Lesmhagow High School

National 4/5

Graphic Communication - Revision Notes

Contents

Graphic Communication Exam Preparation

The exam has written questions to test **Knowledge and Interpretation** skills. A grade A, B, C or D is awarded at National 5. Remember 50% of your course award is made up of the design assignment you undertake in class. All of these elements are equally important and are combined to give you an overall grade for Graphic Communication.

Study Tips

* Start revising as early as possible in S3
* Choose a study room that is quiet and comfortable
* Make a study timetable and keep to it
* Use your revision notes and past paper questions to prepare for Knowledge and Interpretation

Exam Technique

- Make sure you know the time and place of each exam
- Read over all the questions on the paper
- Answer easier questions first. Don't get bogged down on difficult questions—come back to them later
- Answer all the questions
- Keep drawings and written answers neat and tidy
- Take all the time that is allocated for the exam—try to allow time to read over/check all your answers at the end
- Make sure you read the question carefully and that you answer what has been asked

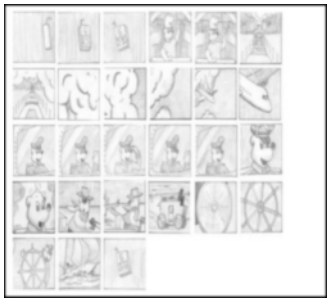
The 3 P's

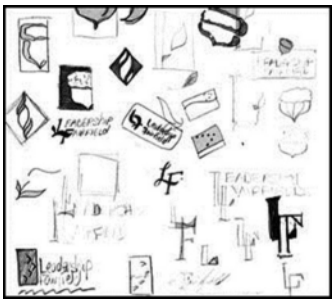
Graphic Communication uses what is collectively known as the 3P's—preliminary, production and promotional graphics.

Preliminary

Preliminary graphics is concerned with the initial stages of graphic design, that is your rough or introductory work. Preliminary graphics often take the form of **'thumbnail sketches'** which are small rough sketches designed to give a quick representation of your designs.

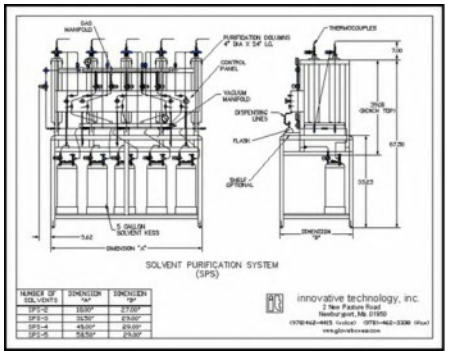
These sketches are ideal at this stage of the design process as they do not take long and give you an immediate representation of your work. They also allow you to develop a whole range of ideas quickly which allows you to build on and expand your designs.

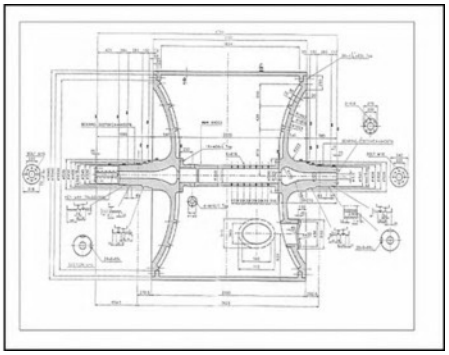




Production

For a graphic image to be considered a 'production' graphic it must convey certain pieces of information which would be of use to someone like a technologist, engineer, architect etc.
Production Graphics are concerned with telling us as much information as possible about a product. For example, it would be of benefit to know things like dimensions, moving parts, cross sections, weight, material selection etc.
These drawings usually come in the form of Orthographic Drawings, Sectional Views, Exploded Views, Assembly Views, Perspective, Isometric, Sections, Stepped Sections and Cut-aways.
In order for the drawings to be clear and concise to the manufacturing sector, the drawings are usually produced on AutoCAD or other CAD packages in the form of working drawings or 3D models.





Promotional

Promotional Graphics are extensively used by the sales and marketing departments of companies. This is where the product or design is displayed, advertised and put into the market place.

Promotional graphics come in the form of posters, advertisements, leaflets, flyers, displays etc. In order for a piece of promotional work to be effective, it must attract the consumers attention and make them want to look at it. Promotional Graphics are strongly linked with the features, elements and principles of Desk Top Publishing, and a good promotional graphic will hit many of the criteria described in the desktop publishing section of this booklet.

Preliminary Graphics:

(Sketching, illustrations and thumbnail layouts)

Benefits

- They are quick to produce.
- They are a good way of recording ideas or designs.
- They are a good way of developing design ideas.
- They can be produced using cheap equipment: pencils and paper.
- They can be quickly annotated to add information.
- They are useful when communicating ideas to a client or colleague.
- They can be easily produced 'on site'.
- They form the basis for production drawings or DTP work.
- The quality of the graphic is not as important as the clarity of the graphic and the information it conveys.

Disadvantages

- They are not normally dimensionally accurate.

Production Drawings:

(Dimensioned orthographic views, exploded drawings, sectional views and surface developments)

Benefits

- They are important when component parts are to be manufactured.
- They can show how components are to be assembled.
- Technical detail can be shown using a number of drawing types.
- They can be easily dimensioned.
- The drawing standards used are now worldwide standards.
- They can be understood by all users, regardless of nationality or language.
- They are accurate. They are drawn to scale.
- A library of reusable parts can be built up.
- Electronic production drawings can be used to control manufacturing machinery – computer aided manufacture (CAM)
- They are useful when surface developments are required to make packaging or panels for car bodies, for example.
- They can be used in promotional documents and animations to show customers how parts assemble or the floor plan of a new building.

Disadvantages

- Training or knowledge is required to produce them: drawing standards have to be learned.
- They can be time-consuming to produce.
- Costly specialist equipment is required: drawing boards and tools, or computers and appropriate software.

Promotional Graphics:

(Illustrations, posters, brochures, booklets, banners, billboards, graphs and charts, web pages and animations, etc.)

Benefits

- They can appear 'less technical' than production drawings
- They tend to be more easily understood than production drawings.
- They can be made to look more realistic than production drawings.
- They can be used in promotional documents or videos.
- They can show the customer what the product or building will look like.
- They may be placed in a virtual environment to enhance realism.
- They can have materials and lights applied to create visual impact.
- They can be animated to create visual appeal.
- They can be styled to appeal to a specific target market.
- They can be made to look attractive in order to help sell the product.

Disadvantages

- They require skill and knowledge to produce.
- They can give a false impression of the product.
- You can't physically handle a rendered model.

S. Atkins

British Standards

The British Standards Institution (BSI) are the body responsible for determining British Standards for products, materials, systems and services at European and International level.

British Standards are universally understood in the production of engineering and design work. They provide several benefits such as:

- Drawings are quicker and easier to draw because products are simplified.
- Drawings are easier to understand due to their concise nature.
- Drawings can impart lots of information efficiently.
- Everyone can understand them without the need for language.

Setting up a Production Drawing

All drawing must be set up in a consistent format so as to avoid errors. The following details ensure that this happens:

Title Blocks:
These should be drawn at the bottom of a sheet and extend to the lower right hand corner of the page. The following information must be included:

- Name.
- Date.
- Title.
- Projection Symbol.
- Original Scale.
- Drawing Number.
- Dimensional Tolerances.

Scale:
Scale determines the size of a drawing in relation to the object been drawn and the size of the paper being worked on. This ensures good proportion and accuracy.

Scale is determined by the following:
1. The size of the object and the paper it is being drawn on.
2. The accuracy of detail required.

Scale is shown using a ratio as follows - **1:1**. this means full size.

- When a scale is increased a larger number will be placed to the left hand side of the above ratio e.g. 2:1 (twice full size), 20:1 (twenty times full size), 200:1 (200 times full size). When calculating these measurements you simply multiply.

- When a scale is decreased a larger number will be placed to the right hand side of the above ratio e.g. 1:2 (half full size), 1:20 (twenty times smaller than full size), 1:200 (200 times smaller than full size). When calculating these measurements you simply divide.

British Standards - Drawing Conventions

The most common drawing symbols are shown below. You will use them in your coursework drawings. It is important that you understand and remember them

A thick, dark continuous line shows visible edges (**Outline**).

A thin, lightly drawn continuous line is used for projection - **construction lines.**

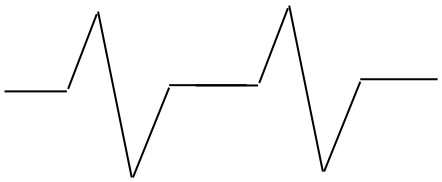
A thin broken line is used to show **hidden** edges.

A thin chain line (long dash, dot, long dash) shows a **centre line**.

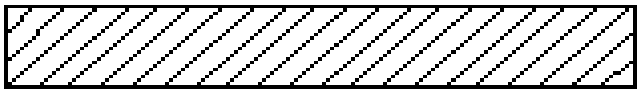
A thin double dash chain line is used to indicate a **fold line** on a development

A thin chain line with thick edges shows where an object is sectioned. It is known as a **cutting plane**

Continuous thin irregular: **Limits of partial or interrupted views.**



Continuous thin with Zig Zags: **Limits of partial or interrupted views.**

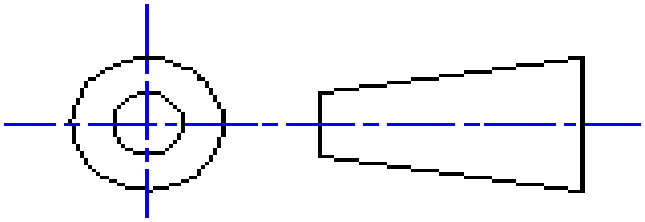


Thin 45 degree cross **hatching lines** show the cut surface produced by a cutting plane. Used in **sectional drawings**.

Indicates **Radius.**

Indicates **Diameter.**

Indicates a **Square section.**



The **Third Angle Projection Symbol** is added to drawings to explain its layout. You will commonly see this in Orthographic drawings, showing that the drawing is laid out using an Elevation, End Elevation and Plan.

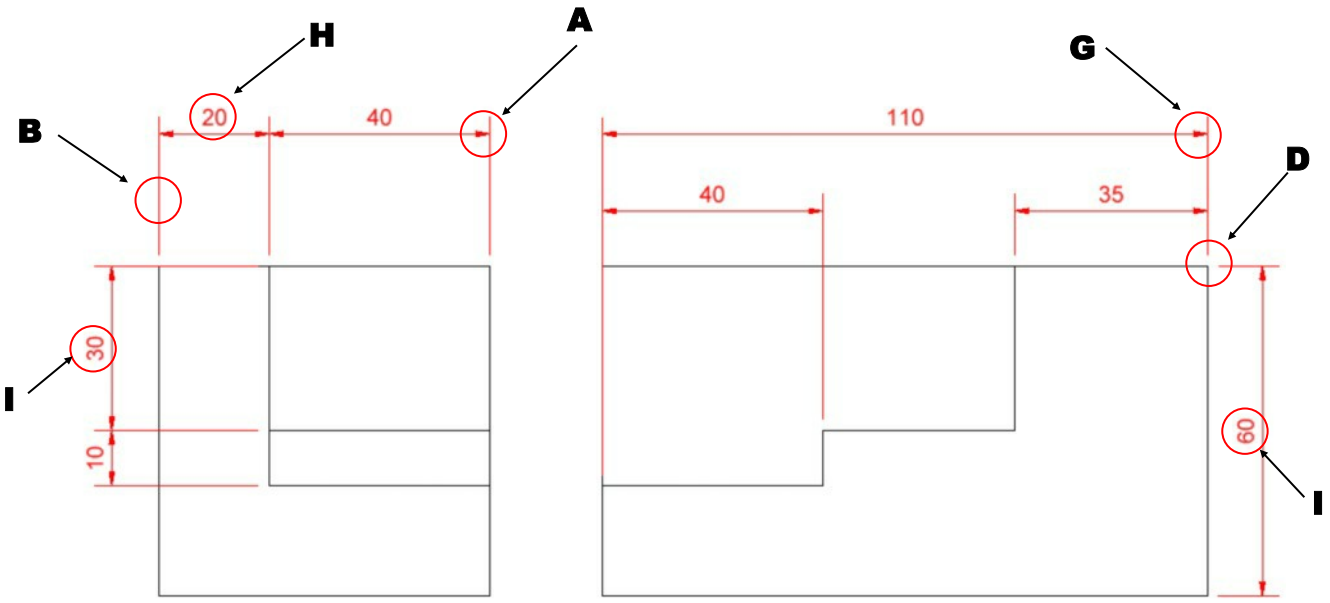
Dimensioning

General Principles

Dimensioning is the process of applying measurements/sizes to technical drawings. This is the process is by which designers and draughtsman will communicate the information required for the manufacture of products. Dimensions Should be applied to the drawing accurately and clearly.

