is on amounts. i.e. The amount of ticket sales sold over a period of time.

## Enhancement

The addition of a graphic could enhance the graph, i.e. make it look more presentable.

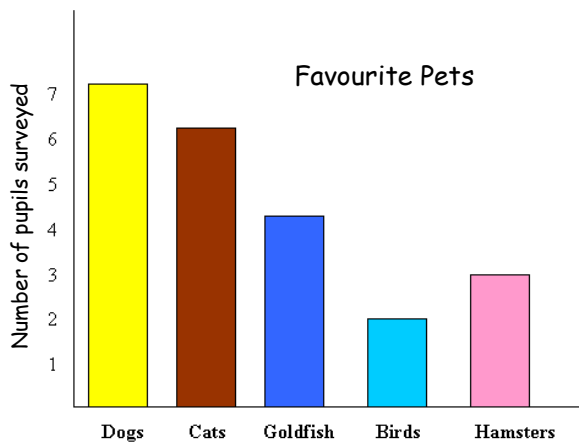


## Bar Charts

A **bar chart** shows how values vary over a period of time or how different values compare with one another.

## When to Use

- When individual figures have to be highlighted.
- When comparison of figures is required.

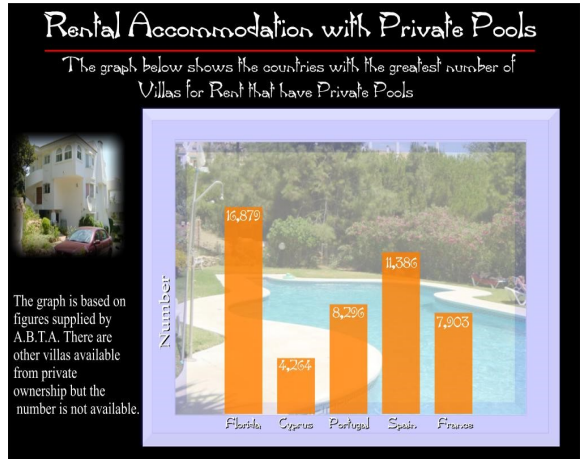


## When not to Use

- When too many bars are required ~ difficult to follow.
- When the flow of figures is more important than individual values.

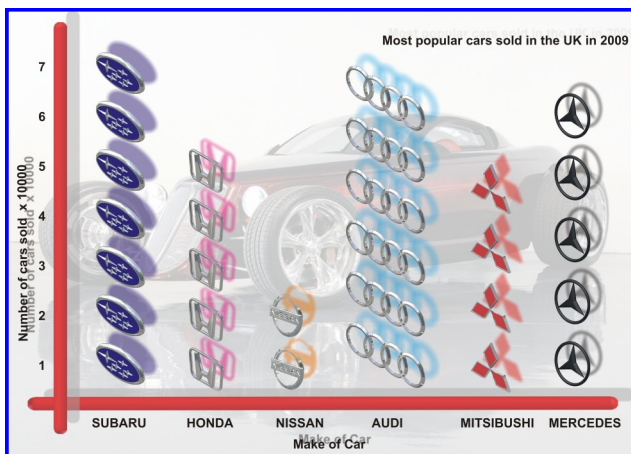
## Enhancement

Enhancement could be in many different forms. Forms such as an added backdrop/picture. However, the main purpose of the graph is to highlight the information on the subject and not the background.



## Pictograms

Similar to bar charts but using pictures or symbols instead.



# 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**.

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.

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

## Floor Plans



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

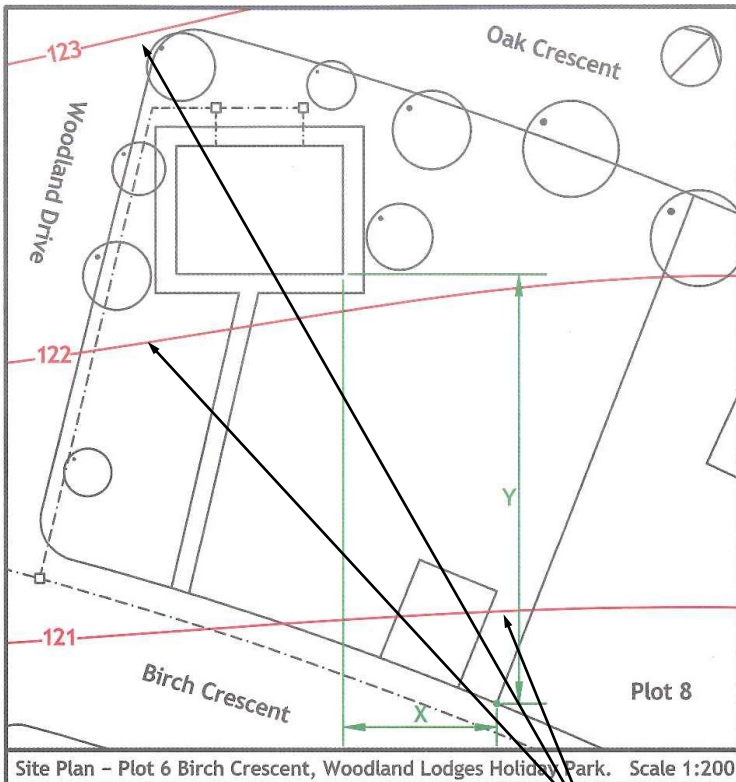


# Site Plans



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.



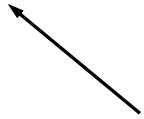
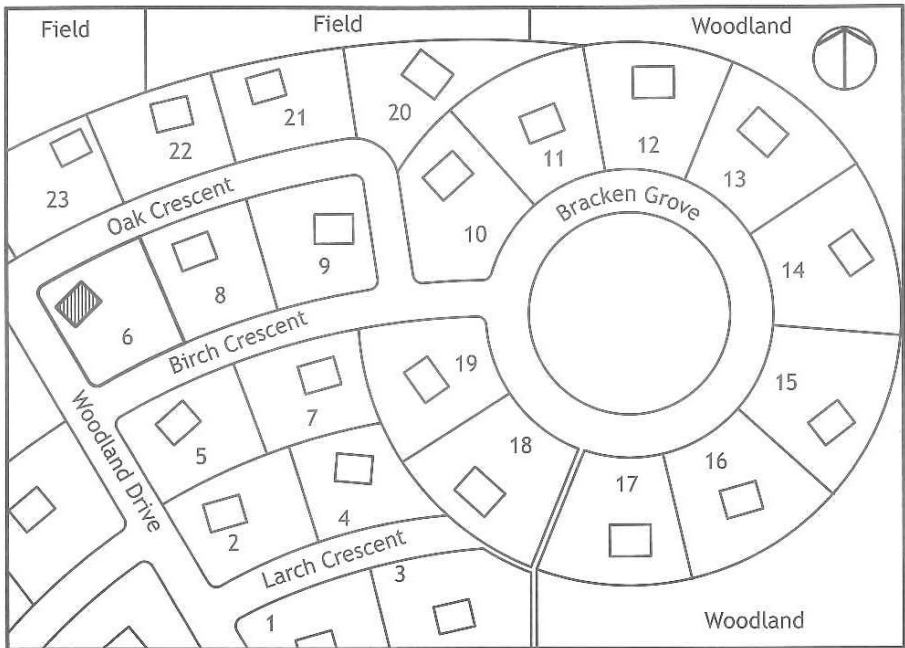
Ground contour lines

# Block Plan / Location Plan



A **Block Plan** or **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.



