

Course Support Materials

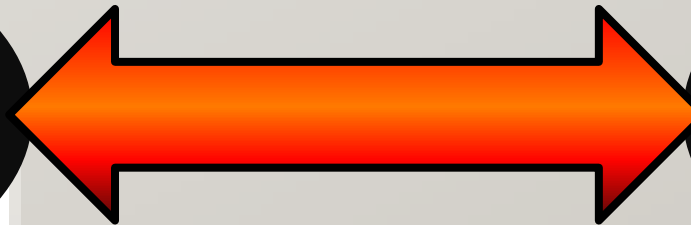
Higher & N5 Graphic Communication

Click anywhere to get started

Home

**Specimen
Papers
Explained**

**Course
Assessment
Specification**





Main Menu 1 of 4

Graphic types	Manual techniques	Computer-aided techniques	Skills in applying drawing standards, protocols and conventions	Geometric shapes and forms
Knowledge and understanding of the role of preliminary , production and promotional graphics in graphic communication activities.	Knowledge and understanding of the use and role of manual graphic communication techniques and processes and their relative merits compared to electronic methods . Knowledge and understanding of a range of common manual graphics media.	Knowledge and understanding of computer-aided techniques, computer-aided design and draughting, desktop publishing , digital capture/input and output techniques and devices .	Knowledge and understanding of recognised drawing standards, protocols and conventions through application, identification and recognition in given contexts, views and items. Line types (including dimension lines, centre line, hidden detail, cutting planes, fold lines) , dimensioning (linear, radial, angular, diameter and tolerance) , and symbols for sections, hatching, building construction , and third angle projection system .	Knowledge, understanding and skills in spatial awareness when interpreting geometric shapes and forms and/or those used in the communication of products, components, assemblies and other items. Interpenetration and intersections of right prisms and cylinders , true shapes, ellipses, common geometric forms and partial cuts of those forms, components built from various simple combinations of forms





Main Menu 2 of 4

Views and techniques	Illustration techniques	Techniques used for producing effective promotional documents and publications	Using technology in graphic communication
Knowledge and understanding of the role, benefits and use of a variety of views and techniques in 2D, and 3D and pictorial formats , in communicating geometric shapes and forms, objects, components, assemblies and other items including: third angle orthographic projection, tangency (internal and external radii location) , true length and true shape, surface development, a range of sectional views (full, part and stepped) , assembly drawings(minimum three parts), auxiliary views where required, exploded views (full and sectioned) cut-aways, oblique , isometric , planometric views, including use of appropriate scales .	Knowledge and understanding of the use of illustration techniques used to support effective graphic communications – the use, role and common techniques for representations of light, shadow, reflection , tone layout, material and texture. Knowledge of visual enhancement techniques, for instance, mediated reality	Knowledge, understanding, recognition and interpretation of the application of techniques used in the production of promotional documents including: colour (warm, cool, contrast, harmony, accent, advancing and receding) , line, shape, texture, value, mass/weight, alignment, balance, depth, dominance, emphasis, proportion, rhythm, unity/proximity, white space and grid structure . 3D rendering techniques including: light source, materials, reflection, shade and sited environment .	Knowledge and understanding of ranges, features and uses of graphic hardware and software computer systems and networks, file management, cloud computing, cloud storage and digital rights management ; digital input and output devices and the advantages and limitations of computer-aided design/draughting . 2D CAD ADVANTAGES 3D CAD ADVANTAGES





Main Menu 3 of 4

Drawing Tools:	Modelling Features:	Modelling Edits:	Constraints:	Terminology:
line , circle , rectangle , ellipse , trim , array (linear , box and radial), offset , mirror , project edge , extend	extrude , revolve , loft , helix/helices , path (extrude/sweep along a path)	shell , fillet (regular/consistent), chamfer (regular/consistent), fillet (irregular) , chamfer (irregular) , mirror , array (linear , box and radial), add , subtract , intersect	linear , radius , diameter , perpendicular , parallel , fixed , tangent , concentric	component , assembly , sub-assembly , workplane/plane , axis , feature , profile , sketch , face , edge , datum , suppress



Assembly:	Views:	Modelling Concepts:	File Types:	CAD libraries:
mate , align , centre axis , orientate , offset , tangent , stock/library components	solid model , wire frame	top down modelling , bottom up modelling , vertices , edges and faces , modelling tree/hierarchy , modelling plan	dxf , 3ds , step/iges	the use and function of CAD libraries and stock models





Main Menu 4 of 4

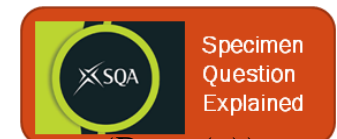
Desktop publishing	Planning strategies	Design Elements	DTP File Types	Graphic communication technology and society
<p>Knowledge, understanding, recognition and interpretation of generic desktop publishing terms and techniques including: copy/paste, text box, handles, colour fill, colour picking, textured fills, gradient fill, margin, single and multi-page format, title, extended text, alignment, page size, orientation, drop caps, linespacing,, heading, cropping (square and full cropping), text wrap, flow text along a path, bleed, pull quote, transparency, drop shadow, rotate, justification, paper sizing, reverse, column, gutter, caption, header and footer and folio.</p>	<p>thumbnails, visuals and annotation, proofs (pre-press), register marks, crop marks, run off.</p>	<p>Bleed ,grid, guides, snap, master page layers, serif and sans serif, font styles, column rule/rule, indent, hanging indent, dropped capital, running headline, reverse, import/export.</p>	<p>Knowledge and understanding of file types: Raster (tiff, jpg, png, bmp), vector (svg, dxf), including their advantages and disadvantages.</p>	<p>Knowledge and understanding of the impact and influence of computer-aided design/draughting systems and graphic communication technologies on industry and society – for example: the paperless office, use of recycled materials, computer-aided design/draughting as it supports manufacturing and other industries, DTP in marketing and promotional activities, remote working, communication crossing international boundaries.</p>



(Part (a))



(Part (b))



(Part (c))



Preliminary Graphics

Further
Reading...



- These are our planning activities. They usually consist of simple 2D & 3D sketches, dimensioned sketches, thumbnails, working roughs, market research, etc. We need to complete these so we know what is needed in the next stage.
 - **Product** – Ortho sketches, pictorial sketches (isometric, 1pt & 2pt perspective), pencil & marker rendering, models, market research charts, surveys
 - **DTP** – Thumbnails & working roughs, market research charts, surveys
- **Key words**

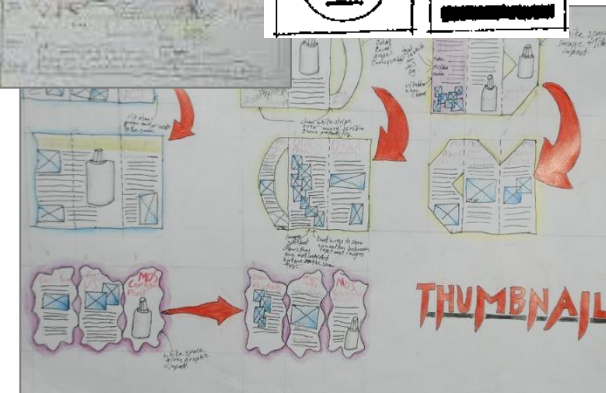
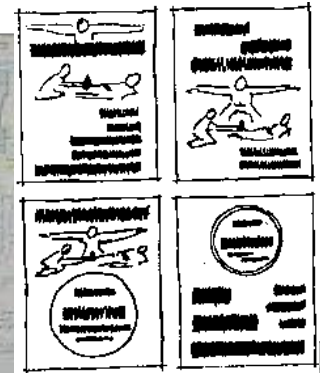
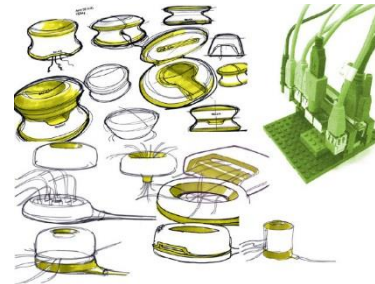
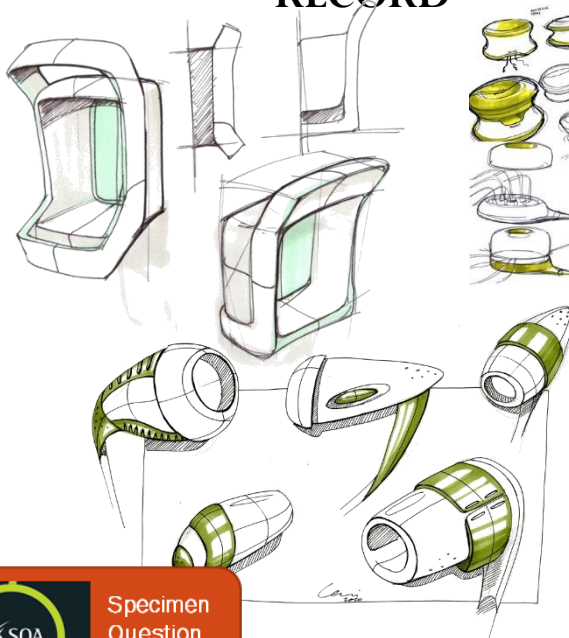
RECORD

PLAN

DEVELOP

CREATE

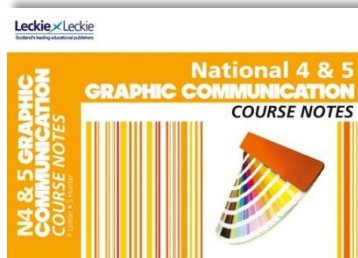
COMPARE



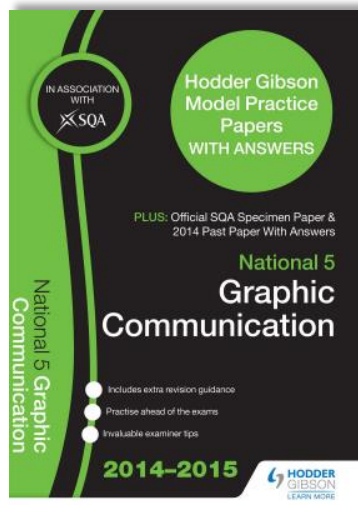
Specimen
Question
Explained



Further Study:



- Page 15 - Read
- Page 16 - Read



- Page 84 – Q4a
- (model paper 3)

Production Graphics

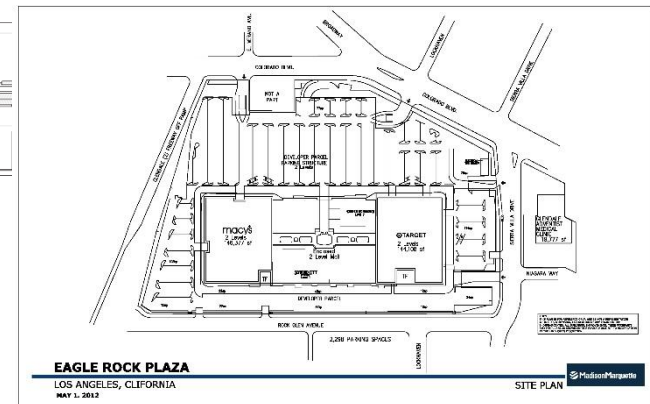
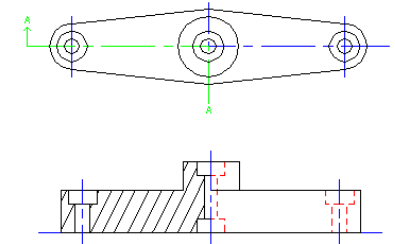
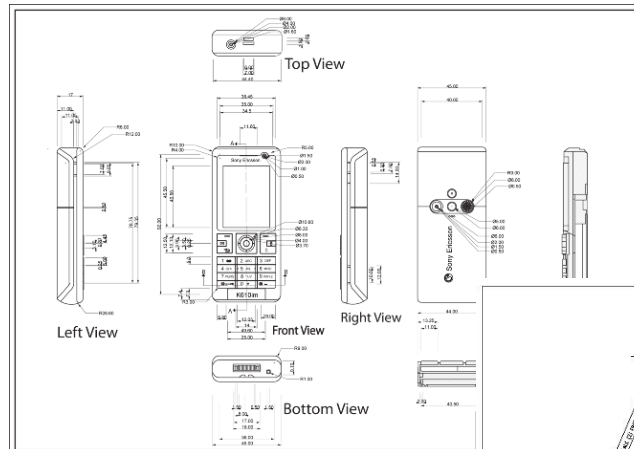
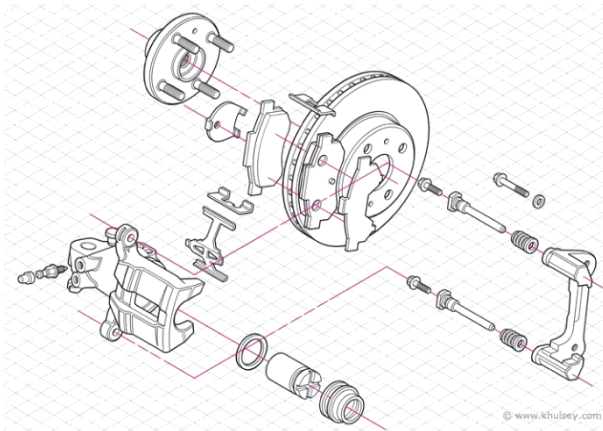
Further Reading...



- The drawings contain precise information about the object: sizes, tolerances, etc. They are likely to be dimensioned orthographic, exploded isometric, assembly drawings, etc.
 - Product – component drawings, manufacturing drawings, assemblies, exploded views, sectional assemblies, tool drawings, parts lists, etc
 - Construction – site plans, location/block plans, floor plans, drainage, wiring diagrams, surveys, etc
- **Key words**

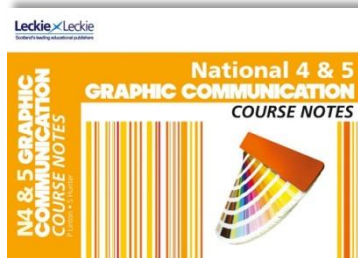
PRECISE SCALE MANUFACTURE CONSTRUCTION
DIMENSIONS

TOLERANCE

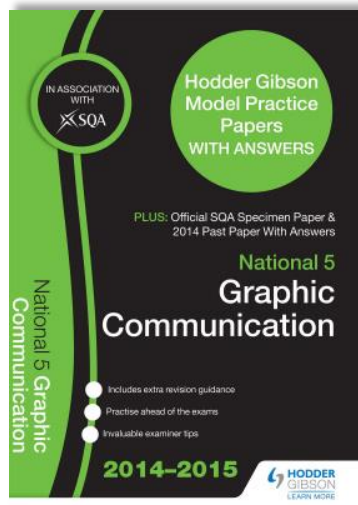




Further Study:



- Page 15 - Read
- Page 16 - Read
- Page 46 - Read



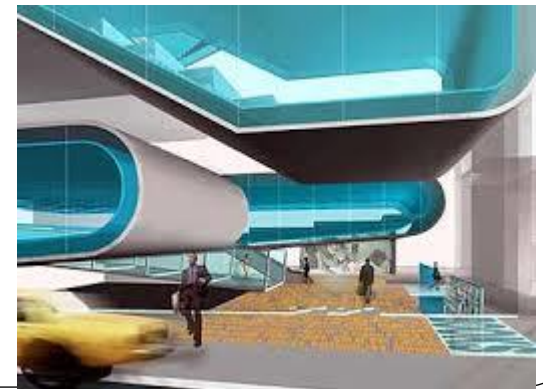
- Page 48 – Q5i
- (model paper 1)
- Page 68 – Q5c
- (model paper 2)

Promotional Graphics

Further Reading...

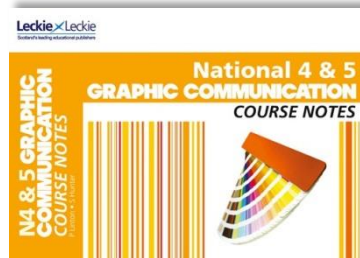


- These graphics bring peoples attention to the product. They will include illustrative graphics and written material. They are used to advertise and sell the product.
- They could include magazine covers, brochures, CAG renderings, CAG environments, illustrations, presentations, displays, models, flyers, packaging websites, animations, photographs.

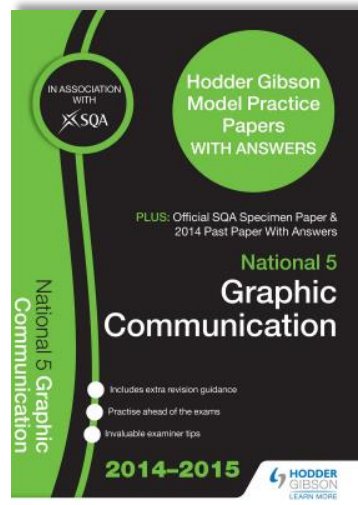




Further Study:



- Page 15 - Read
- Page 16 - Read
- Page 97 - Read
- Page 110 - Read

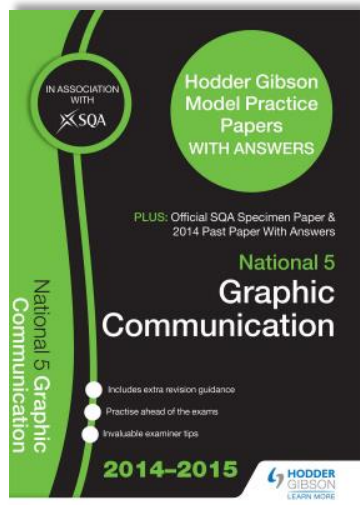
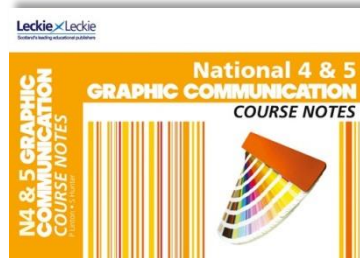




Manual vs Computer Graphics - Comparison

Further Study:

- Page 17 – Read





Interpenetration of 2 Cylinders

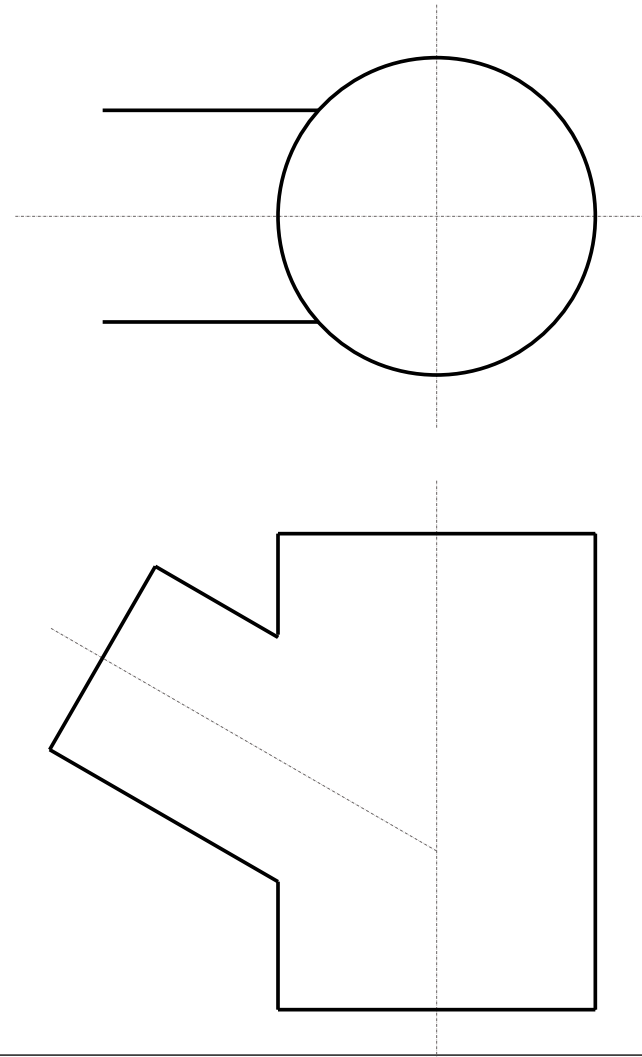
The drawing shows the part Plan and part Elevation of an interpenetration between two cylinders.

Draw :-

The completed Elevation

The completed Plan

The End Elevation

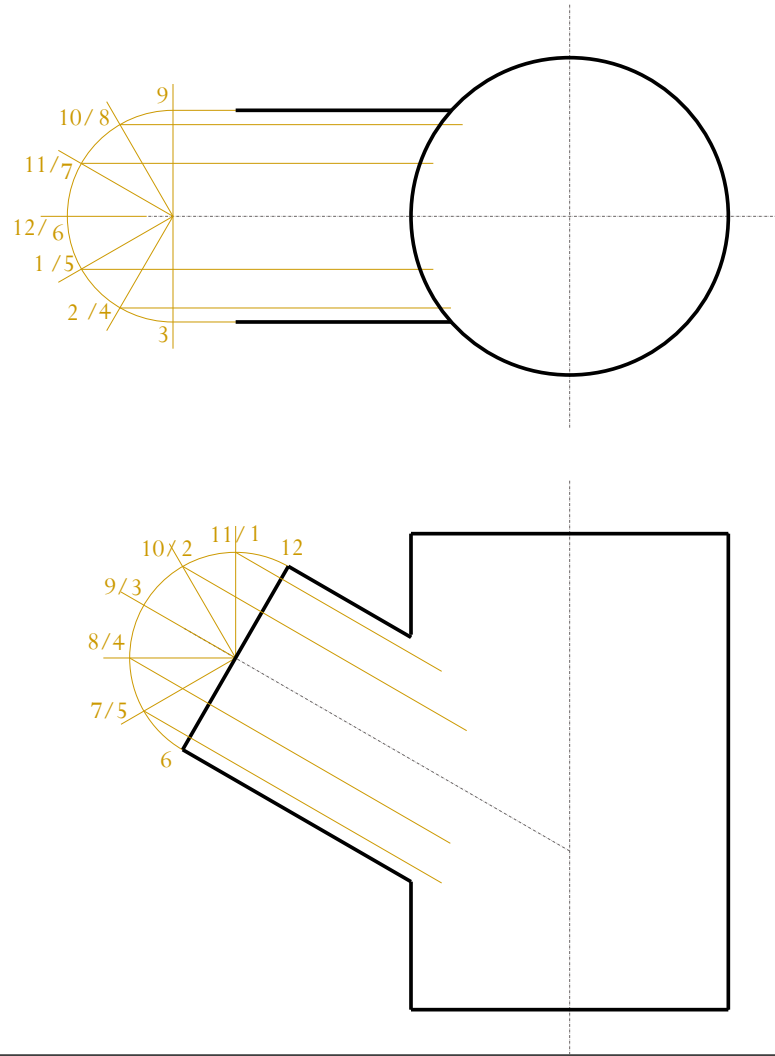


Drawing Generators on Plan and Elevation

Divide the Elevation and Plan into $30^\circ/60^\circ$ parts and number each of the points.

Draw generators from these points on the Plan until they cut the main cylinder.

Project the generators on the Elevation parallel to the angle of the sides of the small cylinder.



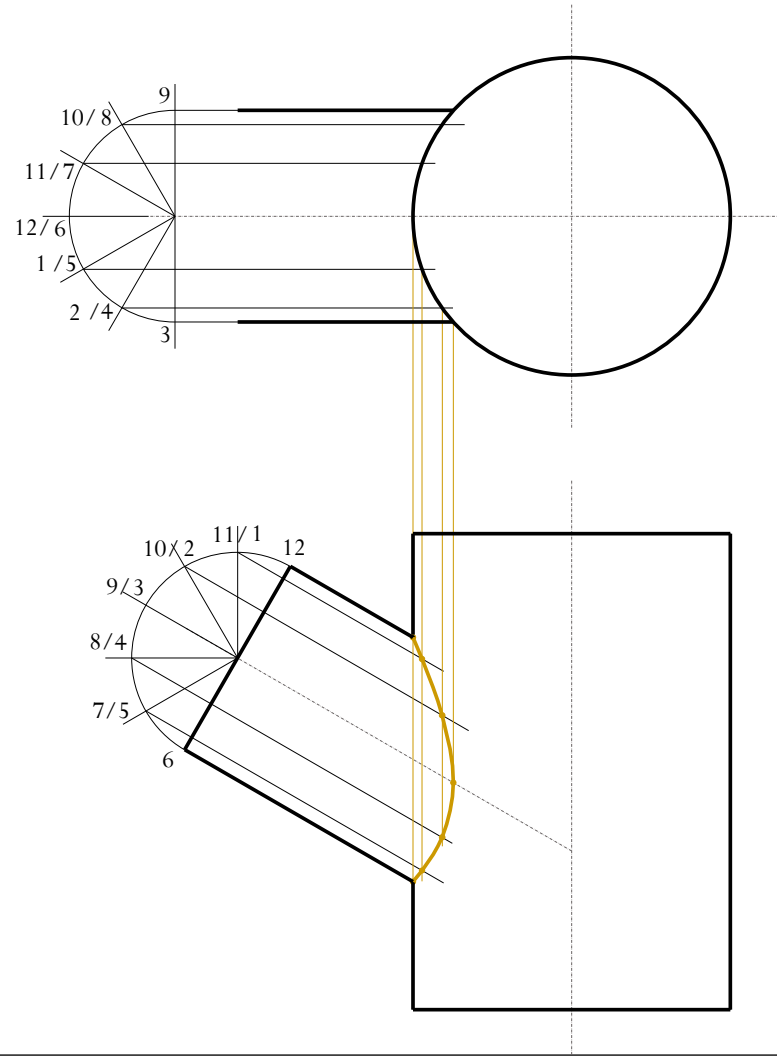
Finding Points of Interpenetration

Project points from
Plan where generators
cut the main cylinder.

Mark where each of the projected lines cross the appropriate generators on the Elevation with a small dot.

Draw a smooth curve through each of the points.

This line of interpenetration can now be darkened.

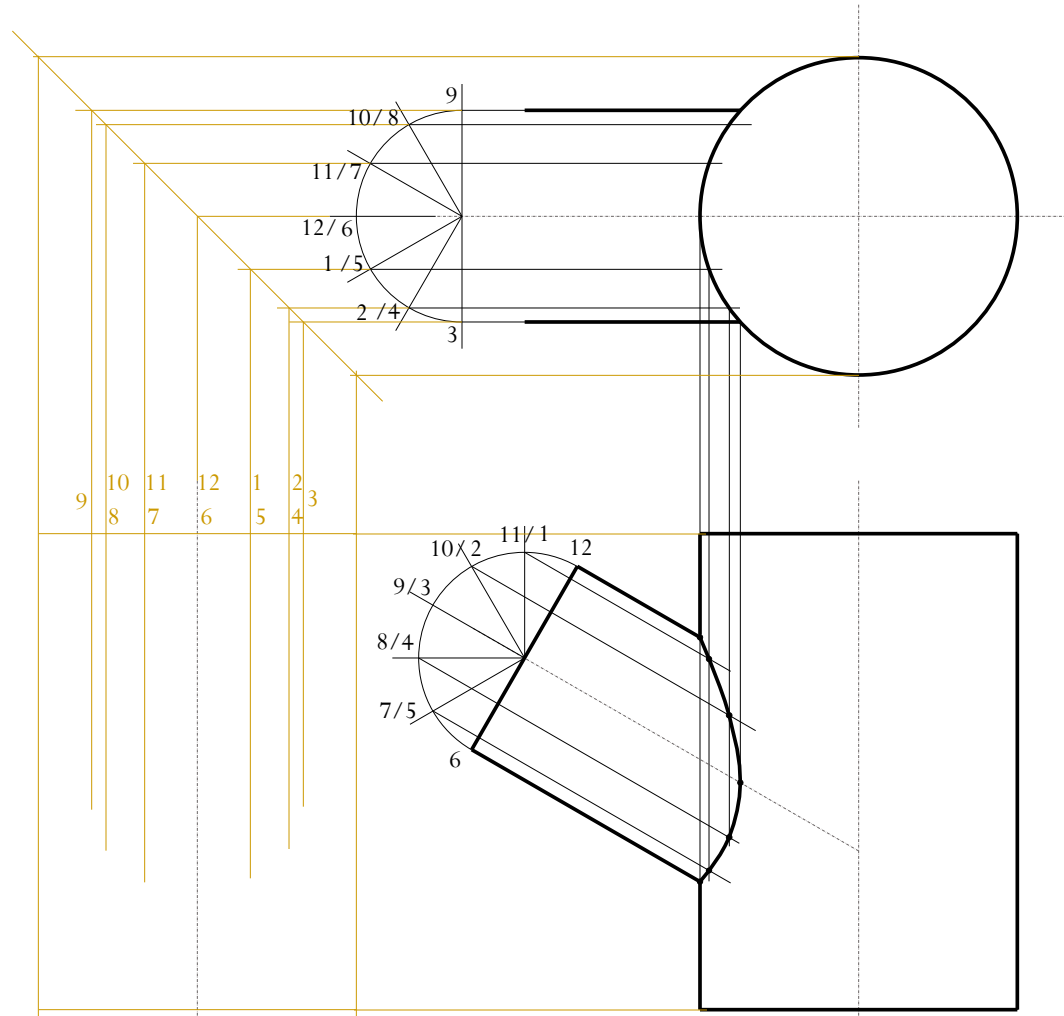


Drawing Generators for End Elevation

Find the position of the
End Elevation.

Project the 12 points
from the Plan onto the
End Elevation.

Number the points
found on the End
Elevation.

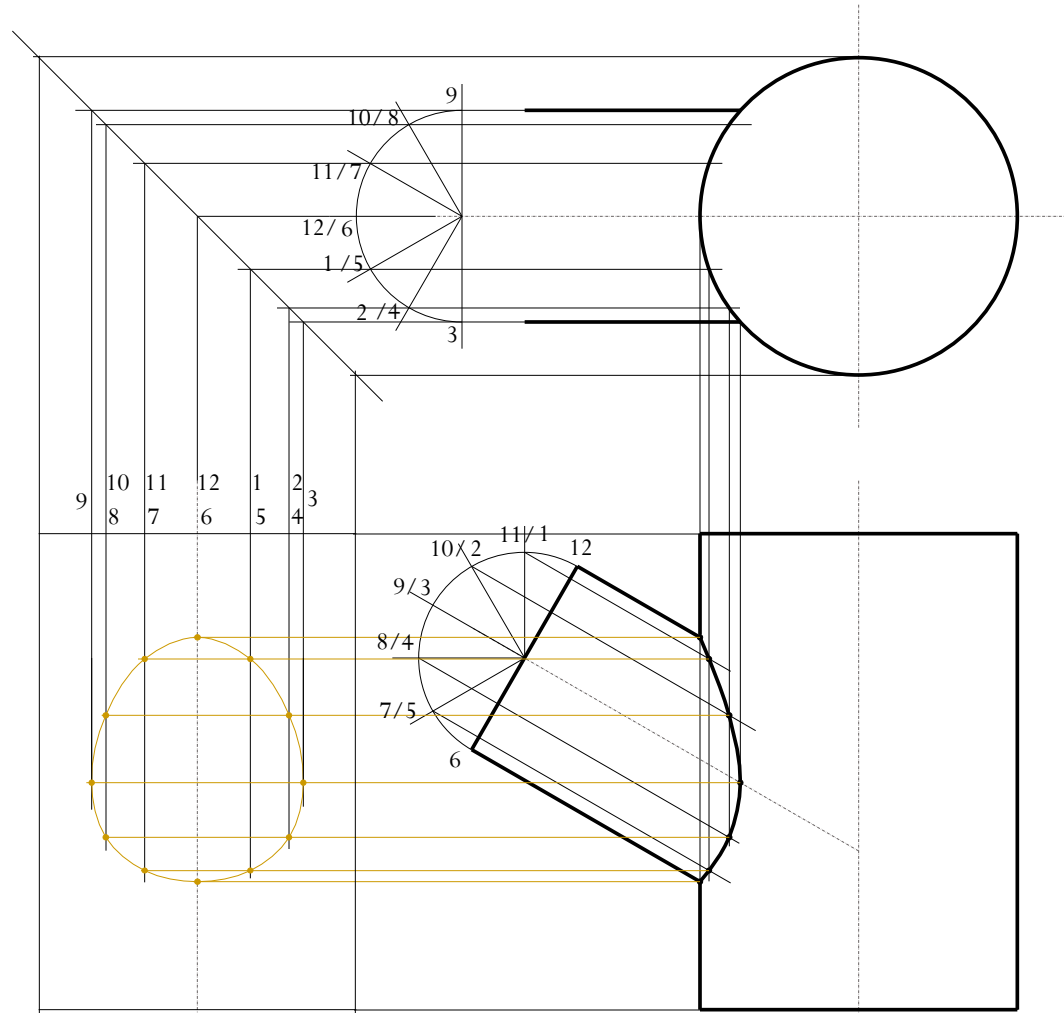


Finding Points of Interpenetration on End Elevation

Project the points from the curve of interpenetration on the Elevation across to the End Elevation.

Mark where these lines cross the appropriate generator on the End Elevation with a small dot.

Draw a smooth curve through each of the points.

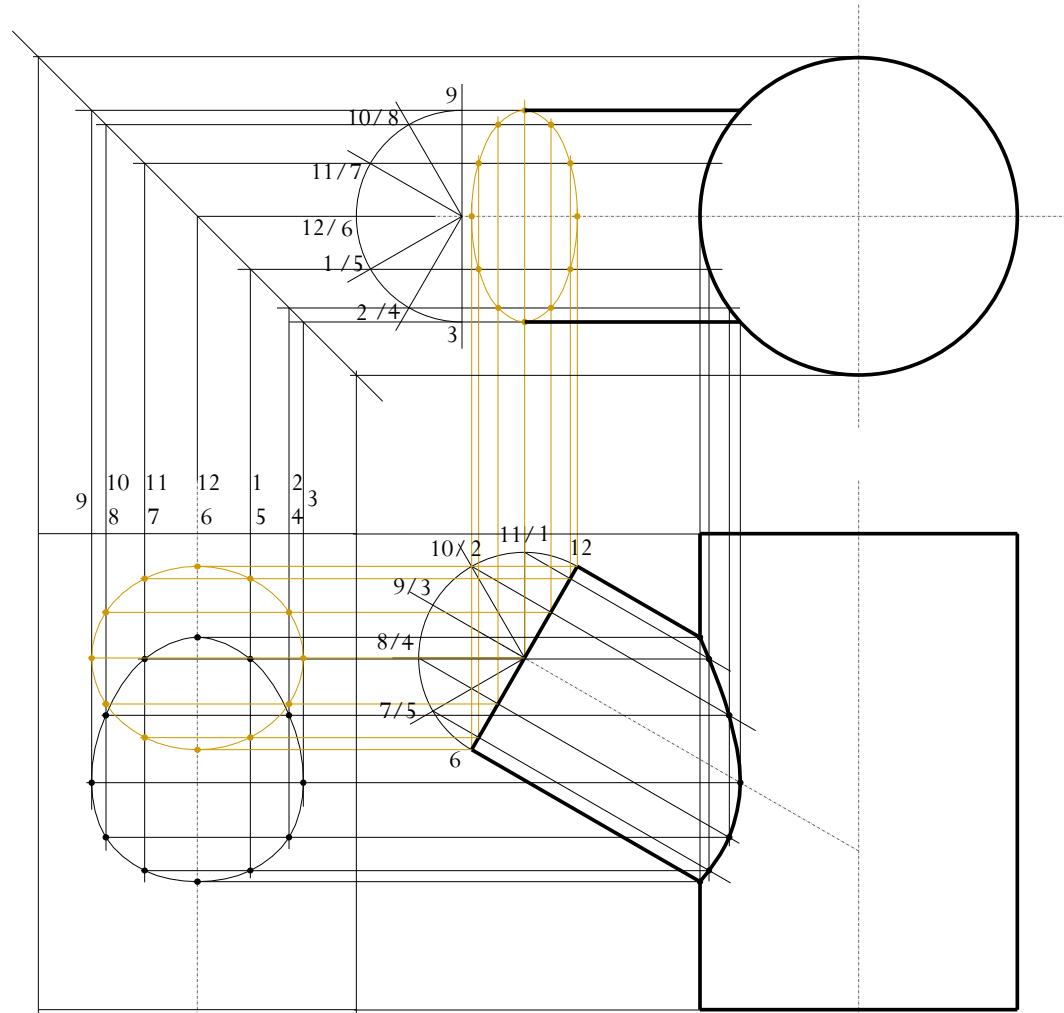


Drawing End Ellipses of Small Cylinder

Project the points where the generators on the Elevation cross the end of the small cylinder across to the End Elevation.

Where they cross the corresponding generators draw a small dot, and draw a smooth line through each.

Do the same thing to find the curve on the Plan.

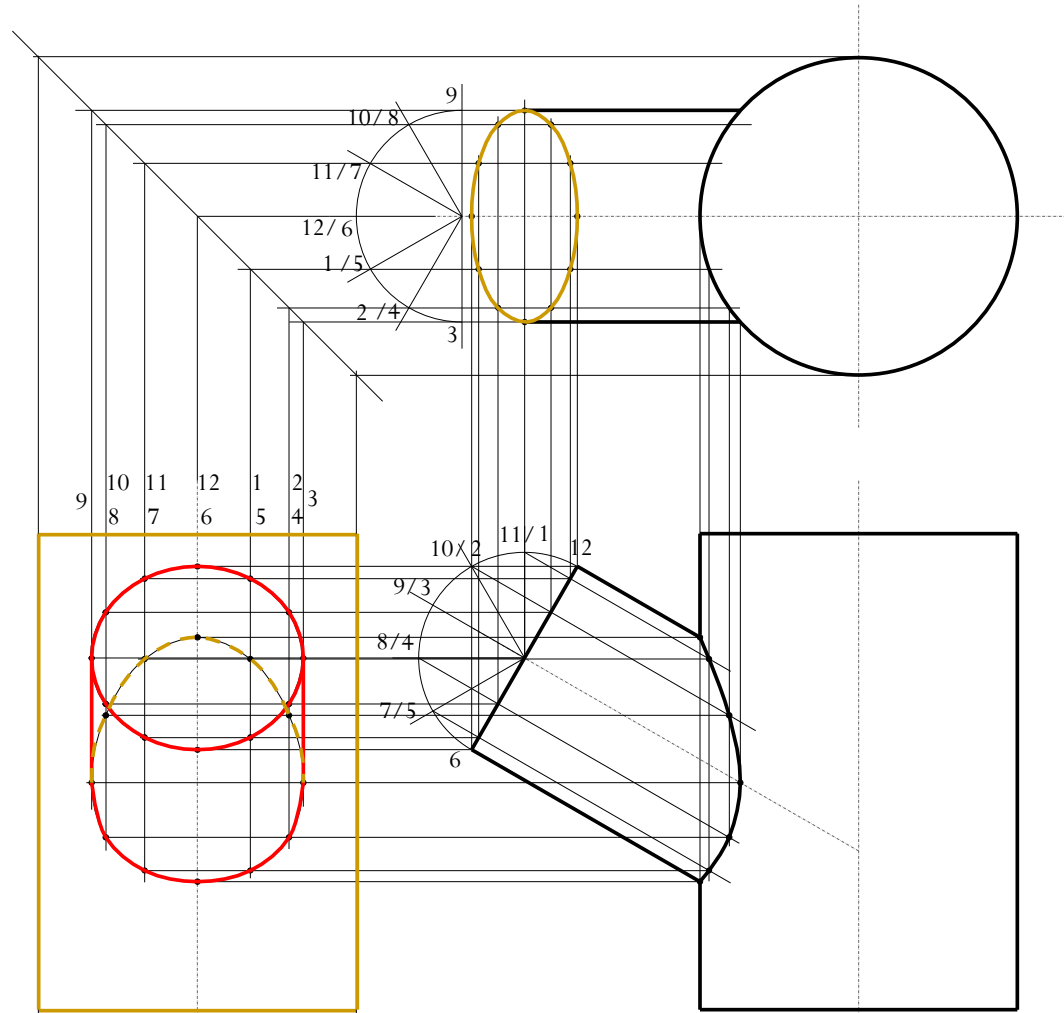


**Further
Reading...**

Finishing the Drawing

To finish the drawing each of the outlines should be darkened.

Make sure that any hidden lines are identified when darkening the outlines.



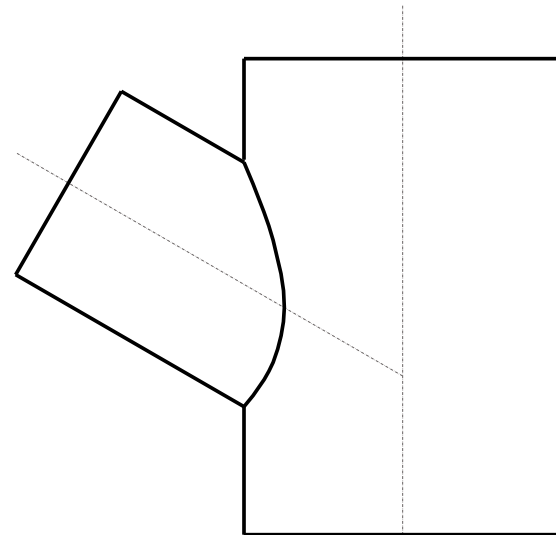
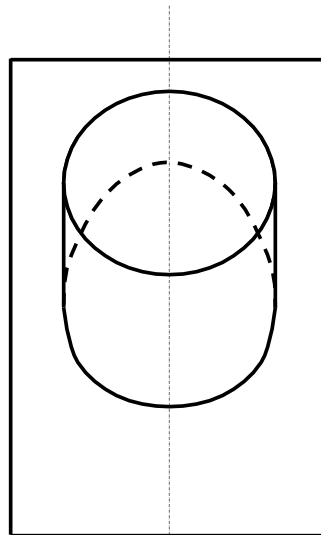
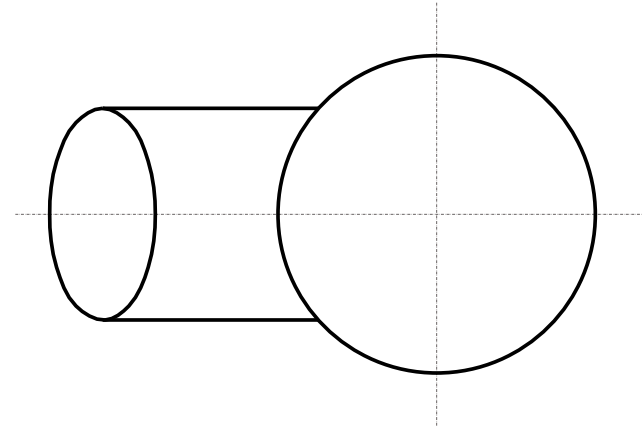
SHOW ME MORE



The Final Drawing

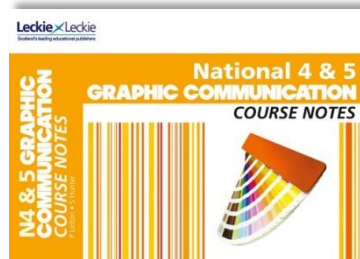
The final drawing should look like this.

The construction lines have been removed to make the drawing easier to understand.