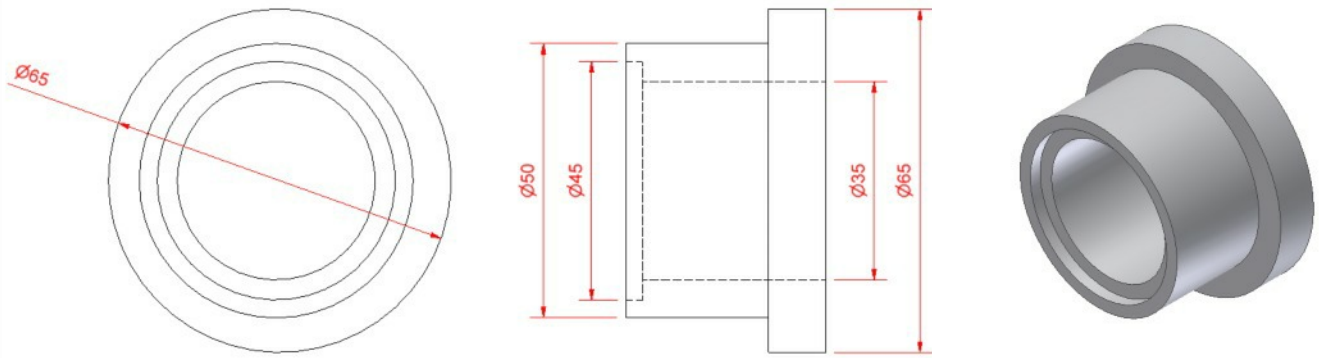
When Dimensioning:

A. Projection lines connect to dimension lines.
B. Dimensions are kept outside the drawing as much as possible to improve clarity.
C. Crossing of dimension lines should be avoided.
D. A 2mm gap should be kept between the projection line and the part being dimensioned.
E. Projection lines are drawn at right angles to the object.
F. Dimension lines should never be broken, even if interrupted by another.
G. A slim block arrow head should be used at the end of a dimension line indicating the position of the part being dimensioned.
H. On **horizontal** dimensions the number should always be placed above the dimension line and in the centre of the dimension line.
I. On **vertical** dimensions the numbers should always read from bottom to top and be placed on the left hand side of the line. They should also be kept central.



Dimensioning Circles:

A. When placing a dimension on a circle, the dimension line should pass through the centre of the circle and touch both edges of the circles circumference. A block arrow head should be placed at both sides of the line.
B. When viewing circles side on, dimensions should be applied as described in the above examples, however the diameter symbol must be included before the number.



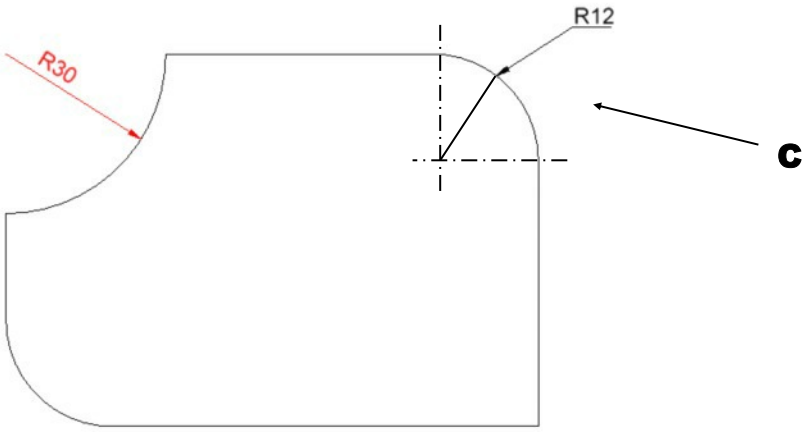
Dimensioning

Dimensioning Radii:

A. Radii should be dimensioned by a line that passes through or is in line with the centre of an arc.

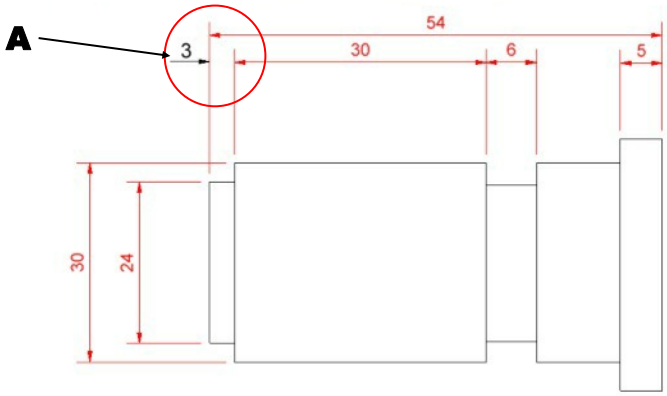
B. The dimension line should only have one arrowhead, which should touch the arc.

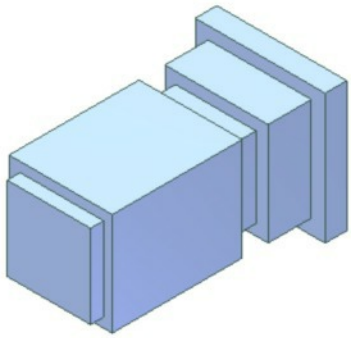
C. Radii of arcs that require their centre to be shown should be dimensioned with a leader line and extension line that connects the centre of the circle to the arrowhead.



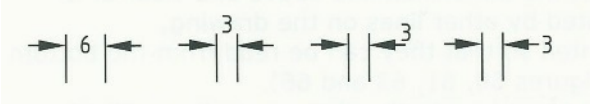
Dimensioning smaller features:

A. Where there is a small feature amongst larger features of an object, the dimension must be applied as is shown below.



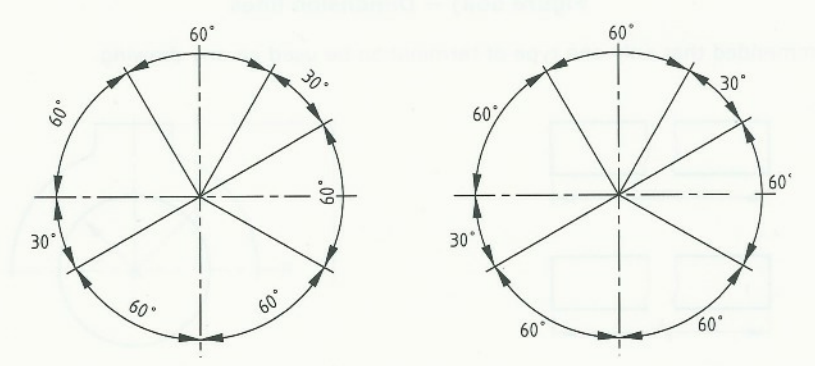


Depending on the position of other dimensions, it is also possible to dimension small features using the methods shown right.



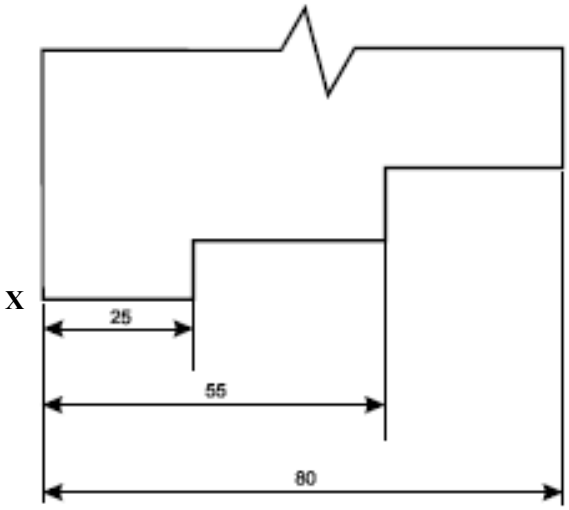
Angular Dimensions:

When dimensioning angles on a drawing, they should be applied as shown in the diagram to the right.



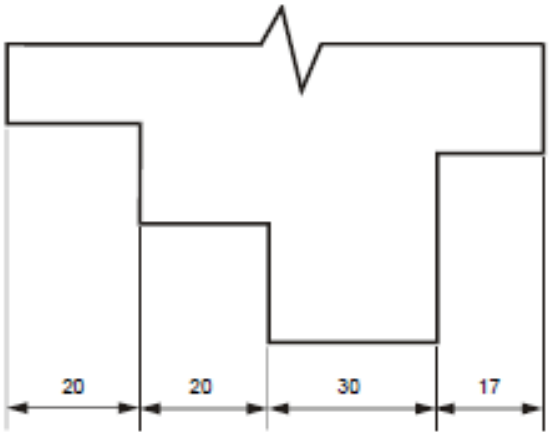
Dimensioning

Parallel dimensioning: consists of a number of dimensions starting from a common reference feature or point (X), see diagram on the right.



Parallel dimensioning

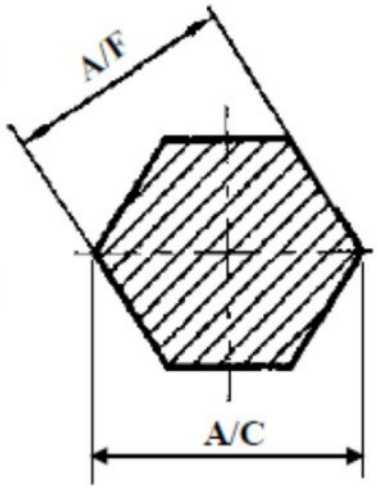
Chain dimensioning: consists of a chain of dimensions. These should only be used where the possible accumulation of tolerances does **not** affect the function of the part, see diagram on the right.



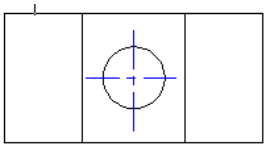
Chain Dimensioning

Across the Flats A/F:
Refers to the distance of a hexagon or an octagon across its sides (flats).

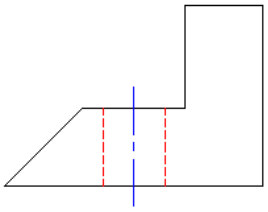
Across the Corners A/C:
Refers to the distance a cross the corners of a hexagon or an octagon.