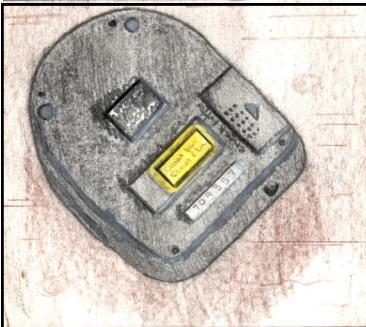
**North Point indicator and scale.**

# Sequence Diagram/Storyboard

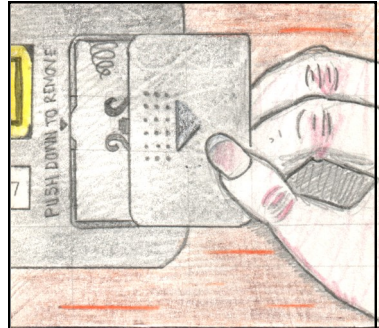


A sequence diagram is used to show stages of an operation graphically and often without words. They are commonly used to give instructions when companies produce products in different languages.

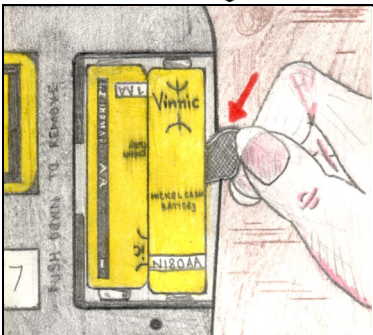
## Changing Batteries in a CD player



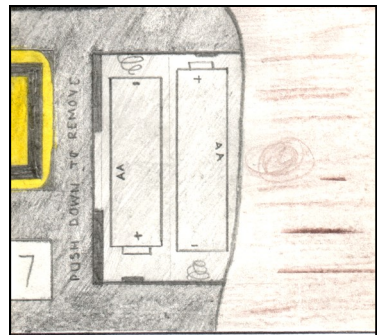
1. Carefully turn CD player on it's reverse side



2. Remove battery cover

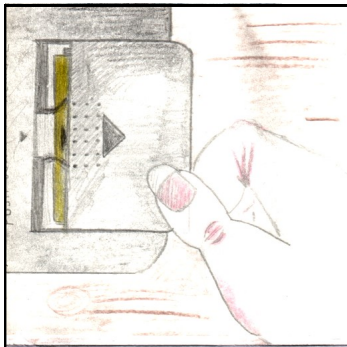


3. Remove old batteries using ribbon as shown

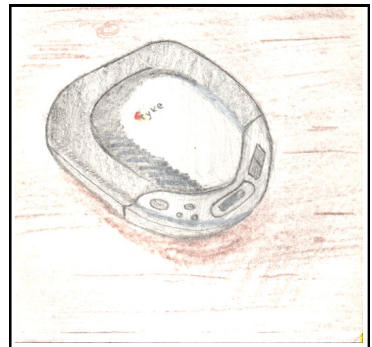


4. Replace with new AA batteries using internal diagram

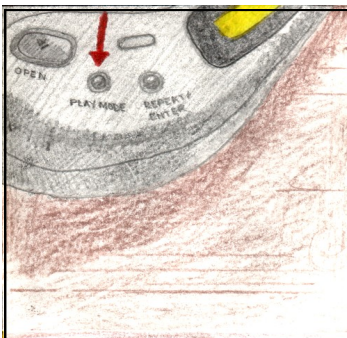
# Sequence Diagram/Storyboard - continued



5. Replace battery cover



6. Return CD player to an upright position



7. Check CD player is working by pressing "Play" button



8. You can now enjoy the true quality of a Tyke CD player.

Many storyboards can be found in user guides for household products such as televisions, video recorders and even mobile phones. You may be asked to produce one for your portfolio and may even be asked to sketch one in your exam.

# Flow Charts

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Sometimes it's more effective to visualise something graphically than it is to describe it with words. That is the essence of what flowcharts do for you. Flowcharts explain a process clearly through symbols and text. Moreover, flowcharts give you the gist of the process flow in a single glance.



The process starts. All flow charts Start/Stop with this symbol and is the Start/Stop of the particular process being undertaken



This symbol represents a decision i.e. Is it broken? Yes or No?



This symbol is the doing task, i.e. Fix the problem, do something.



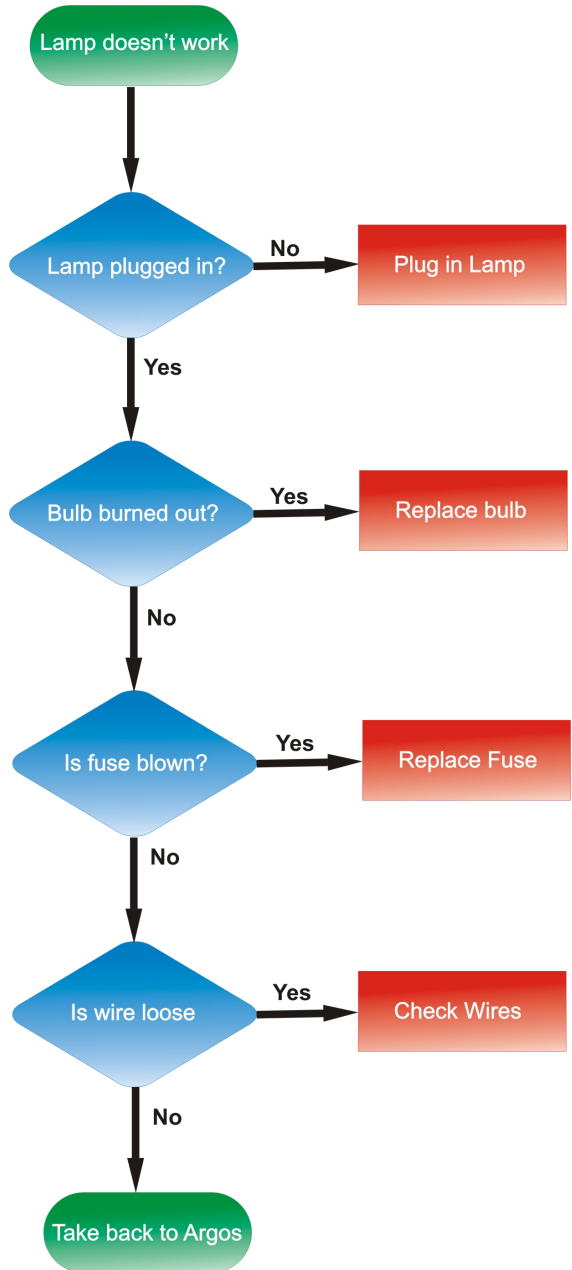
Input/Output e.g. Insert a USB, CD, DVD, etc.

# Flow Charts - continued



The example shown opposite shows the basic flow chart working through a typical everyday fault that could occur in any household or business.

What the chart is basically doing is systematically working through what the possible faults could be before returning to the store where it was purchased.



# 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:**

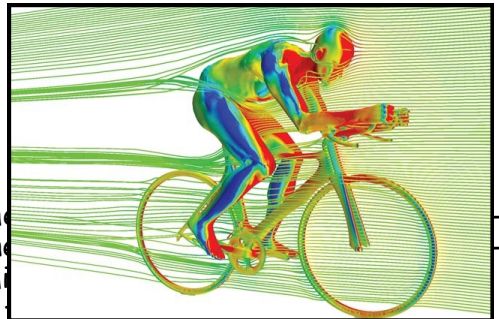
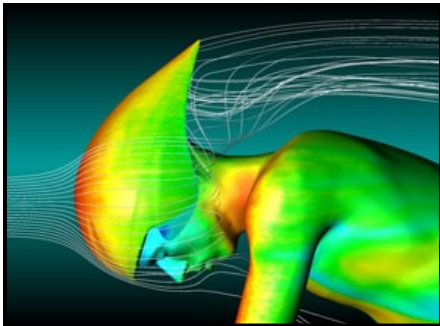
Digital inks are currently difficult to remove in the recycling process. The choice of paper can be limited to approved papers, which are rarely recycled or FSC certified. (Forest Stewardship Council)  
Large amounts of energy are used in the manufacturing of the machines

# CAD/CAM



This an **Acronym** for Computer-Aided Design/Computer-Aided Manufacturing, computer systems used to design and manufacture products. The term CAD/CAM implies that a person can use the system both for designing a product and for controlling manufacturing processes.