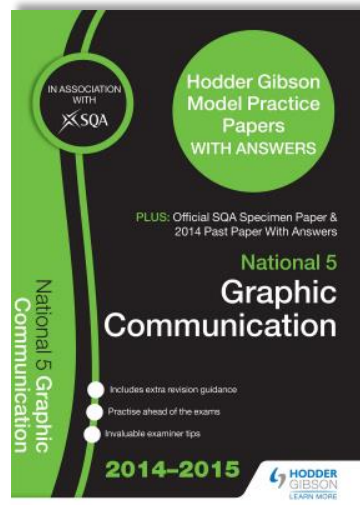




Further Study:



- Page 27 & 28 - Read
- Page 29 & 31 - Read
- Page 33 & 35 - Read
- Page 37 - Read



- Page 18 – Q3
- (Specimen Paper 2013)

- Page 26/27 – Q7a
- (Specimen Paper 2013)

- Page 68/69 – Q5d & e
- (Model Paper 2)

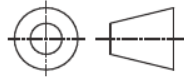
- Page 87-89 – Q5b, c & d
- (Model Paper 3)

Drawing types

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

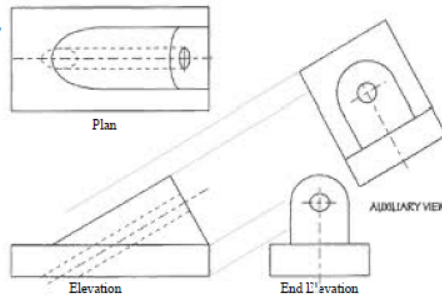
Orthographic Views

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



Orthographic Projection :

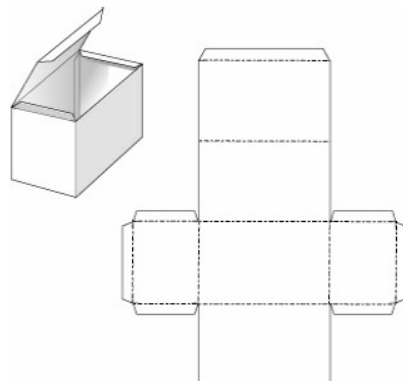
(Elevation, Plan, End Elevation, Auxiliary views).



An **Auxiliary view** shows an object from an exact angle other than the plan, elevation or, end elevation. It is similar to true shape, however it shows the whole object not just the true dimensions of a surface.

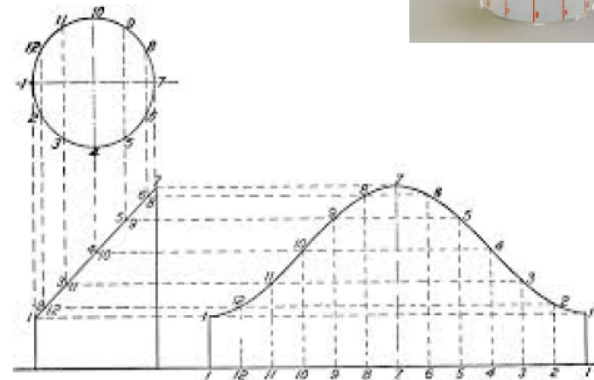
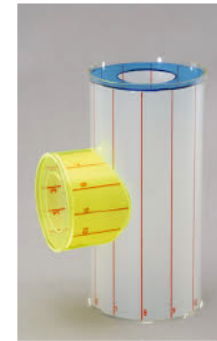
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Interpenetration views

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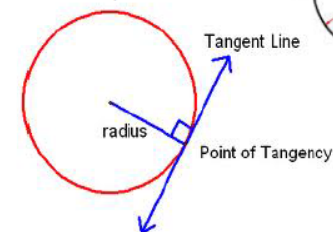
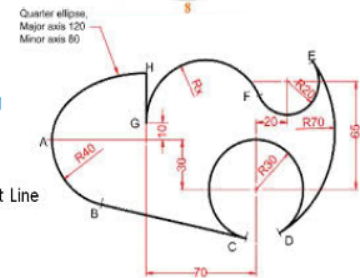
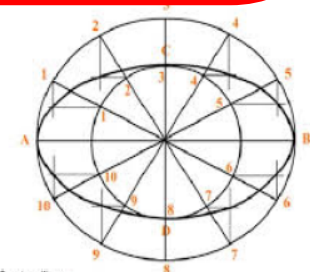


Tangency and Ellipses

These two techniques allow us to draw very complicated 2D designs.

The Ellipse method shown is called the 'concentric circle method'. It uses 2 circles, a minor axis and a major axis.

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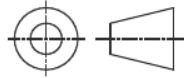


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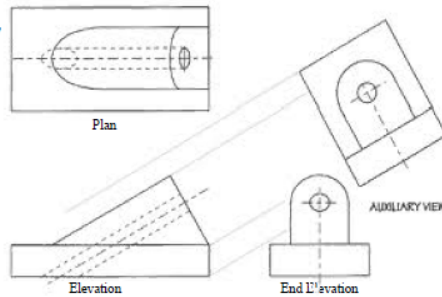
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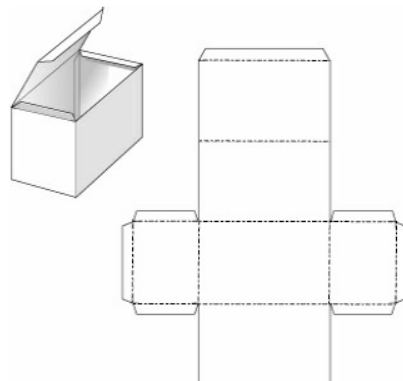
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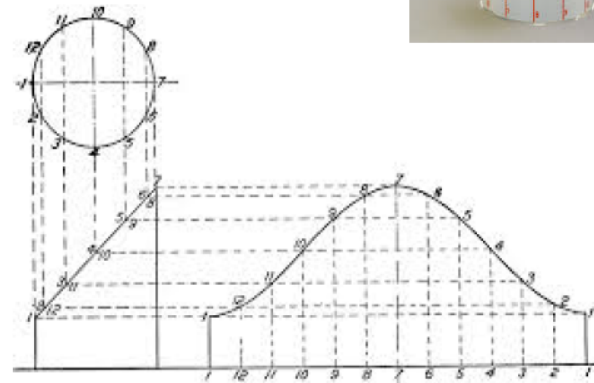
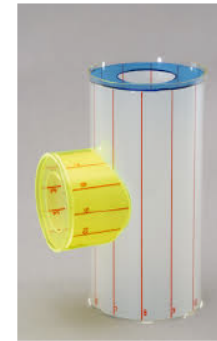
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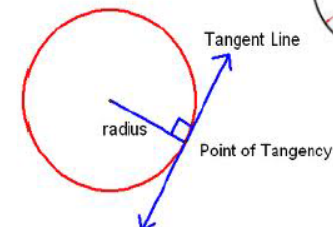
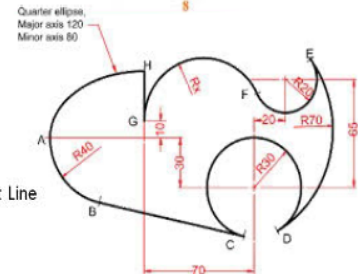
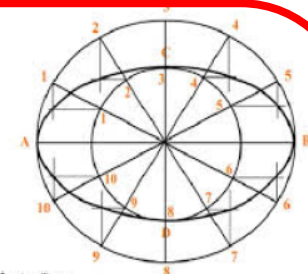


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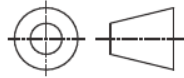


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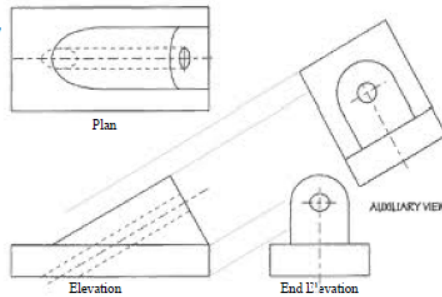
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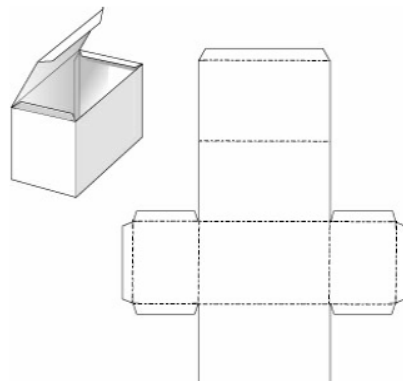
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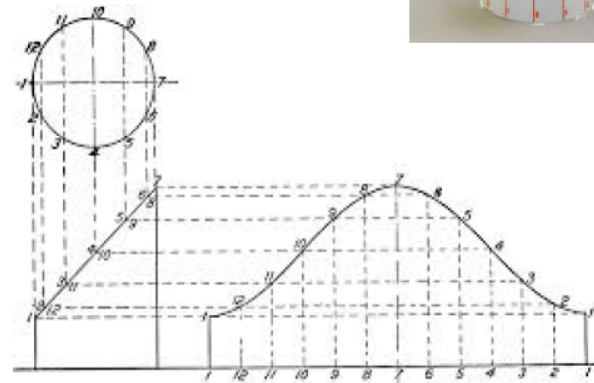
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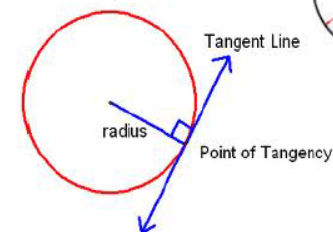
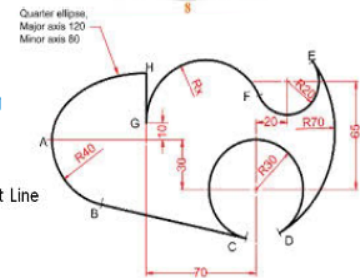
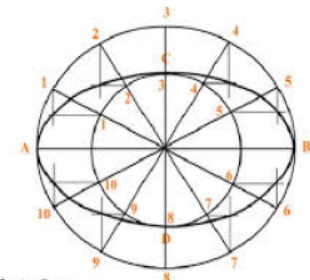




Figure 90. Machining indicated by a general note





These symbols and conventions have been reproduced from PP731 by kind permission of the British Standards Institution. The original figure numbers are included to aid reference.

Conventional representations

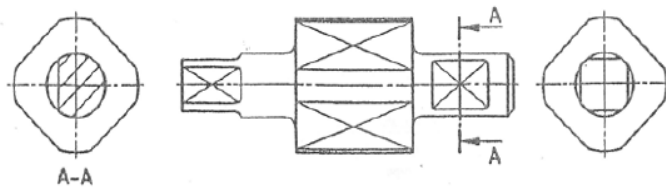


Figure 36. Indication of flat features on a shaft

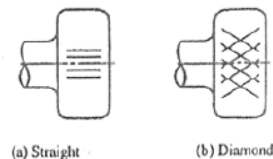


Figure 37. Examples of knurling

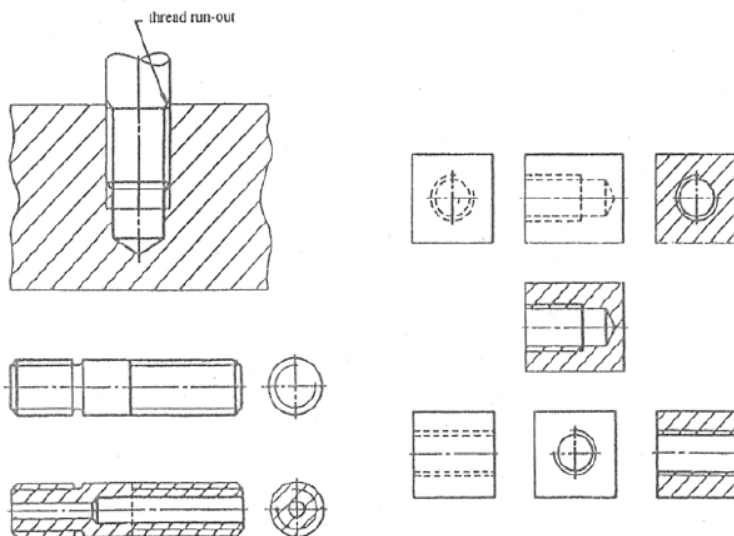


Figure 40. Conventions for screw threads

Bearings

A general convention for all types of rolling bearings in section is shown in figure 42.

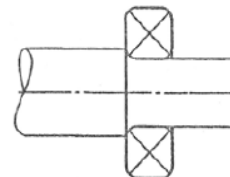


Figure 42. Convention for rolling bearing

Machining and surface texture indication

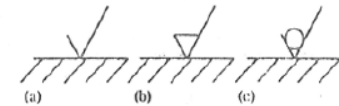


Figure 88. Surface texture symbols

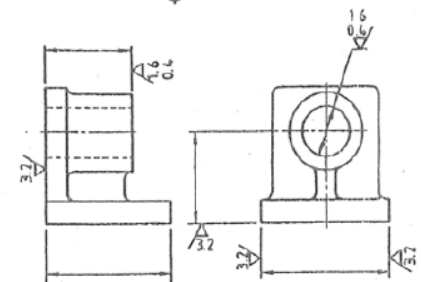


Figure 89. Application of surface texture symbols and values



Figure 90. Machining indicated by a general note

Toleranced dimensions

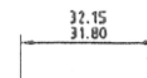


Figure 86. Linear dimension toleranced by specifying limits of size directly

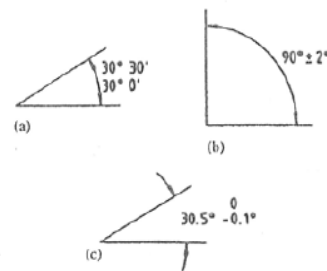


Figure 87. Tolerancing angular dimensions





LINE TYPES

SHOW ME MORE



In the Graphic Communication exam you may well be asked what each of the most common line types are used to represent. Their purposes are listed below and you should do your best to memorise them – if you have not already.



Outline

used to indicate the outline of objects



Construction Line

used in the construction of objects



Broken Line

used to indicate hidden edges/ hidden detail



Chain Line

used to indicate lines of symmetry in objects



Section Line

used to indicate cutting planes



Fold Line

used to indicate fold lines within objects

**Further
Reading...**

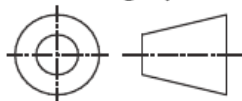


Orthographics

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

Third Angle Projection Symbol

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



Types of line used

Outlines

Continuous thick lines used for visible outlines and edges.



Construction Lines

Continuous thin lines used for projection and dimension leader lines.



Hidden detail

Dashed thin lines used to show hidden outlines and edges.



Chain Lines

There are two types and uses,

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



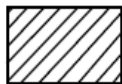
Fold Lines

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



Hatching

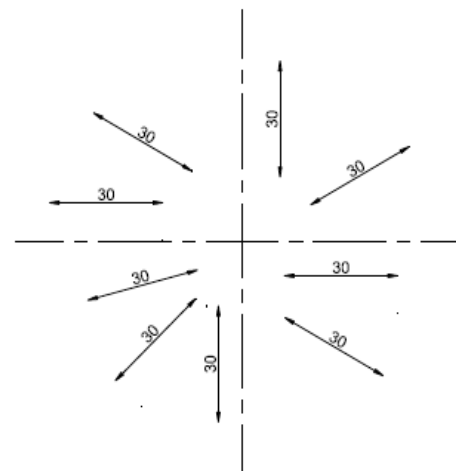
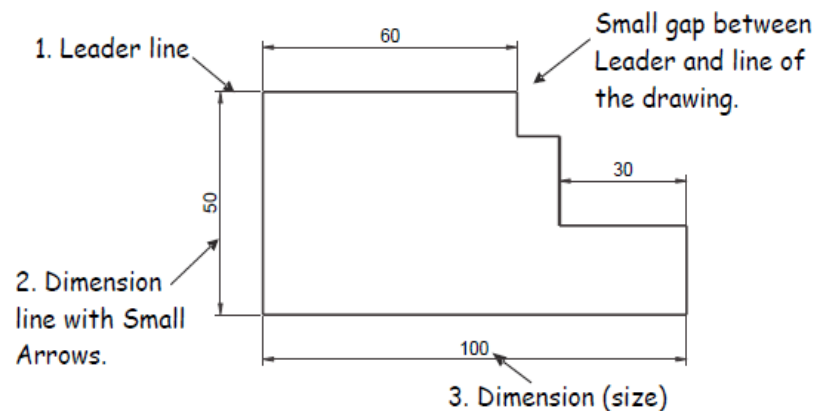
45° lines that show a part has been sectioned (cut through). **See sectioning.**



Dimensioning Lines

There are three parts to dimensioning lines.

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

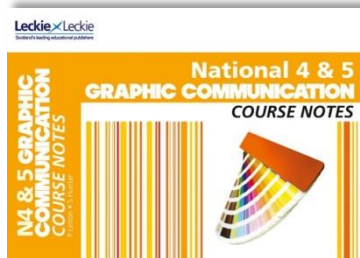


Note the position of the dimensions on each of the lines is always on top and centred.

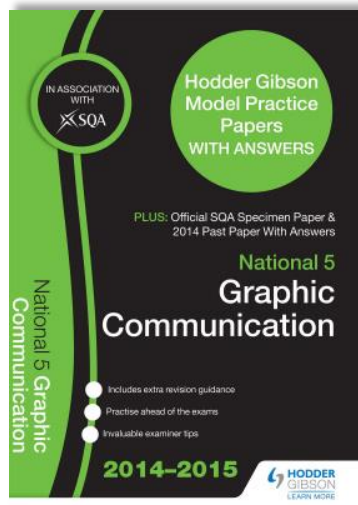




Further Study:



- Page 19 & 20
- Complete Activity on Page 20



- Page 17 – Q2d
- (Specimen Paper 2013)
- Page 24 – Q6f
- (Specimen Paper 2013)
- Page 42 – Q3b
- (Model Paper 1)
- Page 92 – Q7c
- (Model Paper 3)

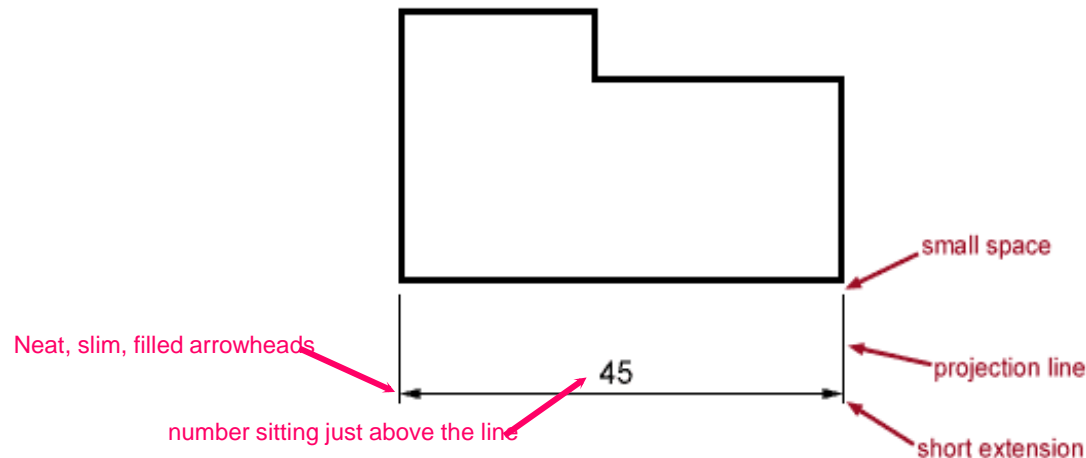




THE BASICS OF DIMENSIONING

When putting sizes (dimensions) onto a drawing, it is important that they are put on correctly. You will find that there are many wrong ways to do it and usually only one right way for each situation. When you give it some thought, it is quite obvious why everyone has to follow the same rules for dimensioning. That way, all drawings can be more easily followed and understood no matter who drew them.

We will look at a few of the most common situations in turn but first let's look at the basic method of adding the appropriate information to any given dimension . . .



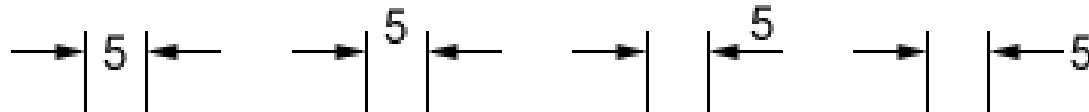
You should keep these five features in mind every time you add any dimension to a drawing, regardless of the situation. We will look at a few specific problems on the next page.

Protocols in Dimensioning

Further
Reading...



DIMENSIONING SMALL FEATURES



When dimensioning small features, placing the dimension arrow between projection lines may create a drawing which is difficult to read. In order to clarify dimensions on small features any of the four methods above can be used.

LETTERING

ABCDEFGHIJKLMNOPQRSTUVWXYZ
1234567890

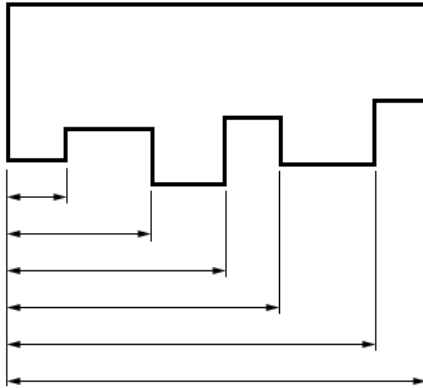
All notes and dimensions should be clear and easy to read. In general all notes should be written in capital letters to aid legibility. All lettering should be of the same size and preferably no smaller than 3mm and no larger than 5mm. An example typeface is shown above.

Linear Dimensioning

Further
Reading...

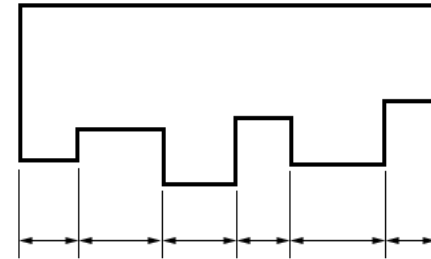


PARALLEL DIMENSIONING



Parallel dimensioning consists of several dimensions all originating from the same projection line.

CHAIN DIMENSIONING

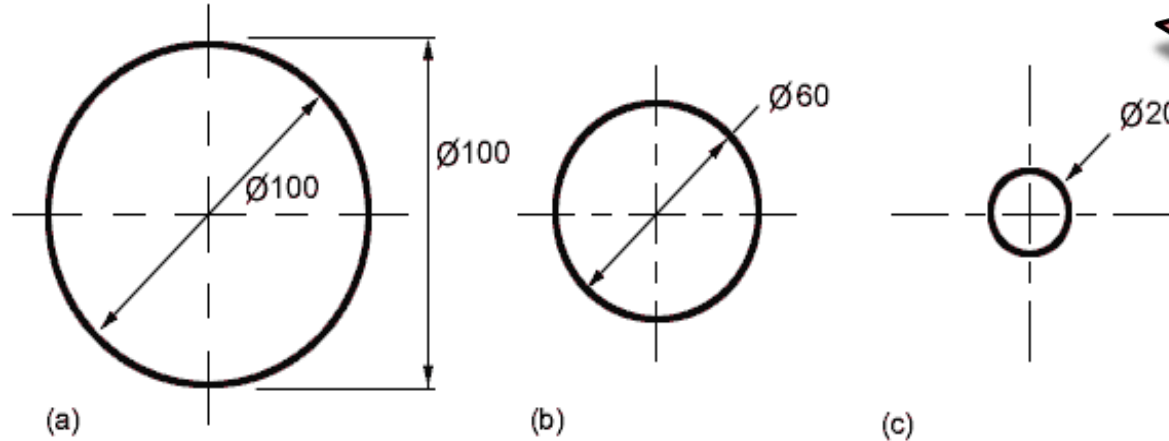


Chain dimensioning can be neater and take up less space. Once you have learned about tolerances though, you will see that this method of dimensioning can cause problems relating to accumulated error.

Diameters & Dimensioning



DIMENSIONING CIRCLES



There are several conventions used for dimensioning circles:

- (a) shows two common methods of dimensioning a circle. One method dimensions the circle between two lines projected from two diametrically opposite points. The second method dimensions the circle internally.

The first method using projection lines is the least used method but the choice is up to you as to which you use.

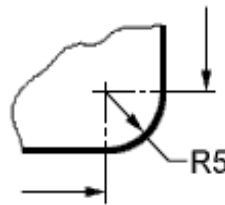
- (b) is used when the circle is too small for the dimension to be easily read if it was placed inside the circle. A leader line is used to display the dimension.
- (c) the final method is to dimension the circle from outside the circle using an arrow which points directly towards the centre of the circle.

Radial Dimensioning

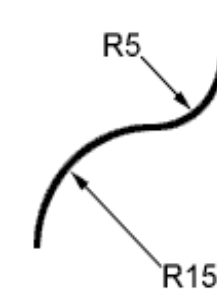
SHOW ME MORE



DIMENSIONING RADII



(a)



(b)

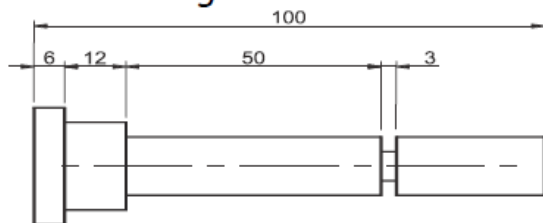
Further Reading...

All radial dimensions are preceded by the capital **R**. All dimension arrows and lines should be drawn perpendicular to the radius so that the line passes through the centre of the arc. All dimensions should only have one arrowhead which should point to the line being dimensioned. There are two methods for dimensioning radii.

(a) shows a radius dimensioned with the centre of the radius located on the drawing.

(b) shows how to dimension radii which do not need their centres locating.

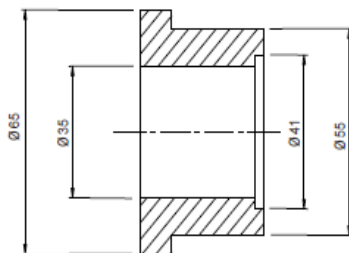
Dimensioning — Continued



All sizes in mm

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

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



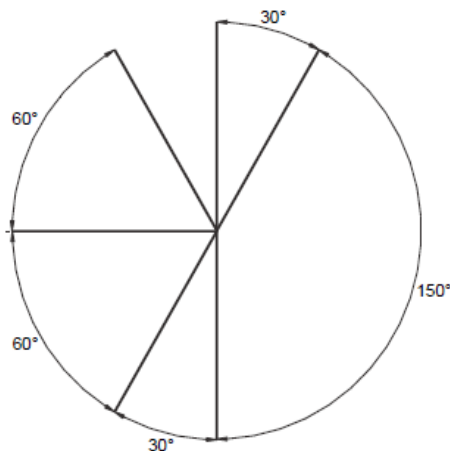
If the item shown was **Square**, then the following symbol would be used $\square 65$ replacing the diameter symbol.

Dimensioning a circle or arc

Refer to National 5 notes regarding diameter and radius.

Angular Dimensions

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

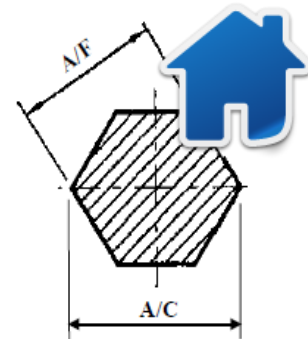


Across the Flats (A/F)

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

Across the Corners (A/C)

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



ASSY

An Abbreviation of the word Assembly.

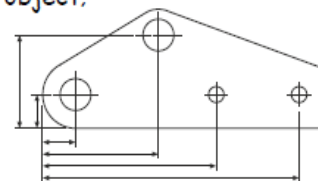
CL or CL

An Abbreviation of Centre Line.

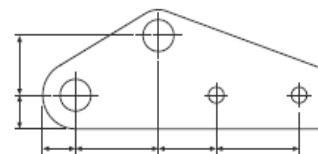
Dimensioning Styles

There are 3 different styles of dimensioning an object:

Parallel dimensioning measures all sizes from one or two **Datum** edges.

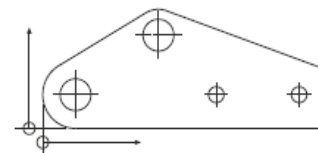


Linear dimensioning (chain dimensioning) measures each size one after the other.



Co-ordinate dimensioning uses a table with dimensional information X axis, Y axis, and diameter.

Hole	X	Y	Ø
A	20	20	20
B	70	55	20
C	105	20	10
D	155	20	10

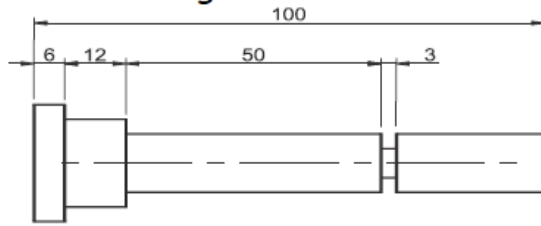


An advantage of Parallel dimensioning over Linear dimensioning is that inaccuracies or tolerances are not accumulated, avoiding large errors.

An advantage of Co-ordinate dimensioning is reduced clutter within the drawing, makes the drawing clearer.



Dimensioning — Continued

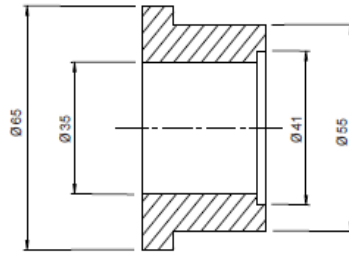


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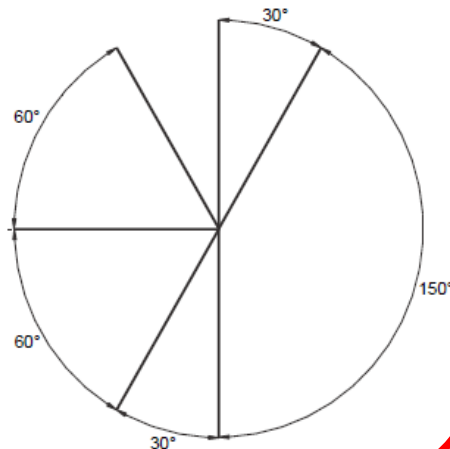


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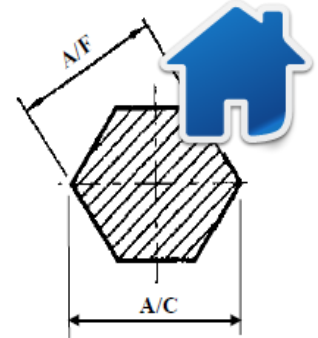


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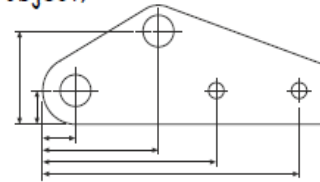
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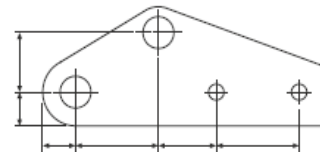
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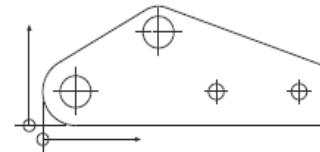


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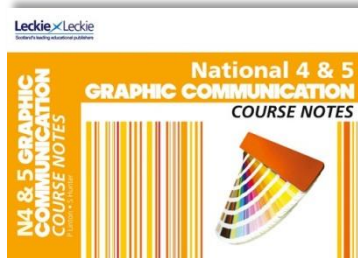


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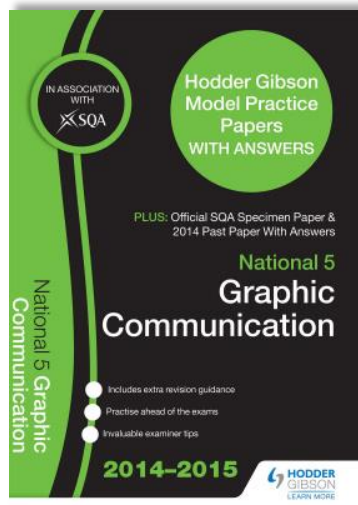
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Further Study:



- Page 21 - Read



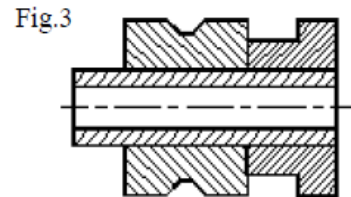
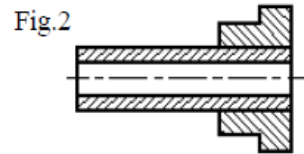
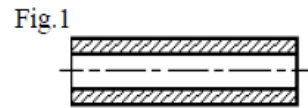
- Page 41-42 – Q3a & b
- (Model Paper 1)
- Page 64 – Q3b
- (Model Paper 2)
- Page 80 – Q3a & b
- (Model Paper 3)



Sectioned views

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

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



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

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

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

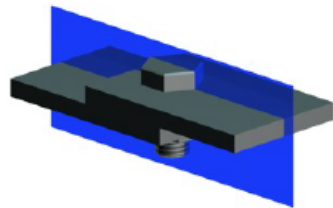


Fig.4

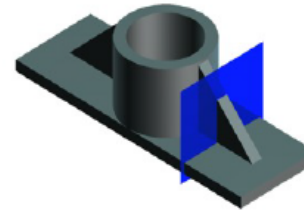
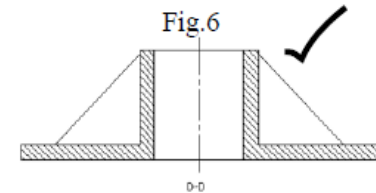
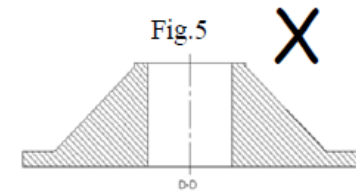
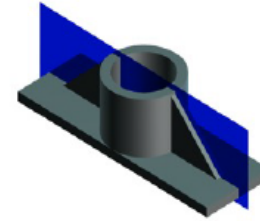
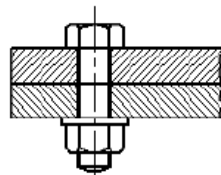
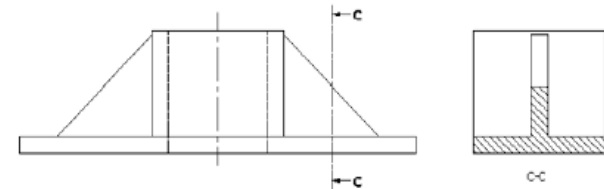
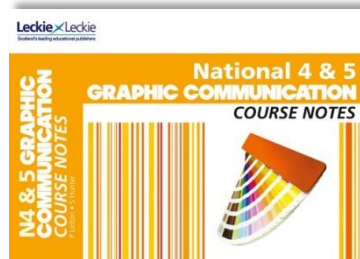


Fig.7

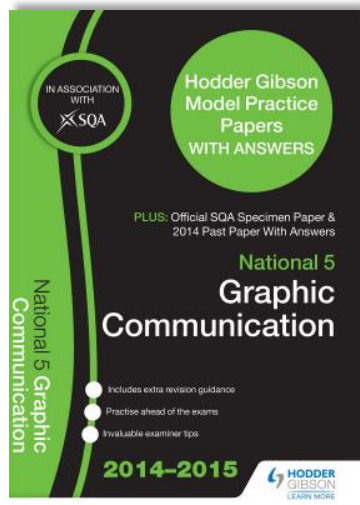




Further Study:



- Page 45 & 46 - Read
- Page 60
- Complete Activity on Page 60



- Page 17 – Q2d
- (2013 Specimen Paper)
- Page 23 & 25 - Q6b
- (2013 Specimen Paper)
- Page 47 – Q5d & e
- (Model Paper 1)
- Page 63 – Q3a
- (Model Paper 2)
- Page 83 – Q3f & g
- (Model Paper 3)

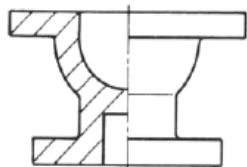


Sections cont..

The type of sections shown on the previous page is are single plane sections. There are five other types of sections which can show varying levels of technical detail.

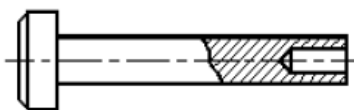
Half Sections

Symmetrical parts can be shown as a half sections.



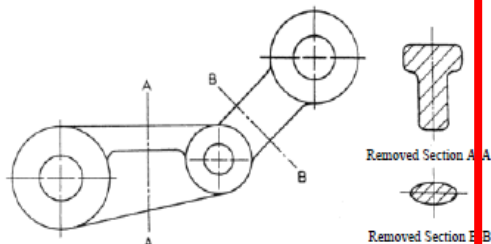
Part Sections

A part area section can be shown. Sometimes called a "broken out view"



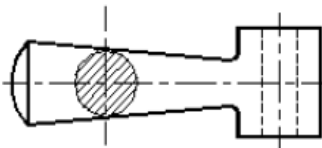
Removed Sections

Cross-sections of a part can be shown in removed sections.



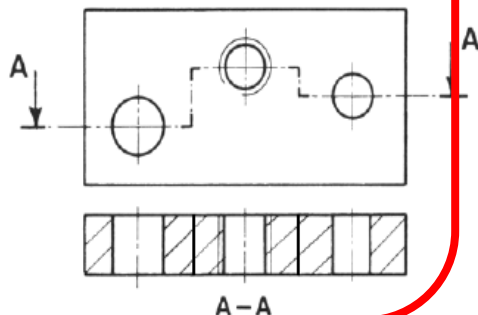
Revolved Sections

Cross-sections of a part can be shown in place using revolved sections. This can only be used for symmetrical areas.



Stepped Sections

A stepped section line can be used to show more detailed internal parts/areas of an object.



Scales

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



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

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

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

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

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

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

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

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



Specimen
Question
Explained

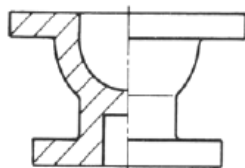


Sections cont..

The type of sections shown on the previous page is are single plane sections. There are five other types of sections which can show varying levels of technical detail.

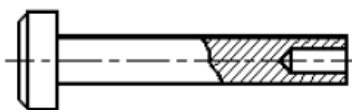
Half Sections

Symmetrical parts can be shown as a half sections.



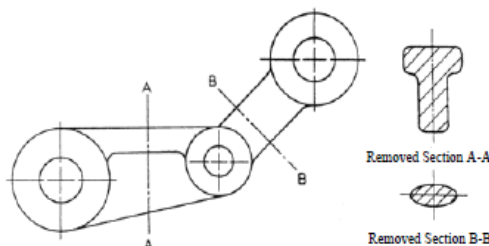
Part Sections

A part area section can be shown. Sometimes called a "broken out view"



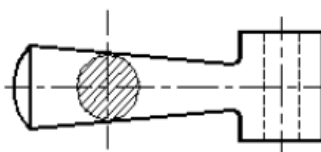
Removed Sections

Cross-sections of a part can be shown in removed sections.



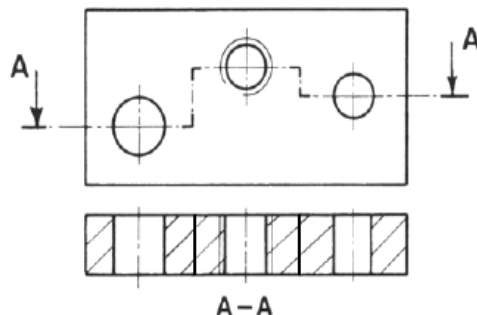
Revolved Sections

Cross-sections of a part can be shown in place using revolved sections. This can only be used for symmetrical areas.



Stepped Sections

A stepped section line can be used to show more detailed internal parts/areas of an object.



Scales

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

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

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

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

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

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

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

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

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



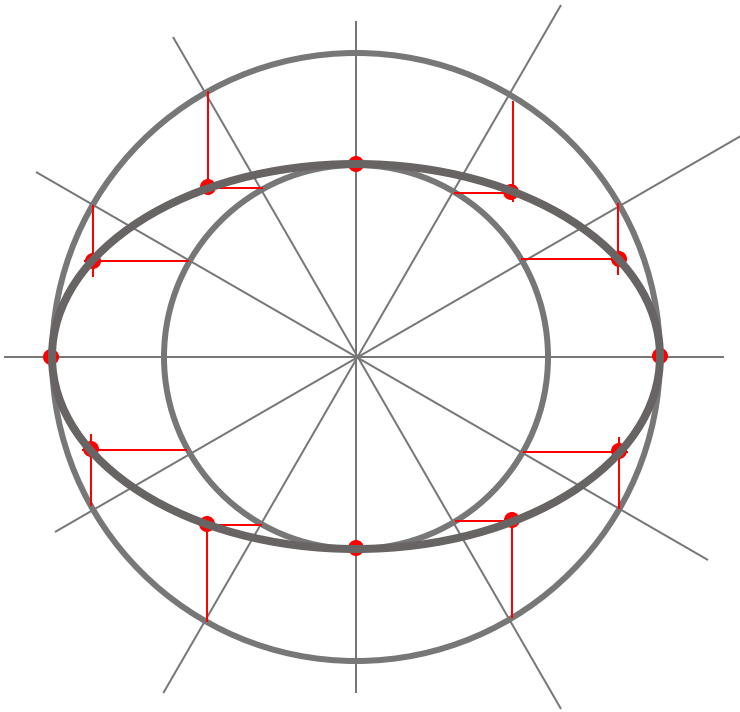
Drawing an Ellipse

SHOW ME MORE



HOW DO YOU DO IT ?

CONCENTRIC CIRCLE METHOD



Step 1 - Draw a circle using the major diameter

Step 2 - Draw another using the minor diameter

Step 3 – Split the circles into 12 equal sections

Step 4 – Identify clearly which way round it sits

Step 5 – Mark the four points at 3, 6, 9 & 12 o'clock

Step 6 – Put in the horizontals and verticals

Step 7 – Identify the rest of the points

Step 8 – Plot the ellipse by joining up the 12 points





Project set

Location plan

Site plan

Floor plan

Elevations

Sectional views

Rendered illustrations

Construction Drawings

Building projects require several types of specialised drawings. This collection of drawings, known as a **project set**, includes:

- the location plan
- the site plan
- floor plans
- elevations
- sectional views
- schematic diagrams
- rendered illustrations.

Buildings are designed by **architects** along with various other members of a design team. The team ensures that the building meets the needs of the client and satisfies local authority planning department and building control regulations.