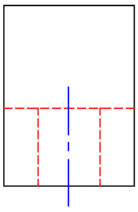
Drawing Types



Plan



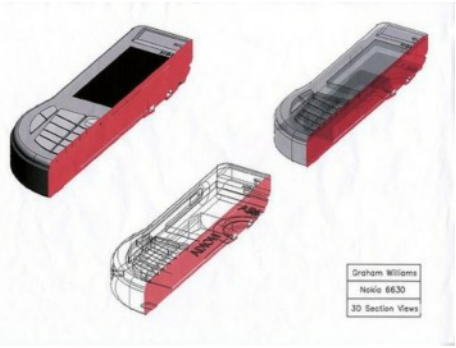
Elevation



End Elevation

Orthographic Projection

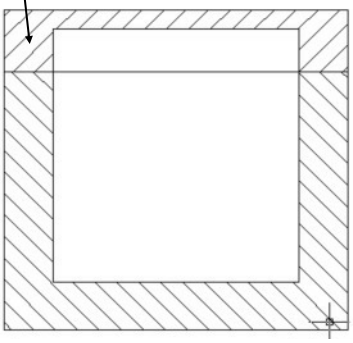
These drawings show 3D objects as 2D drawings. Before a product is manufactured accurate detailed drawings must be produced. These drawings are made using Orthographic projection. This includes three views of an object that are drawn looking face on: ELEVATION (FRONT), END ELEVATION (SIDE) and PLAN (top)

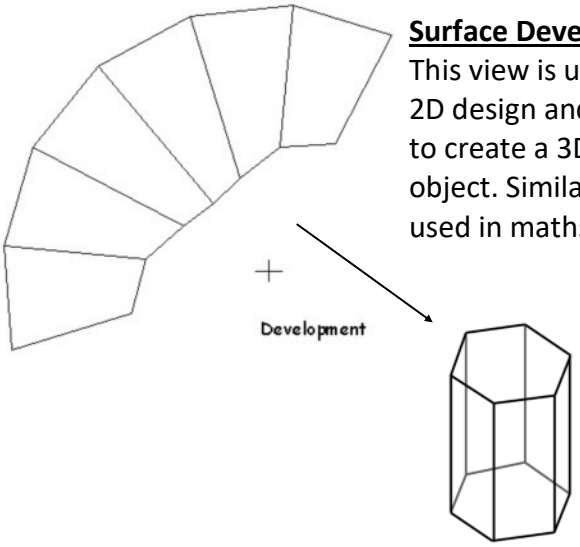


Sectional Drawing

Sectional views are used on drawings to show the inside details of an object more clearly than hidden detail can. They are also used on sectional assemblies to show clearly, how component parts of a product fit together.

Hatching Lines: Always drawn at 45 degrees.



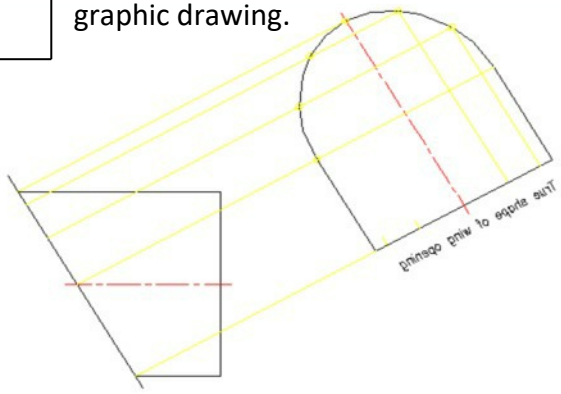


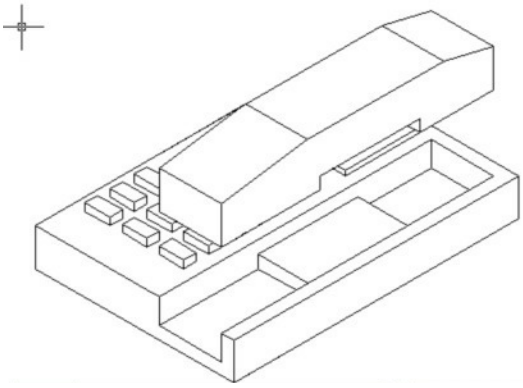
Surface Developments

This view is used to show the 2D design and layout required to create a 3D model of an object. Similar to net shapes used in maths.

True Shape

This is used to show the actual shape a surface, when it is difficult to see this due to the angle of the surface or position of the surface on an ortho-graphic drawing.



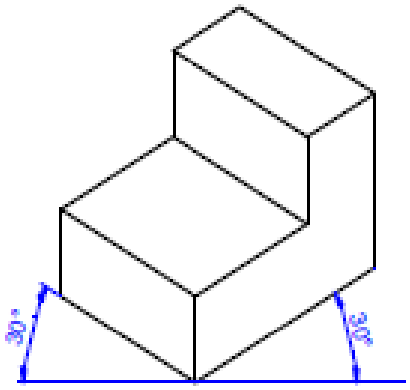


Exploded Drawing

An exploded view shows the separate parts that make up an assembly. The parts are arranged in line to help identify how they would fit together.

Drawings Types—Pictorial

Types of Pictorial Drawing 1

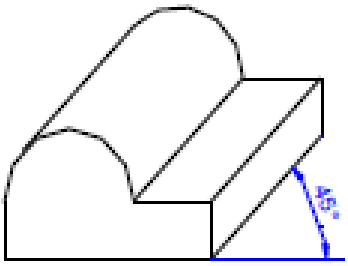


Isometric

Common uses include 3D views of small objects, furniture, engineering components and room interiors .

Rules of Isometric Projection

- Heights are projected vertically upwards.
- Lengths and breadths are projected at 30^0 to the horizontal.
- All measurements along the height, length and breadth are full size.

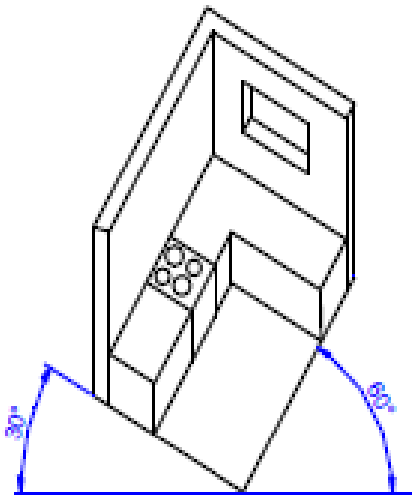


Oblique

Common uses similar to Isometric. Circular parts on surfaces facing the front can be drawn with a compass. Objects look more realistic if distances measured up the sloping lines are halved.

Rules of Oblique Drawing

- The front of an object is shown as a true shape.
- Breadths are projected back at 45^0.
- Breadths are reduced by half actual size to improve realism.



Planometric

Commonly used to draw room layouts garden layouts etc. for display purposes.
Surfaces parallel to the floor are true shapes.

Rules of Planometrics

- The base is a true plan view rotated at an angle to the horizontal, usually 30^0, 45^0 or 60^0.
- Planometric projection is achieved by rotating the plan view at an angle: 30^0, 45^0 or 60^0.
- All vertical edges remain vertical and project upwards from the base.
- All the measurements on the base are true. Vertical measurements (heights) should be full size.

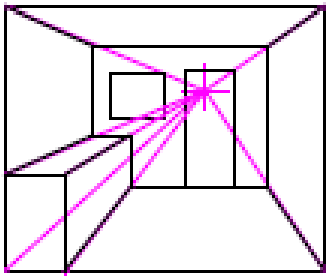
Note:
Isometric drawing is a method of pictorial drawing where all three dimensions and three surfaces are shown in one view. Isometric means 'having equal measure'. You can produce an isometric drawing more easily by constructing an isometric crate first. You can then draw the object inside the crate.

Oblique drawing is a simple form of pictorial drawing, often used because it shows the true front view of an object and circles can often be drawn with a compass.

Planometric drawings are used by architects, civil engineers and interior designers. Planometric projection is easy to draw and offers a clear view of interior spaces. It gives a viewing position looking down from above.

Drawings Types—Pictorial

Types of Pictorial Drawing 2

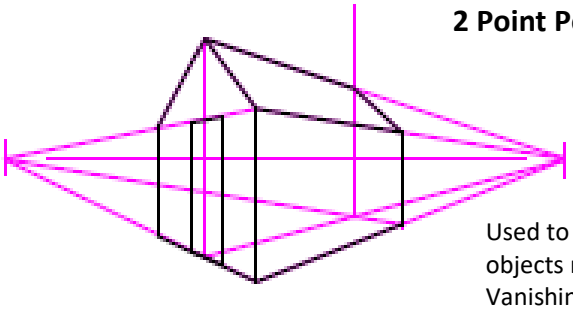


1 Point Perspective

Commonly used for views of room interiors.
All surfaces converge on the same vanishing point.

Rules of 1 Point Perspective

- Starts with a horizon line. It can be placed high or low on the page.
- The vanishing points (VPs) always lie on the horizon line.
- The height of an object reduces towards the vanishing point.



2 Point Perspective

Used to illustrate buildings and objects realistically.
Vanishing points can be positioned to give the impression of height or as if viewed from above.

Rules of 2 Point Perspective

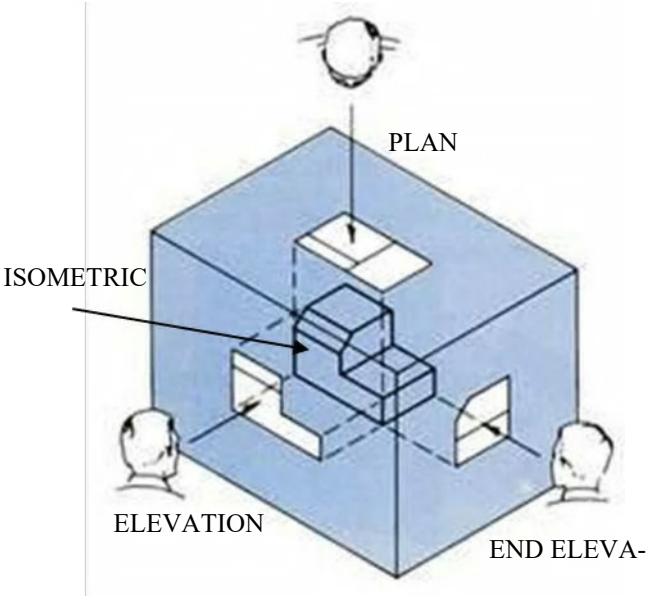
- 2 point perspective does not always require that you have a horizon line and two VPs visible on the page.
- These features take up lots of space and can make your sketch/drawing too small.
- Both left and right hand planes project back to their respective VPs.

Note:
Perspective has the effect of shortening the depths which project back to the VPs (foreshortening effect). In other words lengths, breadths and heights reduce in size as you get closer to the vanishing points.

Sketching or drawing in perspective is the best way to make your sketch/drawing look realistic. Illustrators often use perspective to make the products they draw look impressive. Drawing and sketching in perspective can make buildings and products look bigger that they really are. One Point Perspective uses only one vanishing point whereas Two Point Perspective uses two vanishing points.

S. Atkins

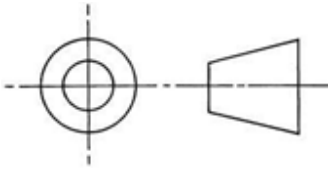
Drawing Types - Orthographic (3rd angle projection)



Orthographic projection shows three dimensional (3D) objects as two dimensional (2D) drawings.
Before a product is manufactured or a building is constructed, accurate detailed drawings must be produced. These drawings are made using orthographic projection systems that are understood around the world. The most common orthographic projection system is called: **Third Angle Projection**.
An object is usually drawn in up to four 2D views:

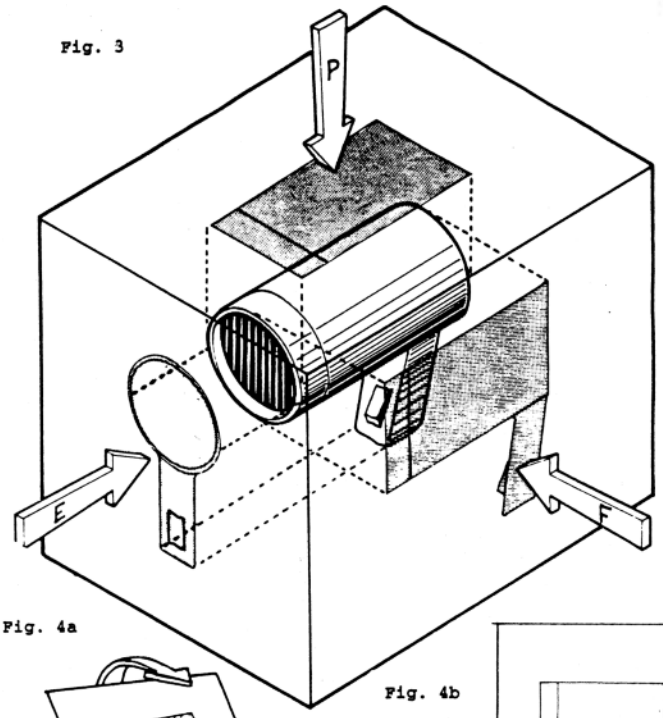
- The **elevation**, viewed from the front
- The **plan**, viewed from the top
- Two **end elevations**, viewed from each end.
- The views are always set out the same way.