In simple terms it basically means we design artefacts on the computer such as the I-pod Nano, the Camera & Clock, etc, in Auto desk Inventor or we could design a fully functioning computer generated car. This is what happens in industry nowadays. These computer files can then be read by machines which can actually use the files as if it was the actual fully manufactured model. This allows the Engineers to see if it actually works before the making of it.



Other  
sign  
nam  
the

The example above shows how such com-

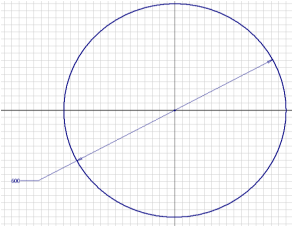
puter simulation has been used to check the aerodynamics of a cyclist. This information will then be used to try to design the optimum flow efficiency around the cyclist.

# 3D Modelling Techniques

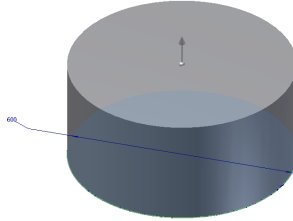


School Bin Lid

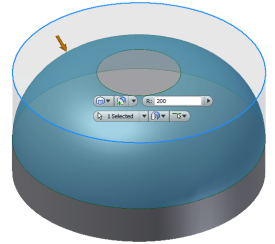
School Bin



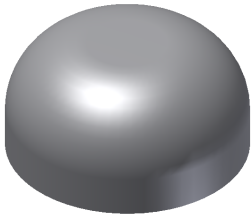
Sketch



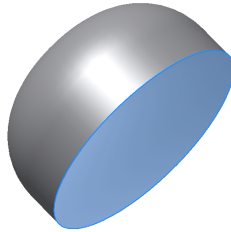
Extrusion



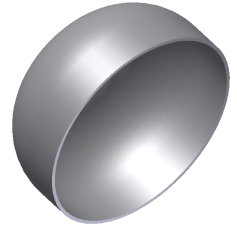
Fillet



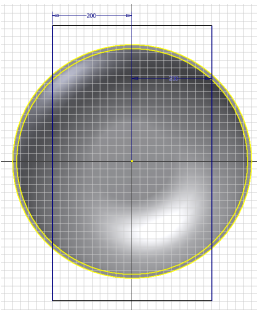
Completed Fillet



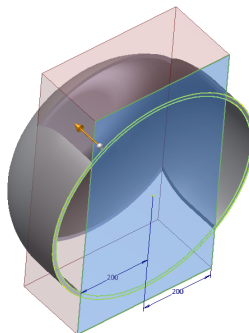
Shell



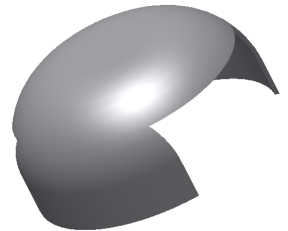
Completed Shell



Sketch



Subtraction - Extrusion

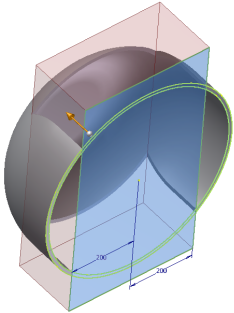


Completed Subtraction

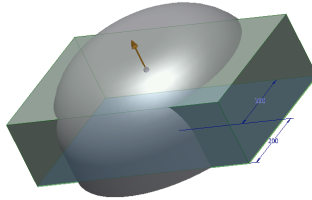
# 3D Modelling Techniques



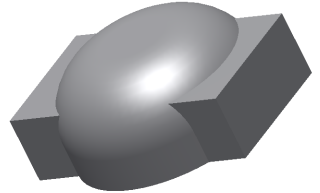
School Bin



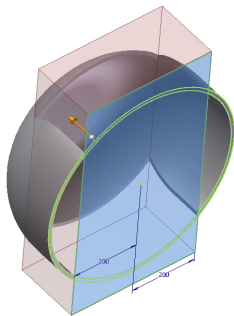
Sketch



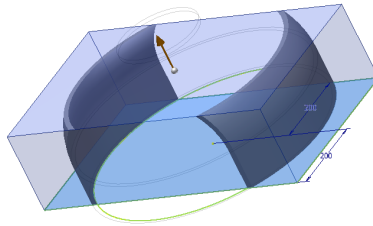
Union



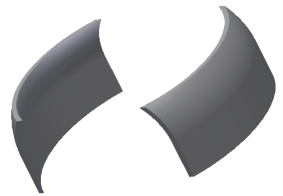
Completed Union



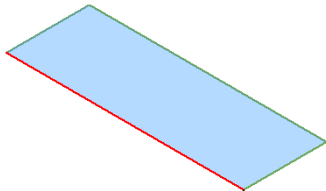
Sketch



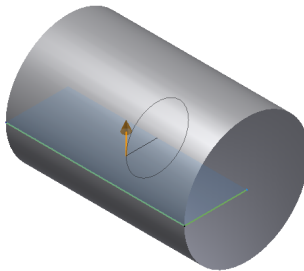
Intersection



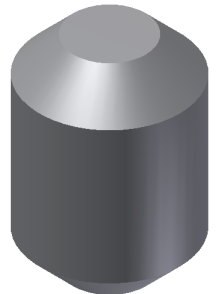
Completed Intersection



Sketch

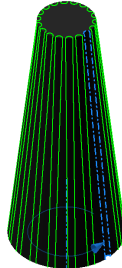


Revolve



Chamfer

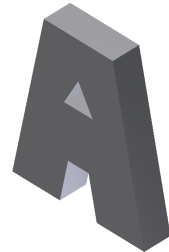
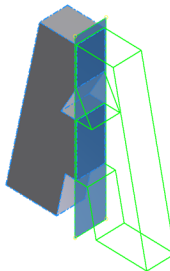
# Circular Array



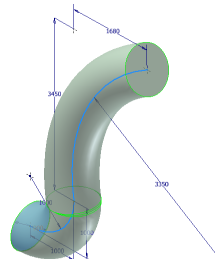
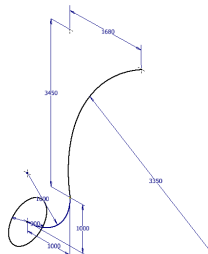
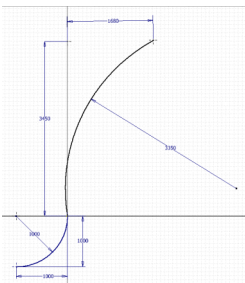
# Rectangular Array



# Mirror



# Extrusion Along a Path



# 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.

## Preliminary Graphics

**Bottle IDEAS**

- Recycling symbol
- nutritional information
- helps you stay fit
- 1 of your 5 a day
- 100% PURE
- lots of white space doesn't distract from the important information
- Text along path helps the graphic flow
- Colours suggest flavour: warm, tropical, fresh
- Colours suggest flavour: warm, tropical, fresh