**Further
Reading...**

Building Drawings 2 of 7

Project set

Location plan

Site plan

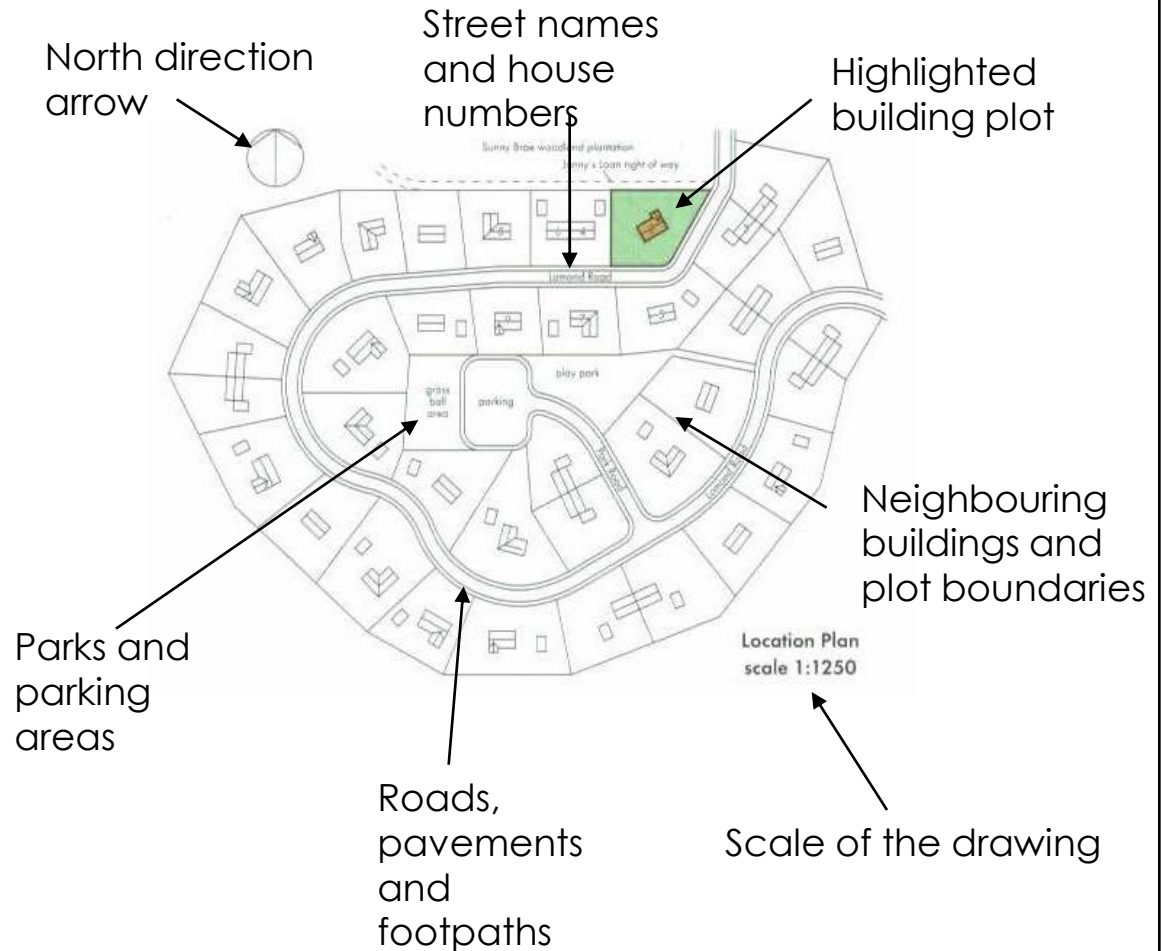
Floor plan

Elevations

Sectional views

Rendered illustrations

**Construction
Drawings**



Location plan scale is 1:1250

**Further
Reading...**

Building Drawings 3 of 7

Project set

Location plan

Site plan

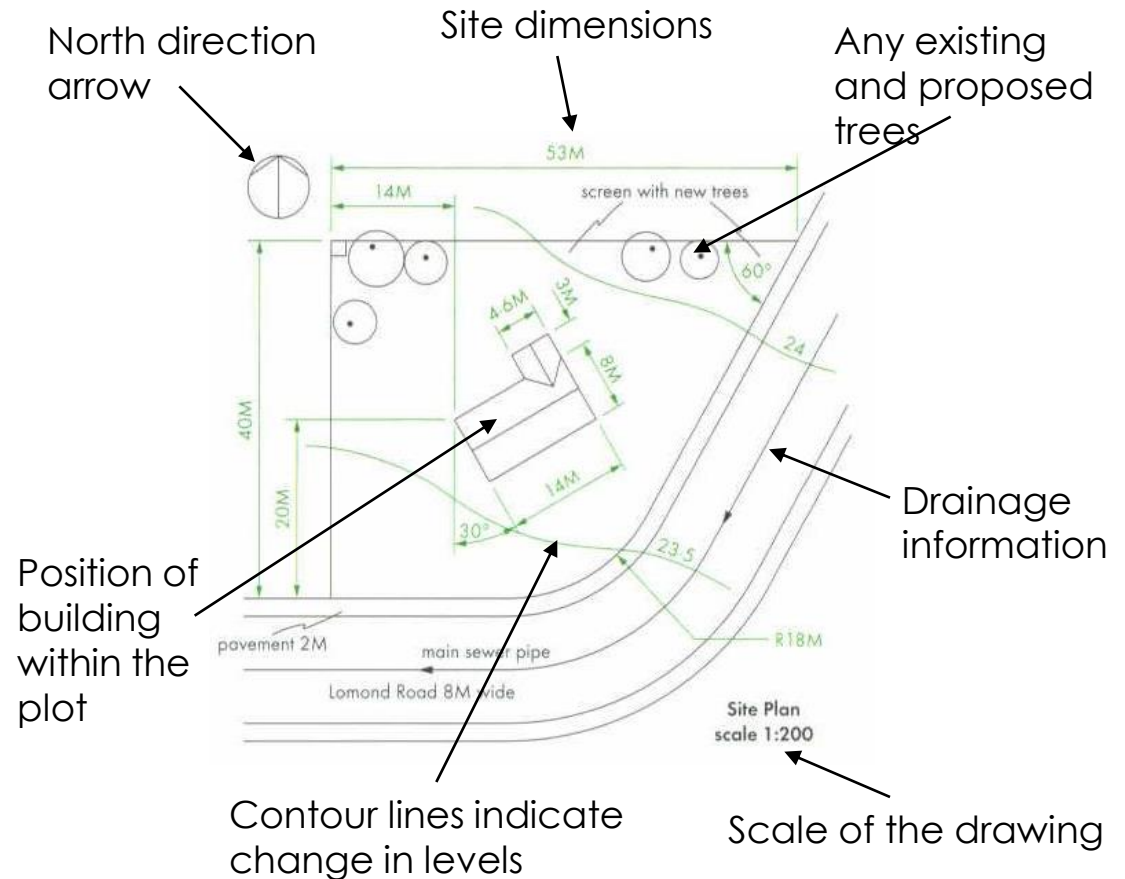
Floor plan

Elevations

Sectional views

Rendered illustrations

**Construction
Drawings**



Scale is 1:200 (domestic) or 1:500 (non-domestic)

**Further
Reading...**

Building Drawings 4 of 7

Project set

Location plan

Site plan

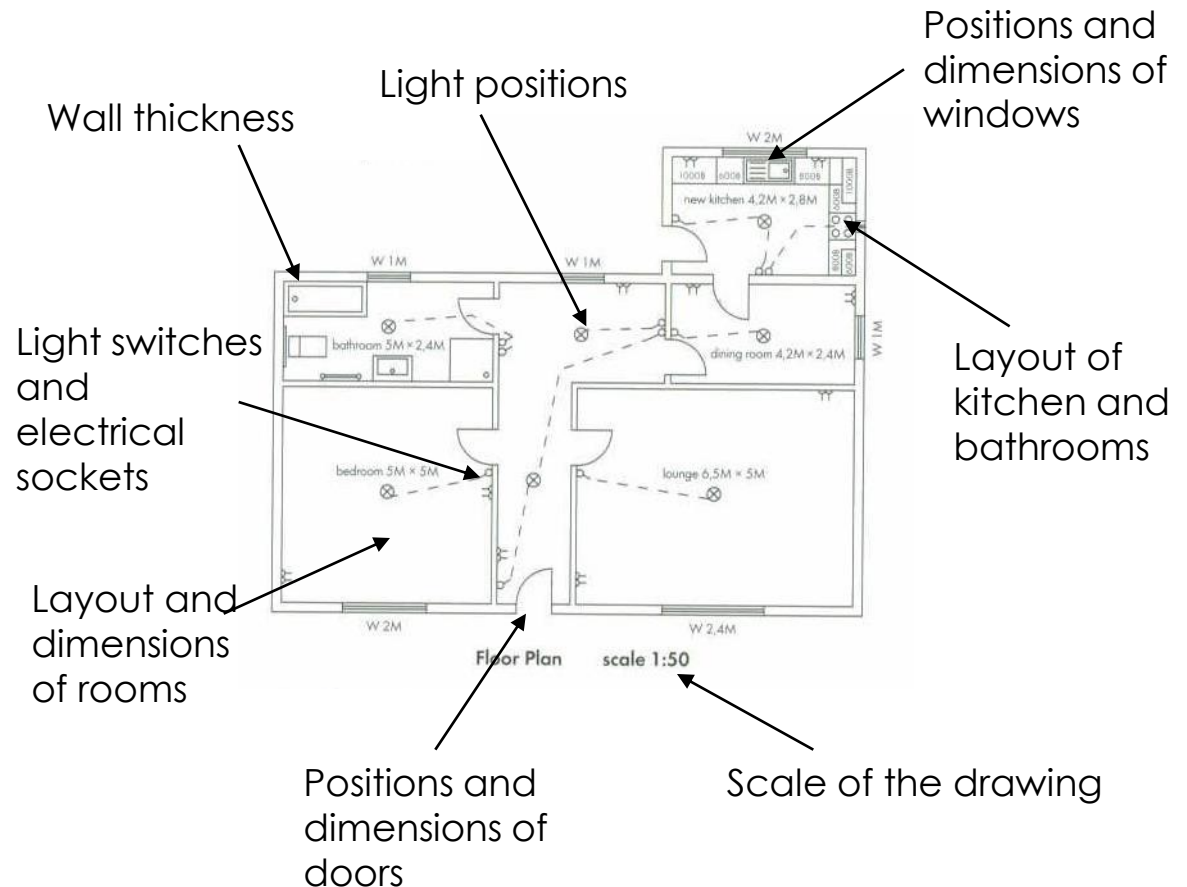
Floor plan

Elevations

Sectional views

Rendered illustrations

**Construction
Drawings**



Scale is 1:50 or 1:100

**Further
Reading...**

Building Drawings 5 of 7

Project set

Location plan

Site plan

Floor plan

Elevations

Sectional views

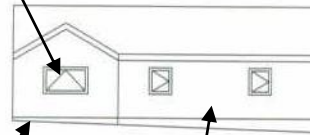
Rendered illustrations

**Construction
Drawings**

External
window
positions

External door
positions

Type of roof
(flat, gable or
pitched)



Rear Elevation



West Elevation

scale 1:100

External
proportions
of the
building

External
finishes and
features

Scale of
drawing and
name of
elevation

Style of the
building
(bungalow,
villa or flat)

Scale is 1:100 or 1:50

**Further
Reading...**

Building Drawings 6 of 7

Project set

Location plan

Site plan

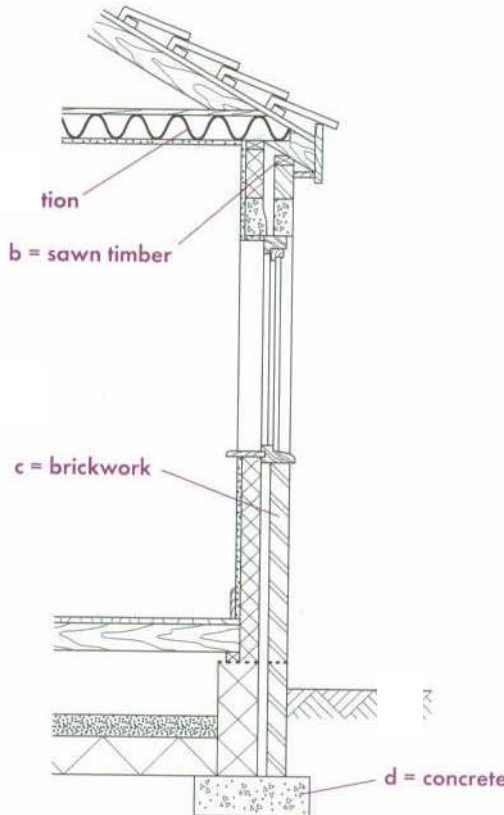
Floor plan

Elevations

Sectional views

Rendered illustrations

**Construction
Drawings**



- Materials used
- Construction details
- Dimensions
- Floor and ground levels
- Design of foundations
- Positioning of insulation
- Wall construction
- Scale of drawing

Scale is 1:20 or 1:50

**Further
Reading...**

Building Drawings 7 of 7



Project set

Location plan

Site plan

Floor plan

Elevations

Sectional views

Rendered illustrations

**Construction
Drawings**



Rendered illustrations are usually produced using computer software. This allows the architect to showcase what the building will look like before it has been built. 3D modelling programs allow a client to visualise what the building will look like without the need for technical knowledge of drawings. These presentation drawings are usually:

*an idealistic
view of what the
building could
look like (people,
cars, trees etc)*

*coloured and
rendered,
showing
materials*

*an
isometric or
perspective
view*

Scottish Qualifications Authority
SCE Higher Grade Graphic Communication
Graphical Symbols and Conventions

Selected electrical and
electronic graphical symbols

Symbols for construction drawings

Further
Reading...

SHOW ME MORE

in PP73



Earth
or ground



Architectural and topographical
installation symbols

Lamp,
general symbol



Luminaire,
fluorescent lamp



Switch,
general symbol



Switch with
pilot light



Pull-cord switch,
single pole



Two-way switch,
single pole



Socket outlet
(power), general
symbol



Socket outlet
(power) with
single-pole switch



Socket outlet with
isolating transformer,
eg shaver socket



Distribution centre,
shown with five
conduits



Pan, shown with
wiring



Water heater shown
with wiring



Information devices

Datums, levels, orientation

1.101
bench mark



Steps and gradients

1.801
direction of RISE,
ramp/stair/steps



1.802
direction of
FALL, slope

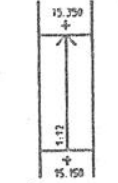


Applications

Straight
stair/steps
1.801



Ramp
1.104
1.801



Materials in section

Wood

2.101
any type, sawn



2.105
softwood,
machined all
round



2.106
hardwood,
machined all
round



Manufactured materials

2.201
board/layer, etc,
any type; small scale*



2.202
sheet, any
type; large scale



2.203
board, any
type; large scale



2.205
plywood sheet



2.206
glass sheet



2.207
metal sheet



2.208
blockboard



2.209
insulation
board



Masonry

2.301
blockwork



2.302
brickwork



2.303
stonework



Site-formed materials

2.403
asphalt/
macadam



2.404
plaster/render/
scjced



2.405
concrete



2.406
granular fill



2.407
hard fill



2.408
subsoil



Landscape

Existing trees

4.202
existing tree



4.203
existing tree to
be removed



Proposed trees

4.303
proposed tree,
any type



Building components

Windows in horizontal/
vertical section/cut

6.101
any type



6.102
with sill/jamb/
threshold



Windows in elevation

6.201
any type



6.202
fixed



6.203
hinged at side



6.204
hinged at top



6.205
hinged at bottom



6.206
pivoted,
horizontal axis



6.213
sliding
horizontally



Doors and doorsets on plans

6.301
hinged leaf



6.307
two hinged
leaves, any type



Piped and ducted services

Pipes, ducts, drains and sewers

7.101
any type



Pipe fittings

7.211
draw off point
(tap)



7.212
spray outlet



Valves

7.301
straight two port



7.309
ballcock



Sanitary fittings (simplified
representations on plan)

7.4R1
sink, any type



7.4R4
sinktop,
R-H bowl



7.4R7
wash basin



7.4R9
bath



7.4R10
shower tray



7.4R11
bidet



7.4R12
wc with close
coupled cistern



Pipework components

7.601
radiator



7.602
heated towel rail



Electrical services

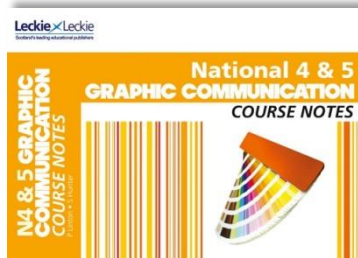
Communications sockets

8.507
socket, telephone

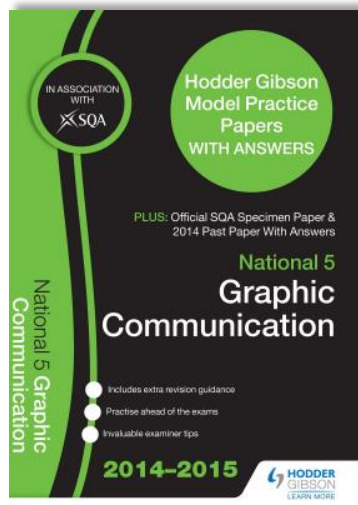




Further Study:



- Page 59 - Read
- Page 60 – Read & Complete Activity
- Page 61 - Read



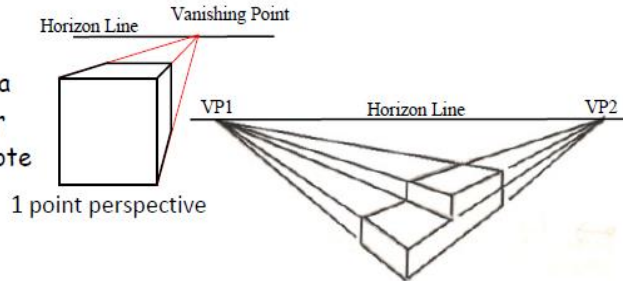
- Page 21-22 – Q5a
- (2013 Specimen Paper)
- Page 50 – Q7a & b
- (Model Paper 1)
- Page 85 – Q4c
- (Model Paper 3)



Pictorial Views

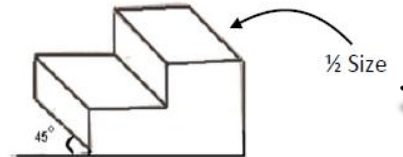
Perspective :

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



Oblique :

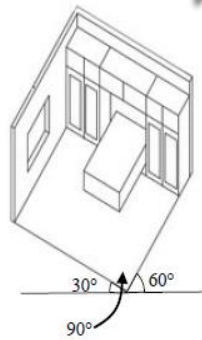
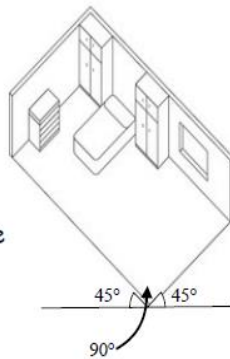
The main advantage of an oblique view is that the initial drawing is 2d. This allows us to easily draw circles before extending the shape back to give a depth. All depth sizes are drawn half size to ensure the drawing looks more realistic.



Further Reading...

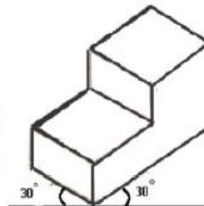
Planometric :

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

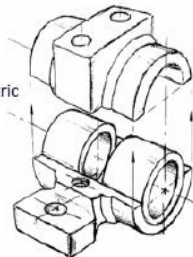


Isometric :

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



Exploded Isometric



Location / Building Drawings

Promotional Drawings :

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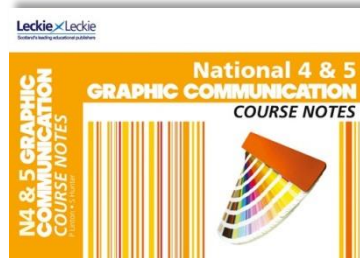
Elevations :

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

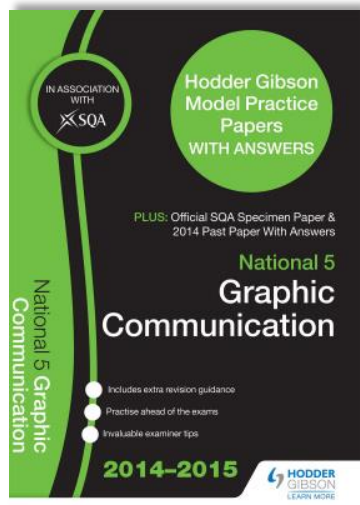




Further Study:



- Page 40, 41 – Isometric - Read
- Page 42 – Planometric - Read
- Page 43 – Oblique - Read



- Page 82 – Q3e
- (Model Paper 3)

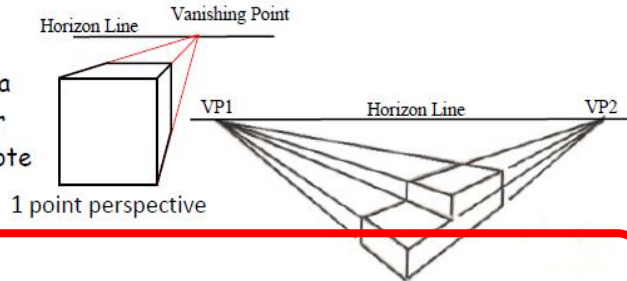
- Page 84 – Qa
- (Model Paper3)



Pictorial Views

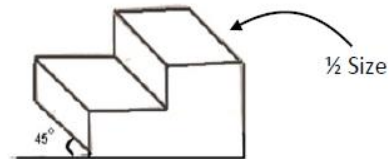
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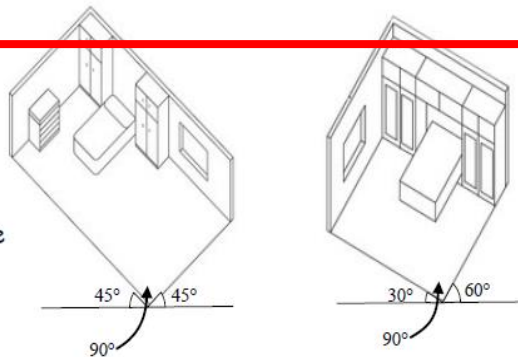
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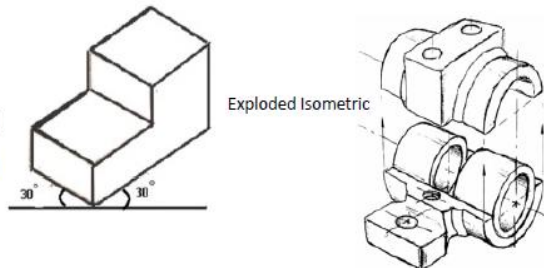
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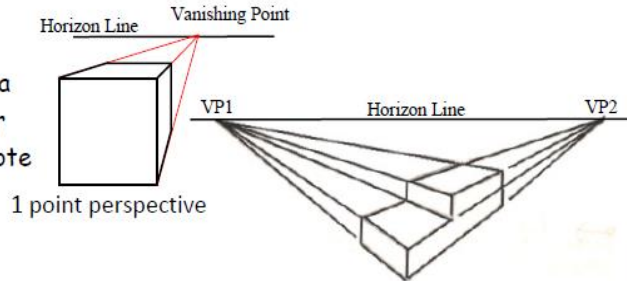




Pictorial Views

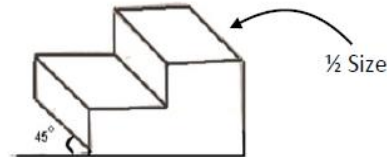
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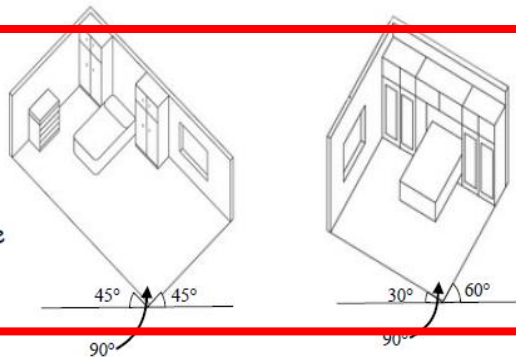
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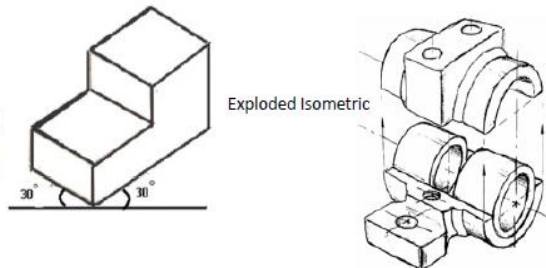
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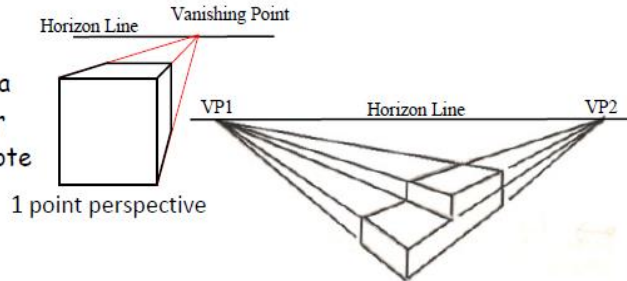




Pictorial Views

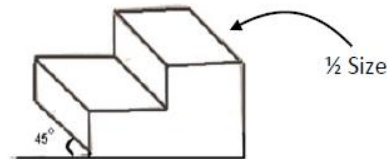
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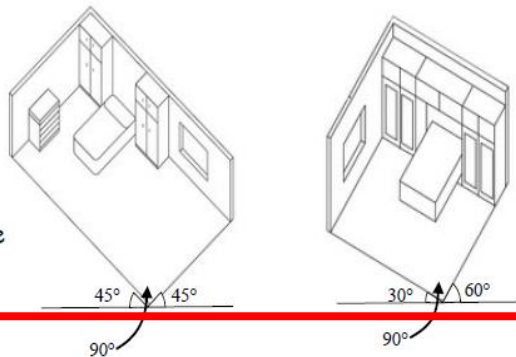
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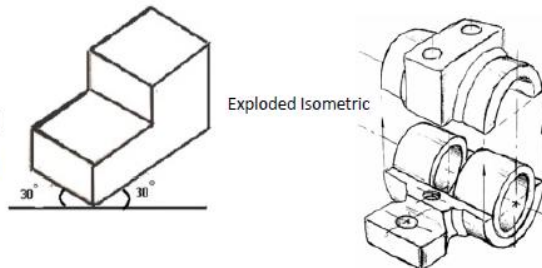
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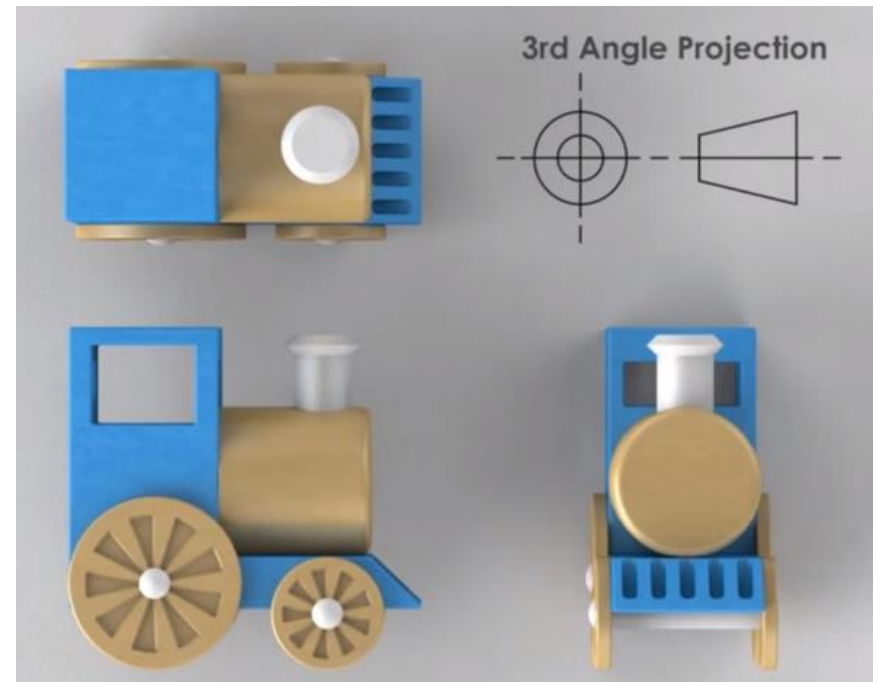






The difference between 3rd Angle and 1st Angle (we use 3rd Angle)

CLICK
PICTURE!



Third Angle Projection

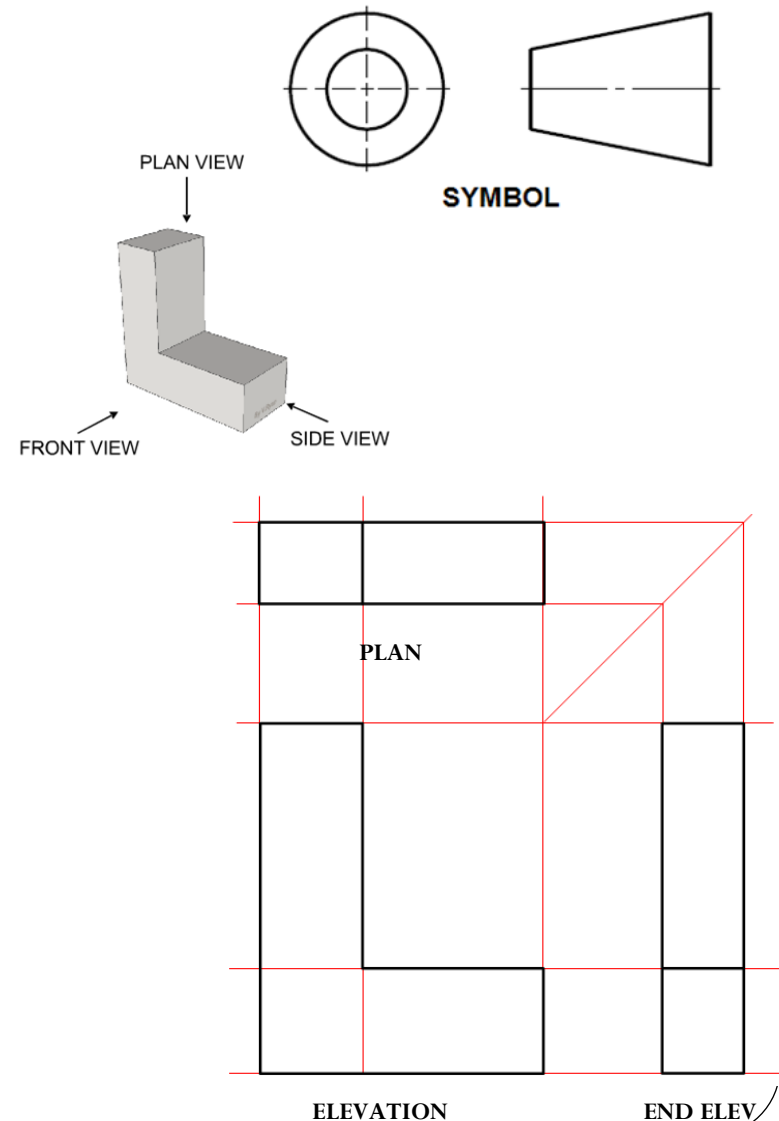
Orthographic projection is a common technique used in a number of engineering fields to communicate important information about the **layout** and **design of an object or structure**. It simply standardises how drawings should be laid out so everybody can understand what they are looking at.

There are two ways of drawing in orthographic - *First Angle* and *Third Angle*. They differ only in the position of the plan, front and side views. An example of **third angle** projection of an L-shaped object is shown opposite.

The **Plan** of the L-shape is drawn as a 'birds eye' view, a view from above.

The **Elevation** is drawn as if stood in front of the L-shape.

The **End Elevation** is drawn as if stood at the side.

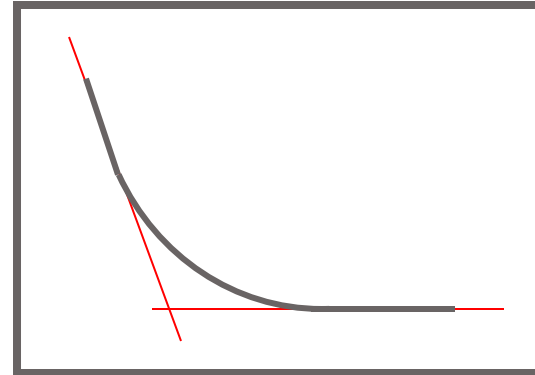
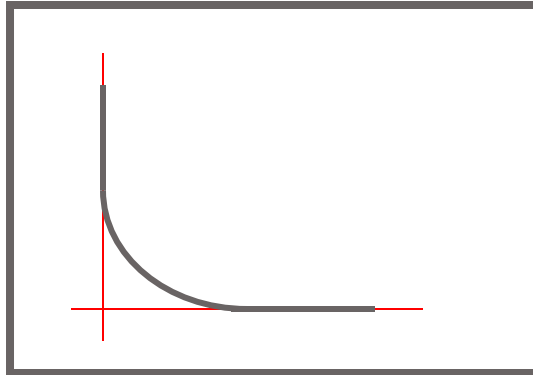




Tangency 1 of 5

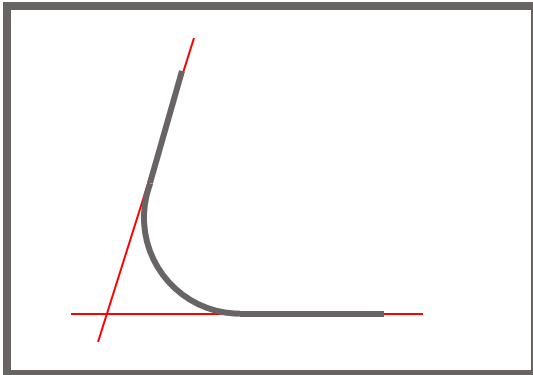
There are four common problems you have to learn to deal with. They are ...

tangent at a right angle

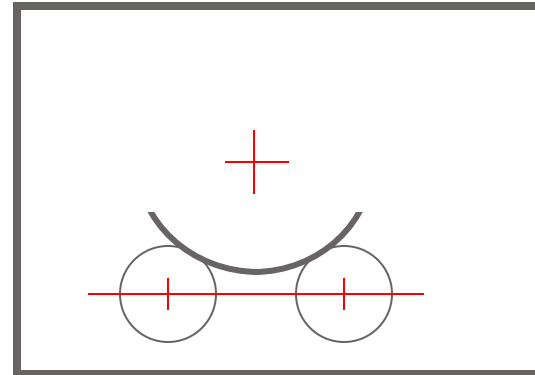


tangent at an obtuse angle

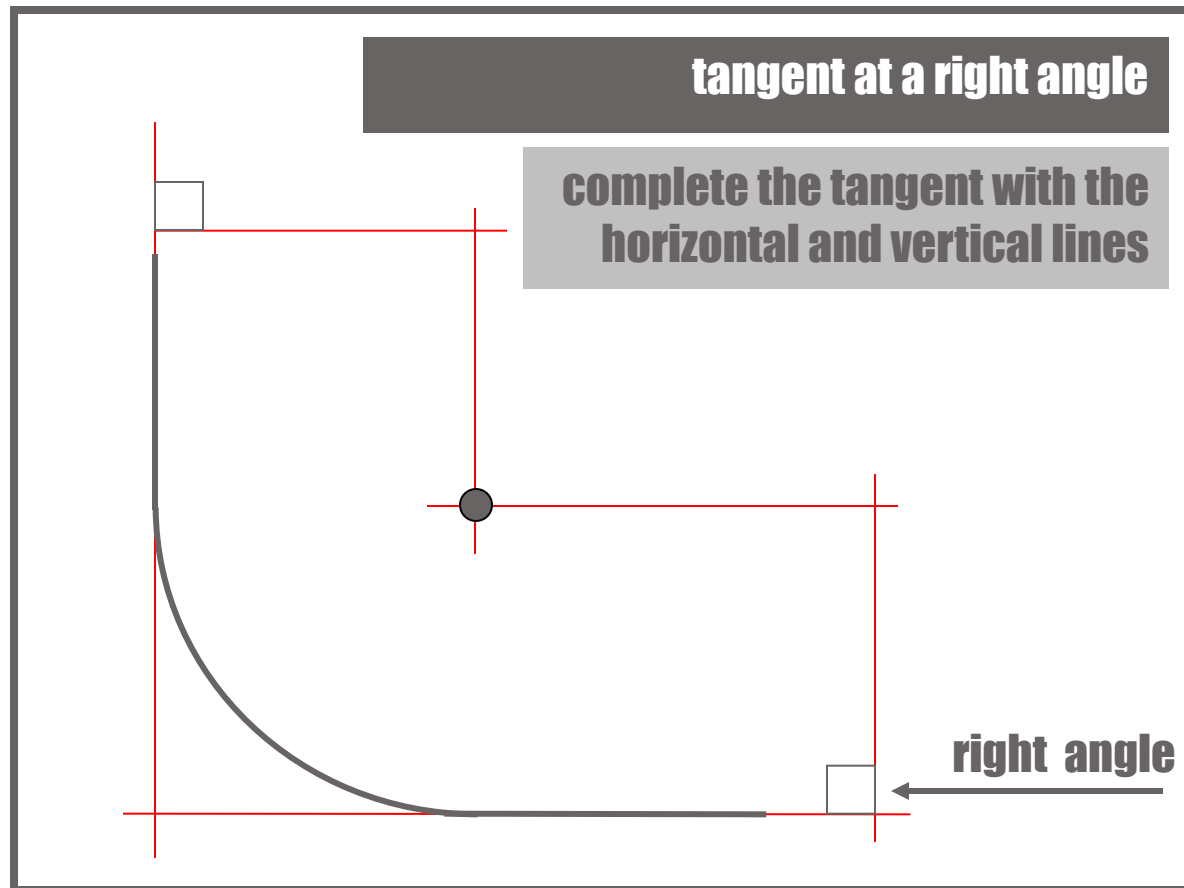
tangent at an acute angle



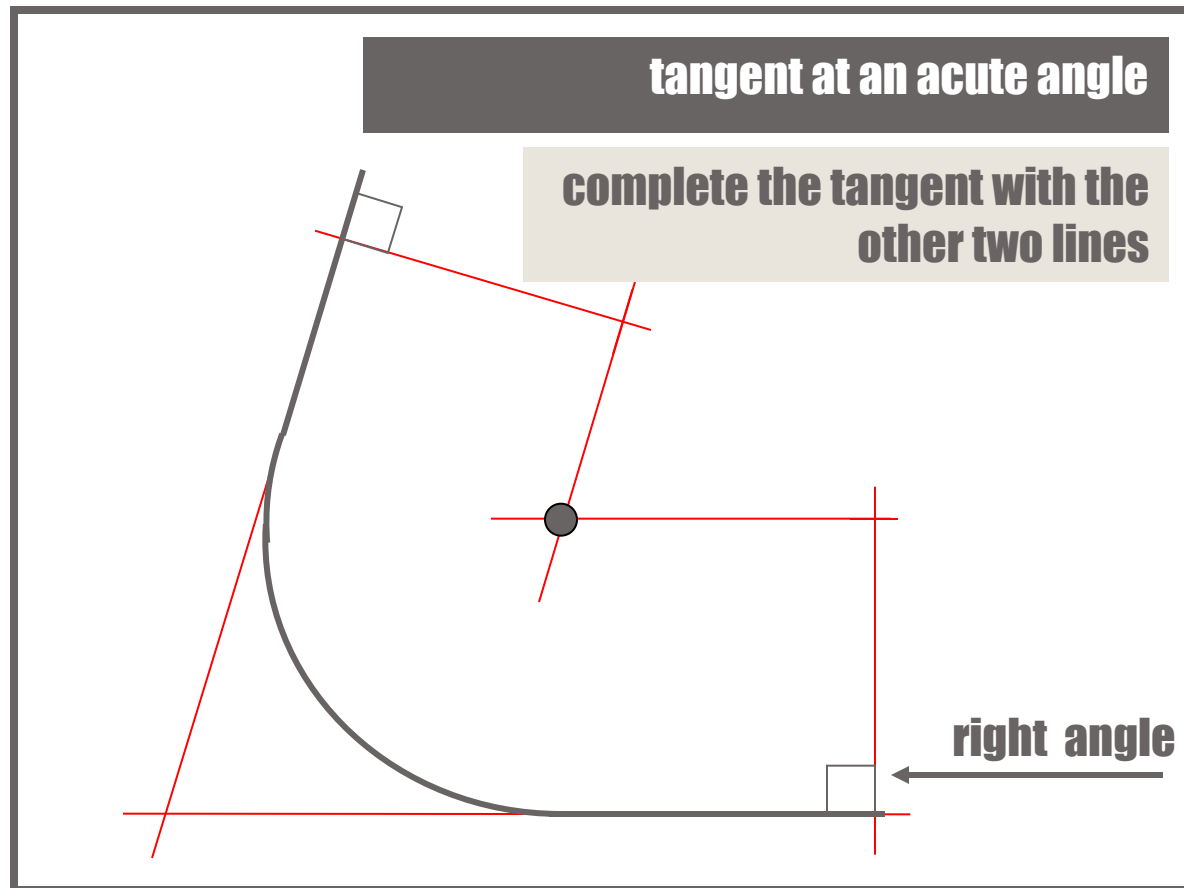
tangent with two curves



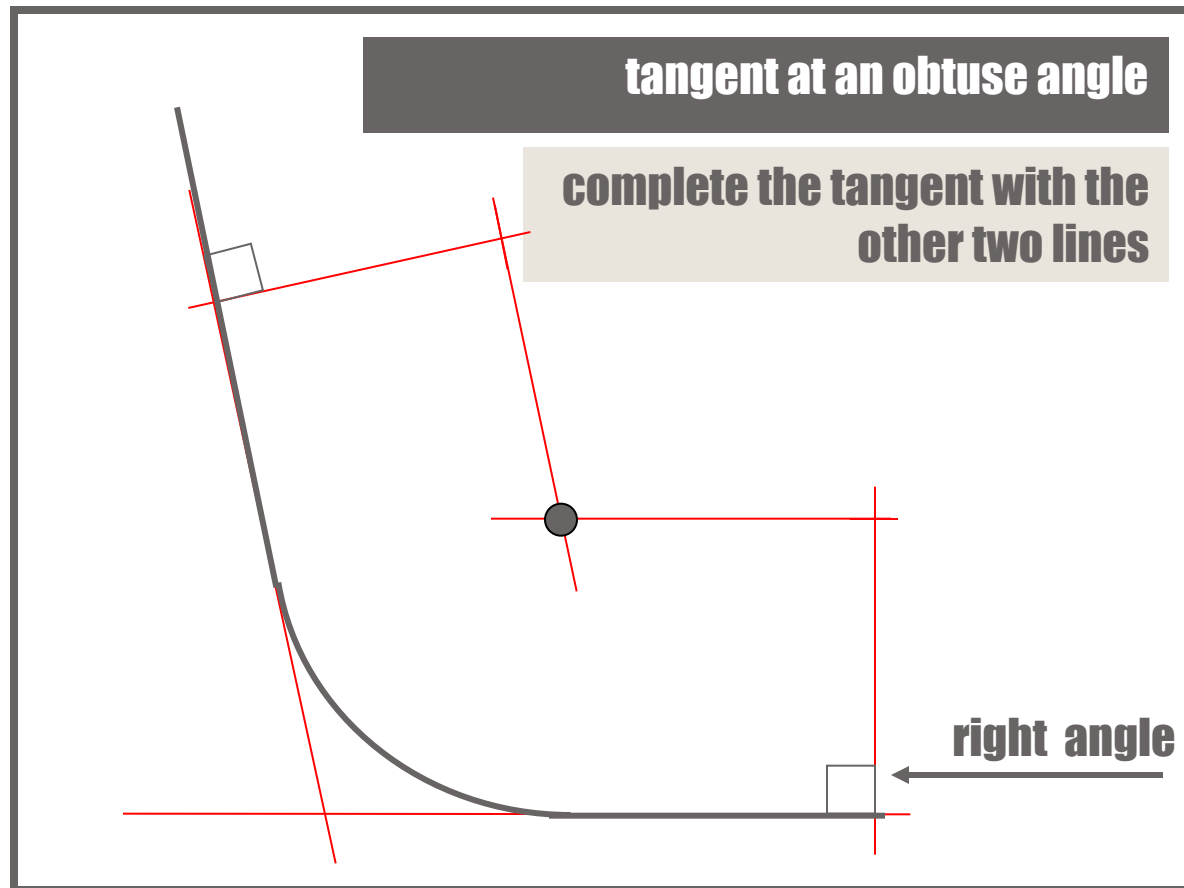
Tangency 2 of 5



Tangency 3 of 5



Tangency 4 of 5



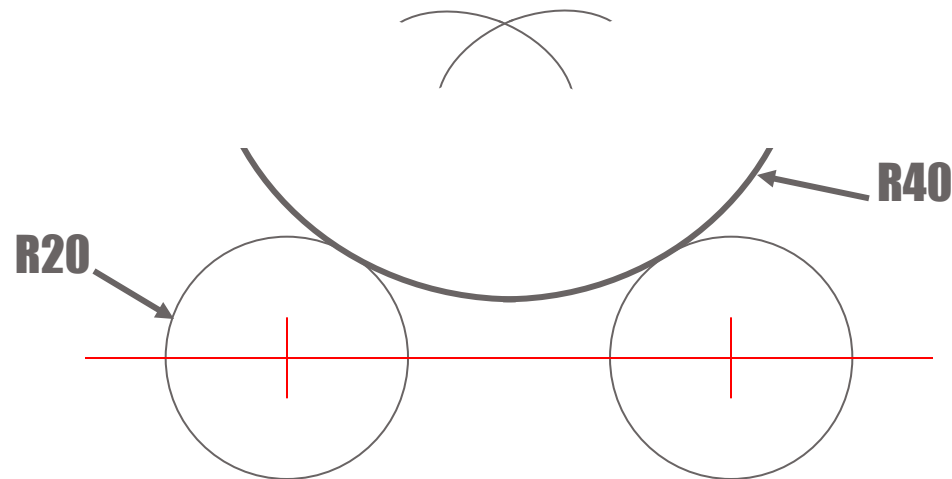
Tangency 5 of 5

SHOW ME MORE



tangent between two curves

**now you can line the required
arc in heavily**

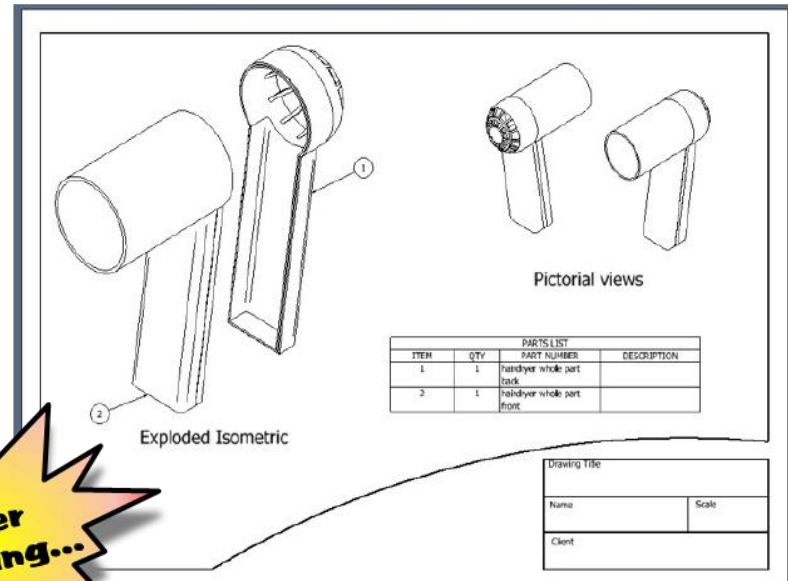
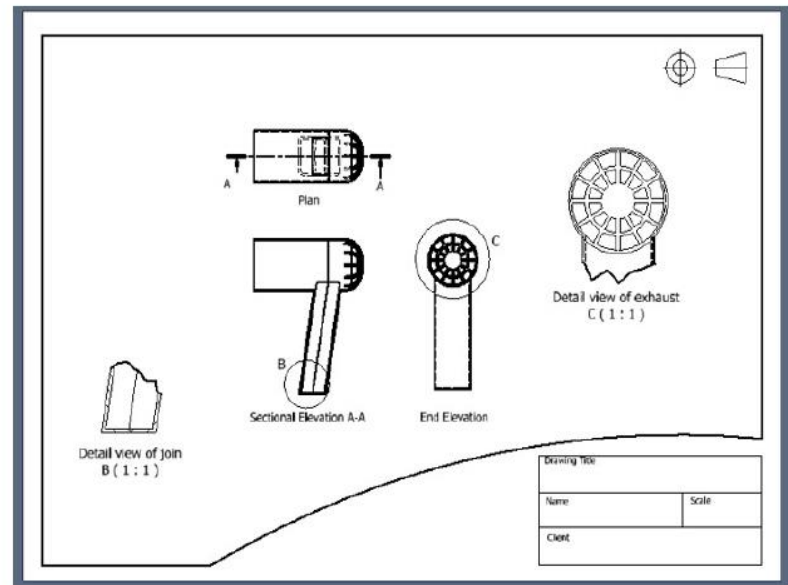
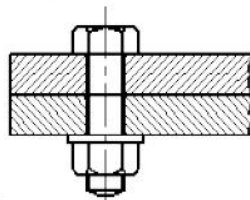
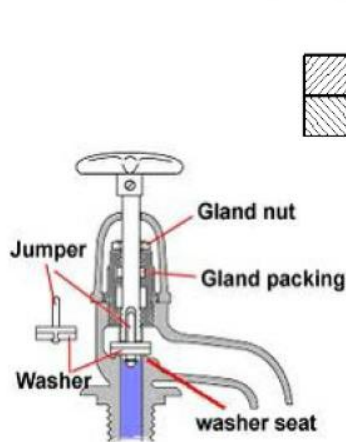
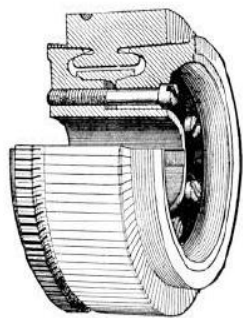
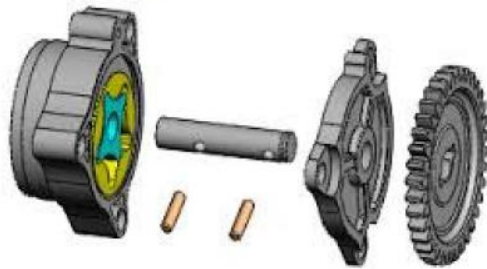