3rd Angle projection symbol



The Third Angle Projection Symbol is added to all drawings to explain its layout. You will commonly see this in orthographic drawings, showing that the drawing is laid out using an **Elevation, End Elevation** and **Plan**.

Fig. 3



If you look through the box at the object , the view that you would see is drawn on the side of the box, Fig.3. Note that if you are looking along the lines of the arrows **E, P and F** and that these arrows are pointing "square on" or at right angles to the object. The prefix "**Ortho**" means square on, straight, upright. If the box is then "**opened out**" and flattened, Fig.4a and b, you can see how the drawing will look on your paper.
Notice that the **PLAN** is above the **FRONT ELEVATION**, and the left hand **END ELEVATION** is to the left of the **FRONT ELEVATION**. This is how you would set out your drawings for Third Angle Projection.

Fig. 4a

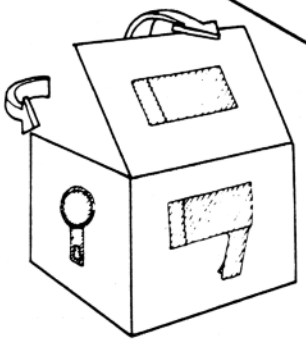
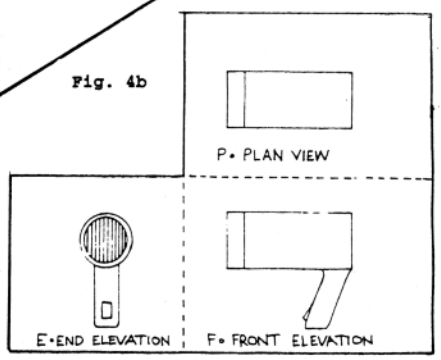


Fig. 4b



Some rules for Third Angle Orthographic Projection

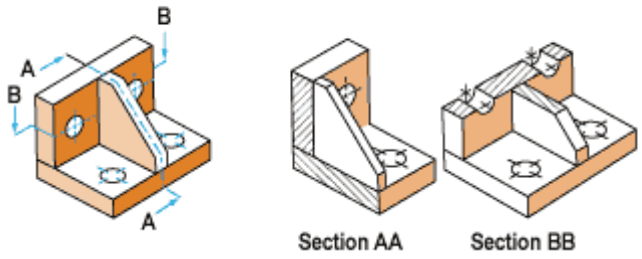
- To avoid confusion, it is important that the same symbols and lines are used by everybody.
- The **British Standards Institute (BSI)** recommends particular ways of showing information on drawings.
- This common use of lines, symbols etc. is called **Drawing Convention**.
- Dimensions are only ever applied to orthographic component drawings. Where an orthographic is shown as an assembly, dimension should not be applied.

Note:
You should be able to give a written response describing **Orthographic Drawings** and how its associated views (Elevation, End Elevation and Plan) are produced. You should also be able to describe what is meant by **Third Angle Projection** as well as **Drawing Convention**.

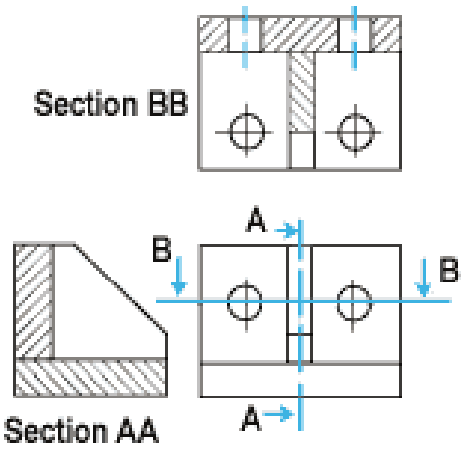
Sectional Drawing, Sectional Assemblies and Exploded Views

Sectioned Views

A sectional view shows a cut through an object, allowing you see the inner workings of it. Sectional assemblies show a section of a fully assembled product, allowing to see inner workings and how each component fits together. The part shown below demonstrates a section of a small wall mounting bracket.

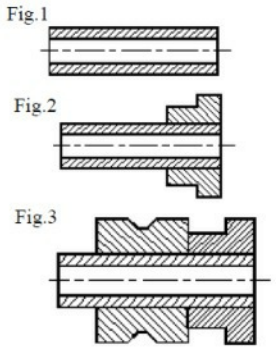


In the orthographic view shown below, notice that both sections AA and BB are positioned based on the cutting plane given. A cutting plane will always have arrows with indicate the area to be shown once the cut has been made. The letters allow you to identify which cutting plane relates to which sectional view.



BSI for Sections

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

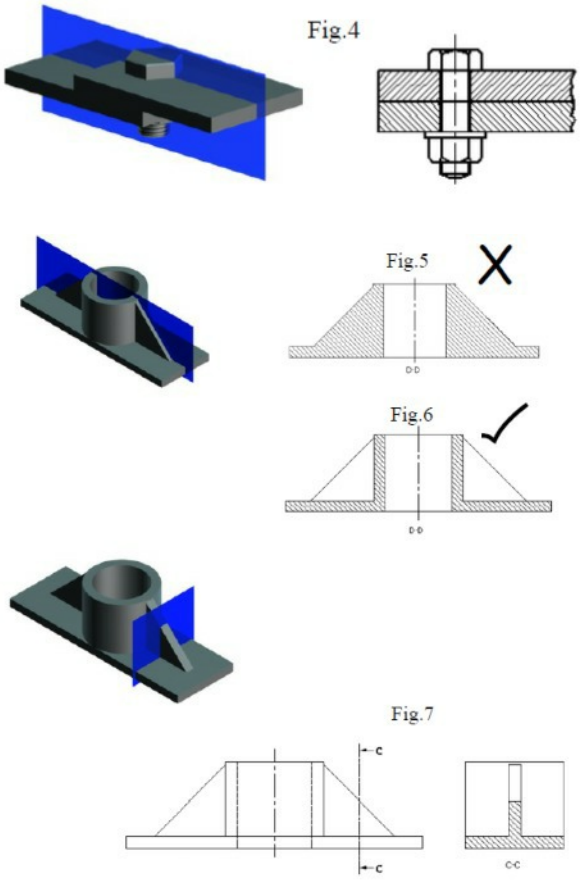


Hatching an object with more than one part (i.e. a sectional assembly) is achieved by firstly changing the direction of the 45° lines ***(fig 2)*** or if there are three or more parts , the spacing between the 45° lines can be altered ***(fig 3).***

BSI conventions also state the certain parts of a sectional view must not contain sectional detail and hatching lines.

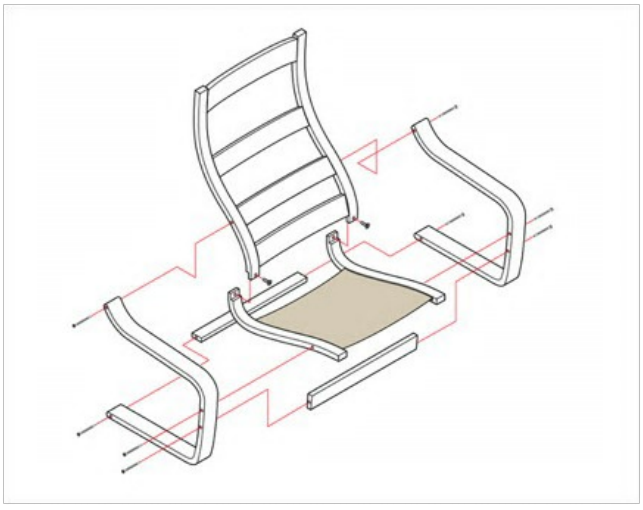
Parts that should not be hatched are: nuts & bolts (***fig 4),*** gears, axles, roller bearings, ball bearings, webs ***(fig 5 and 6),*** ribs, shafts, studs and machine screws .

There are exceptions to this however. The items listed above can be hatched when a cut crosses their axis. Fig 7 shows a straightened boss with the web cut across its axis.



Exploded Views

Exploded views are used in graphic communication to show how parts of an object fit together. They are called exploded because all of the parts are separated from each other. An example is shown below. IKEA use this type of drawing often to show how parts of flat pack furniture are to be assembled



BSI for exploded drawings

- Each part must line up with the part it is to be connected to .
- There must be a clear gap between views so that it is clear where parts go and easier to read the drawing.
- Exploded drawings can be drawn as orthographic or pictorial.

A/C and A/F

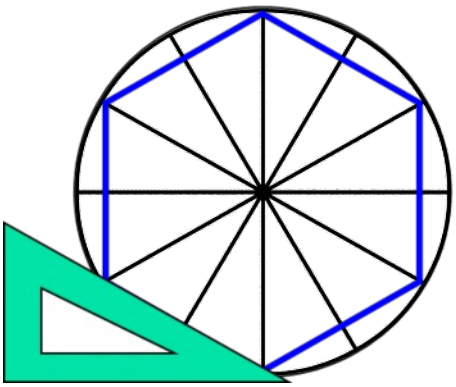
A/C and A/F

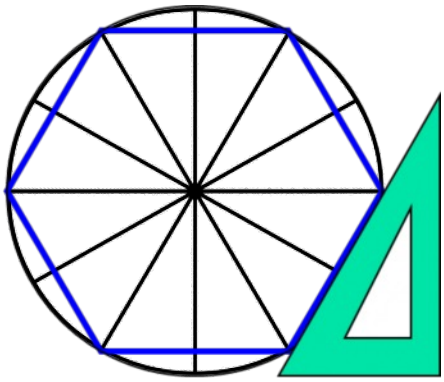
A/C = Across the corners and A/F = across the flats, refers to way in which hexagons and octagons are drawn. **They both determine the size of the hexagon or octagon.** Each method is shown below:

A/C - Across the corners: This results in a smaller hexagon/octagon.

1. Start by drawing a circle to the diameter given for the hex/oct.
2. Divide it into twelve segments using a 30/60 set square.
3. Then join the corners of the segments together as shown in the example below

NOTE: that the shape ends up inside the original circle and is therefore smaller.

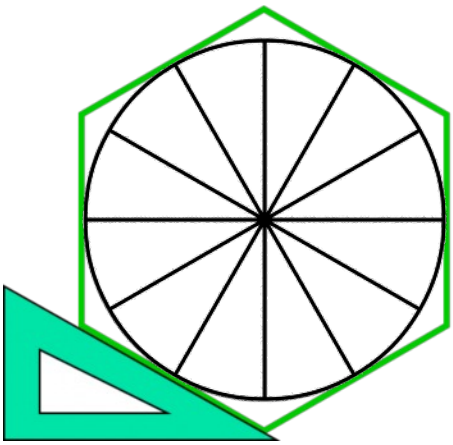


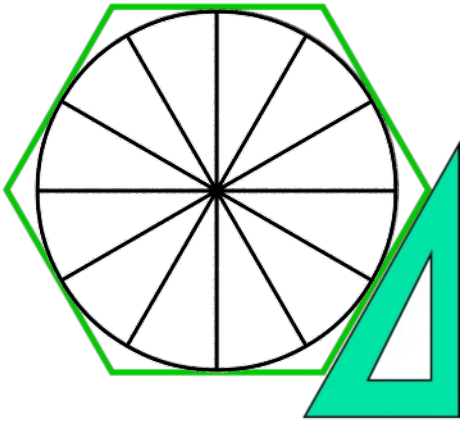


A/C - Across the corners: This results in larger hexagon/octagon.