**Sketch 1: Bottle Design**

- Q-shaped like a pineapple to suggest flavour as do the mangoes on the tree
- The tree takes up too much room - the size could be reduced
- green is a refreshing colour so I want from the brighter oranges of the bottle and label
- colours resemble flavour
- shading colour red orange so that it gives a warm feel and to eye catching
- The bottle unfurls like the top of the J
- the bottle is maybe not visible enough as it's pretty much covered by the label
- using this as my fruit
- more information should be added - reduce the size of trees to allow for more

**Sketch 2: Packaging Design**

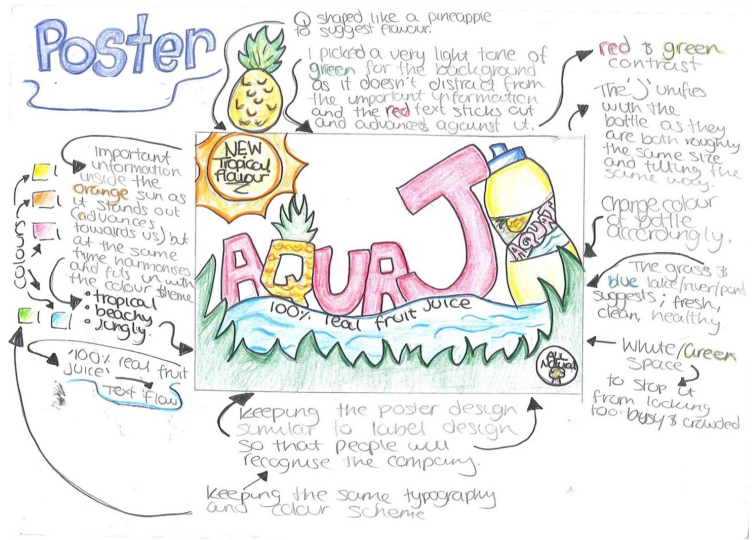
- would prefer to have the typography more unified: AQUA
- As I mentioned I am going for a tropical flavour - blue & green colours - these come forward and the red background helps water make sense
- keeping the background a soft pale red so it still distinguishes itself from the actual brand
- retropos: too busy - too much going on - too many colours
- Minimally as white space must come result in 10s of hours to read
- we need more of an idea of what the brand is
- the fruits need us what flavour is going to be
- the fruits need us what flavour
- white space helps to use above and covers in the package and name of brand a bit of colour to make eye catching
- use the red - now it's a bit stronger
- white space helps to use above and covers in the package and name of brand a bit of colour to make eye catching
- red is orange - it's making the brand look better
- green - it's making the brand look better

**Central Mind Map: AQUA**

- Concept: make/refresh
- Age: 18-25
- Target Market: young people
- Flavours: kiwi, banana, orange, grape, kiwi
- Interests: tropical, fruits
- Recyclable
- Eco Logo
- no chemical preservatives
- SAFETY: don't use natural
- Practical: easy to use
- Anthropometric: size of bottle
- Ergonomics: shape of bottle
- Themes: eco-friendly, green, yellow, natural, fruits, oranges, apples, bananas

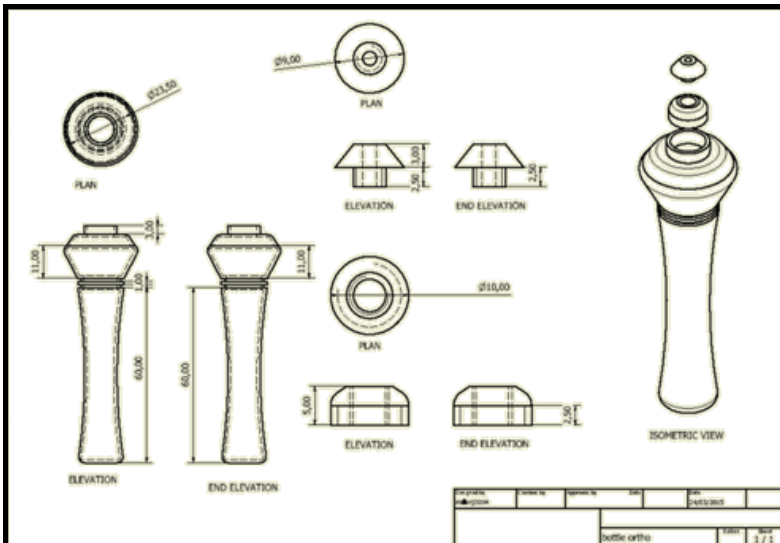
Drawn by Gillian Crisp 2015  
Calderside Academy

A full size Working Rough for the Aqua J Juice bottle poster.



## Production Graphics

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.



# Promotional Graphics



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, labels, etc.



Drawn by Gillian Crisp 2015  
Calderside Academy





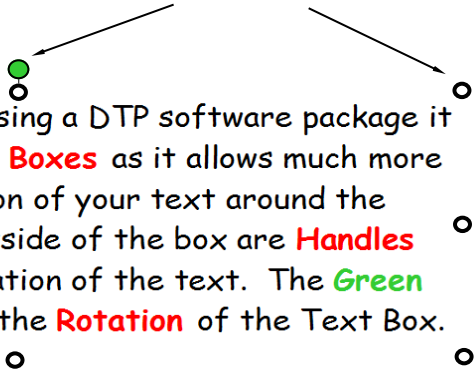
# Typical DTP Terms



## Handles

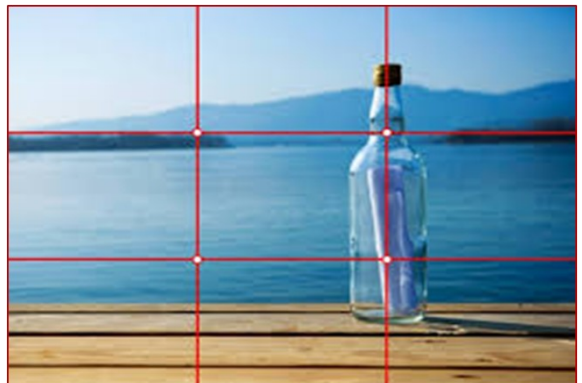
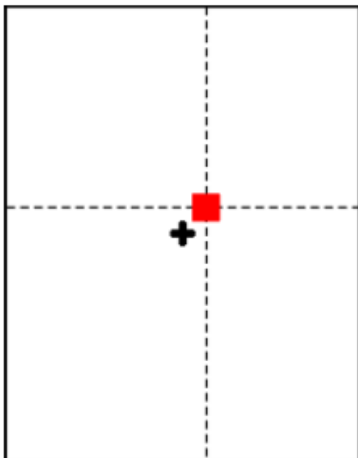
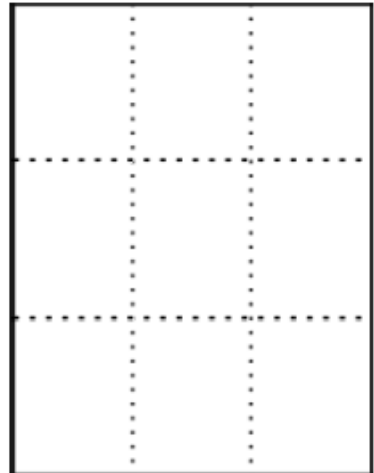
### Text Boxes

- This is a **Text Box**. When using a DTP software package it is advantageous to use **Text Boxes** as it allows much more flexibility in the manipulation of your text around the page. The circles on the outside of the box are **Handles** which also allow for manipulation of the text. The **Green** circle at the top allows for the **Rotation** of the Text Box.
- 
- 
- 
- 
- 