Technical Detail Views

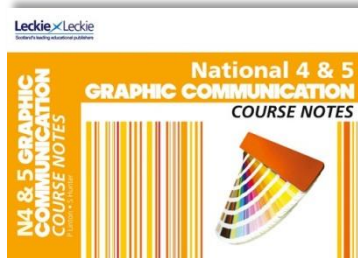
Technical details give us information and additional view points to allow for construction and assembly. Types of technical detail are;

- Dimensioned Orthographic & pictorials.
- Sections (single plane, stepped, revolved, half, part, removed)
- Exploded (isometric, oblique)
- Enlarged views
- Appropriate scaling
- Tangencies
- Cut-aways
- Auxiliary projections
- Helices
- Degree of motion/ range of movement

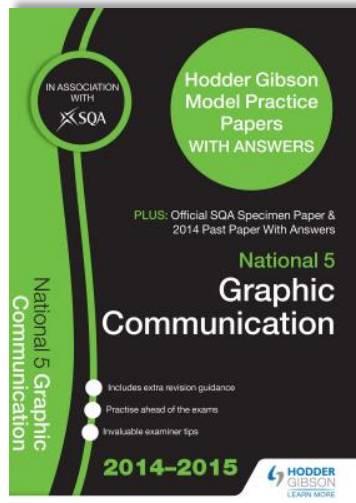




Further Study:



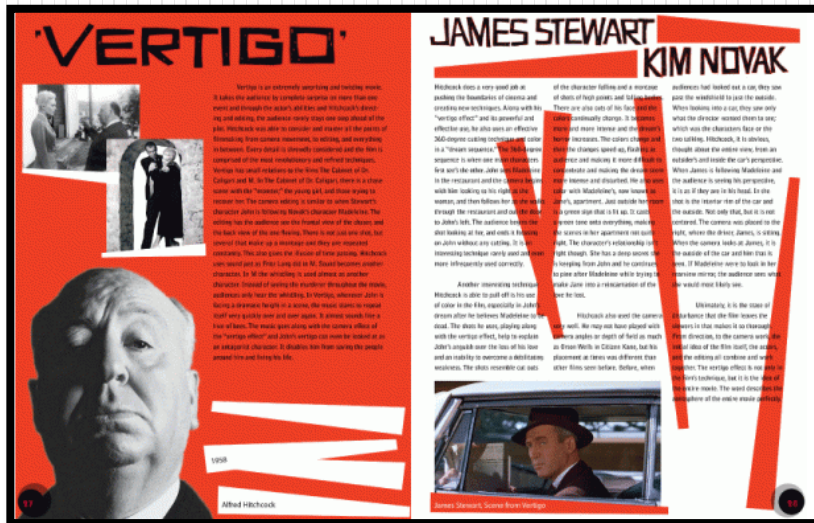
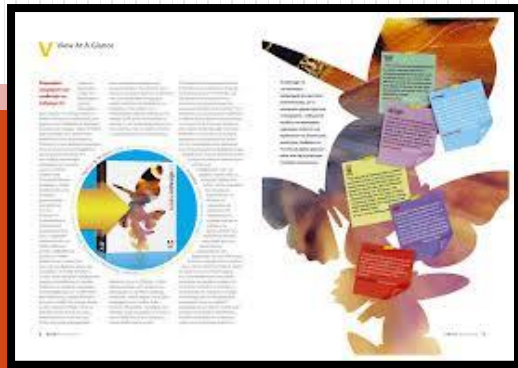
- Page 48 - Read



- Page 44 – Q3e
- (Model Paper 1)
- Page 46 – Q5a, b & c
- (Model Paper 1)
- Page 81 – Q3c
- (Model Paper3)



DESK TOP PUBLISHING 1 OF 10





MagazineLayout_03:Magazine_Spread 22/10/06 1:15 AM Page 2

10 Risk

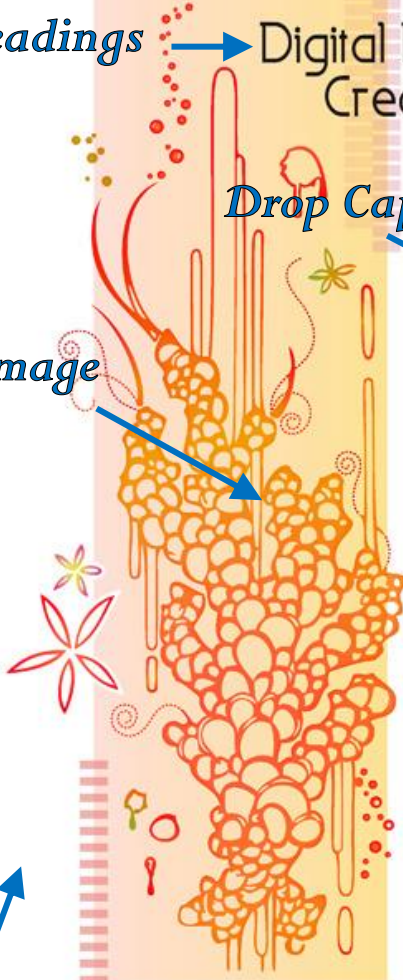
Headings

Digital Illustration: Creating A Cover

Vivamus Non Adipiscing
Purus Dolor Dictum Eu
Lobortis Velit.

Drop Cap

Image



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Header

Body Text

Risk 11

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“ Every artist dips his brush into his own soul, and paints his own nature into his pictures. ”

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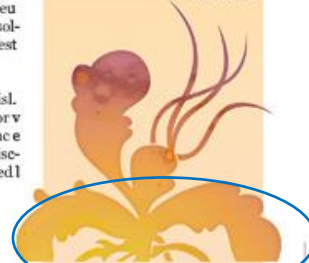
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- David Thompson

Be Sneaky: Turn Designs Into Cash

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- Janet Saxe



Footer

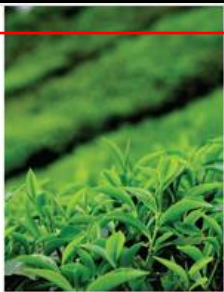
Bleed

White Space



Specimen
Question
Explained

DTP 3 OF 10



It gives the reader breathing space if the publication is quite busy.

I realize in retrospect that I have never regarded magazine design and book design as anything different. Quite a lot my approach to book design is magaziney, and vice versa. I have always thought that magazines should be very readable and enjoyable to read, and not too buzzy.

The relationship between the illustrations and the text – the congruency as I have learned to call it. The balance of illustrations on a page. My *bête noire* is illustrations, of works of art in particular, where the largest picture is shown smaller than the smallest picture.

Wetlands play a key role in the health of our planet. Our carbon sequestration research lacks the tools to explain the link between wetlands and a cleaner environment.

THE CARBON CONNECTION

By Dr. Rhonda McDougall

WETLANDS MORE THAN LOOKS FOR DUCKS UNLIMITED! Canada (PNC) – and that study carbon sequestration and greenhouse gas (GHG) dynamics on the Prairie landscape – I just Black-stone and plant species. Ducks and carbon? What's the connection? And how do we measure and monitor it?

The chemistry of the elements that form our world. Carbon appears in the human eye as a myriad of forms, from the diamond ring on your finger (and your finger itself), to the white marble statue you find, the silver polished metal

It can also be used to create emphasis.

IMAGES/GRAPHIC

DTP 4 OF 10

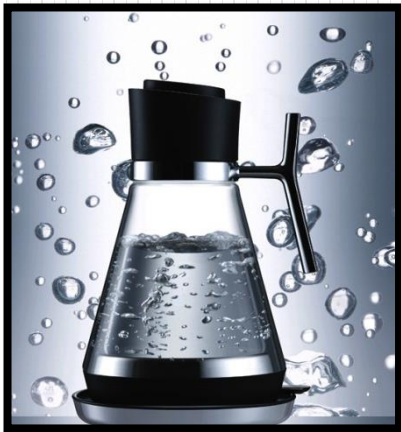
We can manipulate images to enhance the visual impact of a publication.



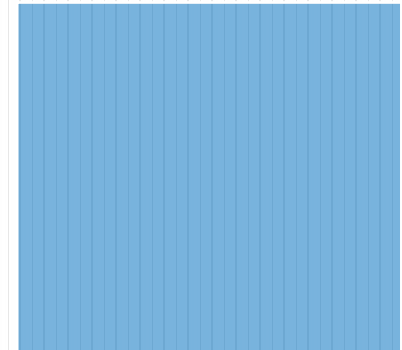
We can do this through *Cropping*.

- **Partial/Square Cropping**

- **Full/Cut Out Cropping**



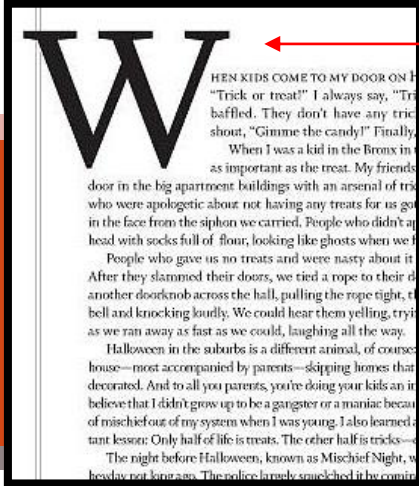
Images can be used to create a tone for the publication and can help to sell an idea of product.



Transparency – making fills and images partially see through.



DROP CAPITAL DTP 5 OF 10



Drop Capital – the first letter (upper case) in an article or paragraph that is enlarged and dropped below the line.

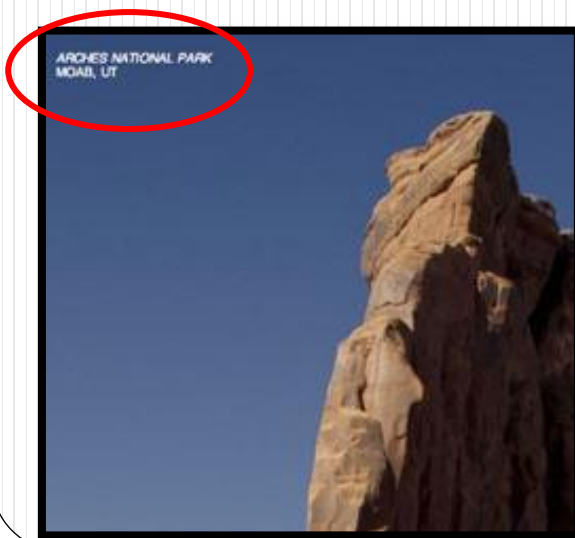
It identifies the start of an article.



Its easy to see how effective a *Drop Cap* can be when compared to articles without one.



CAPTION



Caption– A brief description that accompanies a photograph, graphic or table.

Could often be a description of a product, name of subject or the photographer.



Left Margin – the white space or border at the left side of the article.

Column – the width of the frame of the body text. It shortens the line length making the text easier to read.

While some collectors describe Linda Meaney's highly realistic floral paintings as contemporary botanicals, that term misses a fundamentally important part of the work—her love of sunlight and its affects on the flower.

"Flowers provide the most wonderful subject for light to play on and I never tire of painting them," says Meaney.

"The phrase to describe my work should be that I produce 'oil paintings of nature in sunlight.' Her ability to play and experiment with natural light is even more apparent in her newest paintings.

Meaney usually debuts each year's work annually at the Chelsea Flower Show in London.

"In this year's body of work, I've developed my fascination with shadows and there is more depth and space in the paintings," says Meaney.

Meaney has been painting and showing her florals and still lifes at the Chelsea Flower Show for years. Her love of these subjects began when she was initially commissioned by a friend to do a painting of a flower.

"He wanted one as a present to his wife," says Meaney.

"I was hooked immediately. I love everything, but especially how light played on them, the way that reflected light bounced around the inside of an open flower, the intricate shadows and the sun shining through the petals illuminating their delicate structure.

For years collectors have told Meaney that they have been attracted to her work because of her keen understanding of colour and as well as the realism of the images.

"People describe them to me as happy, optimistic paintings and I get an enormous amount of feedback from people who have bought a painting telling me how they have cheered their home up and how they glow and radiate sunlight on the duller of days. I am often moved by the emotional response that I sometimes get."

INSPIRATION

I am a London based artist who specializes in large oil paintings of flowers. It is sunlight and nature that inspire my art. I try to capture the dazzling effect of sunlight on the most beautiful flowers, to enhance the transparency and texture of petals, the delicate qualities of reflected light and the incredibly subtle variations of colour.

Because I am trying to capture a fleeting moment of light I have to work from photographs. I must take hundreds each year but will only find a handful which are special enough to paint. I know when I've found a really good image because it will evoke an emotional response in me which I hope to convey in the painting. Some of my favourite paintings still, after years of looking at them, bring out the same response in me. They make me happy in the way that a garden on a summer's day does.

DESIGN STRATEGY

I search extensively for the most stunning flowers. During the summer months on days when the sky is clear I visit a number of favourite locations where I know that I will find the best specimens. It is on such days that the sunlight will be strong enough to give me the three types of light that I look for, direct light, reflected light and light shining through the petals. Each flower must also have a very distinct character which I like to enhance. Velvety soft red roses, voluptuous peonies and damask roses like crumpled silk. Each painting is as individual as a portrait.

My favourite light is reflected light because I think that it is this one more than any that make a painting glow and tell us that this is a really hot, sunny day. I also think that somewhere light has to shine through the petals to show how delicate and transparent the petals are. If direct light only is used the petals could be made of wood!

WORKING PROCESS

Each large painting, typically 36 x 36" (90 x 90cm), will take between 4-6 weeks to paint so I only paint about 7 large and a number of small ones each year. I work in oil paint because the colours and tones in my paintings are very subtle and the colour has to dry as close to the wet colour as possible.

I work in many thin layers of paint with black sable brushes to avoid making any visible brush marks. These would detract from the soft textures of the petals which are often smooth and have their own distinct texture.

Each layer is painted completely with background, darks and even lights. Because the paint has to be thinned it can take many layers of paint to achieve the depth of colour or highlights that are needed. But I know when it is finished because the painting will have that wonderful radiant glow to it.

CONTACT DETAILS

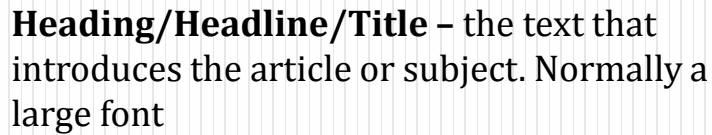
Email: linda@lindameaney.com
www.lindameaney.com

Body Text – the main block of text of a page.

Gutter – the narrow space between the columns of text

Right Margin – the white space or border at the right side of the article.

Text Alignment/Justification – The way the text lines are arranged i.e. left, right, centred, fully justified.



Alignment – when the heading, subheading and text are all positioned and lined up together.



Sub Heading – An intermediate level of heading. It is sized between the heading and body of text.



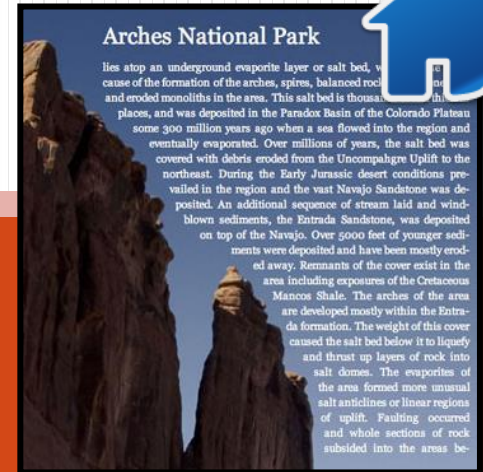
As it is normally a different font from the body text it can give the reader an instant idea as to what the document is about

TEXT WRAP DTP 8 OF 10



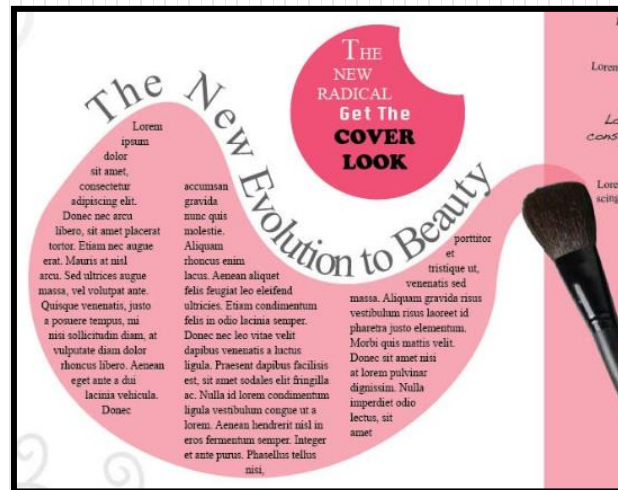
Text Wrap – when text flows along the outline of a graphic or image

FLOW TEXT



Here we see the text wrapping around rocks in a national park.

Publications can use text wrap to sell products and create a more of a tone for articles.



HEADERS AND FOOTERS

DTP 9 OF 10



film / tv

Header – the information that appears at the top of the page in a publication.

- **Normally a title or category.**

Footer – the information in the footer space at the bottom of a publication page.

- **Often a page number or website address.**

www.designcentrehelsea harbour.co.uk



IMAGE BLEED

DTP 10 OF 10

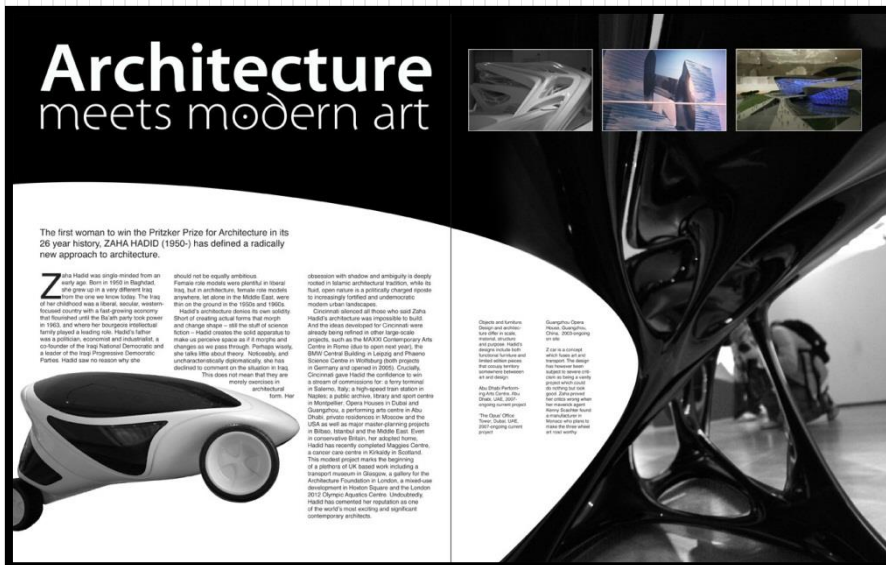


Bleed - The extension of a graphic or image beyond the trimmed edge of a page



Image bleeds ¹ be used to make a publication appear larger than they actually are.

Designers use them to emphasise a point or create a narrative to go along with the body text.

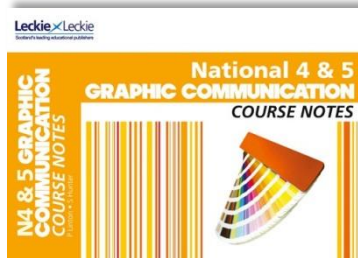


- Strength
- Design
- Structure
- Reliability
- Forward thinking

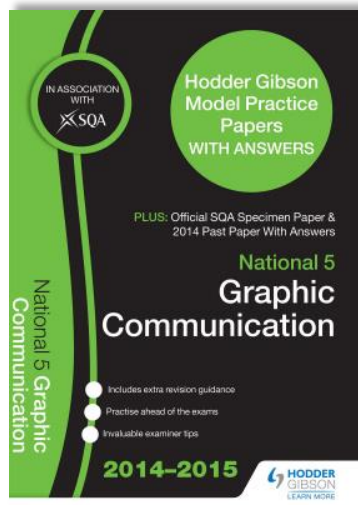




Further Study:



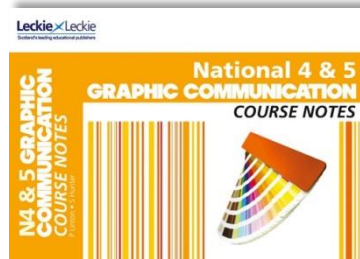
- Page 122 - Read
- Page 123 - Read
- Page 124 - Read
- Page 125 - Read



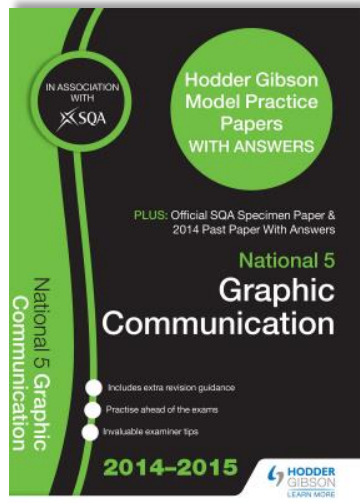
- Page 30 – Q8a & b
- (2013 Specimen Paper)
- Page 36/37 – Q1b, d & f
- (Model Paper 1)
- Page 56 – Q1a
- (Model Paper 2)
- Page 75 – Q1c
- (Model Paper 3)



Further Study:



- Page 126 - Read

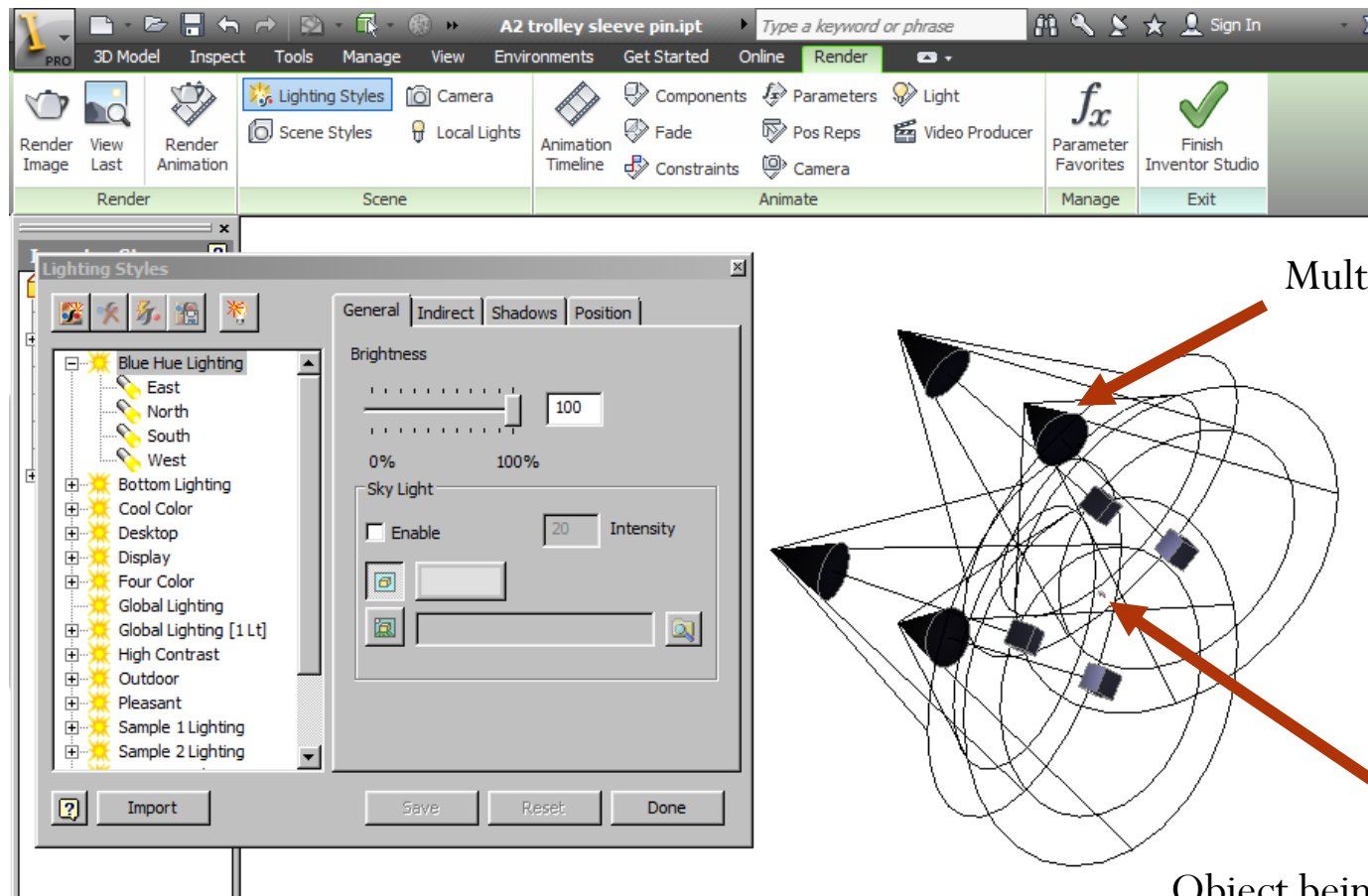


- N/A



3D rendering techniques including: light source, materials, reflection, shade and sited environment.

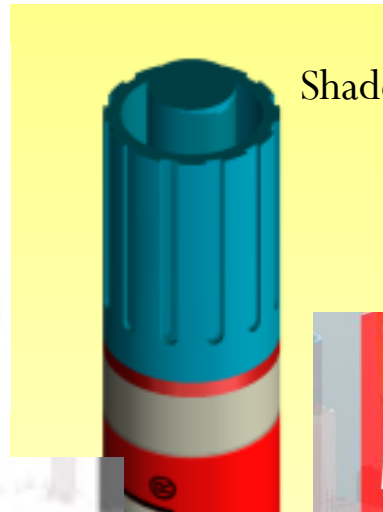
Further Reading...



3D rendering techniques including: light source, materials, reflection, shade and sited environment.



Materials



Shade



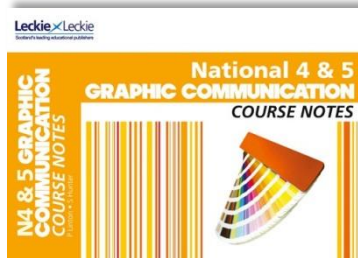
Reflection

Sited environment

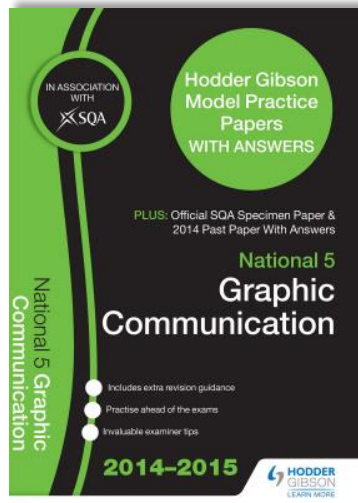




Further Study:

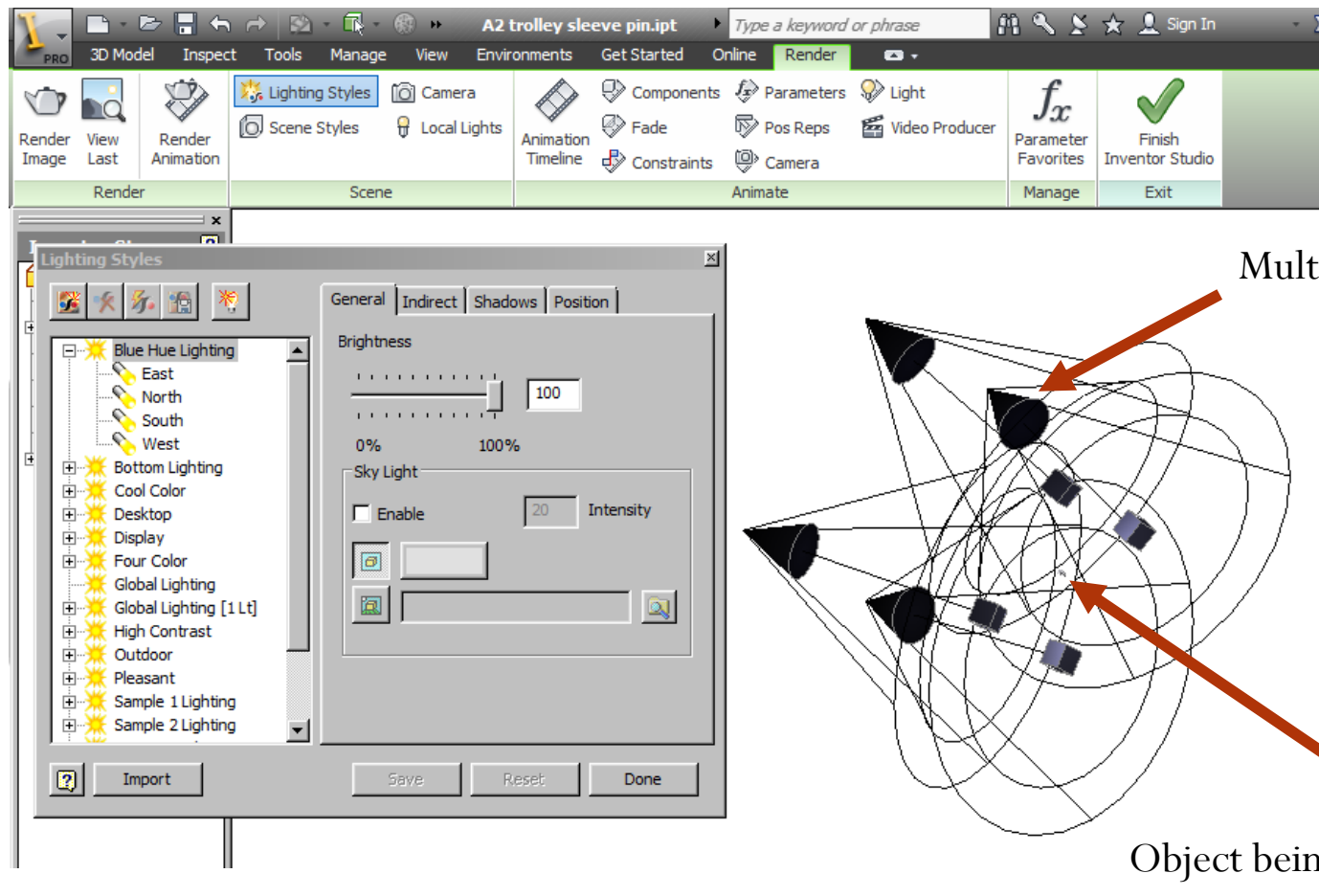


- Page 99 & 100 - Read
- Page 101 & 102 - Read
- Page 103 - Read
- Page 104 – Read (Mediated Reality)



- N/A

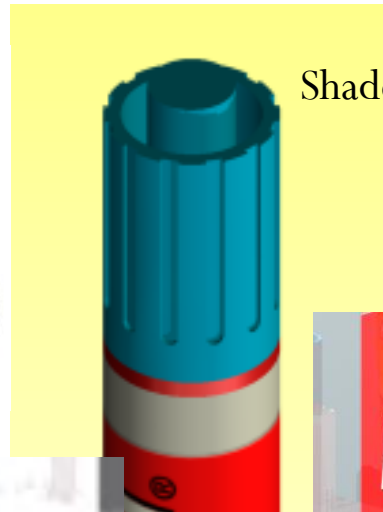
3D rendering techniques including: light source, materials, reflection, shade and sited environment.



3D rendering techniques including: light source, materials, reflection, shade and sited environment.



Materials



Shade



Reflection

Sited environment





C
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GREEN

This cool secondary color is calming, balancing and rejuvenating. Green represents stability and inspires possibility.



WHERE TO USE:

To represent balance and harmony in a design.

Use darker shades to represent stability and affluence.

BLUE

Blue represents dependability, trustworthiness and security. It can also characterize calm and spirituality.



WHERE TO USE:

Dark blues are excellent for corporate and business designs.

Lighter blues can be used for social websites that represent calm and friendliness.

PURPLE

Purple represents nobility, abundance and dignity, but can also stand for creativity and imagination.



WHERE TO USE:

Darker shades of purple characterize wealth and luxury.

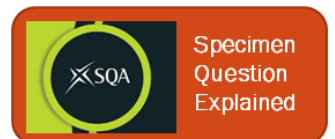
Softer shades can be associated with spring and romance.

MONOCHROMATIC

Cool/ Cold Colours also known as:



Receding Colours



RED

The hottest and the most dynamic color, red is activating, stimulating, passionate, exciting, powerful, and expanding.



WHERE TO USE:

Use minimally in its purest form as an accent to draw attention to critical elements.

For depicting designs that portray power or passion.

ORANGE

Not as overwhelming as red, orange is a balanced color that is vibrant and energetic while being friendly and inviting.



WHERE TO USE:

To give a friendly and inviting impression.

For designs depicting movement and energy without being overpowering.

YELLOW

The brightest and most energizing of warm colors, yellow is happy, warm, stimulating and expansive.



WHERE TO USE:

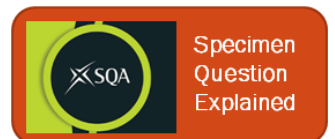
To give an impression of happiness and cheerfulness.

Young to Old: in its pure form, yellow can be used for designs concerning children, while darker shades can be used to give a sense of antiquity.

Warm/ Hot Colours also known as:



Advancing Colours

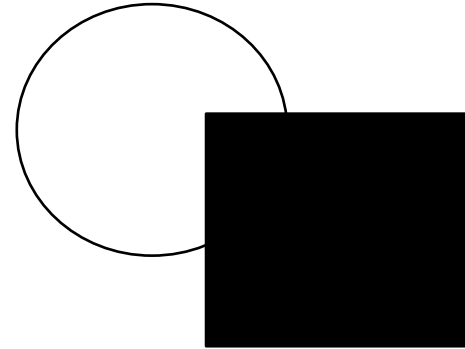




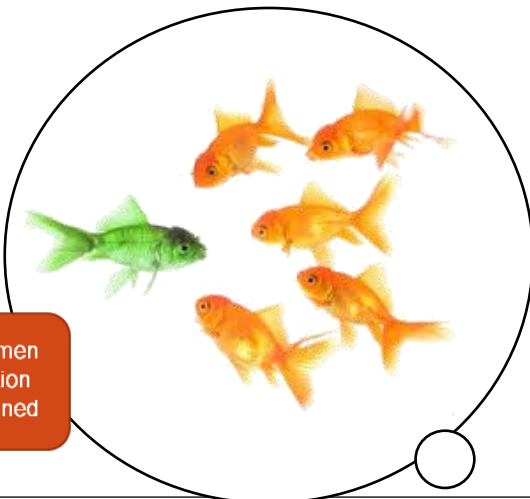
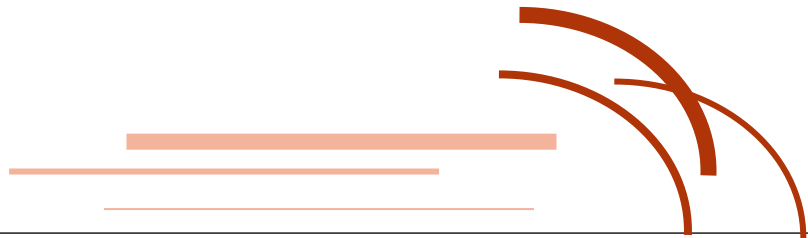
Contrast



- Contrast is created by introducing elements (colours, font styles, shapes and sizes) that are opposite or are very different.
- This will increase the visual impact of your design/layout

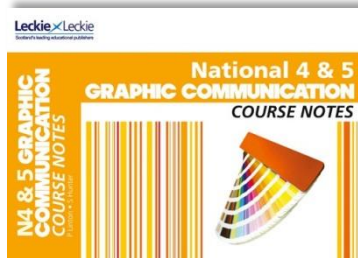


Graphic Design Graphic Design

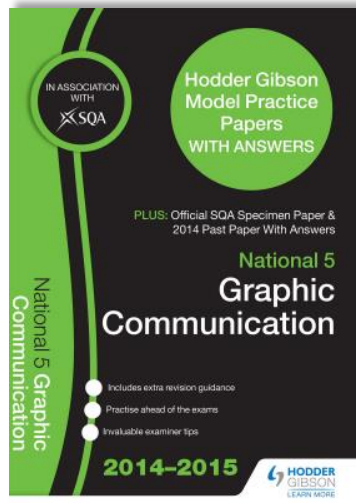




Further Study:



- Page 137 - Read
- Page 143 - Read



- Page 11 Q1c
- (2013 Specimen Paper)

- Page 51 Q8 d & e
- (Model Paper 1)

- Page 57 Q1d
- (Model Paper 2)





Colour

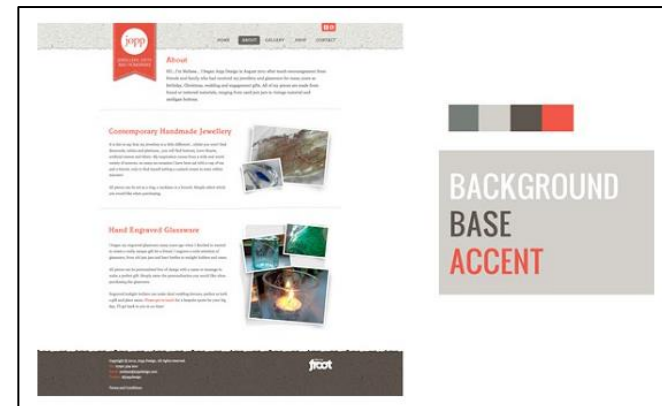
This is a straight forward subject area that has been discussed since S1.
You need to be **very confident** answering questions in this key subject area. In addition to what is detailed below you need to know about the **function** and **uses of colour**.