1. Start by drawing a circle to the diameter given for the hex/oct.
2. Divide it into twelve segments using a 30/60 set square.
3. Then draw lines adjacent to the flats of the circle as shown below.

NOTE: that the shape ends up outside the original circle and is therefore larger.

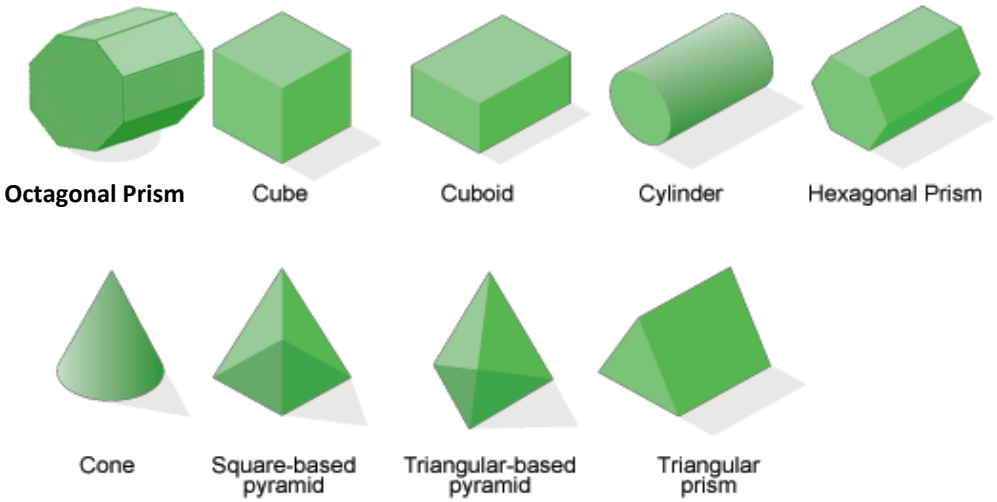




Geometry

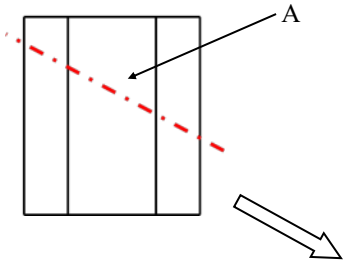
Prisms, Pyramids and Cones

Prisms are common geometric forms used in packaging and counter displays. There are several different types, each taking its name from the shape of its base. For your exam you will need to know each type of prism and how to draw them. Prisms are often drawn in orthographic. You will need to know how to draw cut surfaces as end elevations and plan views, whilst also understanding how to draw the true shape of a cut surface and produce a surface development of the prism. This is also true of pyramids and cones. Pyramids are square/rectangular prisms that have tapered (sloping) edges. Cones are cylinders that have tapered edges. You must know the following:



Surface Cuts on Prisms:

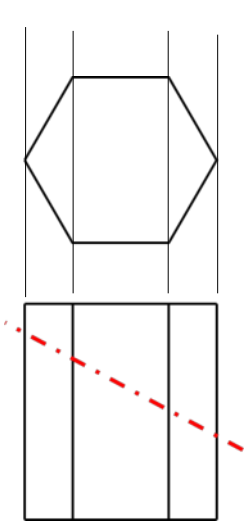
A surface cut refers to a cut that has been taken across any part of a prism. The surface that is left from that cut is known as the cut surface. In the example below, a surface cut (A) is to be taken across a hexagonal prism. From this the graphic designer would need to work out what the plan and end elevation would look like. A worked example is shown below.

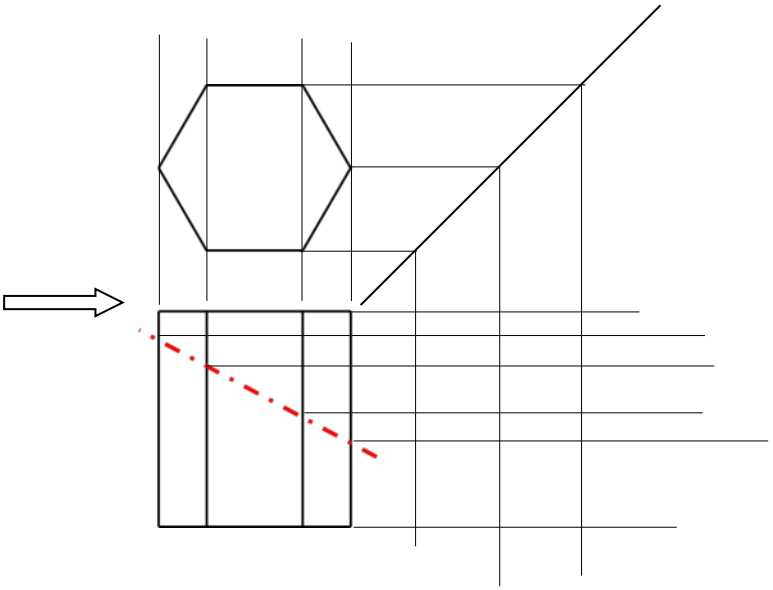


1. Produce the plan using the relevant method for A/C or A/F.

2. Check where the corners of the cutline hit the plan by projecting upwards.

NOTE: In this example the plan is shown as one surface as the cutting plane goes through the entire shape.



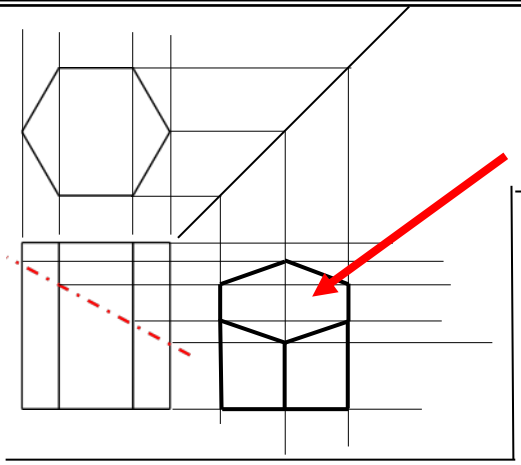


3. Project lines across from the plan and back down via the bounce line.

4. Project lines across from the elevation and in particular the cutting plane where it cuts the corners of the hexagon.

NOTE: This will build up the grid where you can produce the end elevation as shown on the next page.

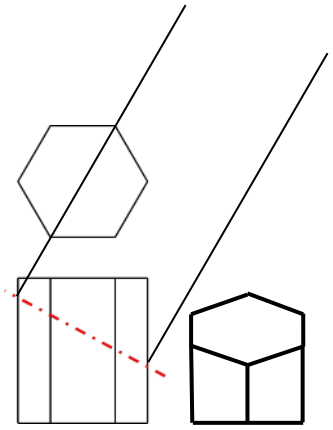
Geometry



5. Finally block in the relevant detail to reveal the end elevation.

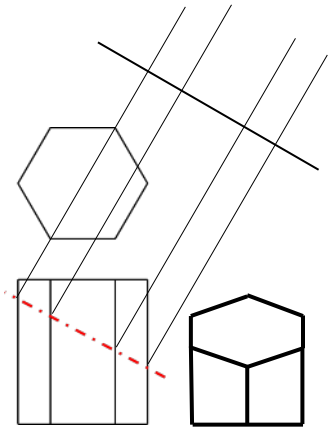
TRUE SHAPES:
Although we can see the shape of the cut surface in both the plan and end elevation, we do not know its true size. This is because in orthographic we are looking at these views straight on. This means that the sloping cut surface is obscured and the shape we see is smaller than its actual size. Therefore we need to draw a draw true shape.

The example below will explain this to you.



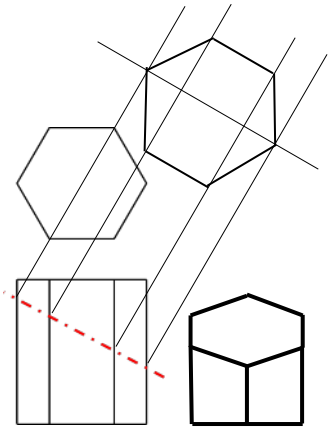
1. Project off of the cut surface on the elevation at right angles to find the **TRUE LENGTH.**

NOTE: The true length defines the exact length of the sloping surface. This can only be found by projecting off at right angles to the elevation.



2. Project further lines from the cut surface where the cutting plane meets the corners of the hexagon.

3. Draw a datum line that represents the centre of the hexagon



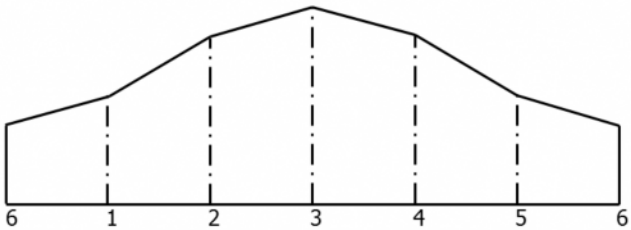
4. Measure the widths from the centre of the plan to the corners of the hexagon.

5. Step these sizes onto the relevant corner lines you have projected from the elevation.

6. Join the points to create your true shape.

SURFACE DEVELOPMENTS:
A surface development is similar to a net shape, the difference being, that a surface development focuses specifically on a set surface of the prism as opposed to its entire shape. For the hexagon above, the surface development would like the example shown right.

To draw this you would **1.** step off the width of one side of the hexagon 6 times onto a straight line. You would then **2.** project lines up/across from these points. Finally **3.** you would then step off the heights from the base of the elevation to cut surface and place them onto the relevant 6 lines of your surface development. This will produce a flattened out version of the surface for the cut hexagon.



This is used when planning packaging to design to evaluate how a package should be developed and assembled.

IMPORTANT STUDY NOTE:

Although the method shown above, demonstrates prism geometry on a hexagon, the method remains the same for square, triangular and octagonal prisms. It is also relatively the same for cylinders the only difference being that you will need a concentric circle to help you find points for the end elevation, plan, true shape, and surface development.

For **pyramids** and **cones** the method remains similar however the main change is in the surface development of these prisms. You will learn about these in class and will draw them whilst also learning how to answer NAT 5 exam style questions regarding this.

IN THE EXAM you may be asked to sketch an end elevation , true shape or surface development. You should be familiar with each technique, know how to draw them and be able to explain them.