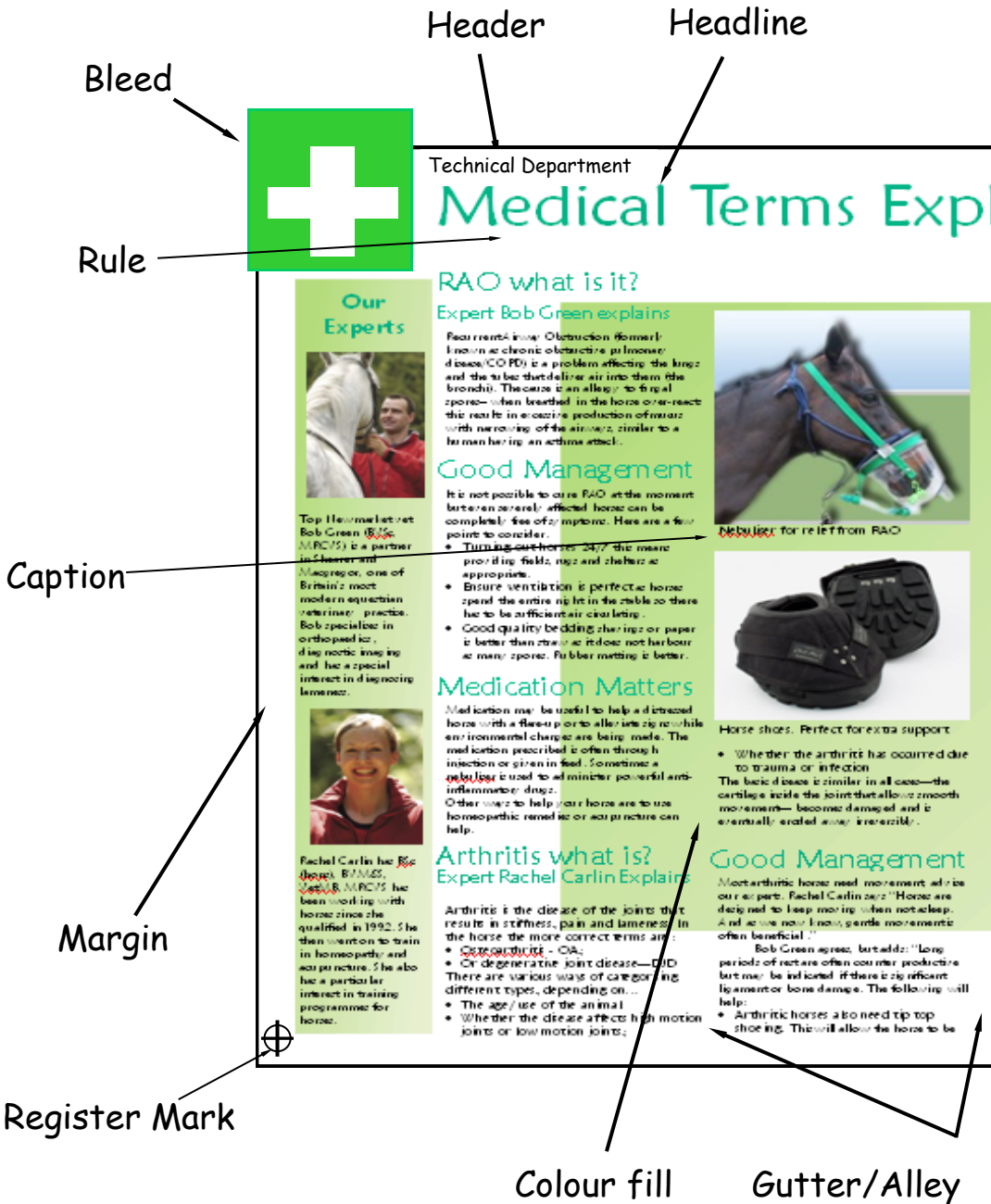


### Rule of Thirds

The rule of thirds says that most designs can be made more interesting by visually dividing the page into thirds vertically or horizontally and placing our most important elements within those thirds.



# Typical magazine page



Column Rule (black line which runs down the middle of the page)

Heading

Reverse (Text)

Tilt

# Gained By Experts

Text

## Azoturia what is it?

Most commonly known as "set feet" and "tiring up" - the correct name for this condition is **azoturia**. This condition is associated with exercise. Exercise in the muscle cells at pain, swelling, irritates the bloodstream resulting in pain, stiffness and lameness. If there is a large number of these enzymes within a blood sample, then muscle damage has occurred. This is most common in young fillies, but can affect any age, type or breed.

## Good Management

A veterinary diagnosis is important to determine the most appropriate care and treatment. There are variations of the cause, and severity of the disease which means treatment may well be different for each horse. A long feed a day that is on a par with the amount of exercise that the horse is receiving. Most importantly always ensure your horse is sound and healthy before you exercise him. Respiratory and orthopaedic disease make horses much more susceptible to set feet.

## Medication

"High-strung" horses also appear to be predisposed to tiring up, in these cases judicious use of fentanyl can be useful especially when the horse may be fresh and excitable. Homeopathic methods are also available. The basic medical advice is to treat your horse with a specific diet. His horse body stores fat can encourage set feet, changing to diet of fibre and vegetable oil enriched feed. Supplementing electrolyte into the diet and will increase levels of sodium as a horse can sweat up to 10 litres in an hour losing 4% of sodium in every litre.

## Exercise

Whilst the condition is triggered by exercise, controlled exercise is central to successful management. Detailed exercise plans will vary depending on the use of the horse and the number of episodes of azoturia it has suffered. Consider your horse. Pick it regarding about the fitness for horse prone to the condition. Consider your environment here. If you've got the feet set in the turnout ring and the exercise time right then you can do what you like with a horse prone to tiring up.

## Tilly's Top Tips!



- A long and sure your horse's bedding is clean and dry.
- If your horse has an outdoor paddock make sure it has shelter.
- After leading with your horse clean and brush him to prevent mud fever (an infection of the lower limb).
- Encouraging your horse to set from the ground will allow the respiratory system.
- A long and sure your horse is fed the correct diet.

## Useful Contacts

- Robb and Shee Veterinarian Clinic 01693 355239
- Top Spec 0570 240 6596
- Trine's consultants 01243 556493



Magnetic boots for arthritis

- Examining old shoes for wear. If one side is more worn than the other then this is how the horse should be shod.
- Turn out with care. The horse will benefit from plenty of turnout, but must be kept warm and dry.
- Magnetic therapy products can be useful. Blankets are good especially for sore backs.

## Medical Matters

Injecting anti-inflammatory drugs directly into the affected joint is a common procedure. This also means that the horse can remain active. Homeopathic methods can also be considered and it organic. Therapies such as acupuncture and physiotherapy are also considered a good form of management. But the cheapest, simplest and most effective way is painkillers and often do a good job.

Margin

Footer

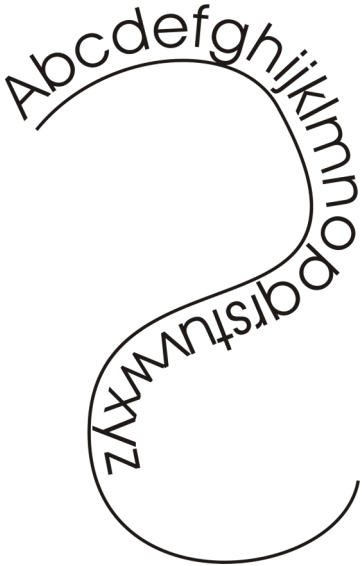
(white space)

Sub Heading

# Flow Text along a path



Abcdefghijklmnopqrstuvwxyz



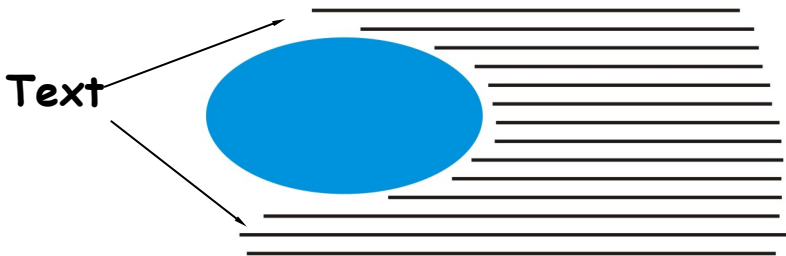
Flow Text along a path



# Drop Shadow



Text Wrap round an object



The graph shown opposite has had a transparency applied to it using the "Transparency" tool in Corel Draw.