Further Reading...



- Warm – red, orange & yellow
- Cool – violet, blue & green
- Contrast – opposite on colour wheel, eg **blue/orange**
- Harmony – next to on colour wheel, eg **red/orange**
- Accent - Accent colours are colours that are used for emphasis in a colour scheme. These colours can often be bold or vivid and are used sparingly, to **emphasise, contrast or create rhythm**
- Advancing - red, orange & yellow
- Receding - violet, blue & green

SHOW ME MORE



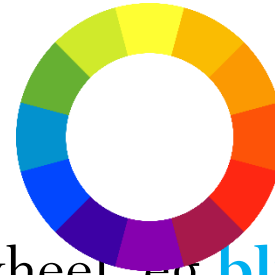




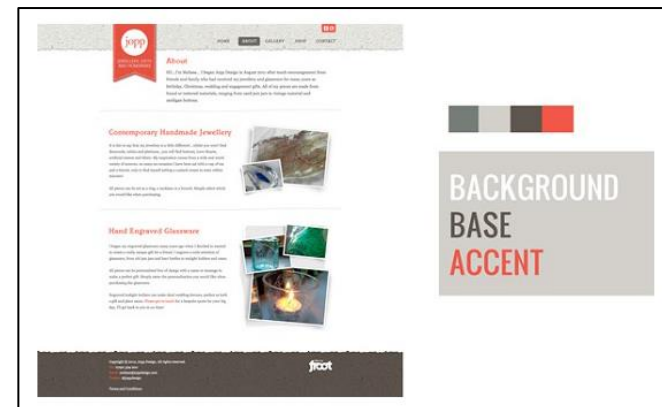
Colour

This is a straight forward subject area that has been discussed since S1.
You need to be **very confident** answering questions in this key subject area. In addition to what is detailed below you need to know about the **function** and **uses of colour**.

Further Reading...



- Warm – red, orange & yellow
- Cool – violet, blue & green
- Contrast – opposite on colour wheel, eg **blue/orange**
- Harmony – next to on colour wheel, eg **red/orange**
- Accent - Accent colours are colours that are used for emphasis in a colour scheme. These colours can often be bold or vivid and are used sparingly, to **emphasise, contrast or create rhythm**
- Advancing - red, orange & yellow
- Receding - violet, blue & green

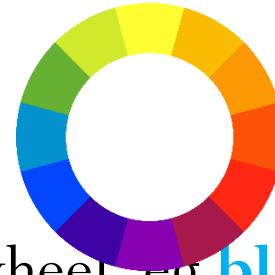




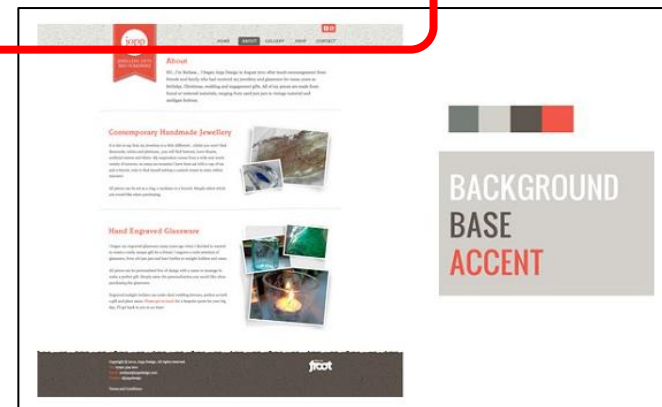


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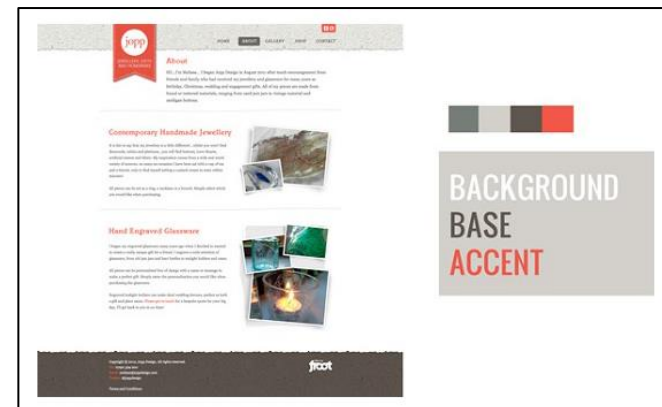
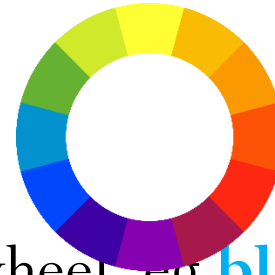


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PINK
romance
compassion
faithfulness
beauty
love
friendship
sensitivity

GREEN
life
growth
environment
healing
money
safety
relaxation
freshness

Blue promotes calm and serenity and people are proven to be more productive in a blue room...

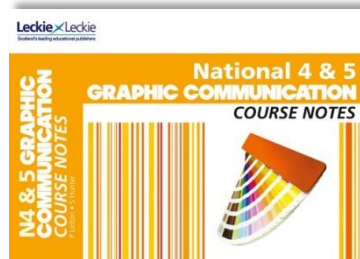
Purple
Symbolises royalty and wealth and so if you're looking to create a luxurious environment,

Function of colour and moods associated with colours.

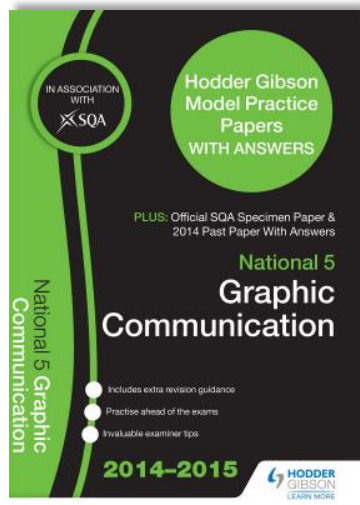
Really easy subject to research on the internet. Make sure you are confident answering questions on this subject.



Further Study:



- Page 136 – Read & Complete Activity
- Page 143 – Read
- Page 144 – Read & Complete Activity
- Page 145 – Read & Complete Activity



- Page 10 Q1b, c, e, & f
- (2013 Specimen Paper)
- Page 36 Q1a & g
- Page 45 Q4a
- (Model Paper 1)
- Page 58 Q1f
- Page 66 Q4a, b, & c
- (Model Paper 2)
- Page 90 Q6b & c
- (Model Paper 3)



Line



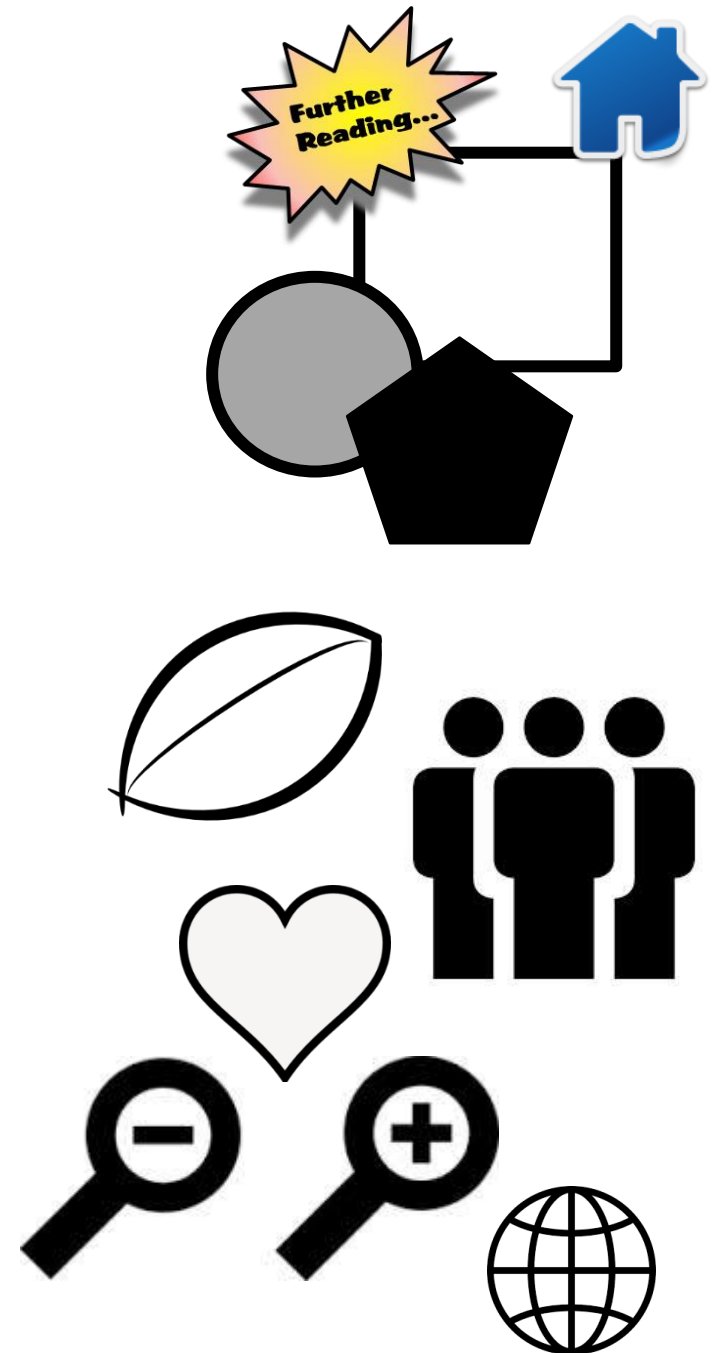
- A line is a mark between two points. There are various types of lines, from straight to wavy to curved and more.
- Lines can be used for a wide range of purposes: **stressing a word or phrase**, **connecting content** to one another, **separating content**, **creating pattern** and much more
- Vertical lines can stop eye movement, horizontal lines can symbol rest and diagonal movement.





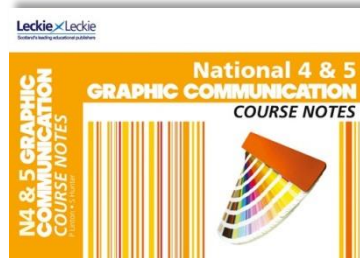
Shape

- Height + width = shape
- A shape is simply formed when a line encloses an area
- Basic shapes: triangles, squares, circles and rectangles
- Odd or lesser seen shapes can be used to attract attention
- Three basic types of shapes:
 - Geometric – squares, circles, etc
 - Natural – leaves, trees, people, etc
 - Abstract – icons, graphic outlines, etc
- Don't allow shapes to dominate any design, they should simply support what you are trying to say or show.

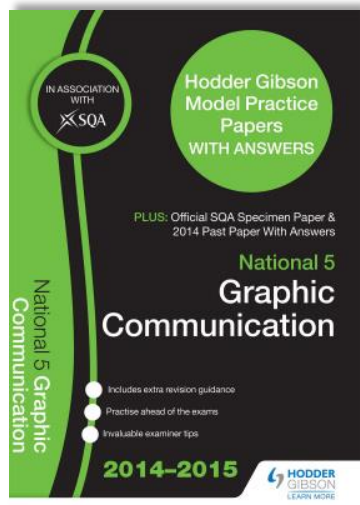




Further Study:



- Page 133 - Read
- Page 141 - Read & Complete Activity



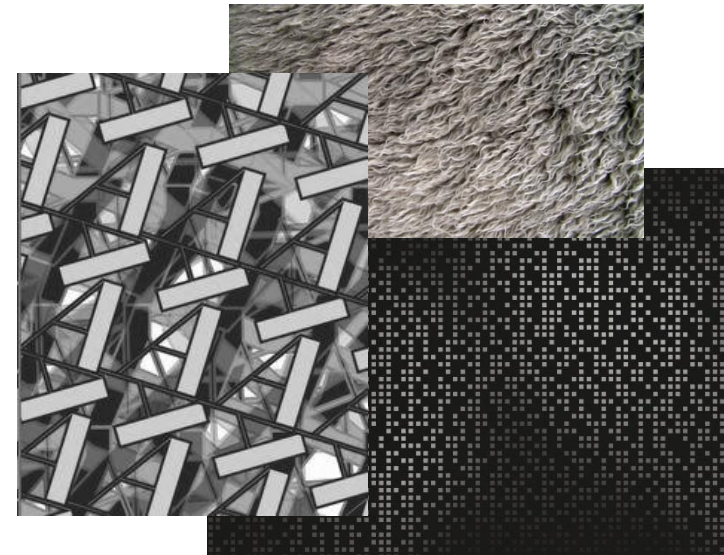
- Page 36 Q1c
- (Model Paper 1)
- Page 37 Q1f
- (Model Paper 1)
- Page 58 Q1f
- (Model Paper 2)





Texture

- Texture can refer to the actual surface of a design or to the visual appearance of a design.
- In the first case, the audience can actually feel the texture, making it unique from the other elements of design. Selection of paper and materials in package design can affect actual texture.
- In the second case, texture is implied through the style of design. Rich, layered graphics can create visual texture that mirrors actual texture.





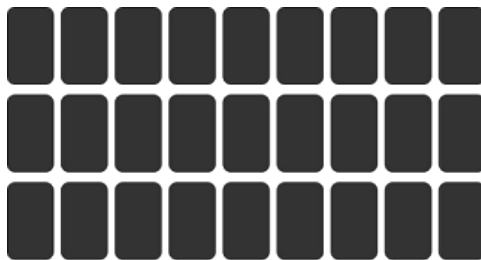
Value



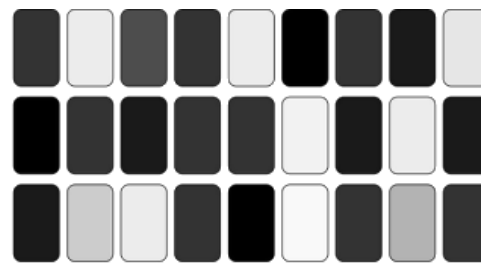
- The **lightness or darkness of an object** or portion of a design, regardless of colour, is its **value**.
- If you use a pencil to draw a circle it can represent a ball but if you then use a few darker and lighter strokes around the edges you can make that circle look more three-dimensional, like a real ball. Value creates the illusion of **depth** and helps the viewer see and interpret a two dimensional drawing. Value can be used with other principles and elements of design to **create emphasis** or a **focal point** in a page layout or image, leading the eye to what the designer deems is most important.
- Value can also be used to increase **contrast** and **create movement**. The greater the difference in the value of an object and its background and other objects, the greater the contrast. Objects with differing values lead the eye from most prominent to least and give the illusion that parts of the design are moving.



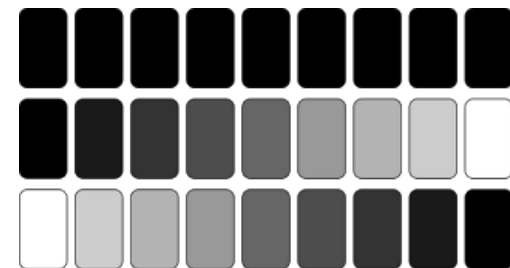
value can be defined a number of ways.
we are looking at levels of light and dark.



even value makes the eye stagnate



random value makes the eye jump around



graduated values can direct the eye

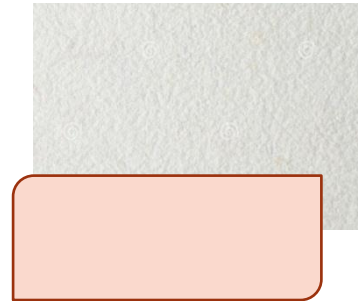


Mass/weight



- Every element you add to a graphic design has mass,
- Compare the images opposite. What looks heavier?

Graphic Design



The following slides provide information on topics that may / will be assessed in the written question paper. You should be familiar with the topics detailed from

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You should be familiar with the topics detailed from your unit assessed work and from knowledge you have gained through your studies to date

Graphic Design



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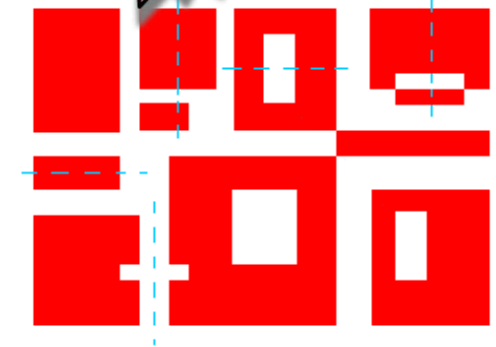
Less mass



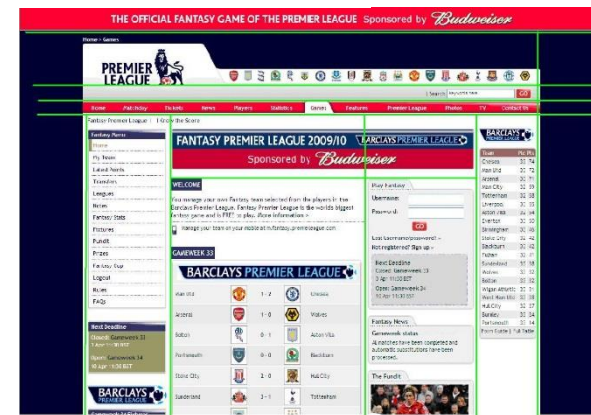
More mass



Alignment



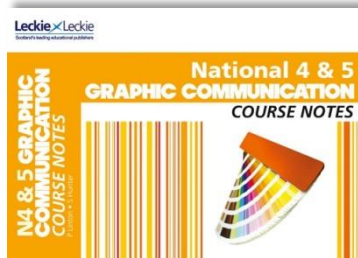
- Proper alignment in a design means that every element in it is **visually connected** to another element,
- **Good alignment improves the structure of a design,**
- All text, images, lines, shapes, etc, need to be positioned and aligned carefully,
- Alignment allows for cohesiveness: **nothing feels out of place or disconnected** when alignment is handled well.



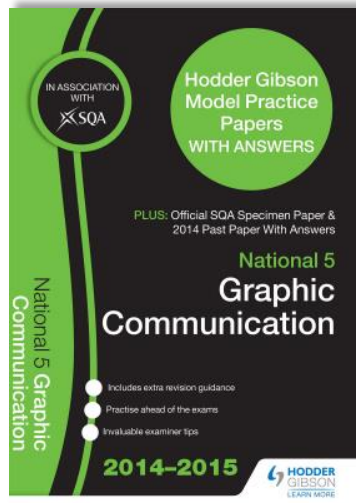
Alignment



Further Study:



- Page 134 – Read & **Complete Activity**



- Page 10 Q1a
- (2013 Specimen Paper)
- Page 30 Q8c
- (2013 Specimen Paper)
- Page 51 Q8c
- (Model Paper 1)
- Page 75/76 Q1g & h
- (Model Paper 3)



Balance (1 of 2)

- Balance refers to the distribution of **visual weight** in a graphic design
- Balance can relate to symmetry, asymmetry or radial balance.
- **Symmetrical Balance** is an even placement of visual weight in the design.
- **Asymmetrical Balance** creates uneven spaces, a sense of imbalance making tension and a suggestion of visual movement. Asymmetrical balance refers to a psychological or "felt" balance. Space and shape don't need to be evenly dispersed on the page
- **Radial Symmetry** relates to images emitting from a point like spokes on a wheel or ripples from a pebble tossed into a pond.



Horizontal
symmetry



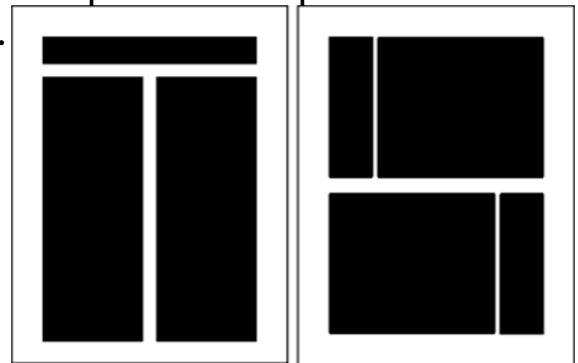
Approximate
horizontal symmetry



Radial
symmetry



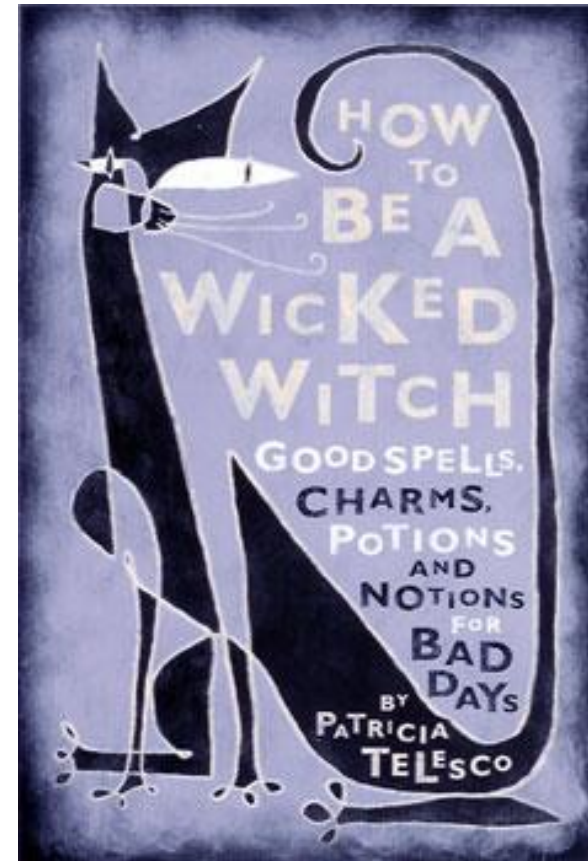
Asymmetry



Balance (2 of 2)



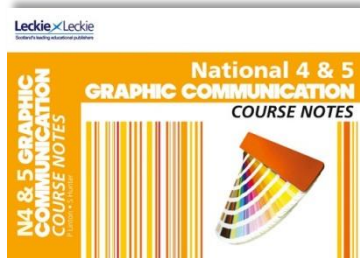
- At first glance, an observer may wonder how this cover could possibly represent a good example of balance. Think of this design not in terms of balancing two mirrored sides (symmetrical balance), but of two different elements - type and shape - offsetting each other.
- The illustration on the left side is basically built of shapes, while the right side of the design is primarily type. The two are placed in the format in such a way as to create a sense of near-perfect balance. The dark border and the tail of the cat coming up to the right edge of the cover do wonders to stabilize the design.



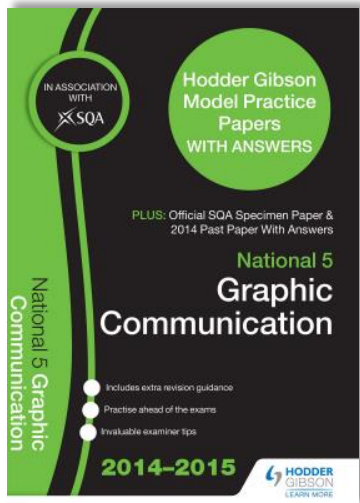
Balance



Further Study:



- Page 135 - Read



- Page 11 Q1d
- (2013 Specimen Paper)
- Page 57 Q1e
- (Model Paper 2)



Depth

- Depth can simply be created by having elements overlapping or layered,
- It creates a foreground and a background,
- We can do this by using colour, applying perspective, using drop shadows and adding backgrounds, etc



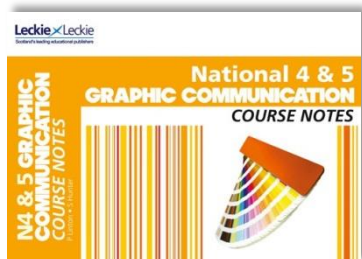
Drop Shadow



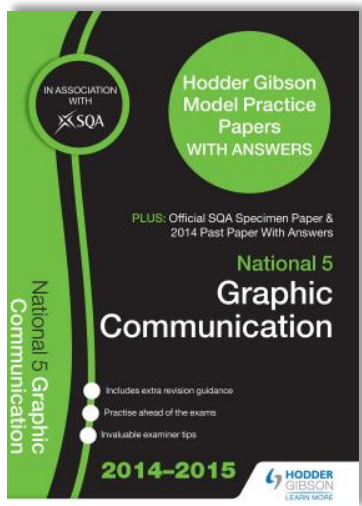
Depth



Further Study:



- Page 138 Read & Complete Activity



- Page 51 Q8b
- (Model Paper 1)
- Page 76 Q1j
- (Model Paper 3)



Dominance/Emphasis

Further Reading...



What is it?

- The first thing the eye sees on a design.

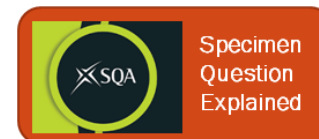
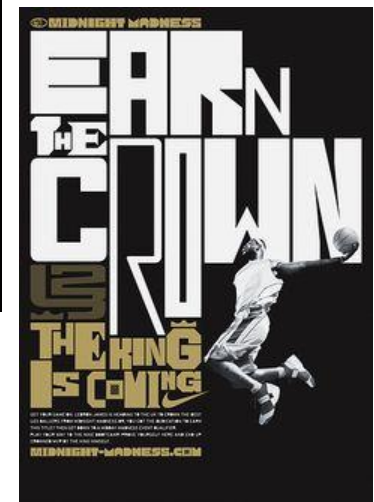
Why is important?

- Dominance manipulates the viewer; dominance is where the viewer is to start looking
- There is an order in a design. You want the viewer to follow the correct direction, getting information in the correct order. To do this you need to force them to a specific start point on the design.
- It gets the viewer's attention.

How to achieve it

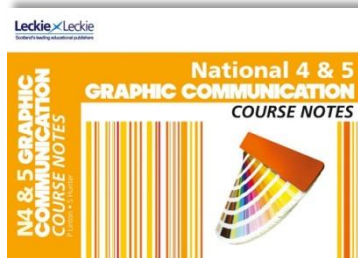
Through the use of some elements:

- Colour
- Image, Text or Words
 - Shocking
 - Weird
 - Controversial
- Contrast (Contrasting colours, e.g. black on white)
- Size (Bigger image vs. smaller)

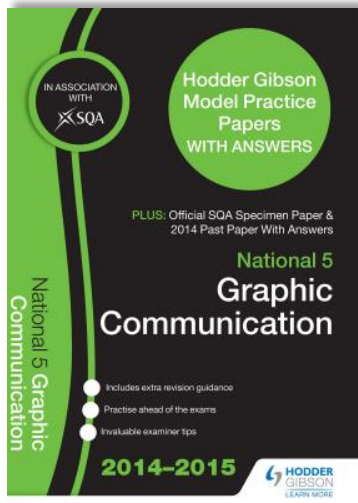




Further Study:



- Page 140 – Read & Complete Activity



- Page 55 Q8f
- (Model Paper 1)
- Page 57 Q1c
- (Model Paper 2)
- Page 76 Q1k
- (Model Paper 3)



Proportion (1 of 2)

- Proportion refers to the relative size and scale of the various elements in a design.
- Proportion can be used in a composition to create a sense of distance or demonstrate a size difference.



Bad Proportion



Equal division creates monotony.

Good Proportion



Division too unequal creates a lack of harmony.

Proportion - Rule of Thirds (2 of 2)



- Use guides to divide your work area into an equal three-by-three grid. Place your key element where two of the axes meet to create a focal point.
- It's then simple to develop the rest of the layout around that element, using the remaining guide intersection for aligning other key elements.





Rhythm



- Rhythm is the repetition of elements in a layout: shape, colour, line, etc.
- It can create a sense of **movement**, can establish a pattern and texture,
- Rhythm can direct the viewer and make the layout easier to understand.

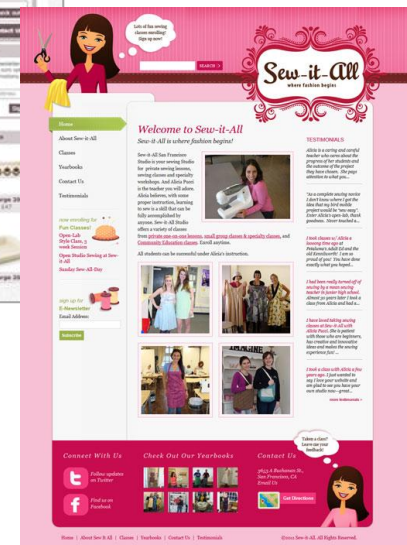




Unity/proximity

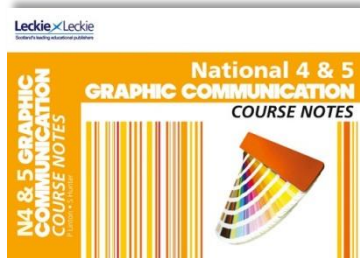


- Unity refers to the relationship or connection between the various parts within a layout and their relationship or connection to the layout as a whole. Positioning items close together can create unity.
- Unity can give a sense of entirety or wholeness to the layout or equally break it up and create a sense of variety or disharmony.
- An layout with good unity will draw the viewer in and focus them around the one area or a few connected areas and generally get the point across very quickly, so are therefore ideal for advertising.
- Images/layouts without unity can be difficult to read or visually awkward.

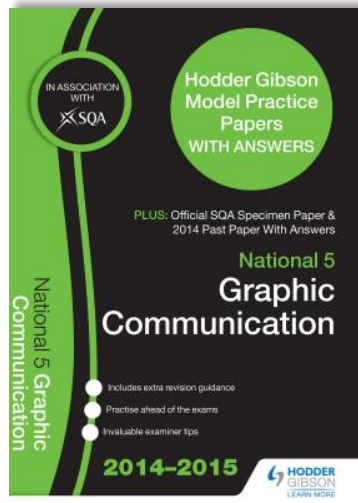




Further Study:



- Page 139 - Read



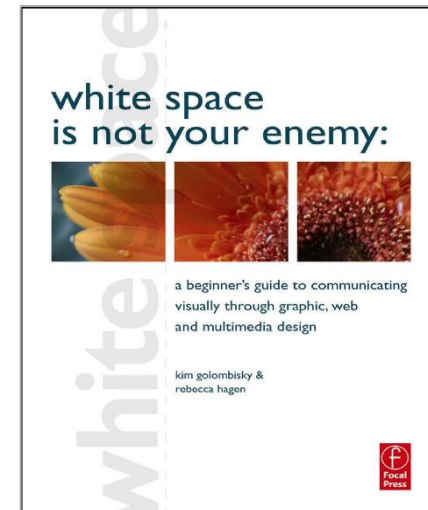
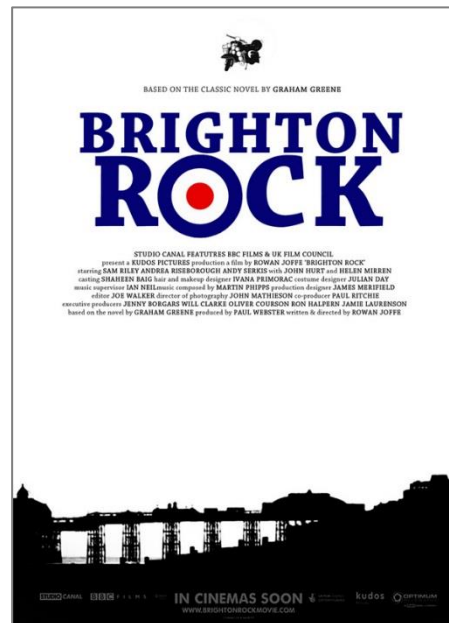
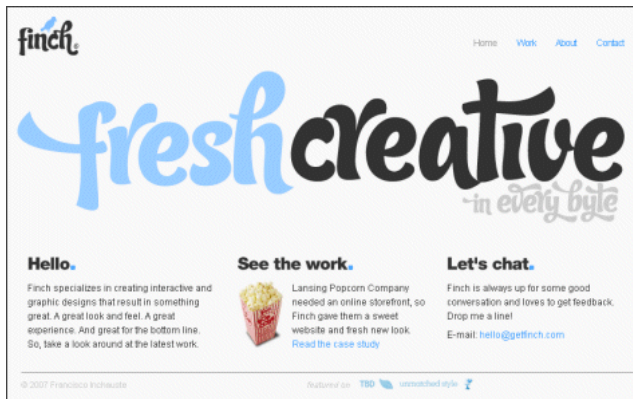
- Page 10 Q1b
- (2013 Specimen Paper)
- Page 51 Q8a
- (Model Paper 1)
- Page 57 Q1b
- (Model Paper 2)
- Page 76 Q1i & I
- (Model Paper 3)



White space



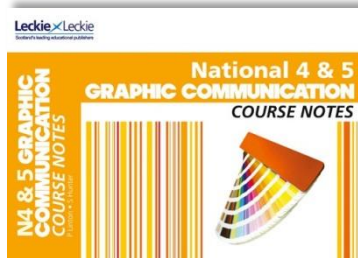
- White space is an area free from text and images,
- It allows the eye to rest, it gives the reader '*breathing room*',
- It can also make the reader focus on particular areas by directing the eye to other areas in the layout.



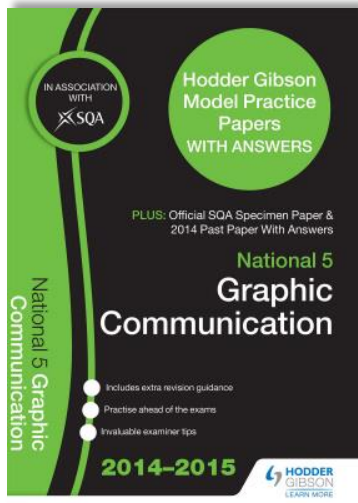
'A cluttered design is like a cluttered desk — you can never find what you need, or if you find it than you spend lots of time looking for it.'



Further Study:



- Page 140 – Read & Complete Activity



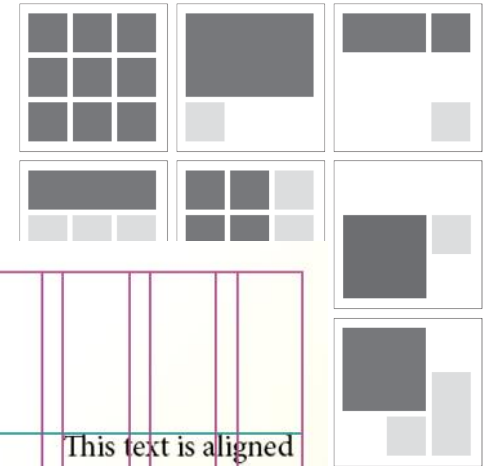
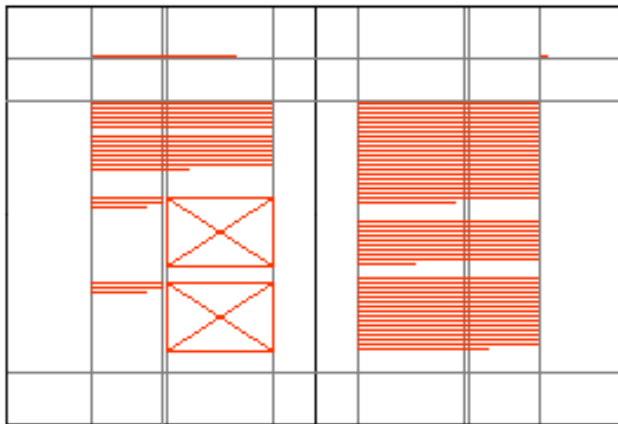
- N/A



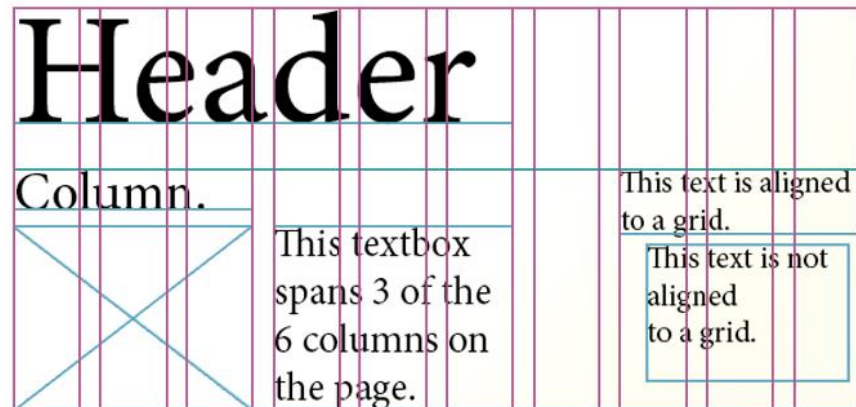
Grid structure



- In graphic design, a **grid** is a structure made up of a series of intersecting straight (vertical, horizontal, and angular) or curved guide lines used to structure content.
- The grid serves as an armature on which you can organize graphic elements (text, images, pull quotes, etc) in a sensible easy way.
- A grid can be used to organize graphic elements in relation to a page, in relation to other graphic elements on the page, or relation to other parts of the same graphic element.

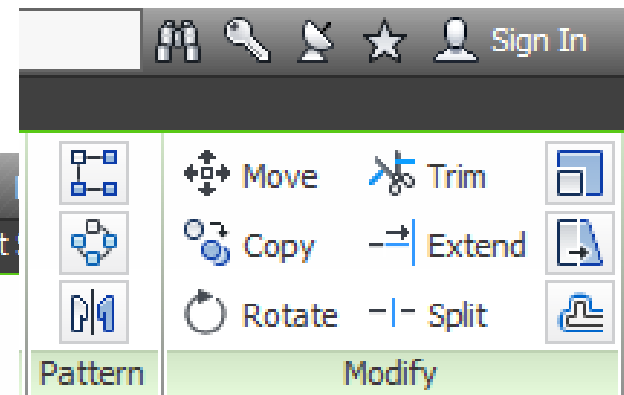
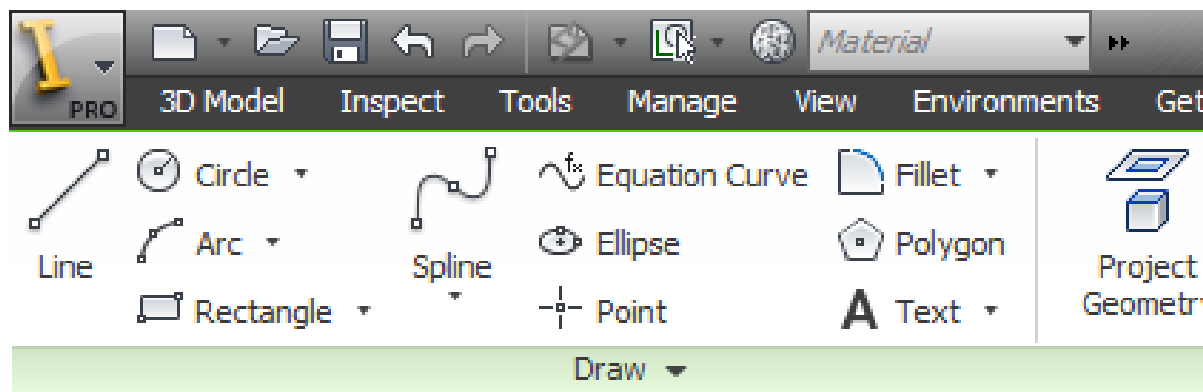
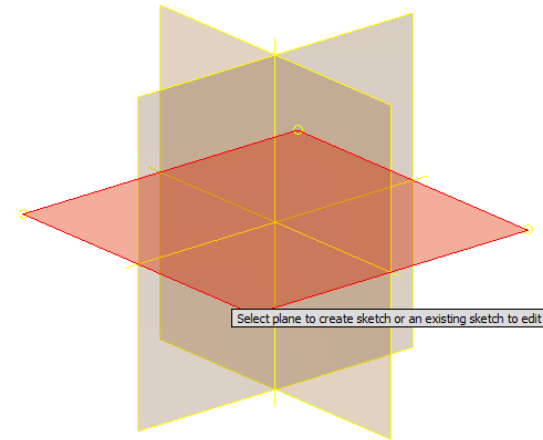
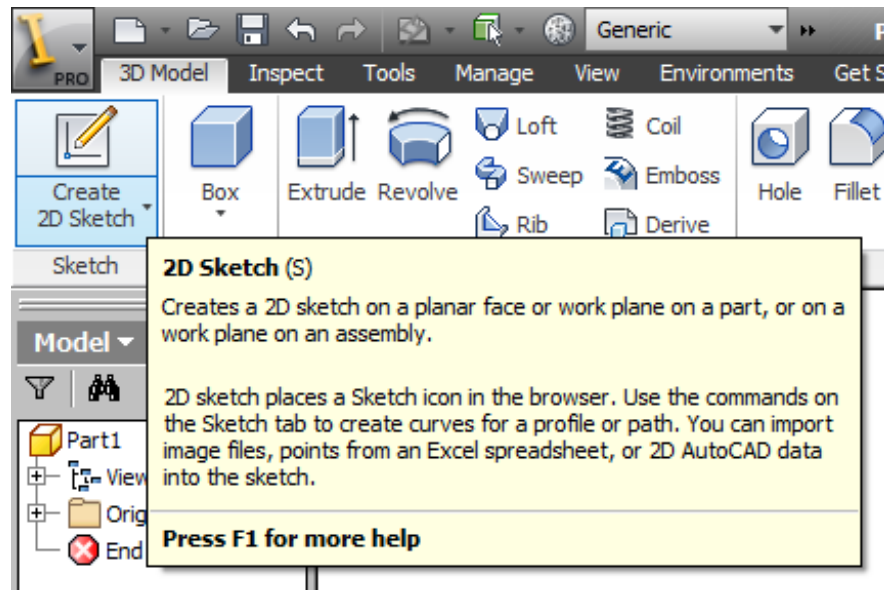


John P. Corrigan



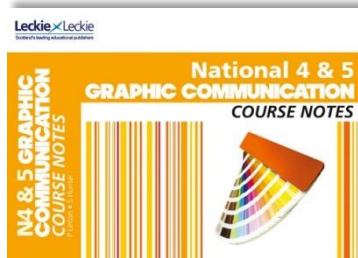


Drawing Tools: line, circle, rectangle, ellipse, trim, array (linear, box and radial), offset, mirror, project edge, extend

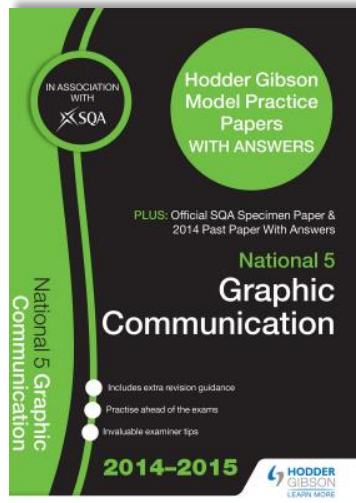




Further Study:



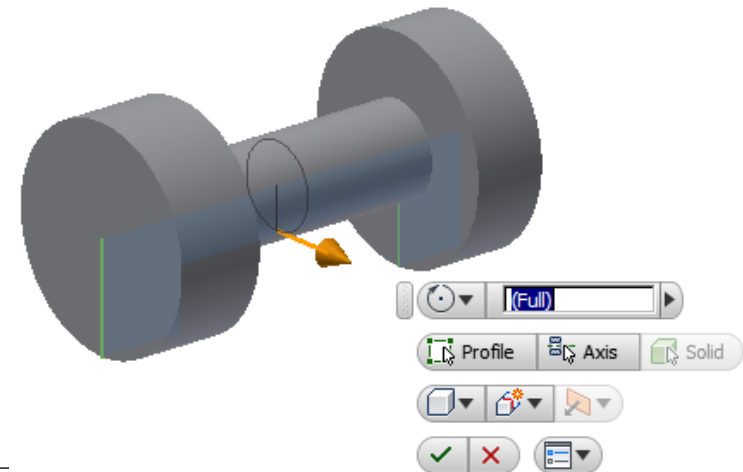
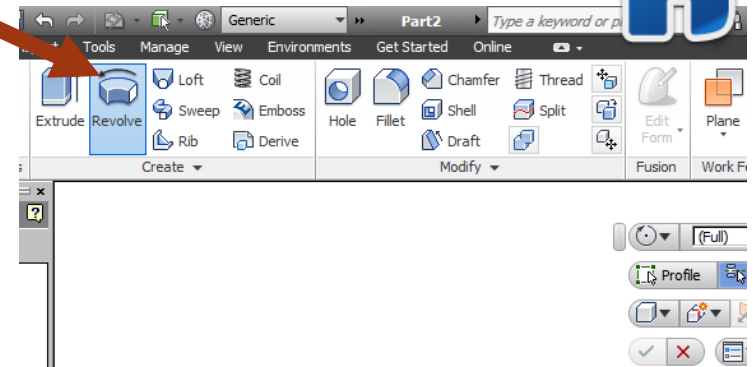
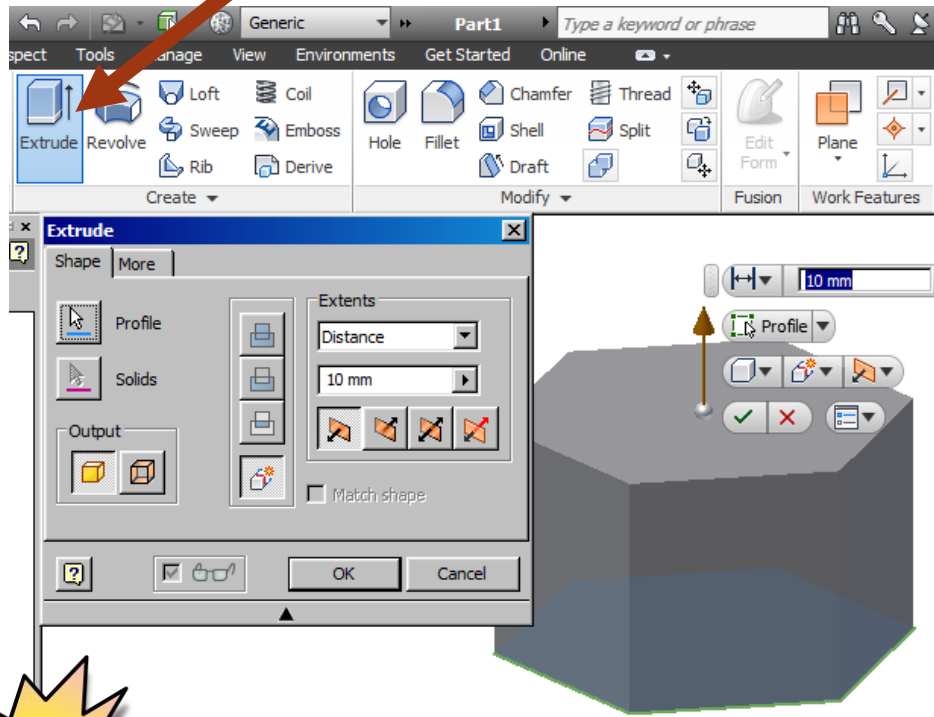
- Page 73 - Read
- Page 86 - Read



- N/A



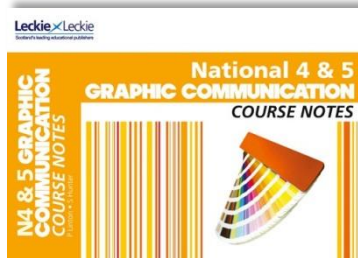
Modelling Features: extrude, revolve, loft, helix/helices, path (extrude/sweep along a path)



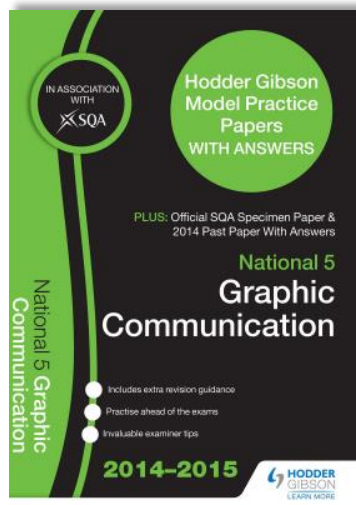
Further Reading...