Drawing Types - Building Drawings

Floor Plan

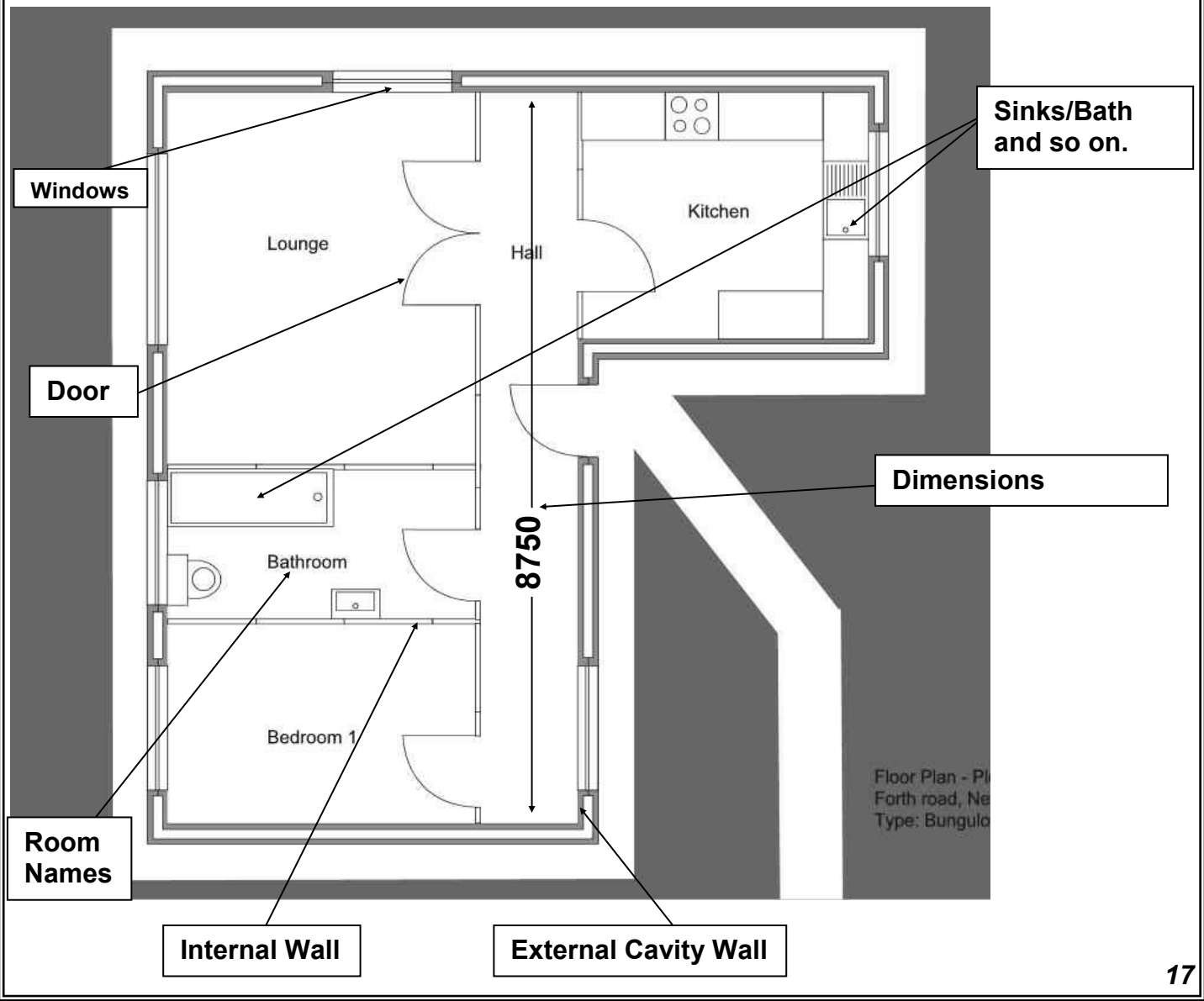
A floor plan is a type of sectional view. It represents a plan view of the building with the roof removed. This shows:

- The internal arrangement of rooms
- The position of doors and windows
- The type of internal and external walls

Floor plans are used by builders, electricians, joiners and plumbers to help plan and construct the building.

The scale of the floor plan depends on the size of the building but is usually **1: 50** (That is 50 times smaller than real size).

An example of a floor plan is shown below:



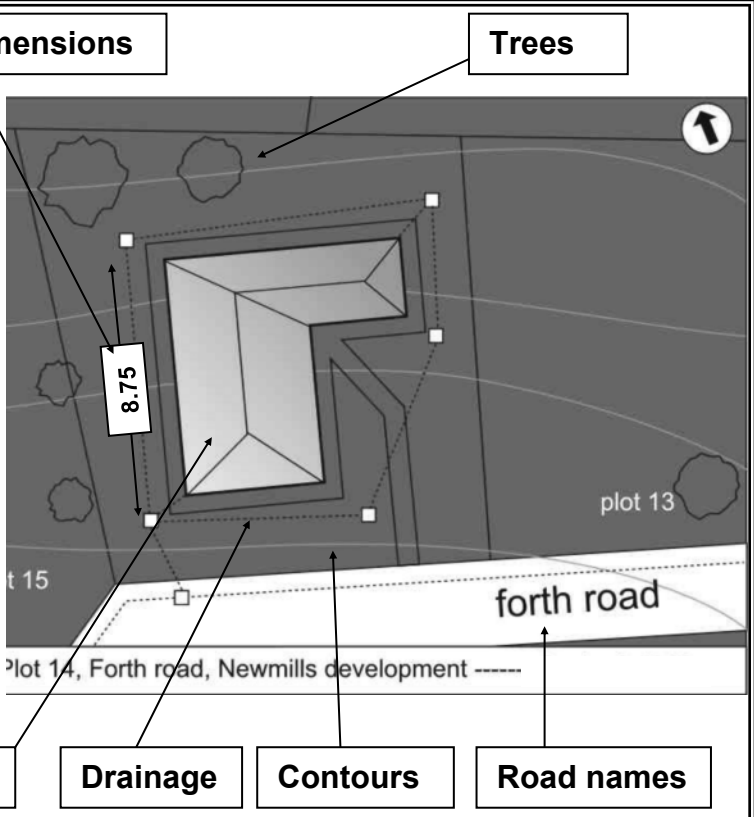
Site Plan

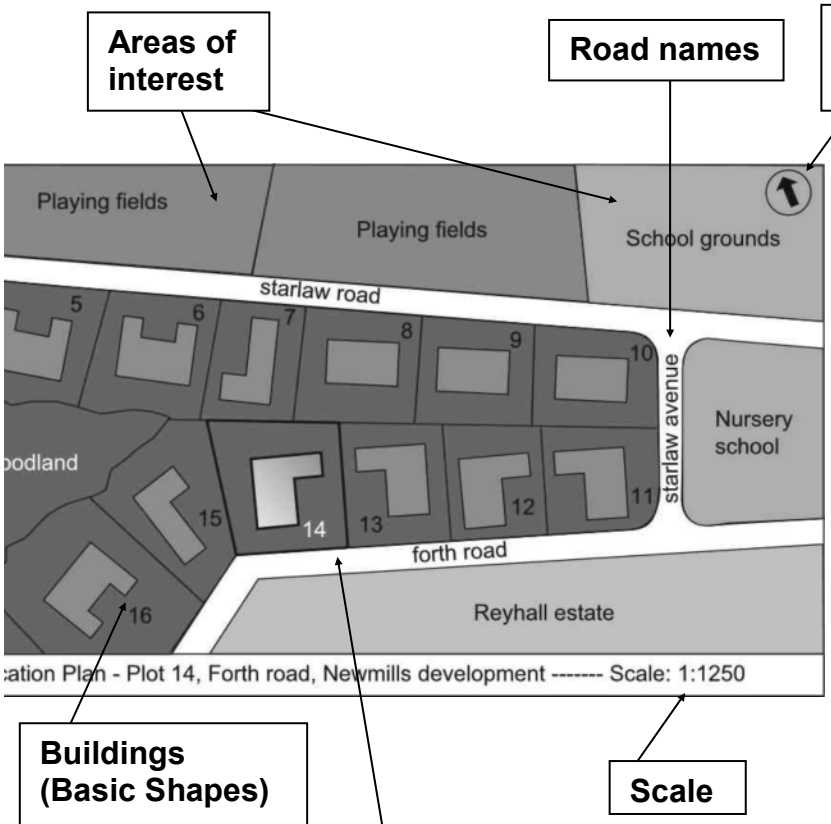
A site plan shows the site boundary surrounding a building. Paths, roads, trees and neighbouring plots are also shown.

This type of plot enables the builder to mark out the site and lay drainage pipes.

The scale of the site plan depends on the size of the building but is usually **1: 200** (That is 200 times smaller than real size).

An example of a site plan is shown:





Location (Block) Plan

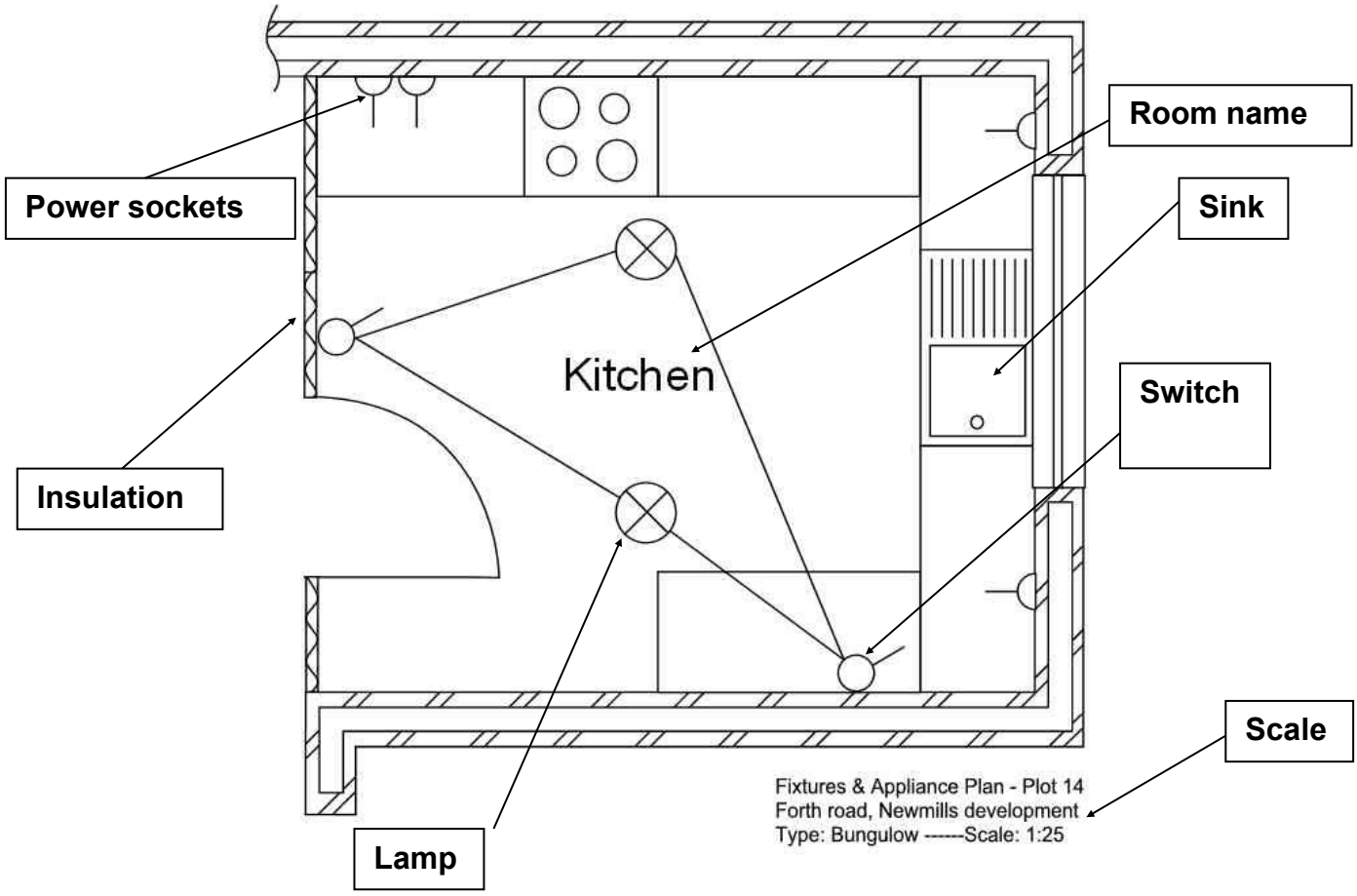
The location plan identifies the location of the new building within it's surroundings. It helps the builder to plan the layout of a new building scheme and is required by the local government planning department.

Location plans show the position of the proposed new building with regard to all of the new buildings in the development.