It basically washes out the picture.



## 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.

Dependant on what type of work that is being carried out basically determines what justification will be used.

## 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.

## **Align left 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 an agreeable whole.**

## **Align right 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 an agreeable whole.**

## **Asymmetrical 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 an agreeable whole.**

# What are Principles & Elements of Graphic Design?



**Principles** - The principles of graphic design are the key rules in which you organise the various elements in a layout, (the recipe to good design) - **THE HOW!**

**Elements** - The **elements** of graphic design can be thought of as the things that are **added** to create the publication, (the **ingredients** to good design.) - **THE WHAT!**

A list of the various Principles & Elements are shown below. You will need to be able to understand and apply these in your own work.

## Principles

Balance  
Rhythm  
Depth  
Unity  
Proximity  
Alignment  
Emphasis  
Dominance  
White Space  
Contrast

## Elements

Line  
Shape  
Texture  
Colour  
Value  
Size  
Weight  
Mass

# Rhythm



In most publications rhythm is used to create movement and is reflected in the repetition of DTP elements in a varied pattern.

The two key aspects of Rhythm are repetition and variation.

**Repetition** - repeats the DTP elements throughout document.

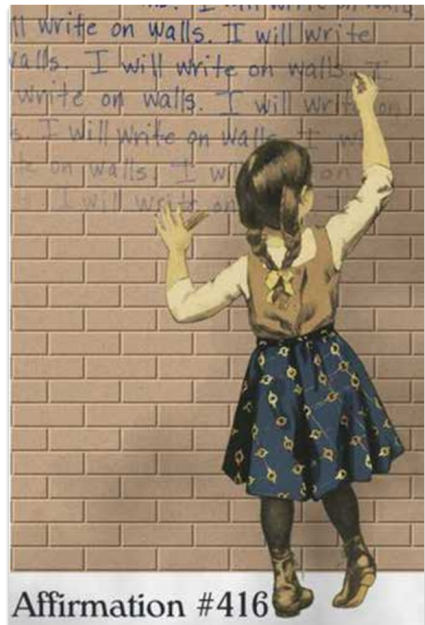
**Variation** - Change in size, placement or style of DTP element.

## Rhythm - Repetition of Colours & Shapes

**Colour:** The blue of the girl's skirt is echoed in the blue writing on the wall and the blue title ("Affirmation #416")

**Patterns/Shapes:** The main background is a repeating brick pattern, the skirt also contains a repeating pattern.

**Words:** The words on the wall repeat over and over.



**Repetition** helps to **unify** a piece, without the use of variation, repetition can be boring. Many pages of identical columns of text should be varied with the use of headlines, sub headlines and images.



# Rhythm Movement



Repetition in the **triangle shapes**, helps create movement for the reader to follow the article across the page. Repetition of **header & rule** at top of page along with use of the same two **colours** for fonts has also been used

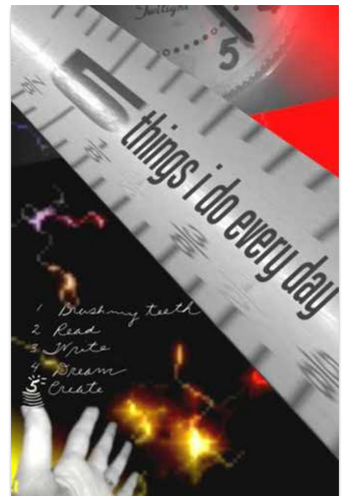


# Rhythm - Repetition of DTP Elements



The primary repeating element in this page is the **number 5**.

- 5 on the clock
- 5 on the tape measure (which becomes part of the page title "5 things I do every day")
- the list of five things
- the 5 lines above and 5 lines below the number 5 on the list
- the 5 fingers of the hand



# Balance



When we look at publications and documents they will have some form of visual balance or visual weight of different graphic elements in their layouts.

There are 3 main types of balance within graphic design and these are described below:-

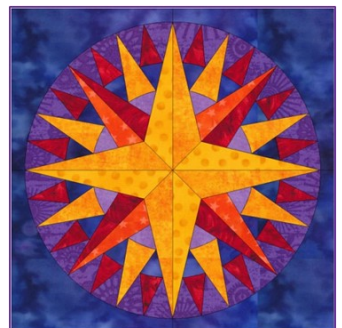
## Asymmetrical



## Symmetrical



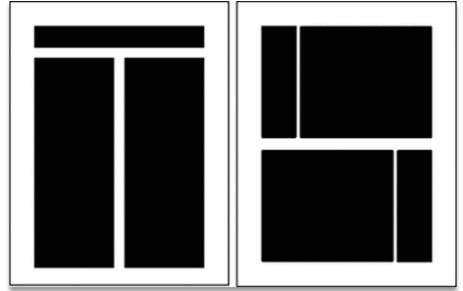
## Radial



# Symmetrical Balance



Publications with symmetrical balance are ones that have an equal distribution of visual weight, all their elements on the page are centred and balanced. It is generally seen as **equal visual weight** that can be described as having mirror reflection vertically and horizontally.



## Uses:

Symmetrical design can communicate **stability** and **strength**, which are appropriate for a traditional or conservative piece, often used by **banks**, **lawyers** and **medical profession** documents.

# Asymmetrical Balance

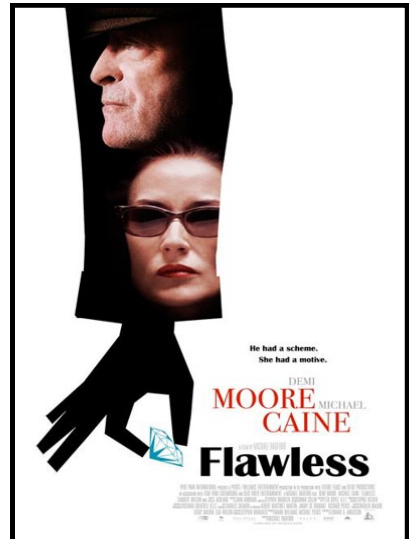


Instead of symmetrical balance you can have **Asymmetrical balance**.

This is when publications have a layout that have a number of elements arranged in an order that can be weighted to a particular side of a document.

## Uses

Asymmetrical layouts are generally more **dynamic** and by intentionally ignoring balance the designer can create tension, express movement, contrast, variety or convey a mood such as anger, excitement, joy, or casual amusement.



# Depth



Depth is the effect of creating designs that appear to stand out from the page, simple techniques can make your publication more eye catching to the reader.

Ways in which you can create depth in your publication can be seen below:-

- Placing text behind an image.
- Using drop shadow to make it stand out.
- Placing text behind and image
- Placing an object in front of other elements (line, shapes, images etc)





Unity in graphic design allows the reader to have visual cues telling them which parts of the layout are linked together.

As seen before in rhythm, **Unity** is closely linked to the repetition of colour, shapes and textures.

This create an instant unity within a document but unity can also be gained through **layout structure** and **grouping** of items and **typography**.

## 2

### A EXUBERÂNCIA DAS FORMAS

**RAIPE ALLES**, natural de São Francisco, EUA, é um compositor e pianista brasileiro conhecido por suas composições, com um estilo que mistura elementos de jazz com características de ritmos brasileiros. Ele é conhecido por suas obras como "The Agony" e "The Agony".