Further Study:



- Page 79 - Read
- Page 80 - Read
- Page 81 - Read

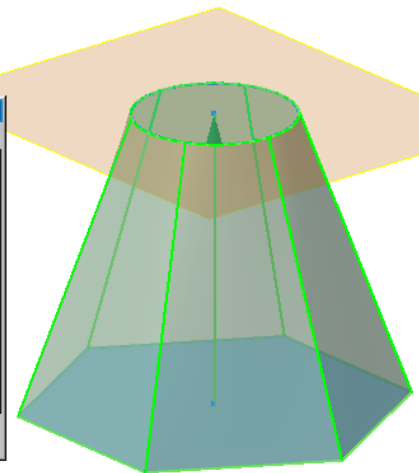
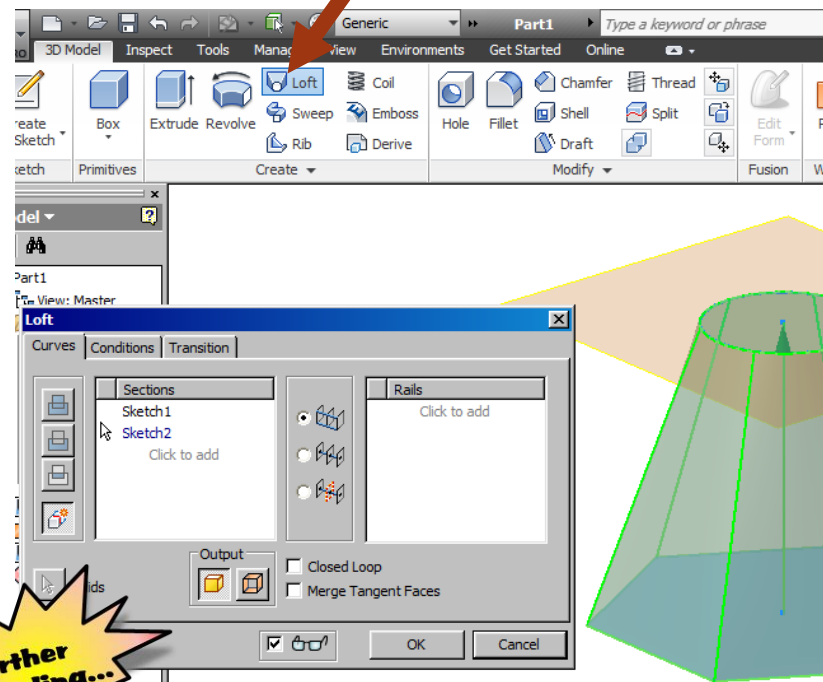
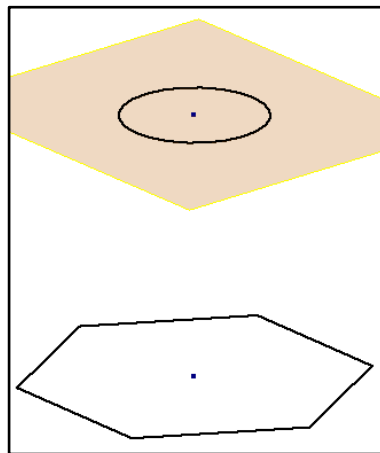
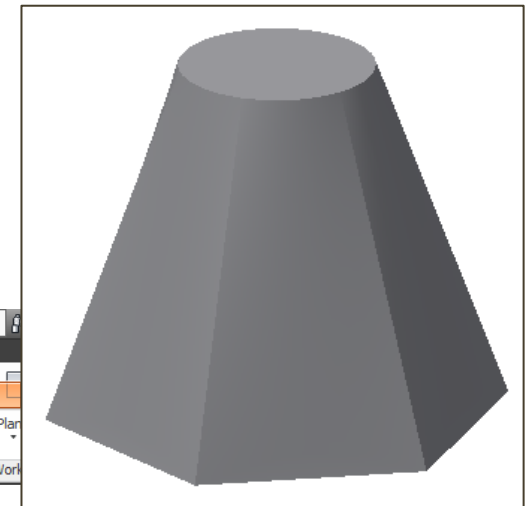
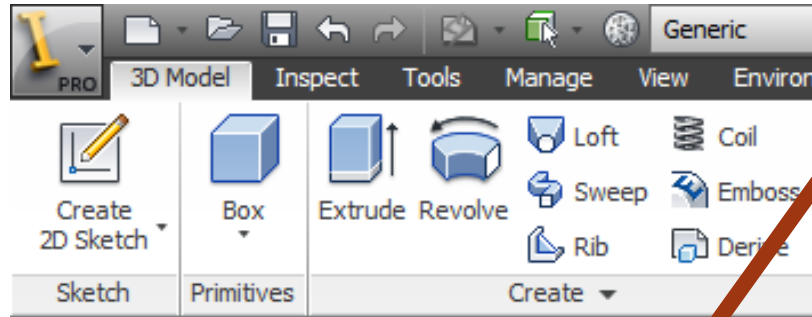


- Page 14 Q2a
- Page 16 Q2c
- (2013 Specimen Paper

- Page 86 Q5a
- (Model Paper 3)



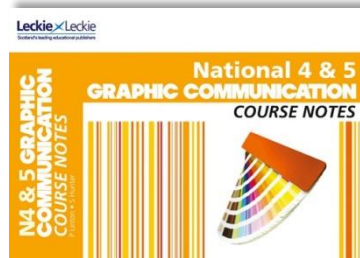
Modelling Features: extrude, revolve, loft, helix/helices, path
(extrude/sweep along a path)



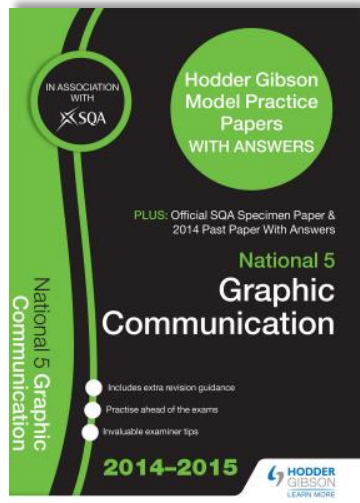
Loft



Further Study:



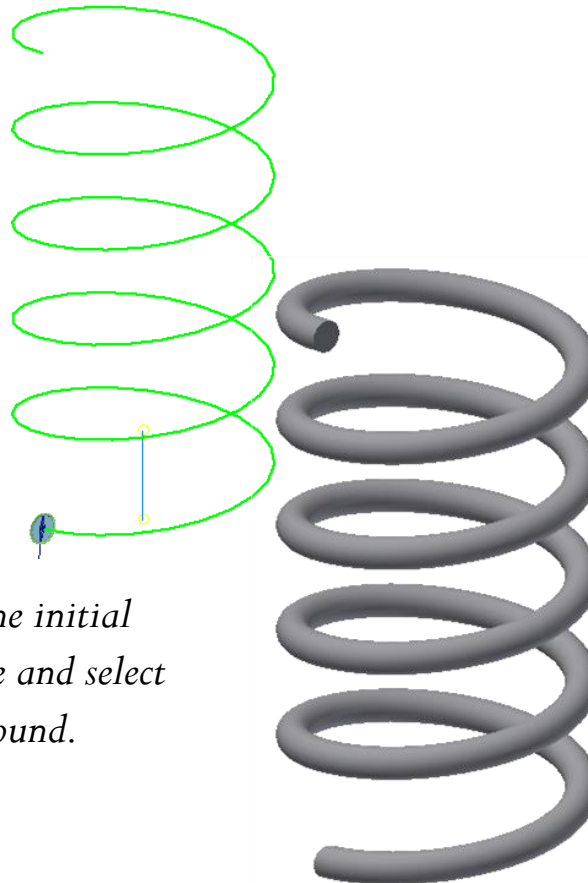
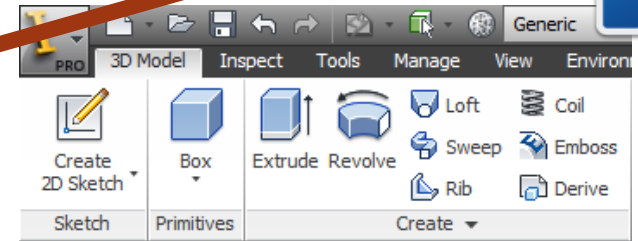
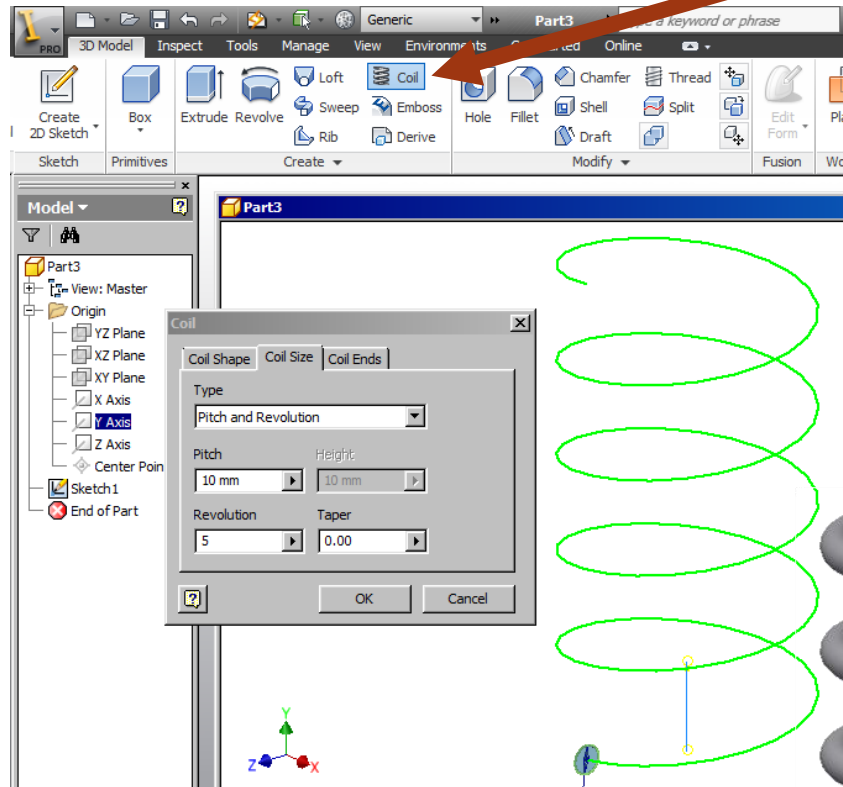
•Page 87 - Read



•N/A



Modelling Features: extrude, revolve, loft, helix/helices, path (extrude/sweep along a path)



We can 'subtract' the helix (coil) to create a thread as shown on the bolt above.

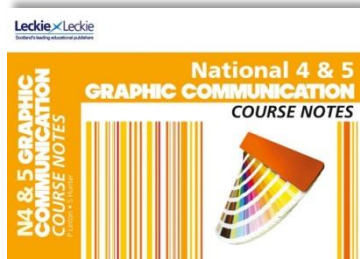
It is important to create the initial sketch on the correct plane and select the right axis to rotate around.

Further Reading...

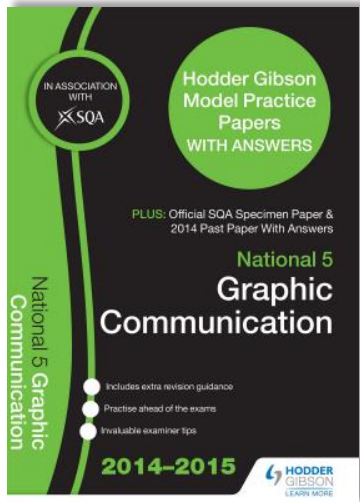
Helix



Further Study:



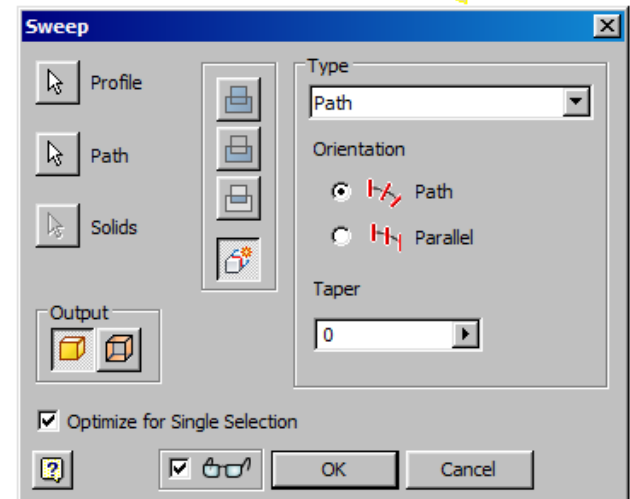
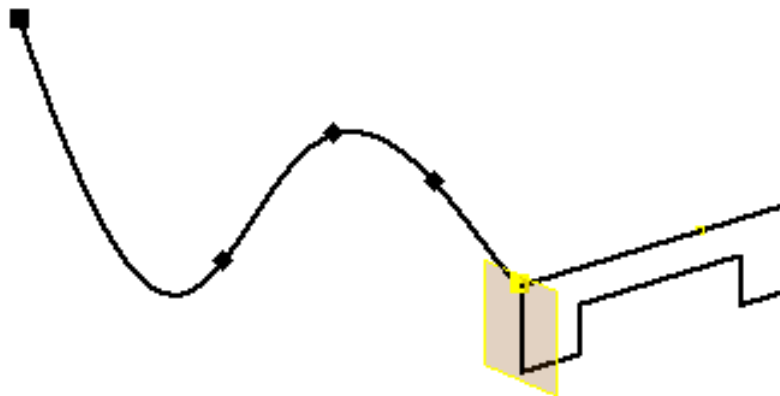
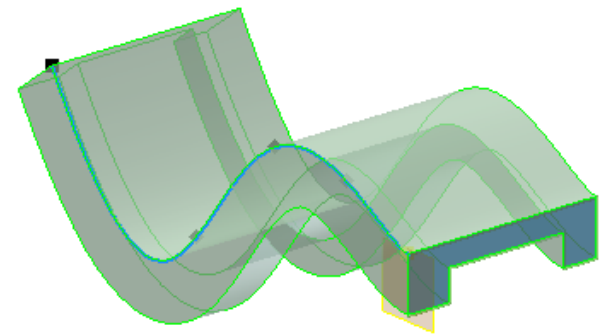
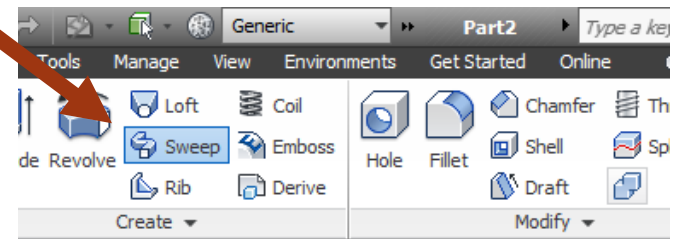
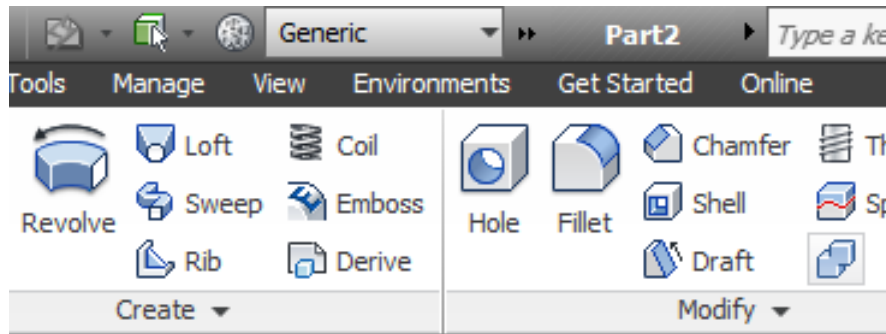
- Page 87 - Read



- N/A



Modelling Features: extrude, revolve, loft, helix/helices, path (extrude/sweep along a path)



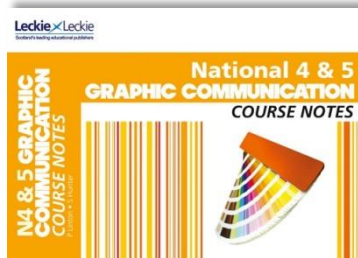
Specimen
Question
Explained



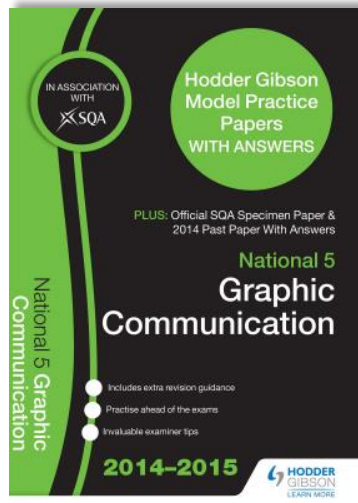
Extrude: Sweep along a path



Further Study:



•N/A

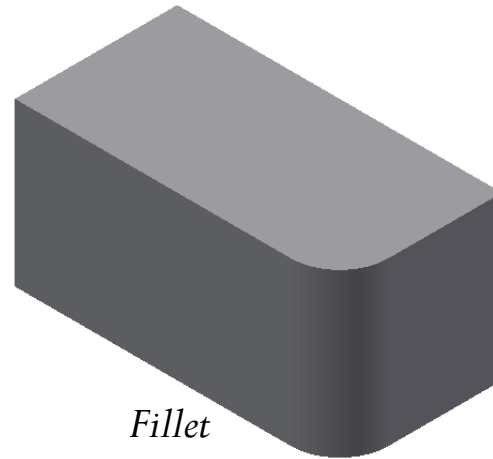


•Page 38 Q2a
•(Model Paper 1)

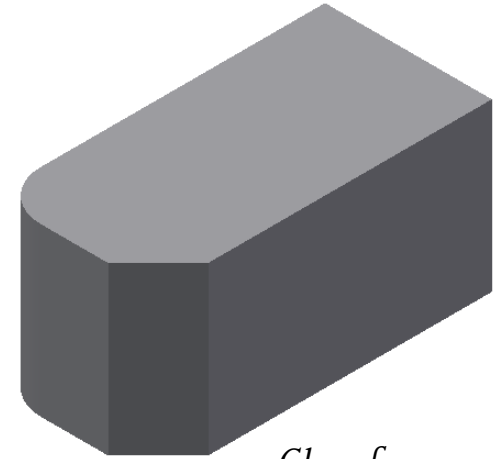




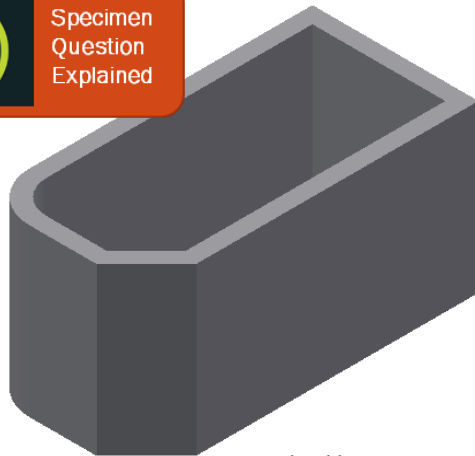
Modelling Edits: *shell*, *fillet* (regular/consistent), *chamfer* (regular/consistent), *fillet* (irregular), *chamfer* (irregular), *mirror*, *array*(linear, box and radial), *add*, *subtract*, *intersect*



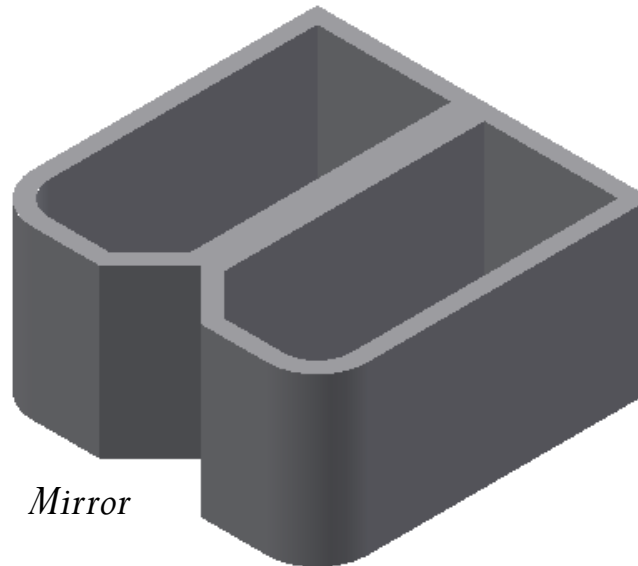
Fillet



Chamfer



Shell

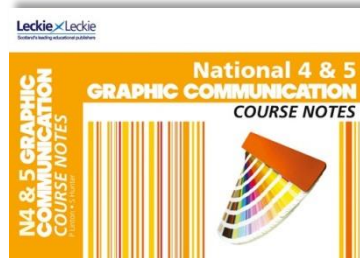


Mirror

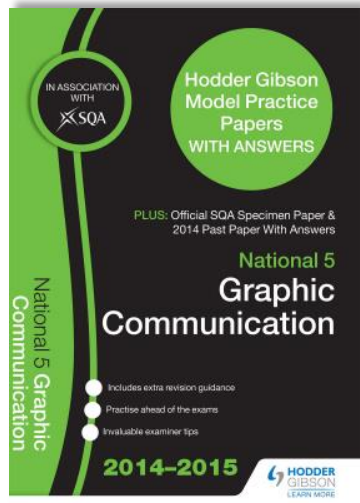




Further Study:



- Page 82 & 83 - Read
- Page 84 - Read

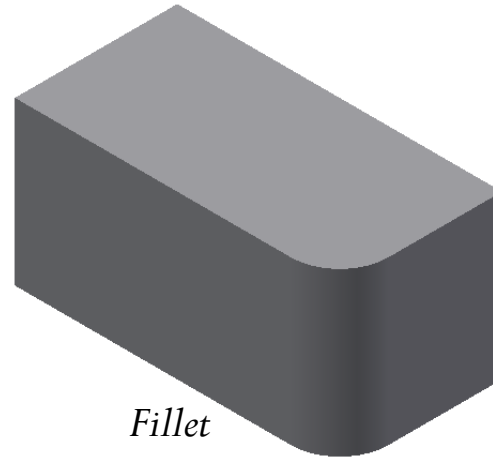


- Page 39 Q2b
- (Model Paper 1)
- Page 59 Q2a
- (Model Paper 2)

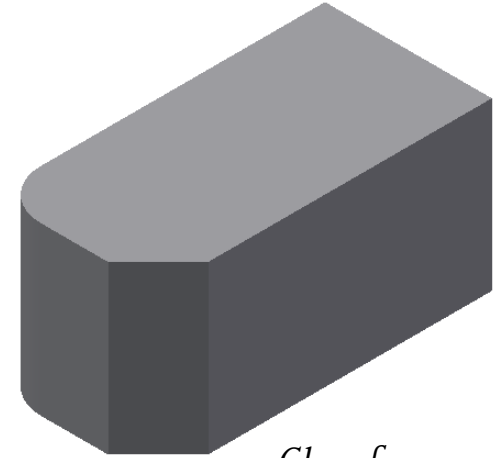




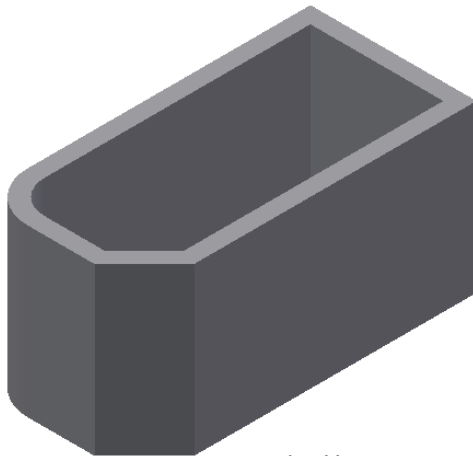
Modelling Edits: *shell*, *fillet* (regular/consistent), *chamfer* (regular/consistent), *fillet* (irregular), *chamfer* (irregular), *mirror*, *array*(linear, box and radial), *add*, *subtract*, *intersect*



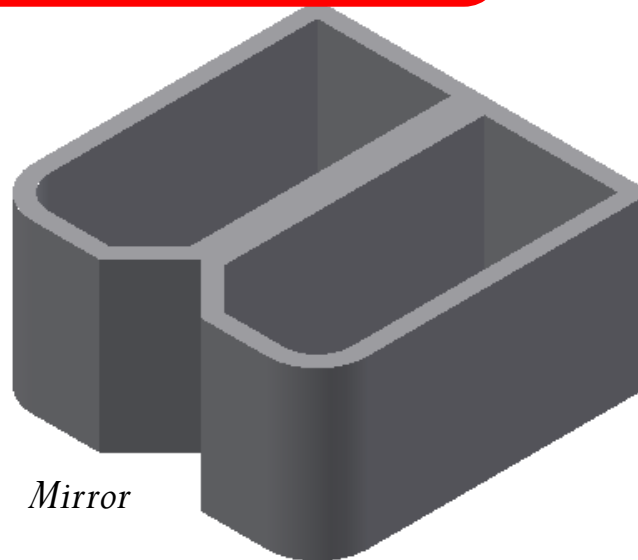
Fillet



Chamfer



Shell



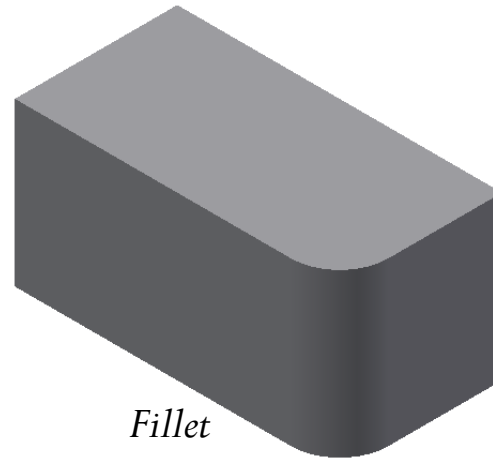
Mirror



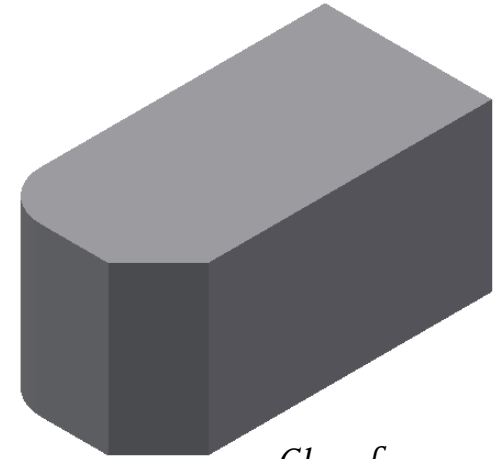




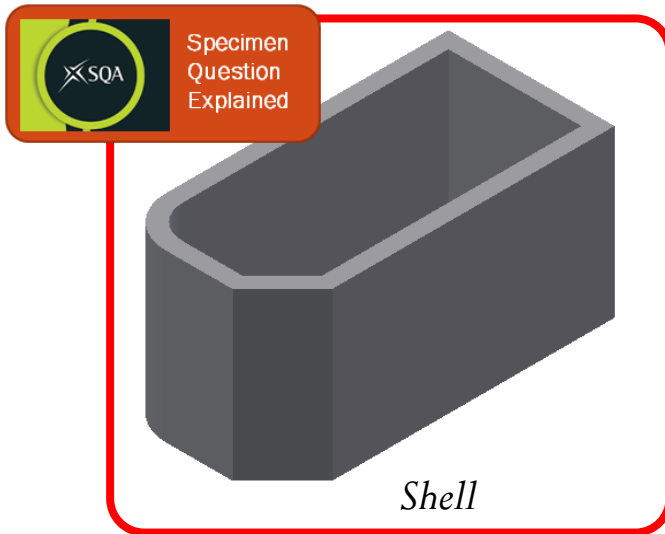
Modelling Edits: *shell*, *fillet* (regular/consistent), *chamfer* (regular/consistent), *fillet* (irregular), *chamfer* (irregular), *mirror*, *array*(linear, box and radial), *add*, *subtract*, *intersect*



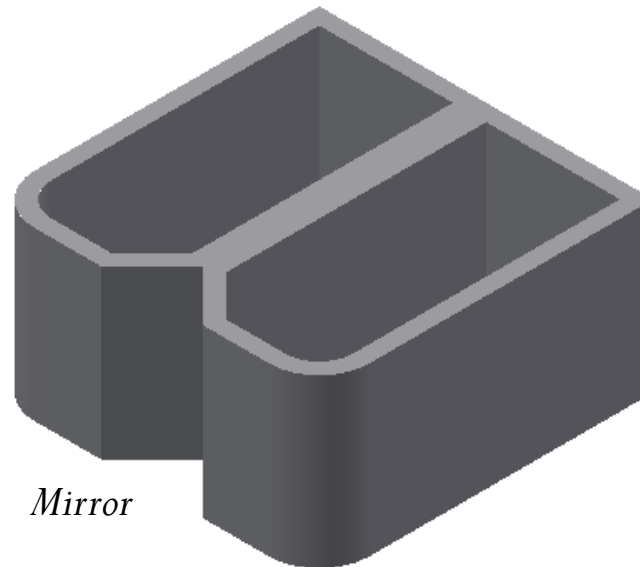
Fillet



Chamfer



Shell



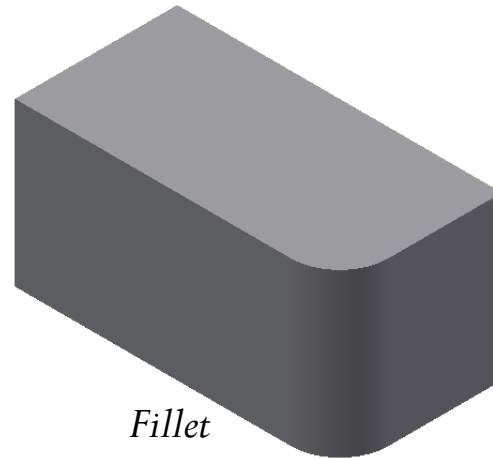
Mirror



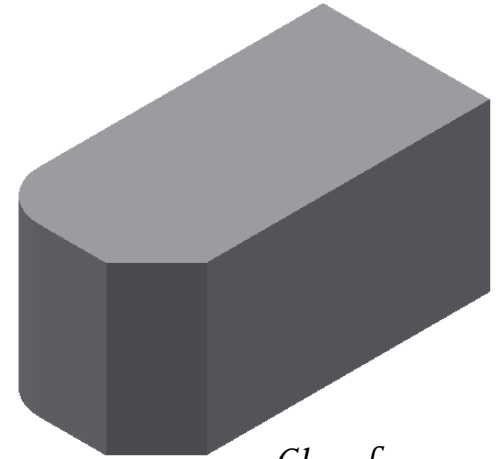




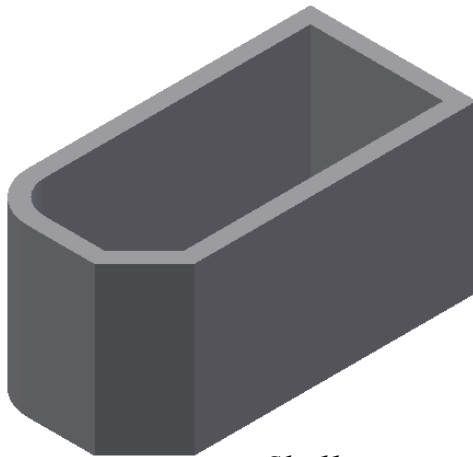
Modelling Edits: *shell*, *fillet* (regular/consistent), *chamfer* (regular/consistent), *fillet* (irregular), *chamfer* (irregular), *mirror*, *array*(linear, box and radial), *add*, *subtract*, *intersect*



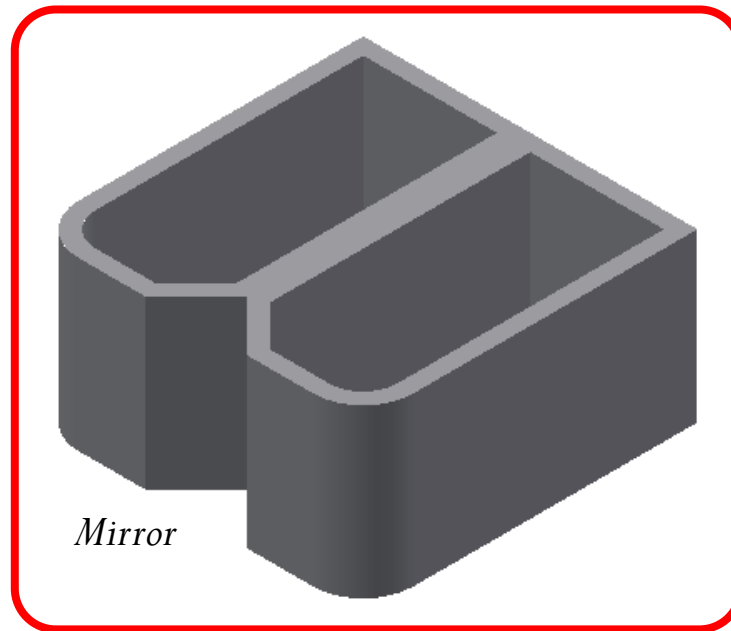
Fillet



Chamfer



Shell

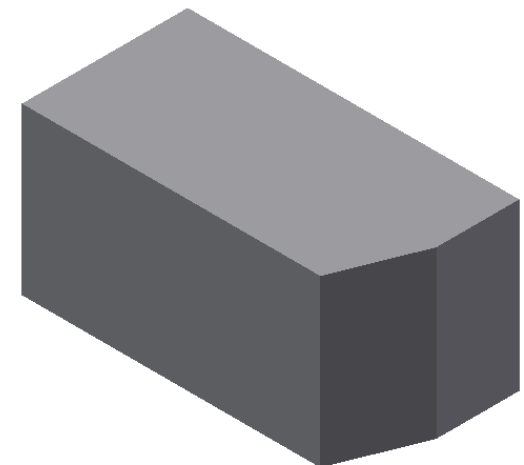
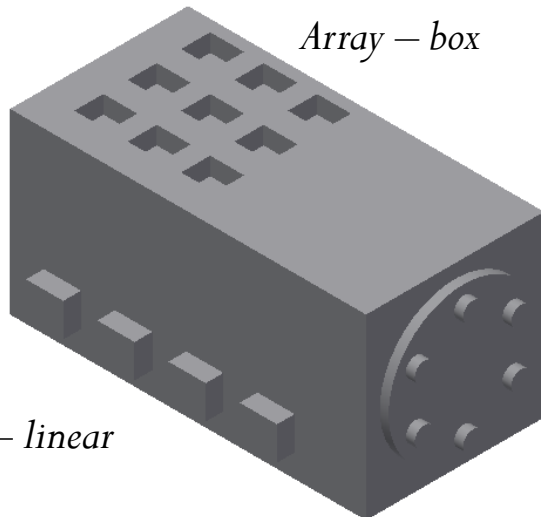
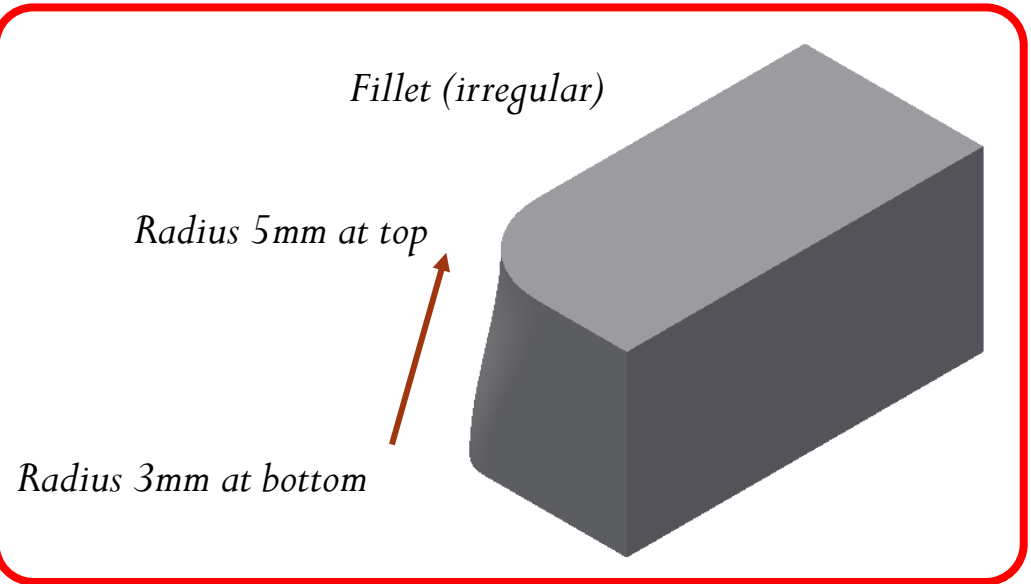
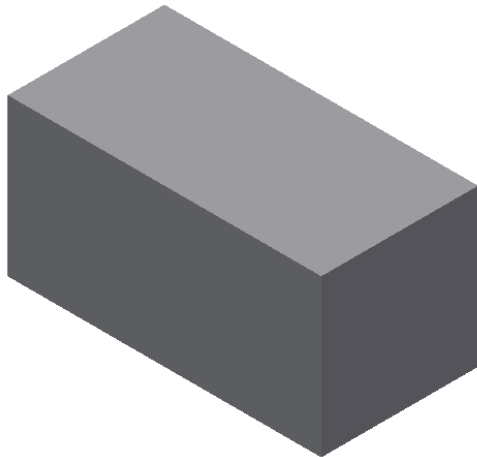


Mirror





Modelling Edits: shell, fillet (regular/consistent), chamfer (regular/consistent), fillet (irregular), chamfer (irregular), mirror, array(linear, box and radial), add, subtract, intersect



Array – box

Array – radial

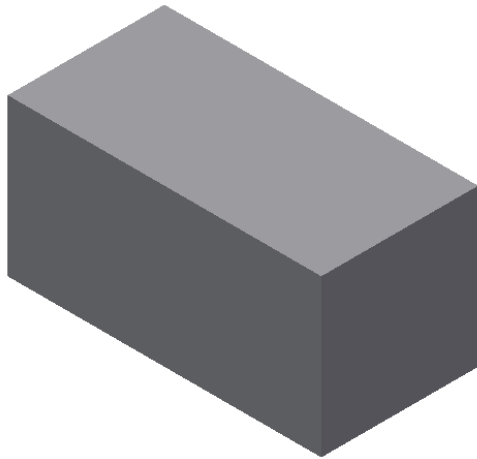
Array – linear

Chamfer (irregular)