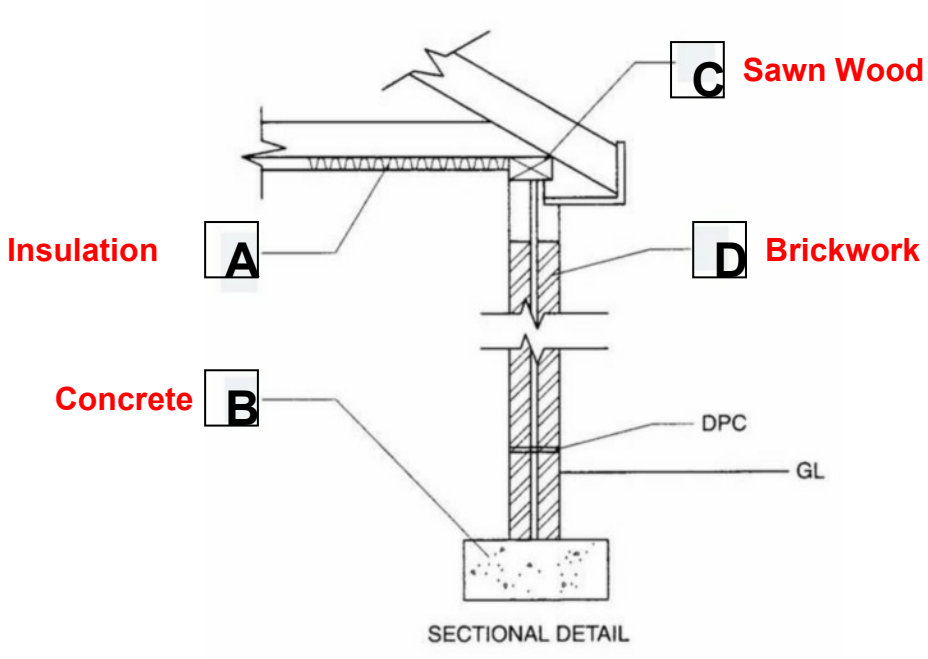
The scale of the location plan depends on the size of the whole building development but is usually **1: 1250.**

Detailed information – *appliance & fixture plans (Scale 1:25)*

Used to show detailed information of appliances and fixtures within an individual room/area.



Detailed information – *sectional views (Scale 1:20)*



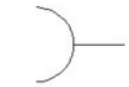
Building BSI Symbols

The most common British Standard symbols are shown below. They are split into 2 categories: Building Symbols and Circuit Symbols. You must recognise and remember all of these symbols.

Building Symbols


Lamp/Light


Switch


Socket


Brickwork


Insulation

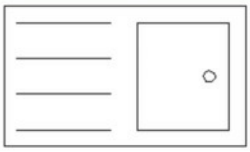

Door

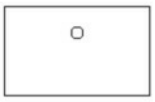

Window

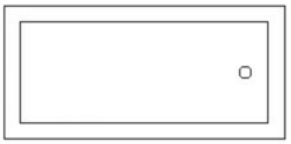

Concrete

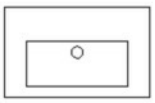

Sawn wood


Radiator

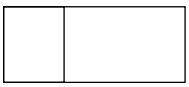

Sink Top


Sink


Bath


Wash Basin


Shower Tray


WC

Safety Symbol


British Standard Kitemark

Circuit Symbols


In-Line Valve

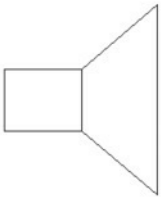

Battery


Crossovers


Switch


Electric Bell

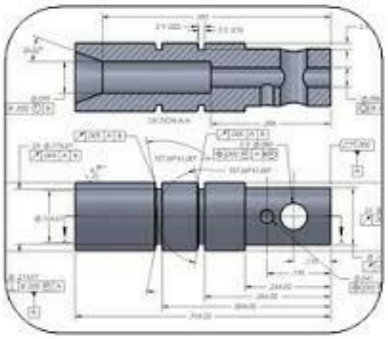

Microphone

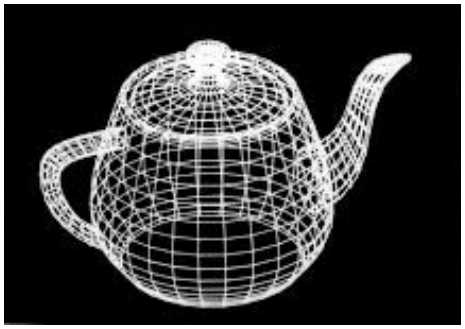

Loudspeaker

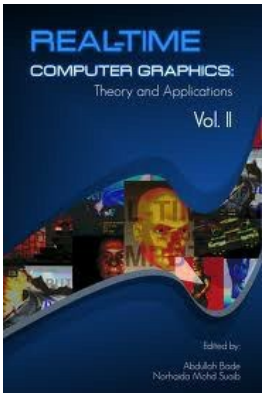
Graphic Communication: Impact on Society

Digital Graphics the Future:

Computer technology has revolutionised almost every industry, but none more so than graphics. Computers are used in the full range of preliminary, production and promotional presentations. In all instances, computers have made the design, editing and production of graphical items quicker, of higher quality and more cost effective. Almost all careers in graphics will require you to understand how to use computer technology to create and share ideas.







Communication:

The internet has revolutionised communication around the world. However prior to the worldwide web, communication of ideas was far slower, often relying on posting paper copies of documents or sending them via fax machines. Now with email you can quickly send text, pictures, animations or even programs to anywhere on the planet. With this almost instant worldwide communication, new problems have been created. Now, more than ever, communicating graphically has become vital.

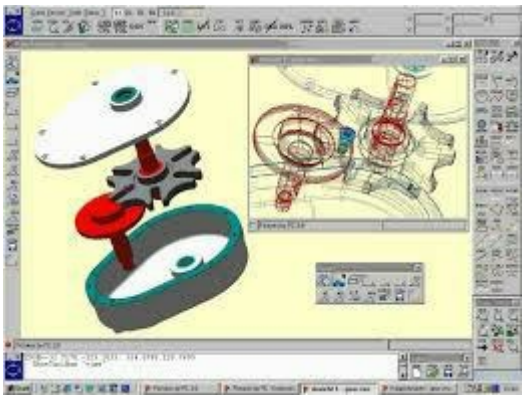
File Management and the Paperless Office:

Keeping organised is important in all aspects of your life. To keep track of your documents, you should have a filing system so that important items don't get lost, damaged or thrown away.
With a computer, it can be easy to lose track of all the files you create. You should take care to use sensible file names and folders– called directories– to store all your files.
You should also back up you files regularly: saving to a secure online site, external HDD or USB memory stick.

Digital technology has allowed a move to what is called a **'paperless office'** due to email and file storage, drawings don't always have to be printed on paper.

Manufacturing:

Computer-aided manufacture (CAM) allows 2D or 3D graphics to control computer-numerically controlled (CNC) machines to produce physical objects. Some 3D CAD software simulates (tests) the manufacture process prior to machining. CAD/CAM has had major social implications: many factories have replaced workers with automated CNC machines and this has caused unemployment.



Graphic Communication: Impact on Society

Computer Illustration:

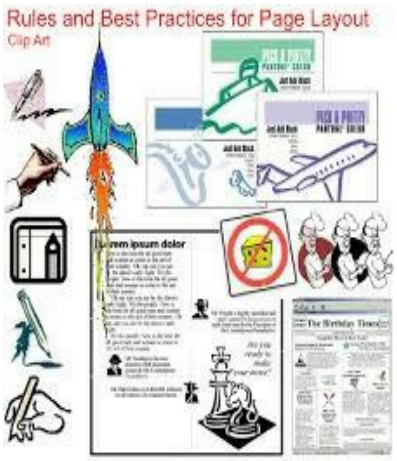
Computer illustration, sometimes called computer-generated imagery (CGI), is the technology used to create visually appealing or realistic-looking graphics.
Computer illustration has surpassed manual methods of illustration in most industries because of the many advantages that it offers.

Computer illustrated images do not rely on the designer having traditional manual skills with artistic tools. These skills are replaced by the imagination and creativity to produce images that have special impact.

New technologies, from the internet and phone applications to video games and architecture, rely on illustrators to create the graphics and images that will appeal to the target audience.

Desktop Publishing:

Desktop publishing (DTP) is the process of using software to create publications such as magazines, newspapers, books, leaflets and posters on a desktop computer or laptop. In short, it enables the production of documents that combine text and graphics.
The industry that creates these documents is the **publishing** industry, while the physical paper documents are produced by the **printing** industry. The publication is designed by a **graphic designer**.



Increasingly in the publishing industry, many functions are outsourced to specialist companies or to self-employed individuals.
Promotional graphics don't only appear in magazines and news papers. Sign making, vehicle wrapping, advertising hoardings and digital media all make use of DTP technologies.
DTP is used extensively to advertise and market products, which in turn influences consumer choice.

Benefits of modern printing methods to the industry and society:

In the recent past, printing, publishing and sign making for a mass market were very labour intensive processes that depended on large machines operated by a very large workforce. The printing and paper industries were also responsible for significant forms of pollution to our environment.

This has changed with DTP production, digital printing methods and computer-aided manufacture (CAM). Modern printing methods bring a number of benefits to the industry and our society:

- The quantities of paper and ink can be controlled digitally to minimise waste.
- Printing inks are becoming 'greener'. Sustainable, eco-friendly inks based on vegetable oils are beginning to replace petroleum-based inks.
- Modern printing technology can use paper that is 100% re-cycled without loss of quality. This reduces the environmental impact of paper production.
- Electronic newspapers and news feeds further reduce the use of paper.
- Modern printing technologies are more energy efficient than previous methods.
- The printing and publishing industries create many thousands of skilled jobs in Britain.

Computer Systems - Hardware

Computer hardware can be described as the physical components of a computer. These are the things that allow the computer to carry out its vital functions and operations like a Modem.

A **modem** allows the computer to connect to and transmit data to and from the internet i.e. opening web pages and sending emails.

For the exam you will need to know the function of a modem and also the names and functions of the following **input**, **output** and **storage** devices.

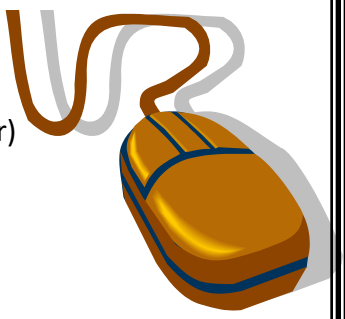
Input Devices - *Input information into the computer to help you control it.*

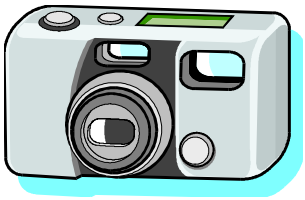
Keyboard

The keyboard includes letter, number and function keys. These keys are used to send letters and numbers to the screen and to send commands to the computer.

Mouse

The mouse is used to guide a pointer (cursor) around on the screen. Functions are selected by clicking on the control buttons.



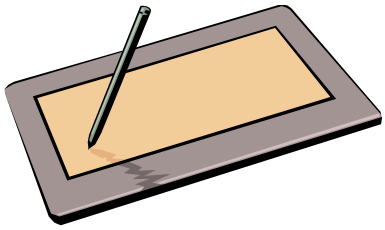


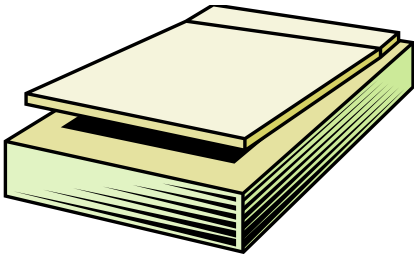
Digital Camera

This device saves images in a digital form. The images can be downloaded onto a computer for enhancement in an image editing program. Digital cameras don't use film and you can instantly view the images taken. Graphic artists often use digital cameras to create images for brochures and instruction manuals.

Graphics Tablet

This device gives pinpoint accuracy because the puck or stylus detects an exact position. This makes it ideal for tracing line drawings or for inserting CAD library components.





Flatbed Scanner

A Scanner electronically converts a paper-based image into a computer file. Drawings, photographs and text can be scanned in full colour.

Hand Held Scanner

This device works in the same way as a flatbed Scanner, except it is held by the operator and moved by hand.

Output Devices *output information to show what the computer is doing or what you have produced.*

Monitor (Visual Display Unit or VDU)

Modern monitors use technology which can display high resolution images. The bigger the monitor, the more of the work can be seen at the same time. 17" is a minimum useful size for a monitor.