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### DEBUTA-PIEDA DE

## Ralph Alessi

AND

### THIS AGAINST THAT

WITH

—RALPH ALLESSI—  
—TONY MARABAY—  
—ANDY MILNE—  
—DREW GREENE—  
—MARK FERRIER—

Ralph Alessi, natural de São Francisco, EUA, é um compositor e pianista brasileiro conhecido por suas composições, com um estilo que mistura elementos de jazz com características de ritmos brasileiros. Ele é conhecido por suas obras como "The Agony" e "The Agony".

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# Unity - Key Points



Unity can be seen within layouts such as

- Unity in **Colour**
- Unity in **Shapes**
- Unity in **Close Connections**

The example shown demonstrates unity within the publication through the repetition of the **hexagonal** shape from one graphic to another.

The use of the **red** and **green** colours in fonts and borders, links with elements within the images.

# Alignment



Alignment of DTP elements can help improve the layout structure of a publication, alignment will often vary from one layout to another.

As with all layouts, it depends on the purpose of the publication and the target market it's aimed for.

- The **structure of body text** within an article
- Positioning of the various **DTP elements** on the page



Alignment is the placement of text and graphics so they line up on the page. It's one of the principles of design that help us create attractive, readable pages. Use alignment to:

- create order
- organize page elements
- group items create visual connections

# Alignment - Positioning of DTP Elements



Alignment of elements such as **text**, **images** and **shapes** on the page should be placed in a way that does not appear random.

**This is headline number one**

**PIC 1**

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By **aligning elements** you should be looking to connect the various elements in the document visually to achieve a neat and structured layout, this should be carried out deliberately.

**PIC 2**

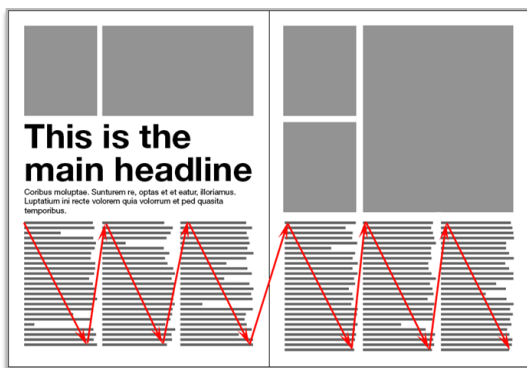
**This is the secondary article title of the page**

**PIC 3**

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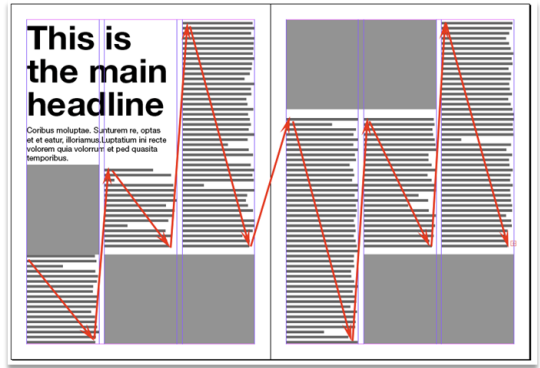
The layout to the left shows how alignments has been carried out in the positioning of images, columns of text and headings. They have been aligned with each other.

**Strong alignment** can make a huge difference to the overall layout of a publication, it should make the publication appear neat-er and easier to follow for the reader.





Poor alignment in a publication can make the reader distracted and lost in the layout making it harder to present the message of the publication.



## Emphasis & Dominance

Emphasis and Dominance are similar elements, the difference between are show below:-

**Emphasis** - happens when an item is made more **eye catching**.

**Dominance** - occurs when one item stands out more than others, it **dominates** the layout.



**Dominance** placed on large logo / company name.

**Emphasis** has been carried out by changing colour of key information.

**Emphasis** has been created in the headline in the book below, structured body texts with varying background colours as well as reversed text in the layout.



**Dominance** placed on the graphic (*Light Bulb*) on the top right of the page, as it is the largest element on the page creating a focal point.

## White Space



White space refers to the canvas space left in between different elements of your design.

You may have also heard it referred to as negative space. It's important because it keeps your design from being too cluttered or too confusing.



The term "**white space**" is actually a bit of a confusing one because it implies that the space has to be white in colour. White space can actually be **any colour**

White space provides the brain with visual clues as to which graphic design elements belong together and which are separate.

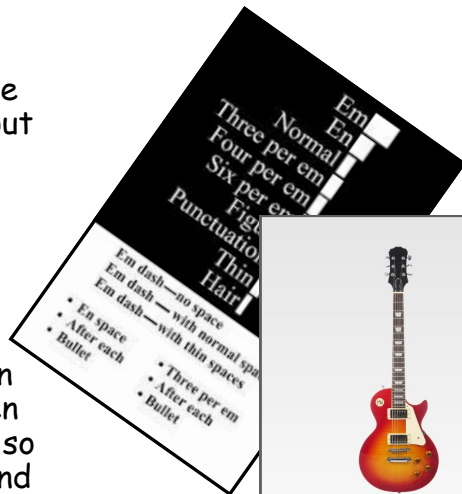


The white space between the different lines of numbers give your brain the signal that each is a part of a new and different sequence instead of one long number.

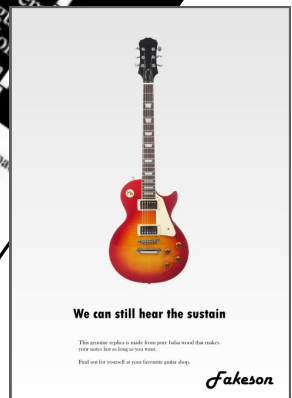


Space is also used to separate each individual character from the rest, making them legible and easy to comprehend.

As you can see from example images, our brains tend to put emphasis and importance on design elements that are surrounded by white space.



This is why important design elements like logos are often surrounded by white space, so that they are emphasized and clearly visible.



# Contrast



Contrast occurs when two elements are different. The greater the difference the greater the contrast.

The key to working with contrast is to make sure the differences are obvious.

Four common methods of creating contrast are by using differences in:

- Size
- Colour
- Shape
- Typeface



Having a contrast of size adds visual interest in the composition, and will help you establish the key elements in your layout so you can be sure the viewer is focusing on the right area.

Contrast of size is not applicable to just text; it can also be the images in the publication.



## Contrast Colour



Contrast of colour is arguably one of the key principles of design and, as mentioned before, it's probably one you're familiar with.

You can get a very simple example of this theory if you take a white background and drop black text on it. The contrast between white and black values is pretty clear.



## Contrast Shape



Utilising contrast in shape for your publication can really help make things stand out.

It'll allow you to make the principal elements of your publication stand out by creating a noticeable difference in shape compared to the rest of the elements in the layout.

From the example to the right, the obvious contrast in shapes are created in the circular shapes and the geometric lines.

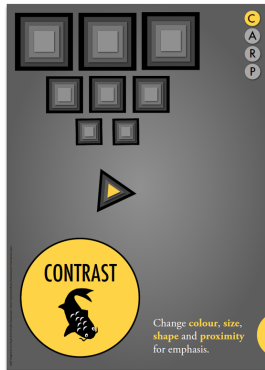
The contrast in colour found between the colourful shapes and the grey lines.

# CONTRAST



Two layouts showing how contrasting shapes have been used in a publication.