**Further
Reading...**



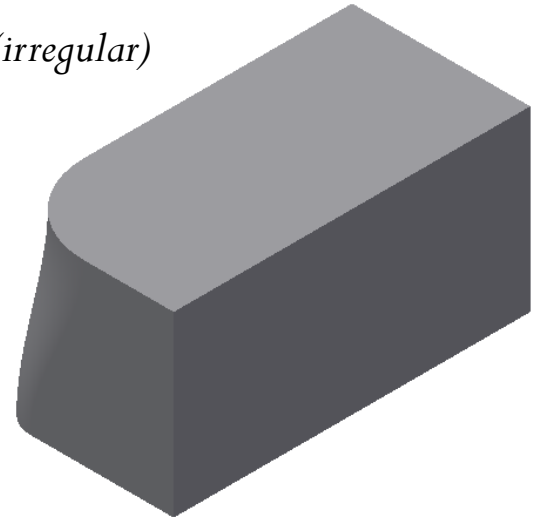
Modelling Edits: shell, fillet (regular/consistent), chamfer (regular/consistent), fillet (irregular), chamfer (irregular), mirror, array(linear, box and radial), add, subtract, intersect



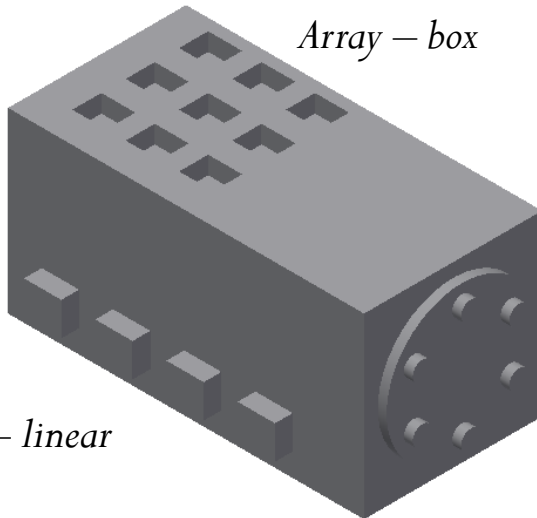
Fillet (irregular)

Radius 5mm at top

Radius 3mm at bottom

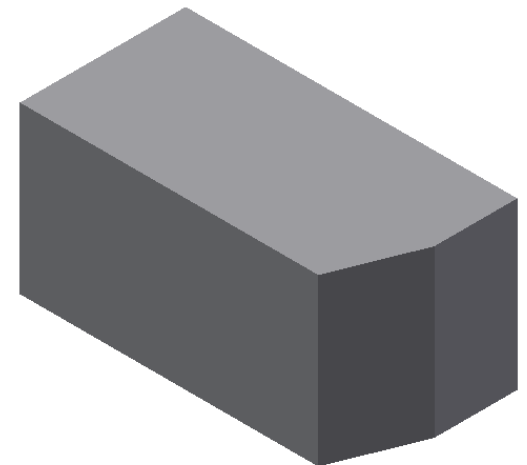


Array – box



Array – radial

Array – linear

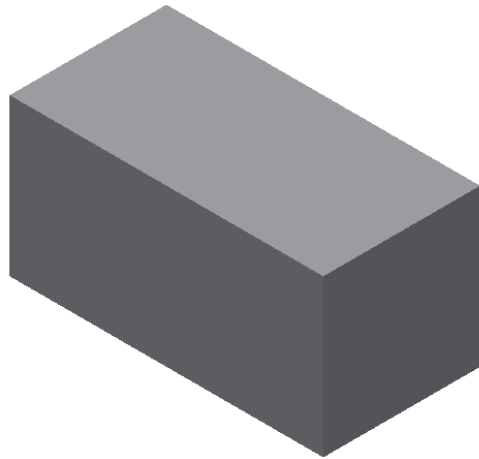


Chamfer (irregular)

**Further
Reading...**



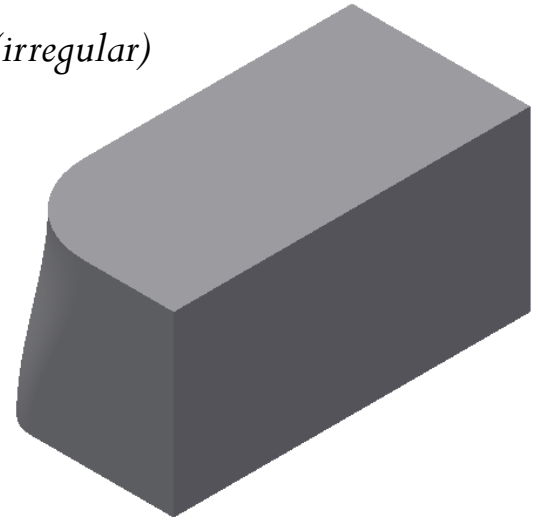
Modelling Edits: shell, fillet (regular/consistent), chamfer (regular/consistent), fillet (irregular), chamfer (irregular), mirror, array(linear, box and radial), add, subtract, intersect



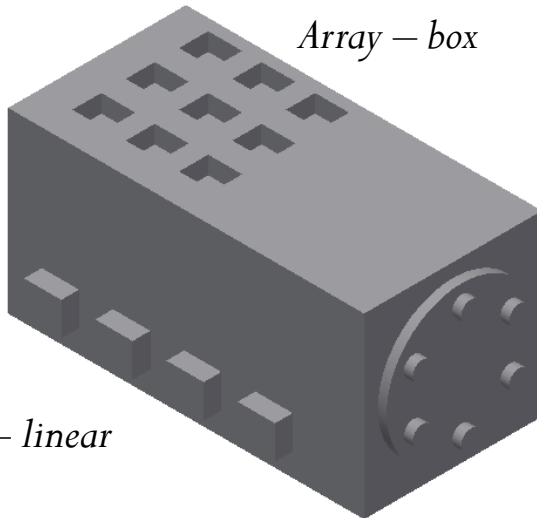
Fillet (irregular)

Radius 5mm at top

Radius 3mm at bottom

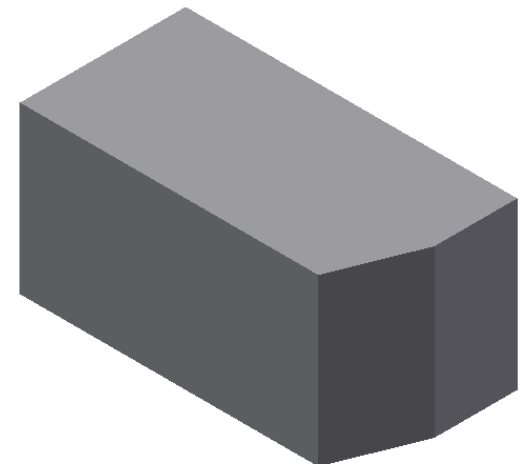


Array – box



Array – radial

Array – linear



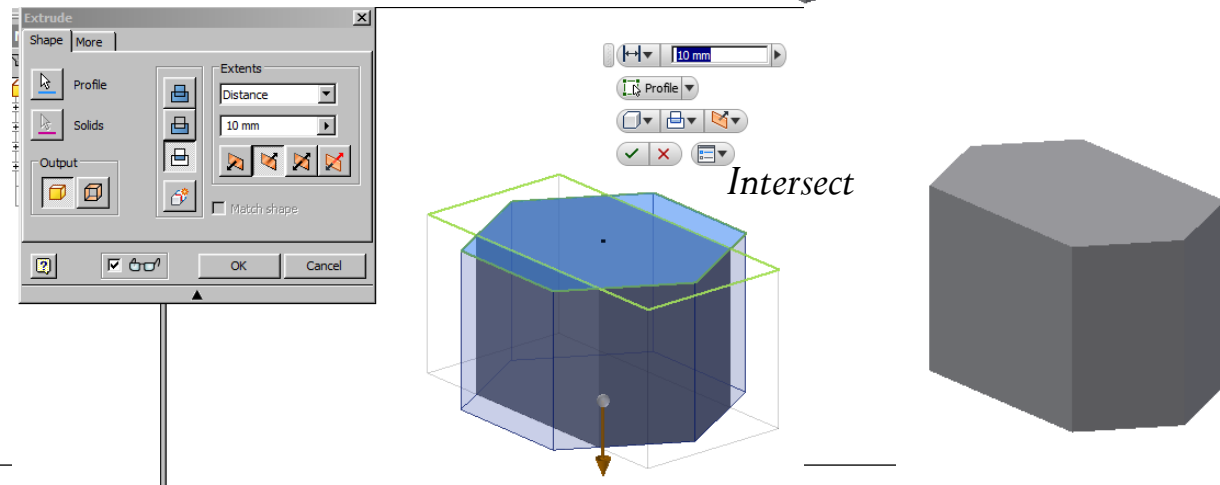
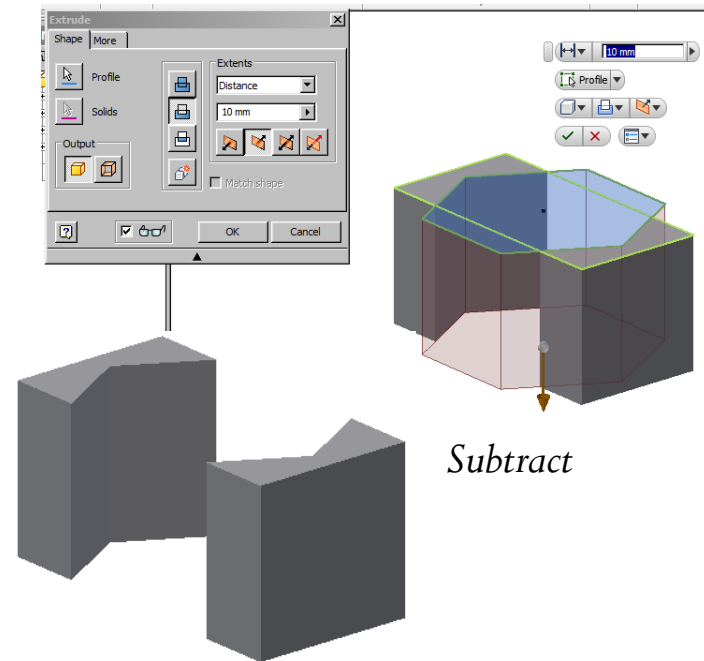
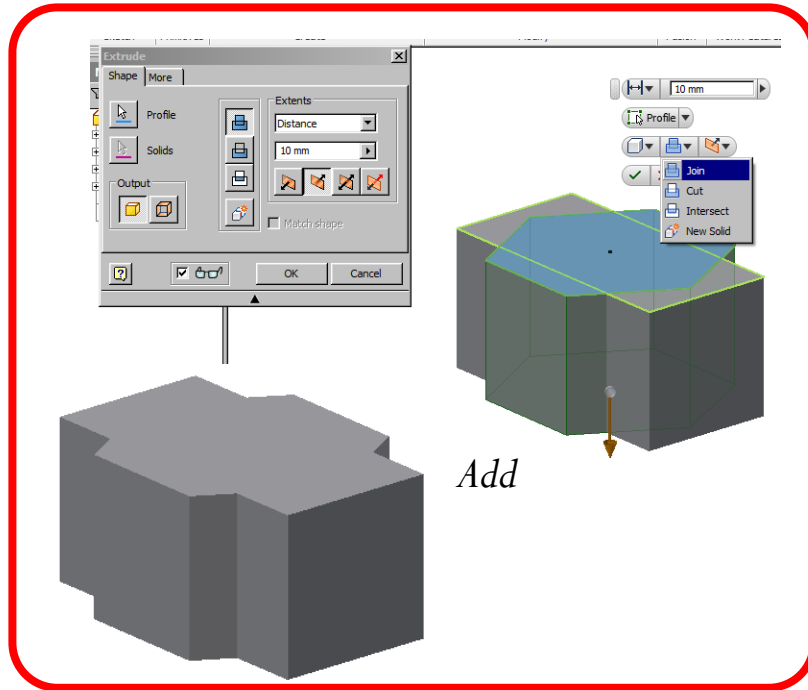
Chamfer (irregular)

**Further
Reading...**





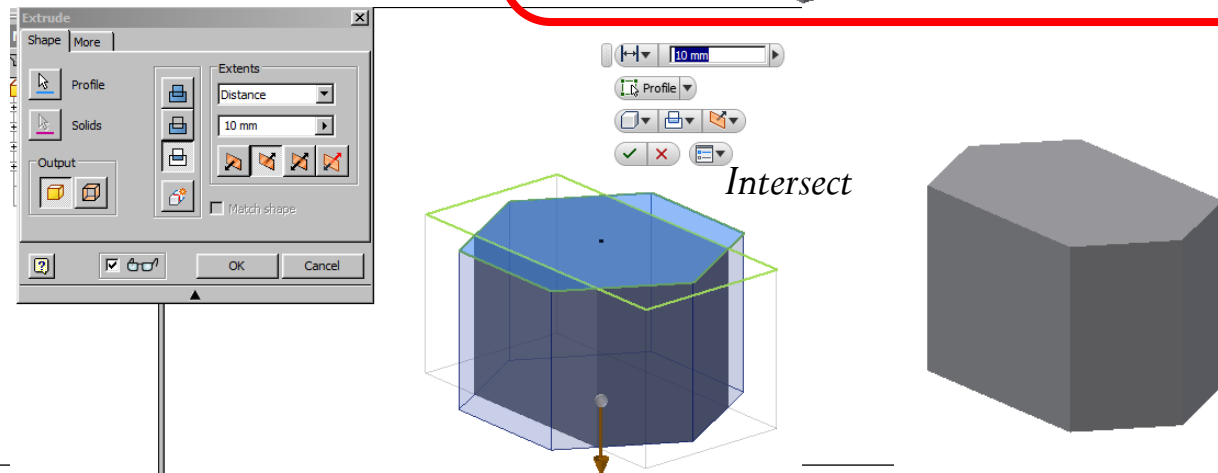
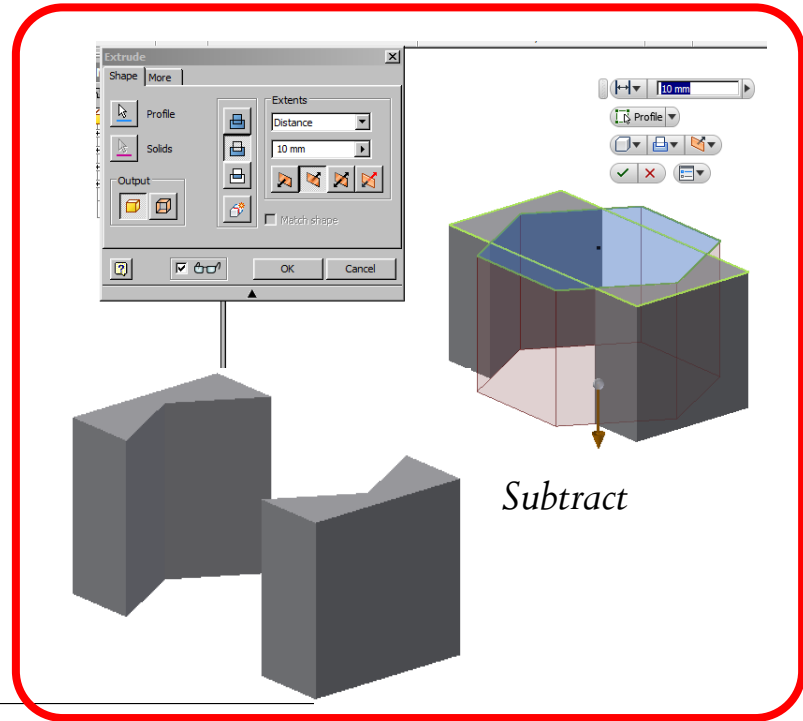
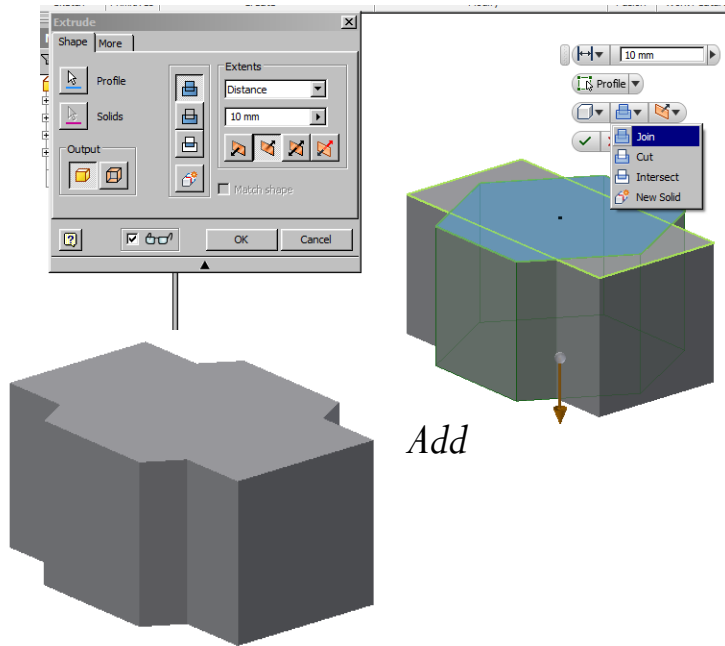
Modelling Edits: shell, fillet (regular/consistent), chamfer (regular/consistent), fillet (irregular), chamfer (irregular), mirror, array (linear, box and radial), **add, subtract, intersect**



Further Reading...



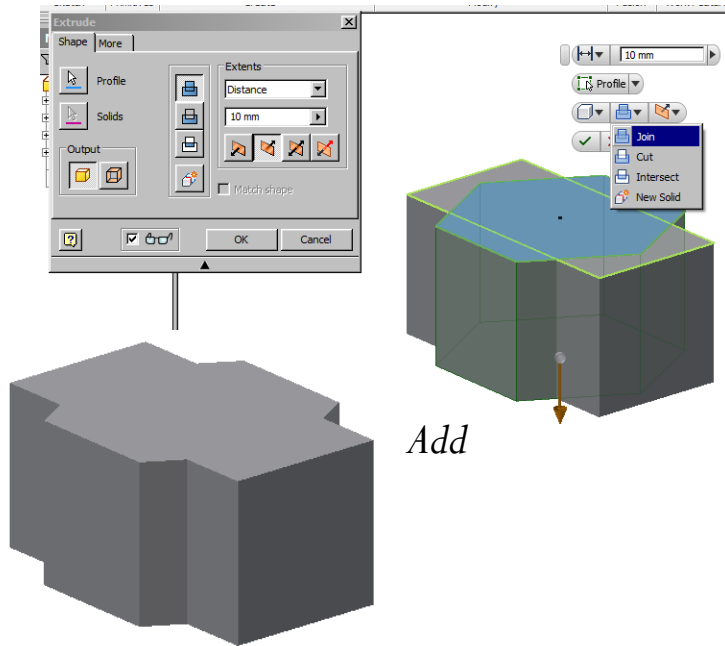
Modelling Edits: shell, fillet (regular/consistent), chamfer (regular/consistent), fillet (irregular), chamfer (irregular), mirror, array (linear, box and radial), **add, subtract, intersect**



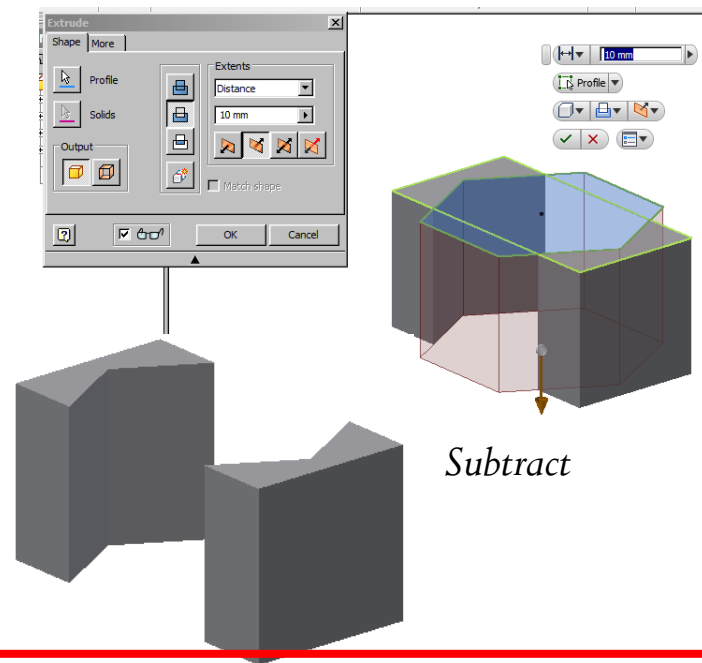
Further Reading...



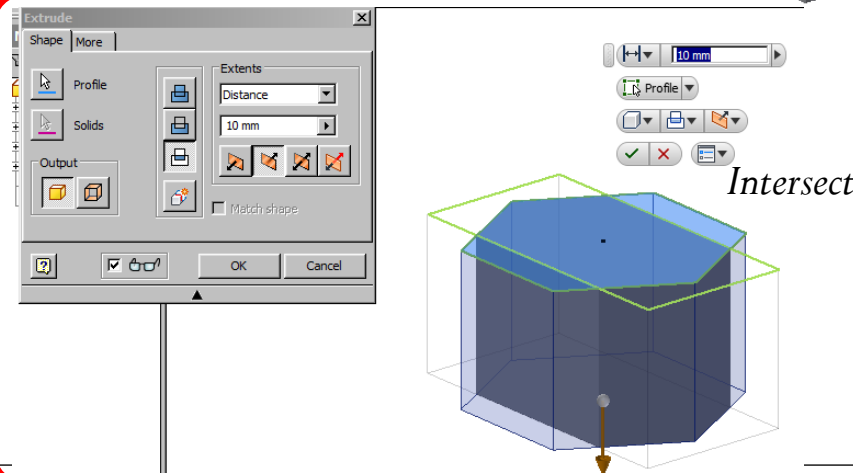
Modelling Edits: shell, fillet (regular/consistent), chamfer (regular/consistent), fillet (irregular), chamfer (irregular), mirror, array (linear, box and radial), **add, subtract, intersect**



Add



Subtract

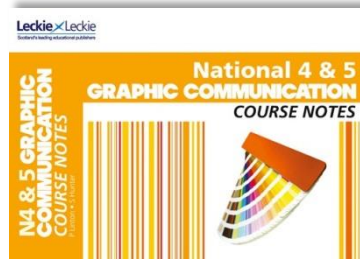


Intersect

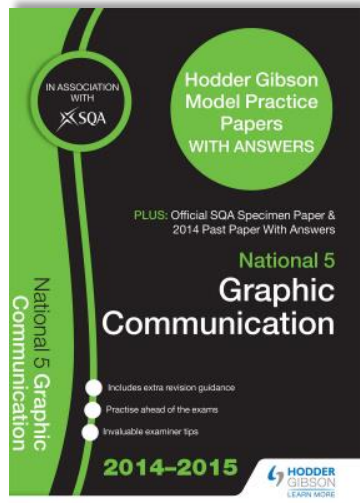
Further Reading...



Further Study:



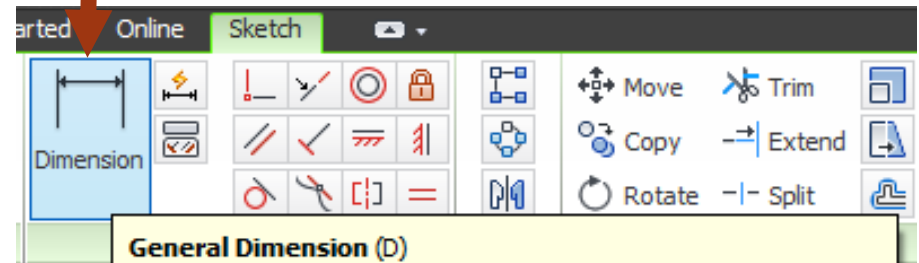
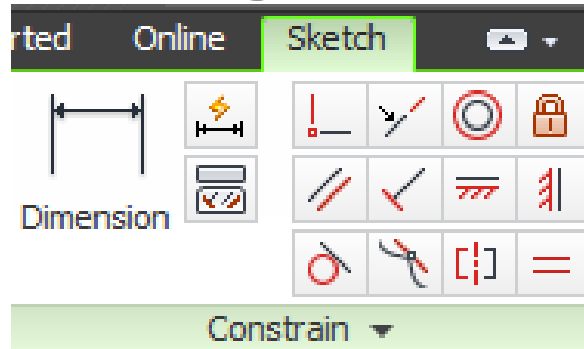
- Page 81 - Read



- N/A



Constraints: linear, radius, diameter, perpendicular, parallel, fixed, tangent, concentric



*By simply adding dimensions
you are constraining your
sketch.*

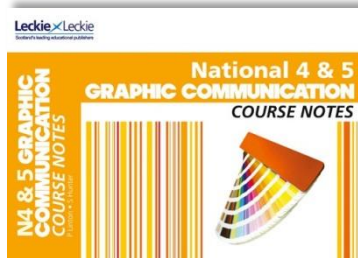


Press F1 for more help

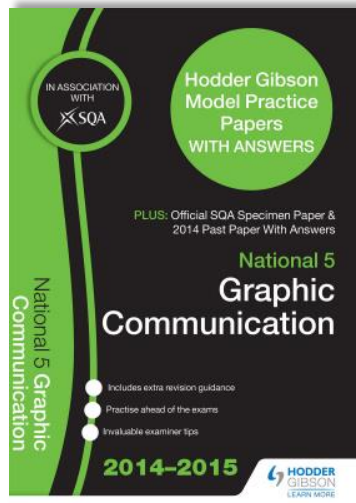
Constraints – Linear/ Radial/ Diameter



Further Study:



•Page 86 - Read



•N/A



Common CAD and computer 2D Sketching commands

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

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

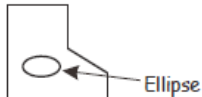
Grid This gives an on screen grid to make it easier to construct Orthographic or Isometric drawings and position objects.

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

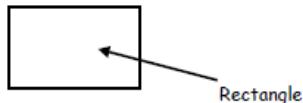
Line Allows the user to draw a line from one point to another.

_____ Line

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



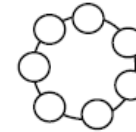
Square / Rectangle / Box Allows the user to draw a quick shape rectangle or square.



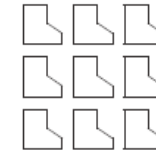
Scale Allows a user to accurately increase or decrease the size of an object keeping all parts in proportion.

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

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



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

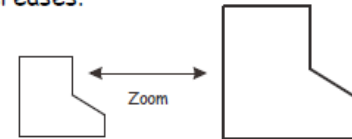


Further Reading...

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



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



Text Allows the user to add text onto a drawing.

This is Text

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





Common CAD and computer 2D Sketching commands

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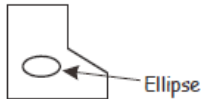
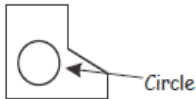
Grid This gives an on screen grid to make it easier to construct Orthographic or Isometric drawings and position objects.

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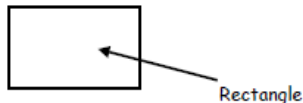
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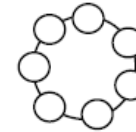
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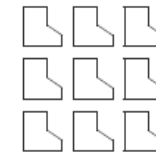
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Box / Rectangular Array or pattern This allows the user to draw a pattern of shapes or objects in columns & rows.

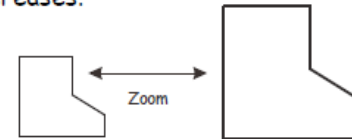


Rotate Allows the user to rotate / turn an object about a specified point.



Further Reading...

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Common CAD and computer 2D Sketching commands

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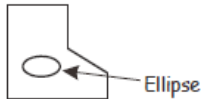
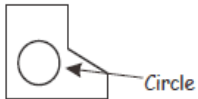
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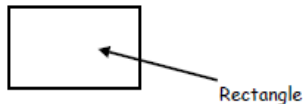
Line Allows the user to draw a line from one point to another.



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



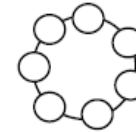
Square / Rectangle / Box Allows the user to draw a quick shape rectangle or square.



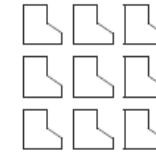
Scale Allows a user to accurately increase or decrease the size of an object keeping all parts in proportion.

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

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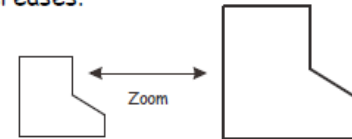
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Further Reading...

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Common CAD and computer 2D Sketching commands

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

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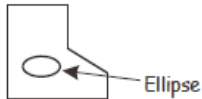
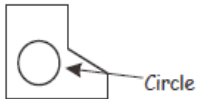
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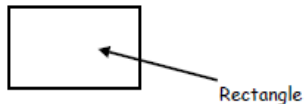
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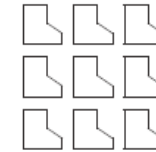
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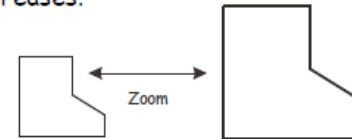
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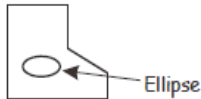
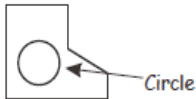
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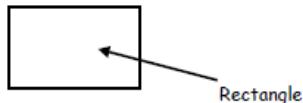
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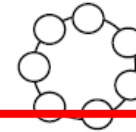
Square / Rectangle / Box Allows the user to draw a quick shape rectangle or square.



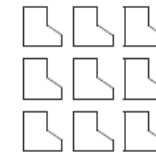
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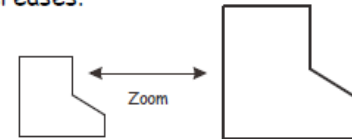
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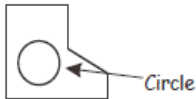
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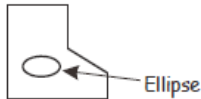


Line

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



Circle

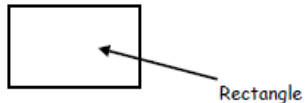


Ellipse



Arc

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



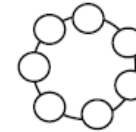
Rectangle

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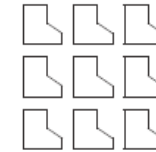
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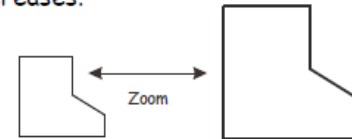
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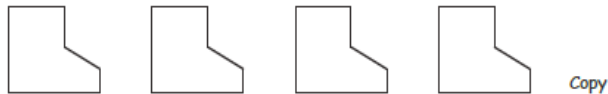




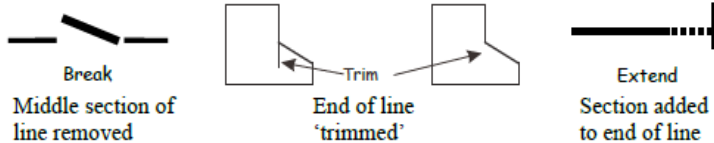
Mirror Image This flips an object about the horizontal or vertical axis.



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



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



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



Chamfer Chamfer cuts off a corner.



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

Erase Means removing part of a drawing.

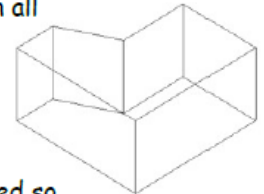
Undo Means to reverse the last command.

Further Reading...

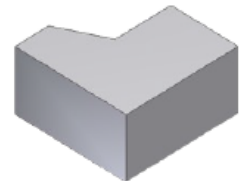
Learn CAD and computer 3D modelling commands

There are 3 types of computer generated 3D model.

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



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



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

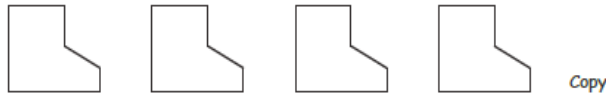




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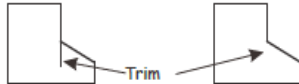
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Break
Middle section of
line removed



Trim
End of line
'trimmed'



Extend
Section added
to end of line

Further Reading...

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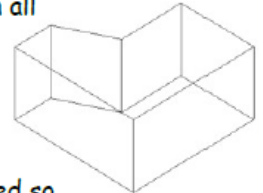
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Common CAD and computer 3D modelling commands

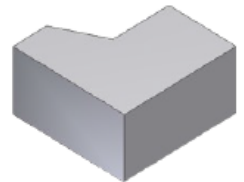


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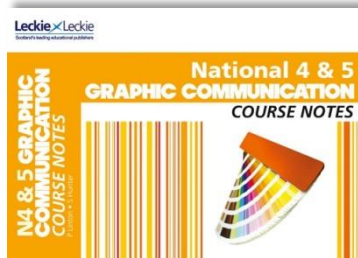


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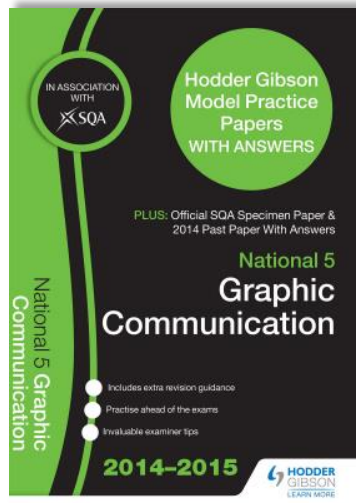




Further Study:



- Page 84 - Read
- Page 73 - Read
- Page 86 - Read

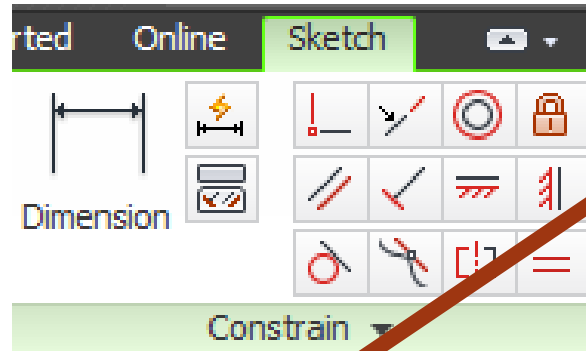


- Page 39 Q2b
- (Model Paper 1)

- Page 59 Q2a
- (Model Paper 2)



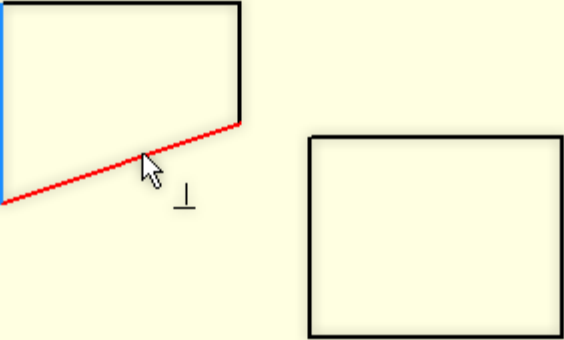
Constraints: linear, radius, diameter, perpendicular, parallel, fixed, tangent, concentric



Perpendicular Constraint

Causes selected linear geometry to lie at right angles to each other.

Perpendicular is available for sketch geometry with ellipse axes, spline handles, text edges, and imported images.

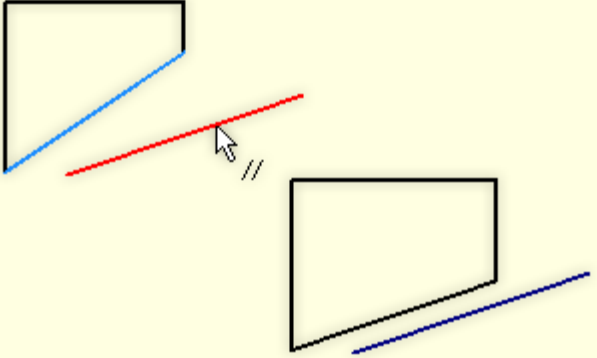


Press F1 for more help

Parallel Constraint

Causes selected linear geometry to lie parallel to each other.

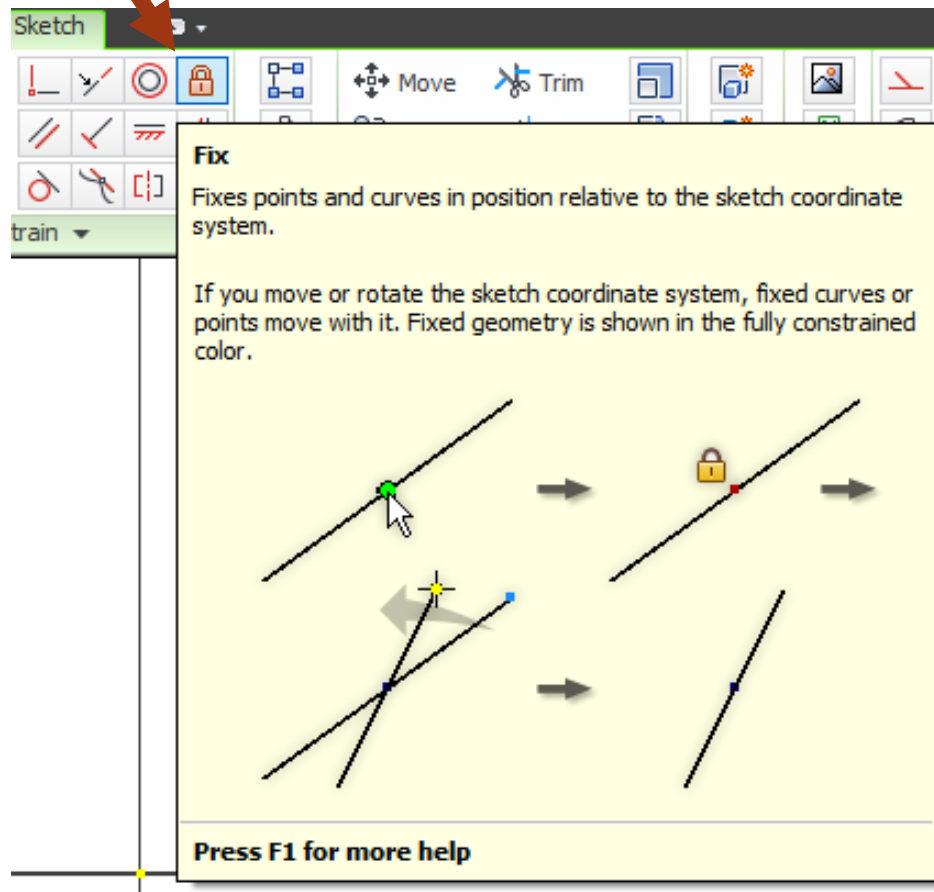
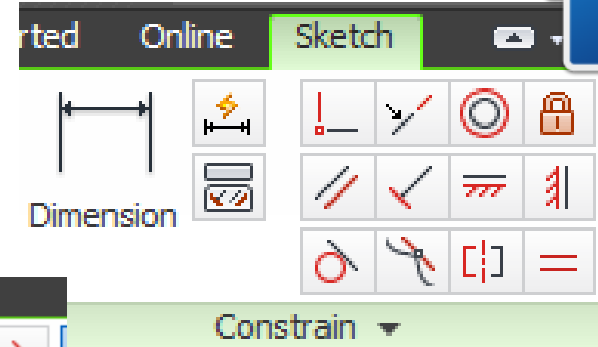
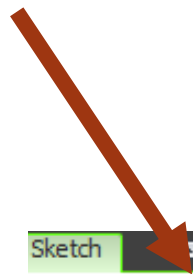
Parallel is available for sketch geometry and with ellipse axes, spline handles, text edges, and imported images.



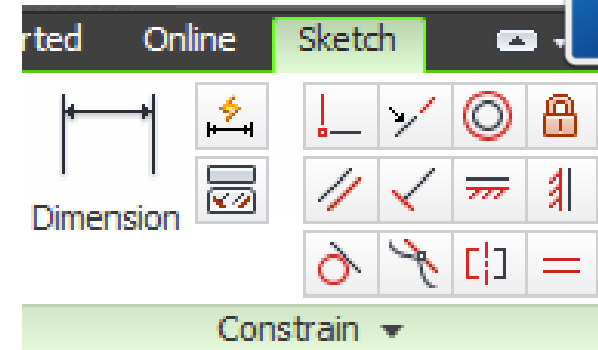
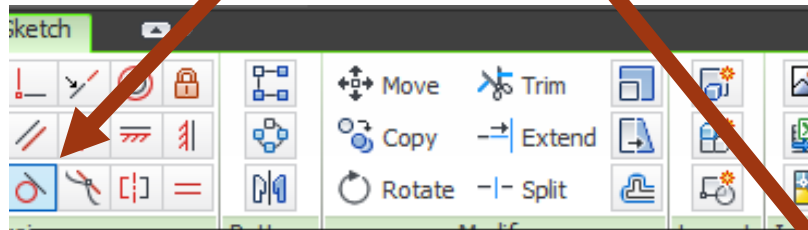
Press F1 for more help



Constraints: linear, radius, diameter, perpendicular, parallel, **fixed**, tangent, concentric



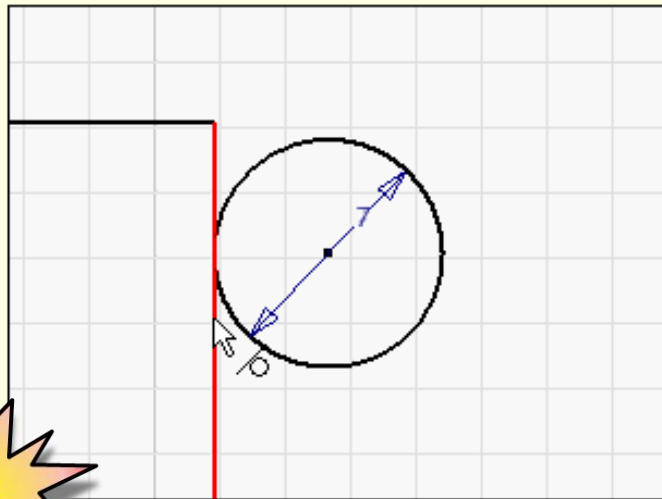
Constraints: linear, radius, diameter, perpendicular, parallel, fixed, **tangent**, **concentric**



Tangent

Constrains curves, including ends of a spline, to be tangent to other curves.

Select the two curves to be made tangent. One curve can be tangent to another even if they do not physically share a point. Constraints, if they exist, are respected.



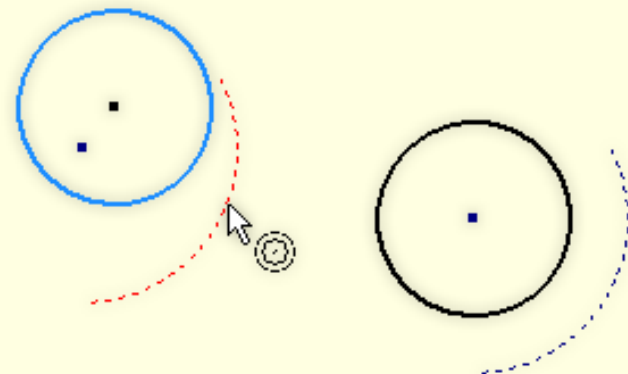
Further Reading...

Press F1 for more help

Concentric Constraint

Causes two arcs, circles, or ellipses to have the same center point.

When this constraint is applied to the center points of two circles, arcs, or ellipses, the result is the same as a coincident constraint.