Flatbed Plotter

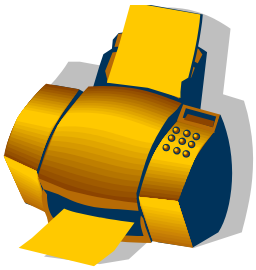
This device produces medium quality output. Paper sizes are limited by the size of the bed. Coloured pens are changed as required. An arm moves left to right and forwards/backwards to plot the print detail delivered from the computer. Very useful for printing CAD line drawings.

Drum Plotter

Drum plotters are used in industry to produce drawings on very large sheets of paper up to A0 size. The paper is supplied on a roll which is rotated back and forth to provide one axis of movement while the pen carriage moves from side to side giving the second axis of movement.

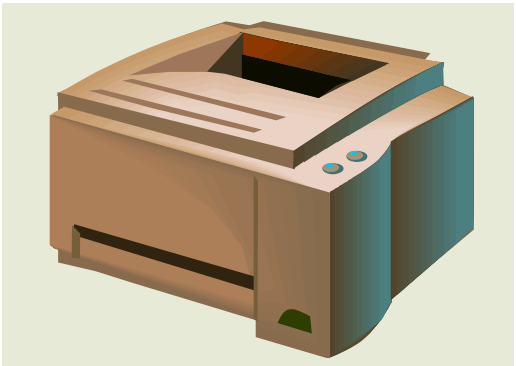
Ink-Jet Printer

An ink-jet printer sprays a jet of ink onto the page to form text or graphics. The print quality is usually very good and they are not too expensive to buy. The running costs can be high if you are printing colour graphics. Inkjet printers can be quite slow. In comparison to laser printers the ink for these printers is relatively cheap. The ink takes time to dry however, meaning it can smudge if touched too early.



Laser Printer

Laser printers produce very high quality output (600 dots per Inch or better). They are much faster than inkjet printers and produce better quality print outs. Running costs are cheaper when printing bulk print outs as they use toner ink, however laser printers are expensive and can therefore be non viable for the individual consumer.



Speakers

Allows the computer to produce sound.

Storage Devices - *allows you to store and backup data.*

Hard drive

This a magnetic Storage device which is usually located within the Central Processing Unit (CPU). It is used to store the operating system and the software used by that computer. Typical capacity 16GB—4TB

External Hard drive

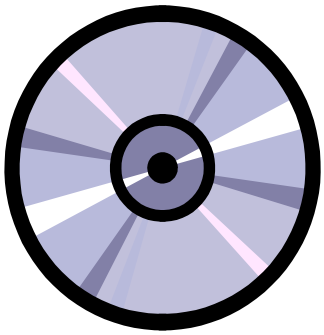
Similar to the magnetic Storage device located within the Central Processing Unit (CPU). Here though, the disk is separate from the computer and connects to it via USB. These are used to store files and backup data. Typical capacity 16GB—4TB

Recordable Compact Disk CD-R

An optical medium which can be read in any CD-ROM drive, though it requires a special drive to record. Storage capacity 700MB

Digital Versatile Disk (DVD)

An optical medium similar to a CD-ROM with a much larger storage capacity—Typically 17GB



Blu-Ray Disc

Advanced optical medium similar to a CD/DVD with a much larger storage capacity—Typically 50GB

Memory Stick/USB Flash Drive

This is a storage device with a capacity of up 22GB. Can be connected to any computer via the USB port.

SD and SD Micro Cards

Small storage cards that hold several GB's. Used to store photos in camera and camcorders.

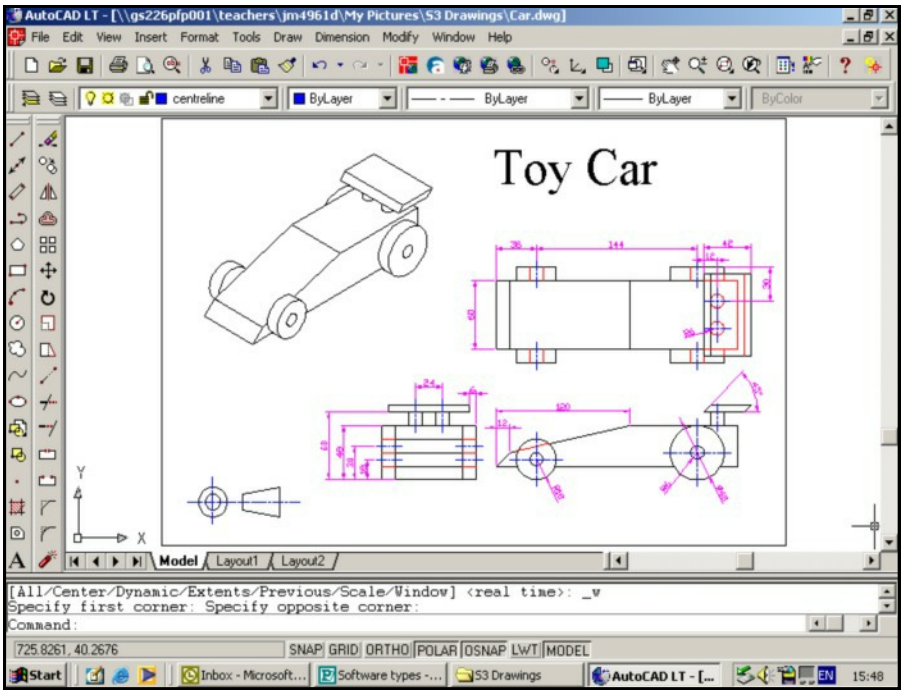
Computer Systems - Software

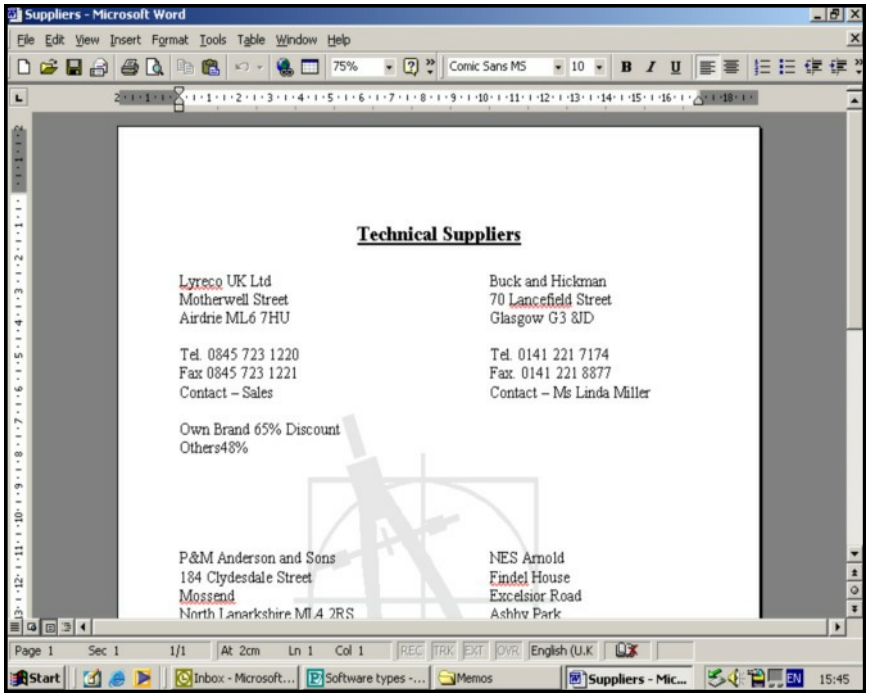
Software Used In Graphic Communication

Computers have greatly influenced the work of designers and graphic artists who previously did all of their work on paper. They now have access to many software packages which make their work easier. Some of the software packages available are illustrated below:

Computer Aided Designing/Drawing (C.A.D.)

CAD packages such as *AutoCAD* have numerous advantages over pencil and paper. These advantages are described elsewhere in These notes.





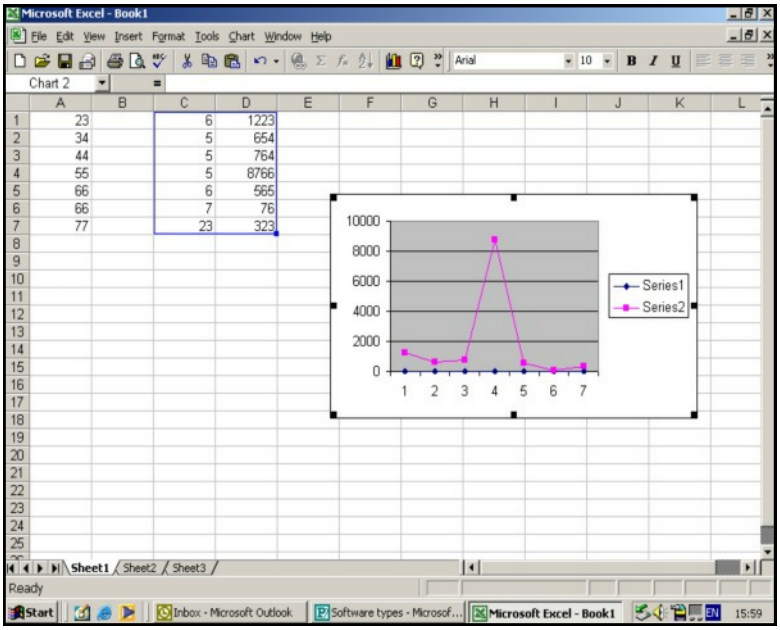
Word Processing

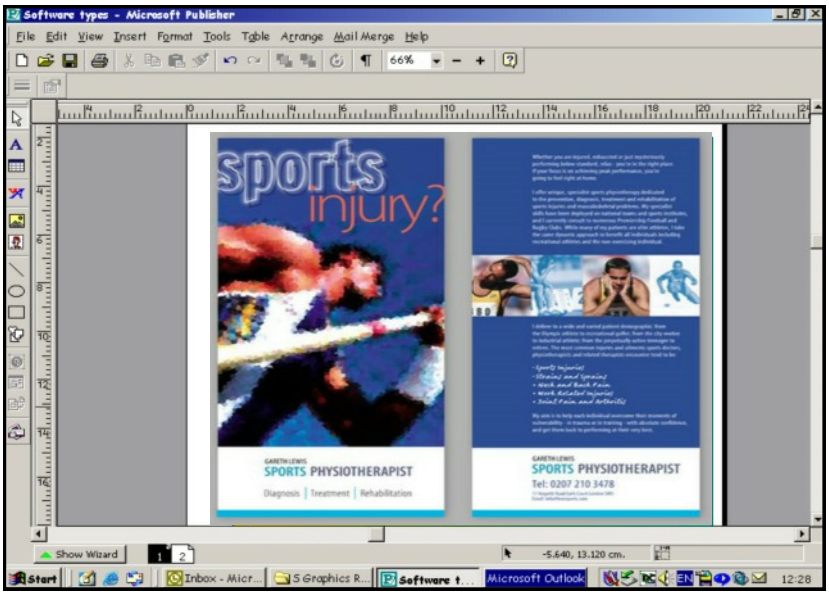
Word Processing packages such as *Microsoft Word* allow the input and editing of text. They can be used to produce a wide range of text documents such as letters,
reports, manuals and mailing lists.

Spreadsheets

Spreadsheets are used for inputting and automatically calculating tables of numbers. Changes can be made quickly and easily: if one number is changed, all of the numbers are recalculated.

Spreadsheet software such as *Microsoft Excel* can automatically produce Graphs and Charts for Presentations.





Desktop Publishing (D.T.P.)

DTP packages like *Microsoft Publisher* are used to create publications such as brochures, magazines and newsletters by combining text and graphics. They contain many powerful functions which allow complex page layouts to be created accurately.

Illustration Software

Illustration packages such as *Serif Draw* can be used to add colour, tone and texture to CAD drawings or to create new drawings/graphs from scratch.

Complex illustrations can be created and easily edited using this type of software.