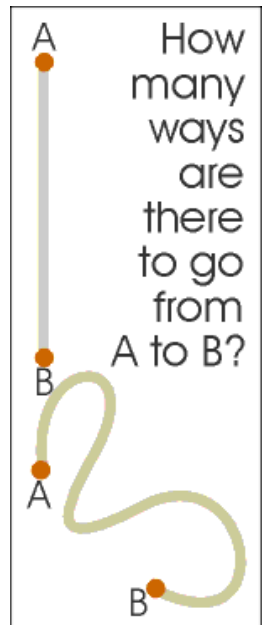
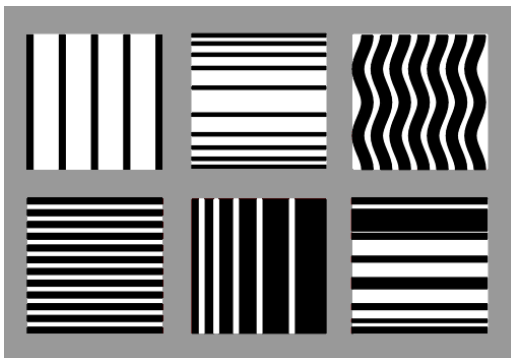
This creates a visual appeal that is often used to draw attention to a specific message.



## Lines



Lines are an important element in the design of publication, they are used to **separate** parts of a layout, **connect** parts of a layout or create **emphasis** to particular text of a layout.



The width of a line has a direct effect on its visual impact. Thick lines are bold and strong; they draw attention to themselves. Thin lines tend to do the opposite.



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!"

**50% OFF**

All Christmas Decorations


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

Curved lines often give a more dynamic or fluid look to a design. They indicate **movement** and **energy**.



They're also more common in designs with an organic nature, as they're more likely to be seen in nature. Straight lines are more formal and structured, and indicative of "civilised" culture.

# Shape

Shapes are  two-dimensional. Circles, squares, rectangles, triangles, and any other kind of polygon or abstract shapes.

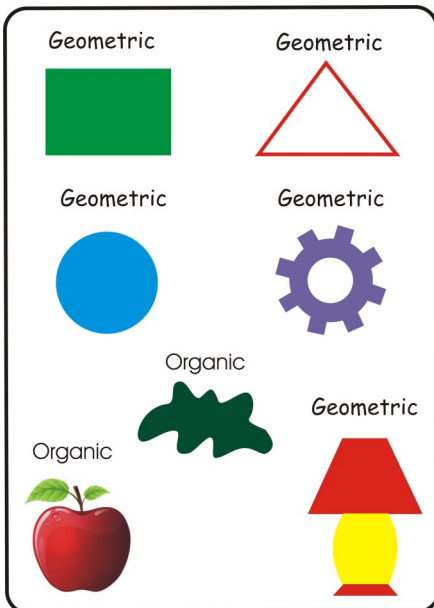
Designers use shapes to:

- Organise information through connection and separation.
- Symbolise different ideas.
- Create movement, texture, and depth.
- Convey mood and emotion.
- Emphasise and create entry points and areas of interest.
- Lead the eye from one design element to the next.

**Triangles** - Symbolize action or conflict.

**Circles** - Symbolize infinity, security and completeness

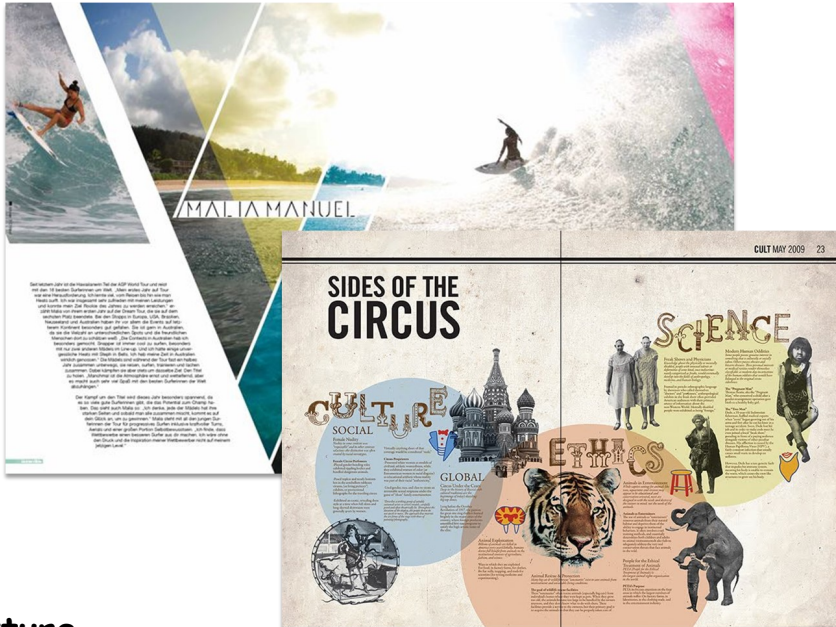
**Squares and Rectangles** - Symbolize honesty, stability, equality and comfort.





For example, circles are often associated with movement, and also with organic and natural things. Squares are more often seen with orderly, structured designs.

The colour, style, and texture of a shape can make a huge difference in how it is perceived.



## Texture

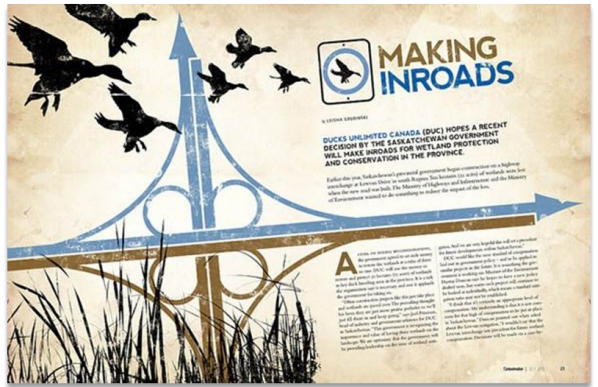


Textures are an important part of just about any publication. Even publications that, on the surface, don't seem to use textures actually are ("smooth" and "flat" are textures, too).

Textures can add to the feeling and **mood** of a design, or they can take away.

The most commonly seen textures, apart from flat or smooth, are things like paper, stone, concrete, brick, fabric, and natural elements.

Textures can be subtle or pronounced, used liberally or sparingly, depending on the individual design. But texture is an important aspect of design that can have a surprising effect on how a design comes across.



Examples of how textures can be used are shown, in a background and also as a connection to create unity linking one item to another.

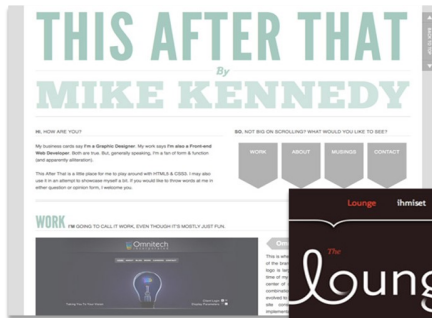


# Value

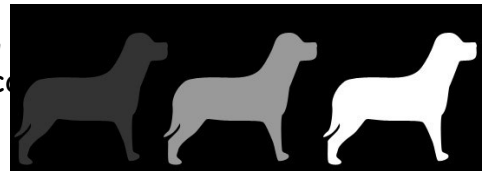


Value is closely related to colour, but it's more general. It is how **light** or **dark** a specific design is in relation to other parts of the design.

Again, this relates directly to the **mood** a piece gives. Darker designs convey a different feeling than lighter designs, even with all other design elements being equal.



The contrast between light and dark is often used to create emphasis to a particular part of design, i.e. headlines, brand names, slogans to name a few.



# Size, Mass & Weight



In your design publication, most items within your layout can be thought of having **mass**. A heading that has been **bold** will carry a greater mass than other possible headings or body text that hasn't.

Elements like **line** and **colour** can add mass to publication by their **thickness** and **size**.

- There is physical size and visual size.
- Mass is 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.