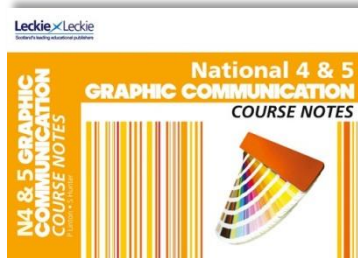


Press F1 for more help

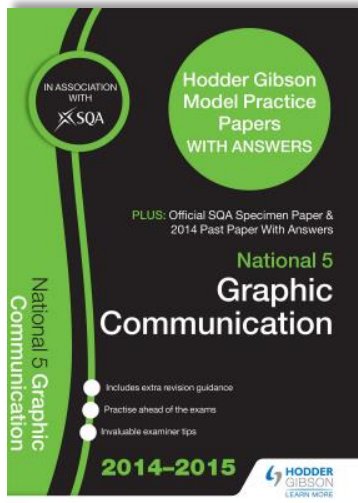
Constraints – Perpendicular/ Parallel/ Fixed/ Tangent/ Concentric



Further Study:



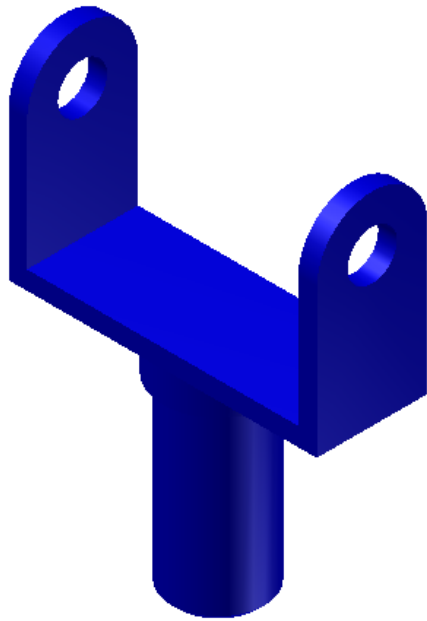
•Page 86 - Read



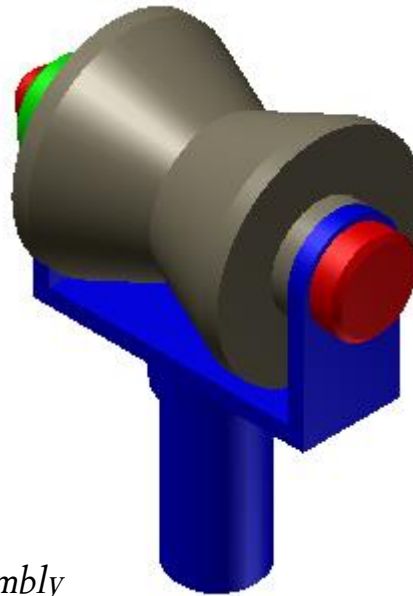
•N/A



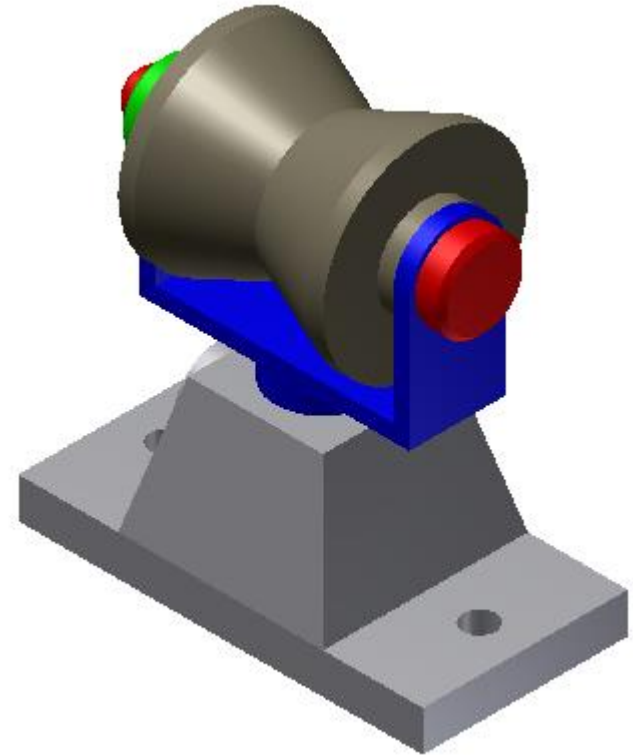
Terminology: component, assembly, sub-assembly, work-plane/plane, axis, feature, profile, sketch, face, edge, datum, suppress



Component



Sub-assembly

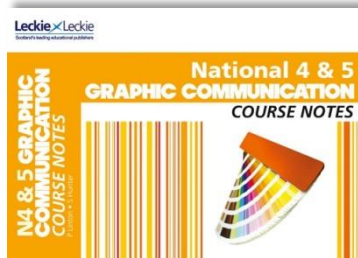


Assembly

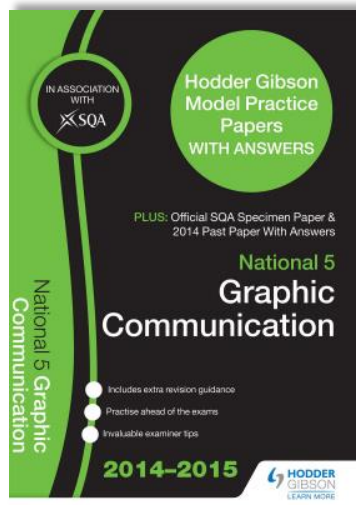




Further Study:



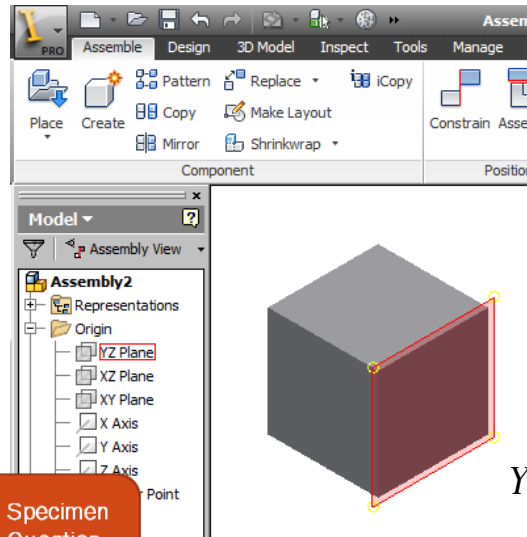
- Page 46 - Read
- Page 78 - Read
- Page 88 – Read & Complete Activity



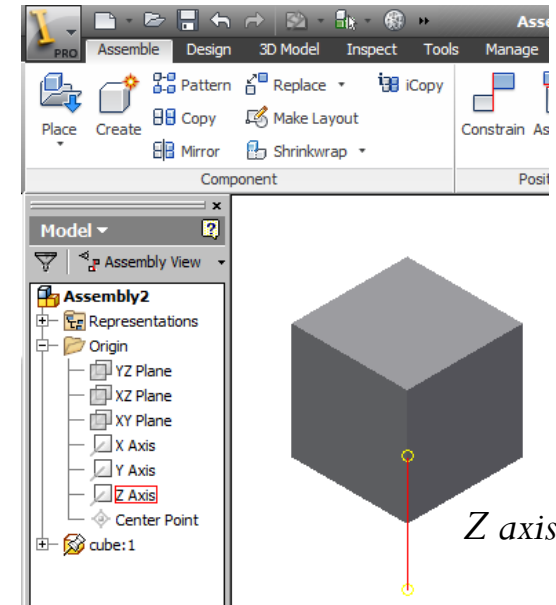
- Page 26 Q6d
- (2013 Specimen Paper)
- Page 48 Q5i & j
- (Model Paper 1)



Terminology: component, assembly, sub-assembly, work-plane/plane, axis, feature, profile, sketch, face, edge, datum, suppress



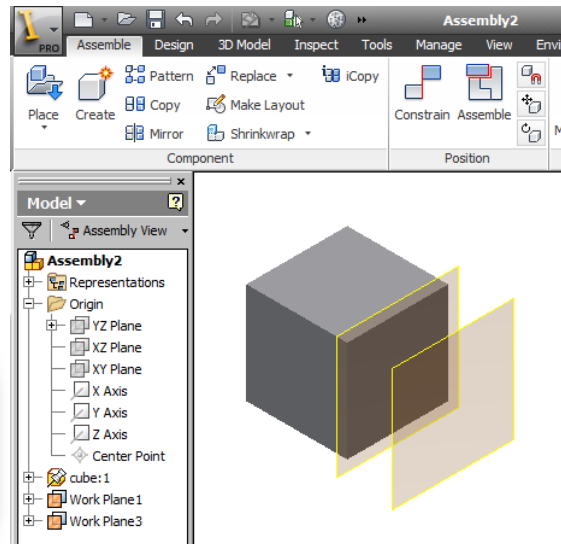
YZ plane



Z axis



SHOW ME MORE



Work plane taken from the YZ plane

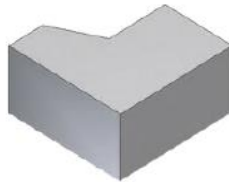
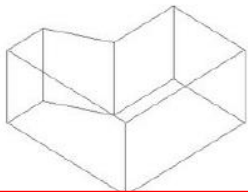
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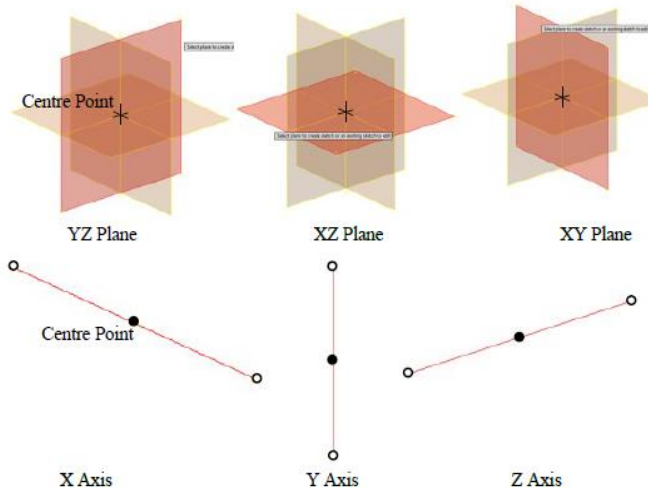
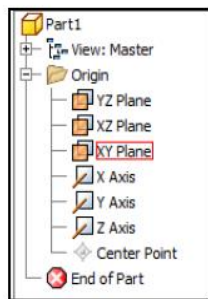
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Further Reading...

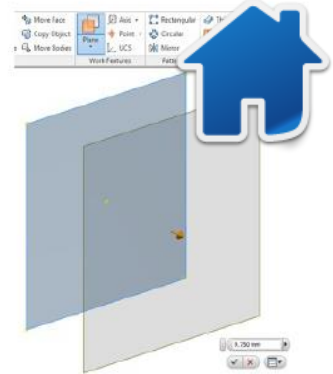
Workplanes and Work axis

There are 3 main workplanes and work axis. These are used to position an object relative to the origin (0,0,0). They can be made visible at any time during construction of a project. Workplanes are used to draw sketches on or to help position parts in an assembly.



Offset Workplanes

Using the planes tab you have several options for creating your own workplanes. To create an offset workplane, (a plane parallel to an existing workplane), click the corner of the workplane and drag. You can set an exact distance between the workplanes. As with all workplanes they can be made visible at any time during construction of a project.



Solid forms and Surfaces

When creating a form you are often asked whether you want a solid form or a surface. Solid forms are 'block forms'. Surfaces are very thin forms with a zero value for thickness. Any 3D form made up of surfaces is completely hollow with the sides having a zero value thickness. A surface model can then be given a thickness by using the thicken/offset command.



The surface model looks transparent due to the zero thickness value.

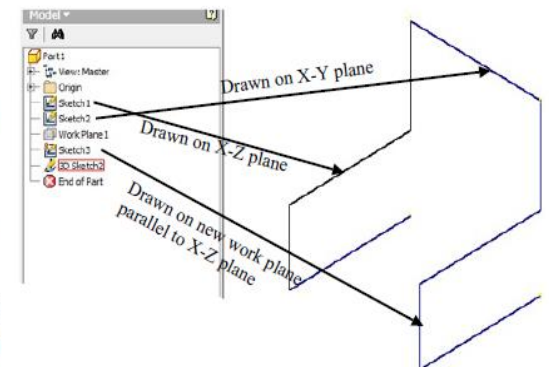
Solid model

Surface model

3D Sketch

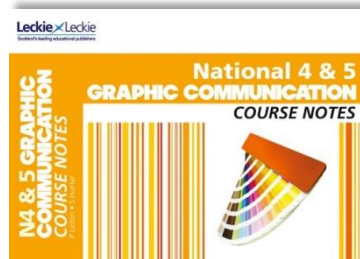
A sketch drawn on more than one directional plane (X-Y, X-Z, Y-Z).

In this example 3 2D sketches have been used to form the 3D sketch. This is called 'include geometry'. Including the geometry of a shape or other 2D drawing is often the easiest way to form a 3D sketch.

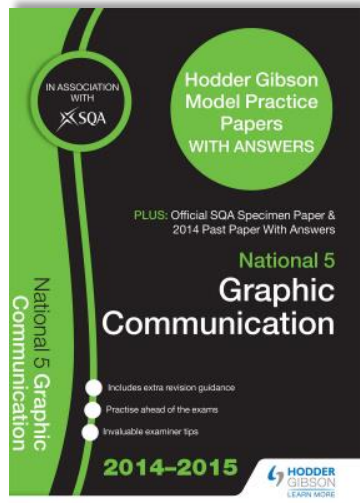




Further Study:



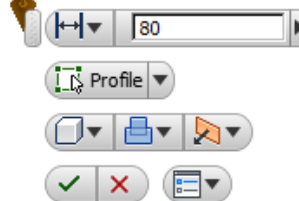
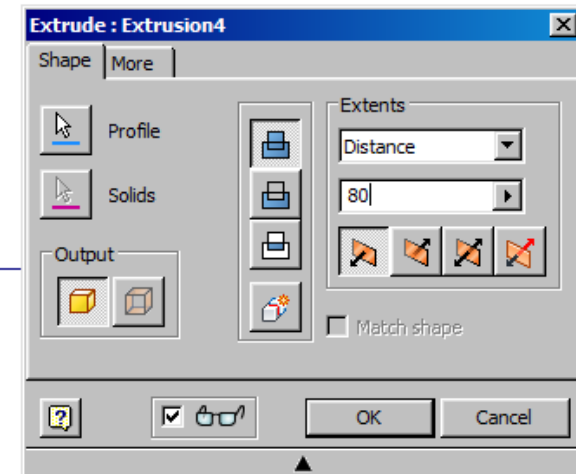
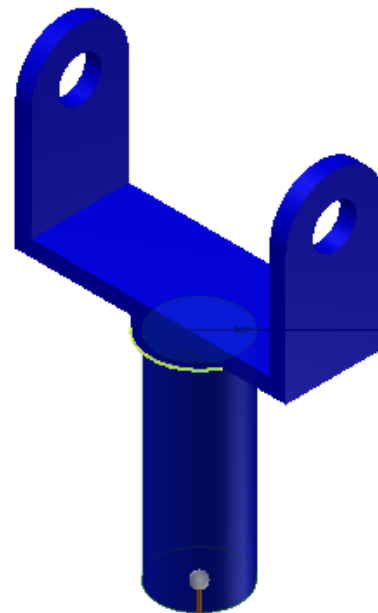
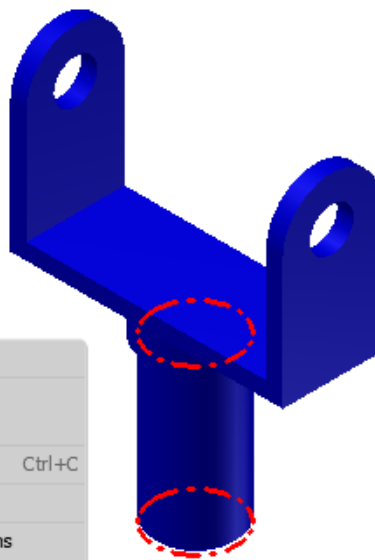
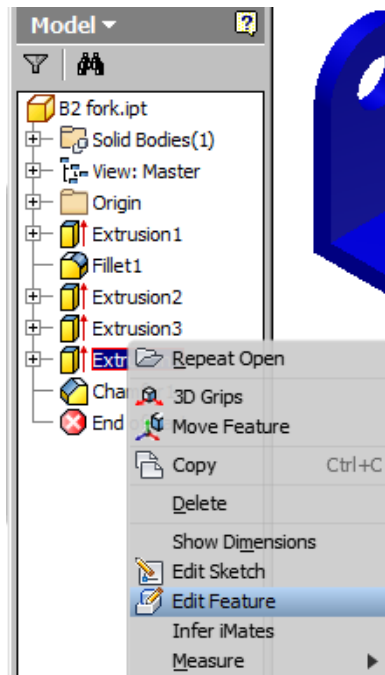
- Page 78 - Read
- Page 81 - Read



- N/A



Terminology: component, assembly, sub-assembly, work plane/plane, axis, **feature**, profile, sketch, face, edge, datum, suppress



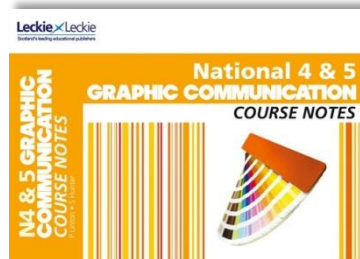
Feature — something you have modelled.

You can change this at anytime by going into the modelling tree, right clicking and edit feature.

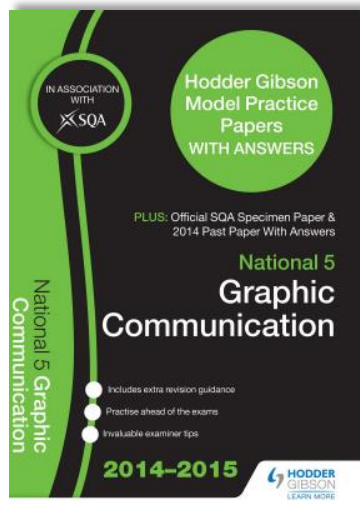
Feature



Further Study:

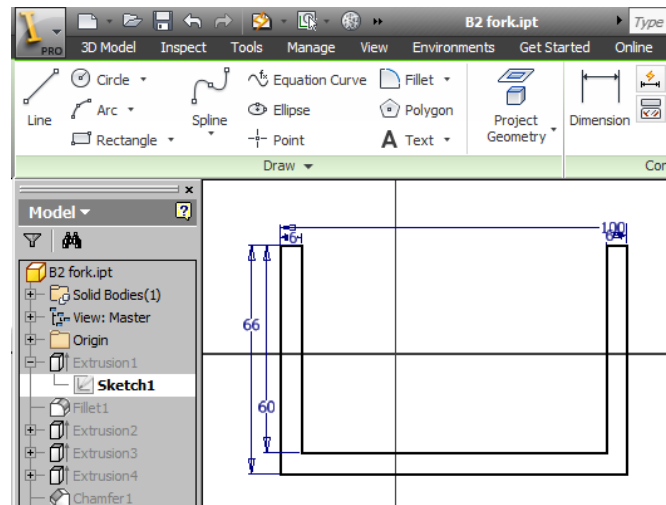


- Page 78 - Read
- Page 83 - Read



- Page 78 Q2b
- (Model Paper 3)

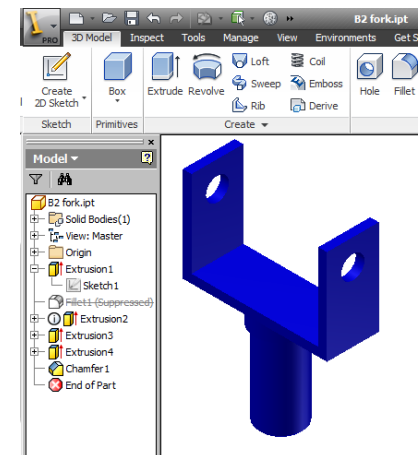
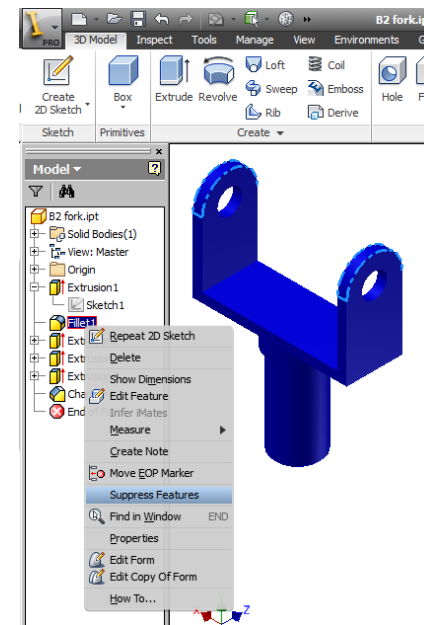




Sketch – your very first stage in any 3D modelling. You can change this at any stage by going to the modelling tree, right clicking and edit sketch.

Datum – In simple terms it's where you measure from.

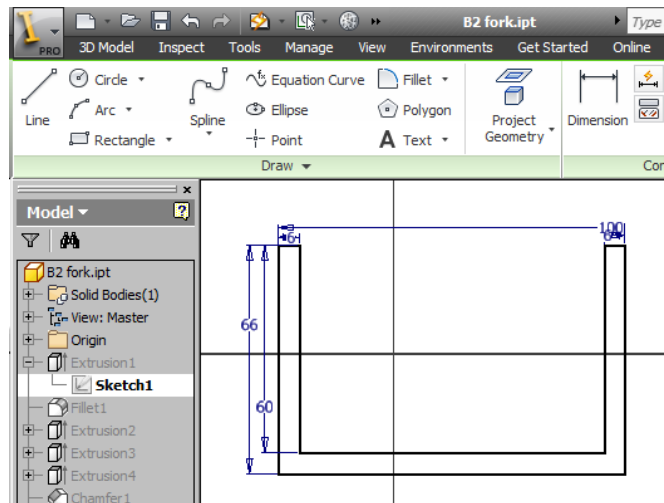
Suppress – think of it as simply turning off a feature, it is still there, you just can't see it. In the example below the fillets used to round the top edges have been suppressed. They have not been deleted, we just need to un-suppress to show them back on.





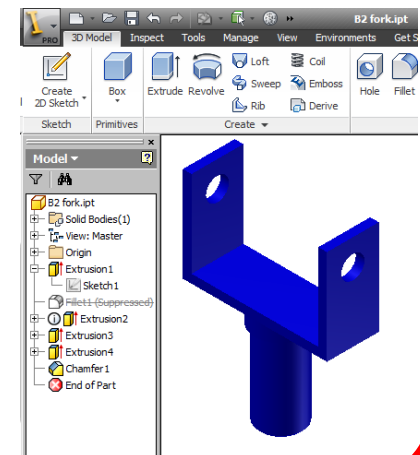
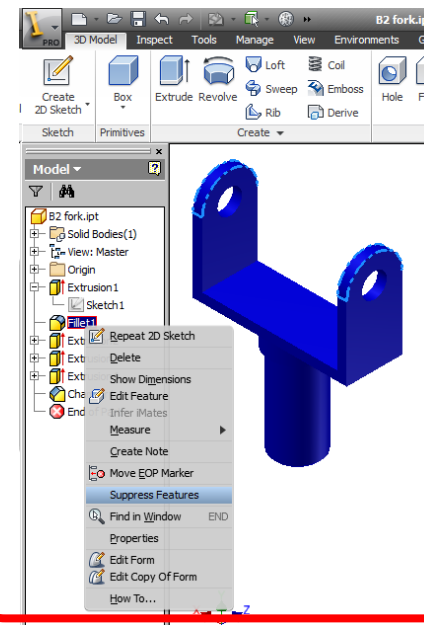


Datum – In simple terms it's where you measure from.

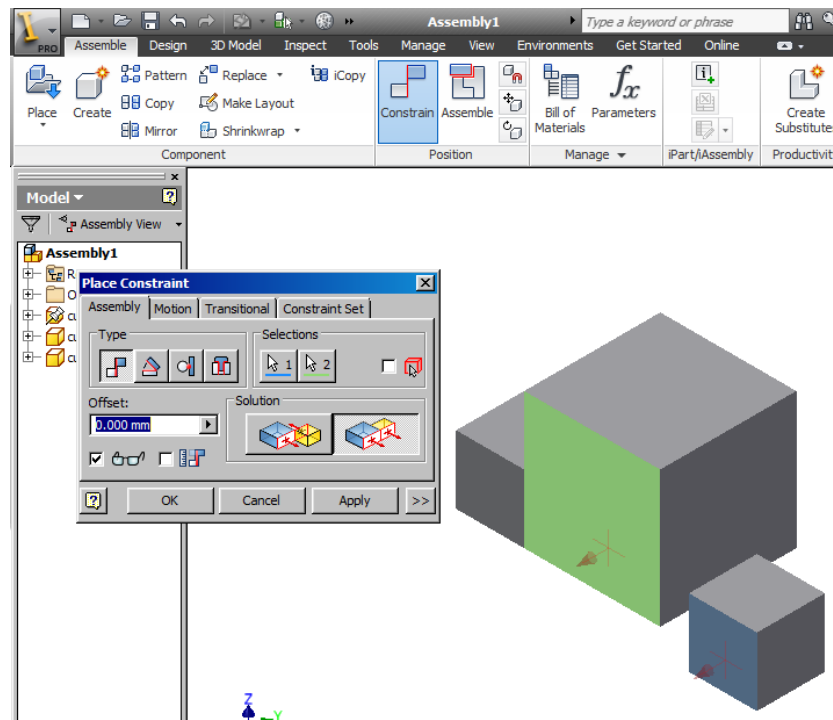


Sketch – your very first stage in any 3D modelling. You can change this at any stage by going to the modelling tree, right clicking and edit sketch.

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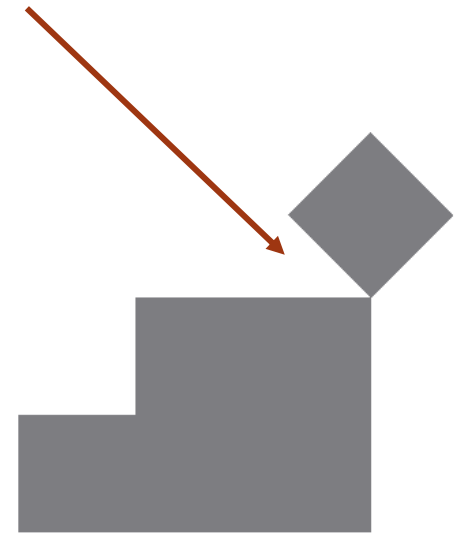




Constraints

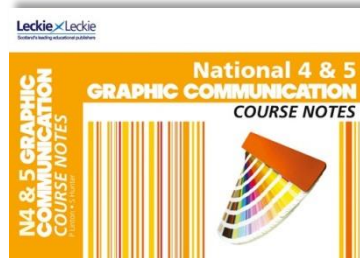
You can:

- Mate faces
- Mate axis and planes
- Offset faces
- Make faces flush with one another
- Mate tangents
- Insert - for circular holes and objects
- Set faces and axis at angles
- Etc, etc

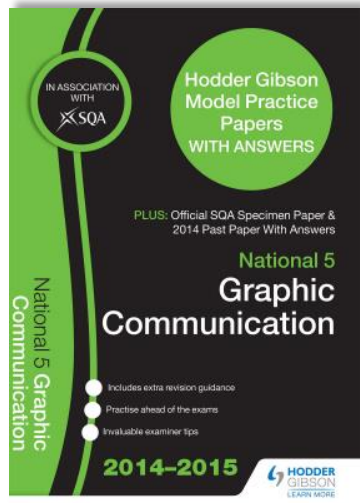




Further Study:



- Page 88 - Read & **Complete Activity**
- Page 89 - Read

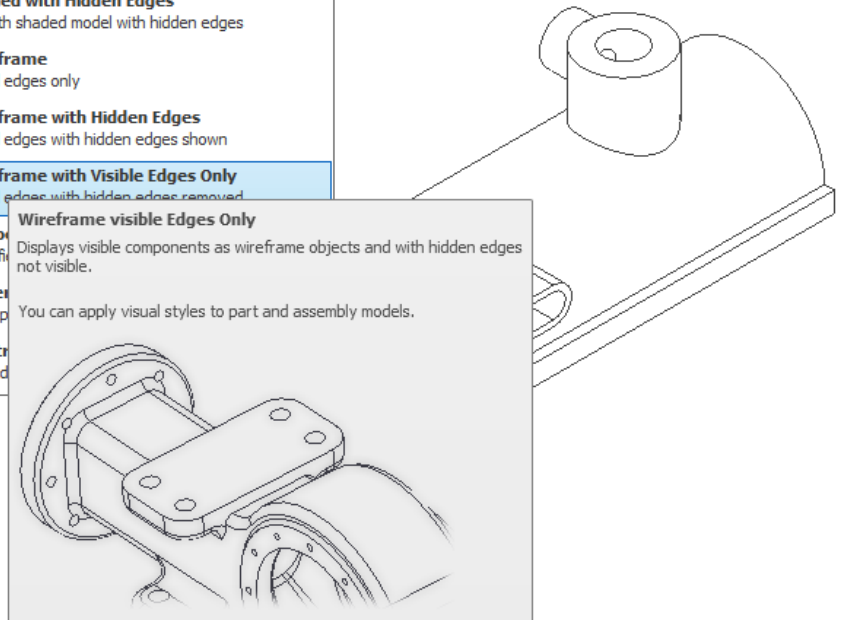
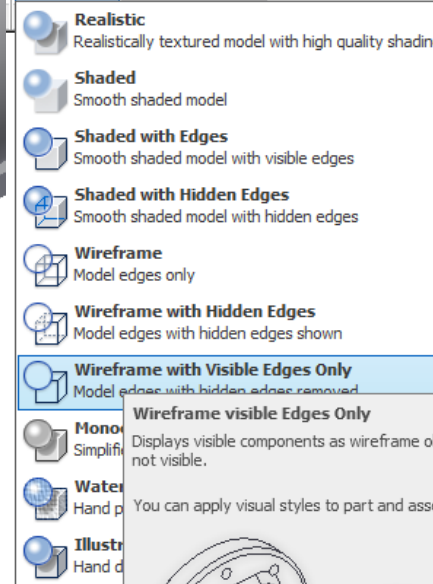
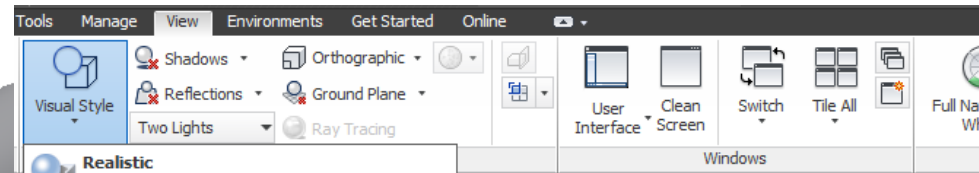
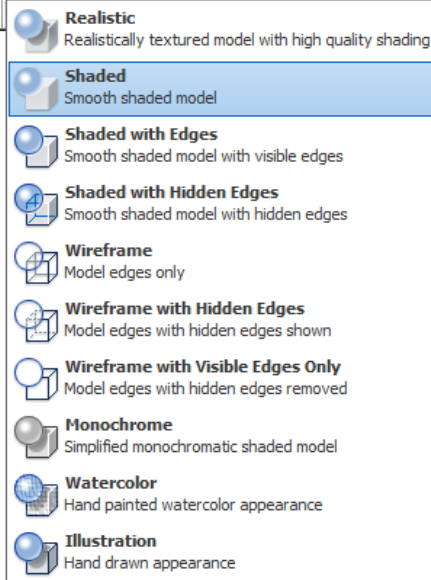
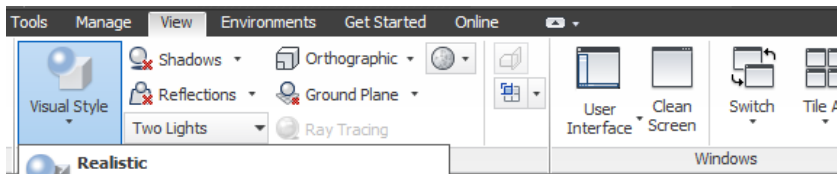


- Page 40 Q2c
- (Model Paper 1)
- Page 60 Q2b
- (Model Paper 2)



Views: Solid and Wireframe:

Further Reading...



SHOW ME MORE



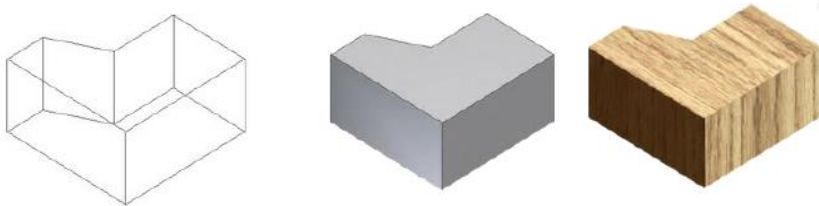
CAD and computer 3D modelling commands

There are 3 types of computer generated 3D model.

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

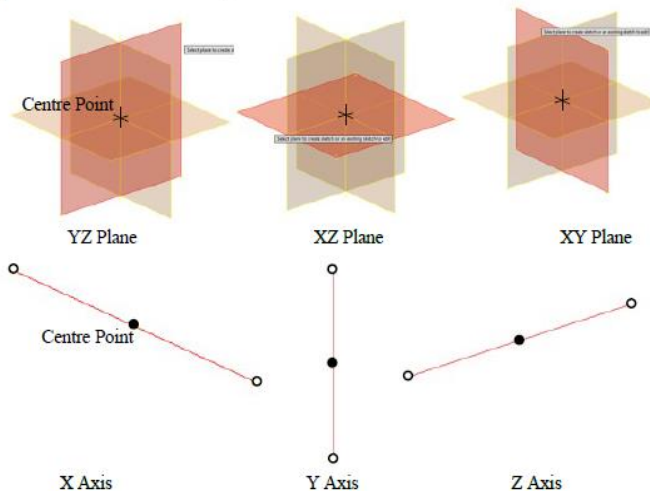
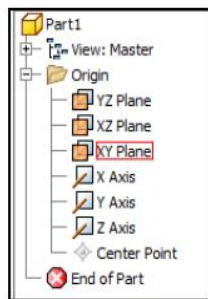
Solid model The wire-frame model is coloured so that it looks 'solid'. This is sometimes called base material and is usually a uniform brown or grey colour with no shadows or highlights.

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



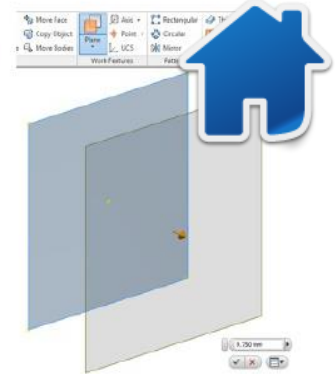
Workplanes and Work axis

There are 3 main workplanes and work axis. These are used to position an object relative to the origin (0,0,0). They can be made visible at any time during construction of a project. Workplanes are used to draw sketches on or to help position parts in an assembly.



Offset Workplanes

Using the planes tab you have several options for creating your own workplanes. To create an offset workplane, (a plane parallel to an existing workplane), click the corner of the workplane and drag. You can set an exact distance between the workplanes. As with all workplanes they can be made visible at any time during construction of a project.



Further Reading...

Solid forms and Surfaces

When creating a form you are often asked whether you want a solid form or a surface. Solid forms are 'block forms'. Surfaces are very thin forms with a zero value for thickness. Any 3D form made up of surfaces is completely hollow with the sides having a zero value thickness. A surface model can then be given a thickness by using the thicken/offset command.



Solid model



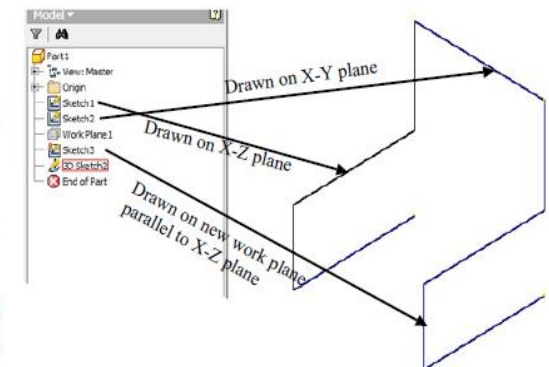
Surface model

The surface model looks transparent due to the zero thickness value.

3D Sketch

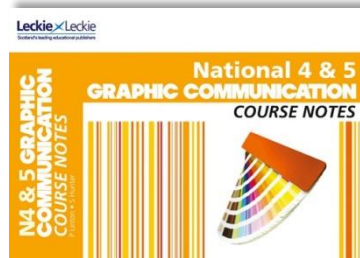
A sketch drawn on more than one directional plane (X-Y, X-Z, Y-Z).

In this example 3 2D sketches have been used to form the 3D sketch. This is called 'include geometry'. Including the geometry of a shape or other 2D drawing is often the easiest way to form a 3D sketch.

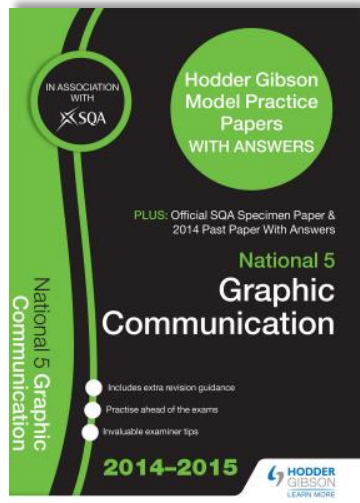




Further Study:



- Page 101 - Read
- Page 102 & 103 - Read



- N/A



Modelling Strategies: Top Down Modelling



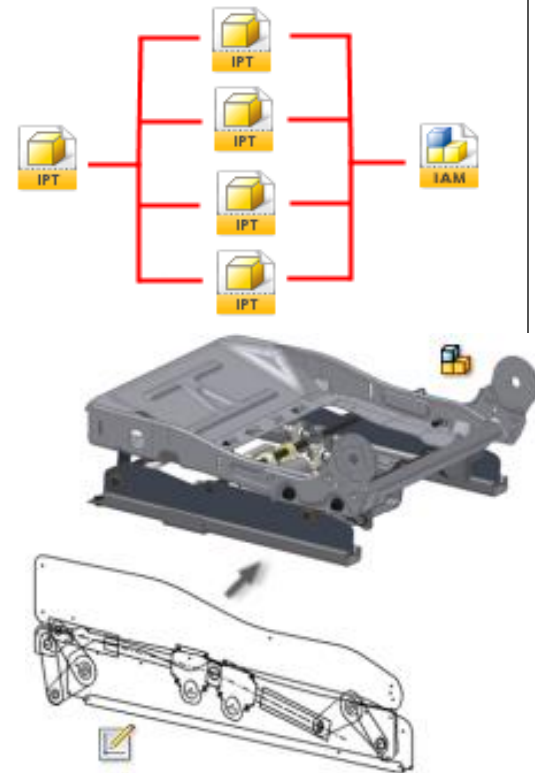
Most assembly modelling combines the strategies of bottom-up and top-down design. Some requirements are known and some standard components are used, but new designs must also be produced to meet specific objectives.

Top down modelling

In this method, you start with a single part file. In this part file you create all the parameters, work features, geometry, features or solids you will need to model your assembly. You then use Inventor's 'derive' tools to push or pull the geometry out into individual part files.

When you recombine these parts into an assembly file, you will naturally find that they fit perfectly with no constraints required. The relationships between the parts are geometric. They are handled by the master part file.

Any changes to the master part file are propagated to the individual part files. With no constraints to fail, this can be a powerful technique for modelling large assemblies, and is particularly suited to bespoke work and working in teams.



<http://knowledge.autodesk.com/support/inventor-products/learn-explore/caas/CloudHelp/cloudhelp/2015/ENU/Inventor-Help/files/GUID-63FA128E-63E2-4176-8653-327BD80D8A43-htm.html>

Modelling Strategies: Bottom up Modelling



Bottom up modelling

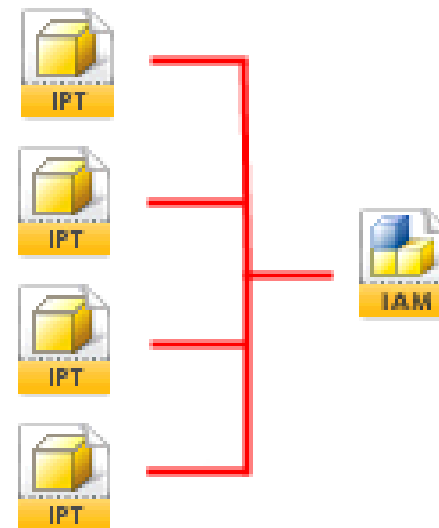
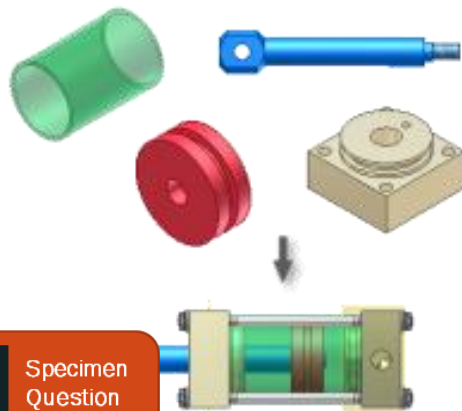
This is probably the method you have learned so far.

Each part is created individually.

Each part is added to an assembly file and constrained into position.

Any relationship between parts may be handled outside of Inventor, by a separate ERP system for example.

This technique is suited to companies that manufacture multiples of the same parts, which are assembled in different configurations.





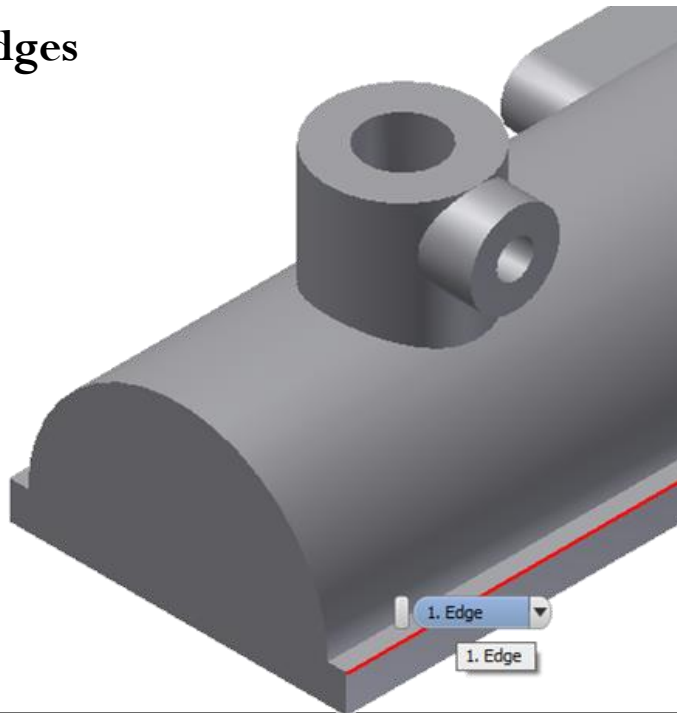
Modelling Concepts: Vertices, Edges, Faces



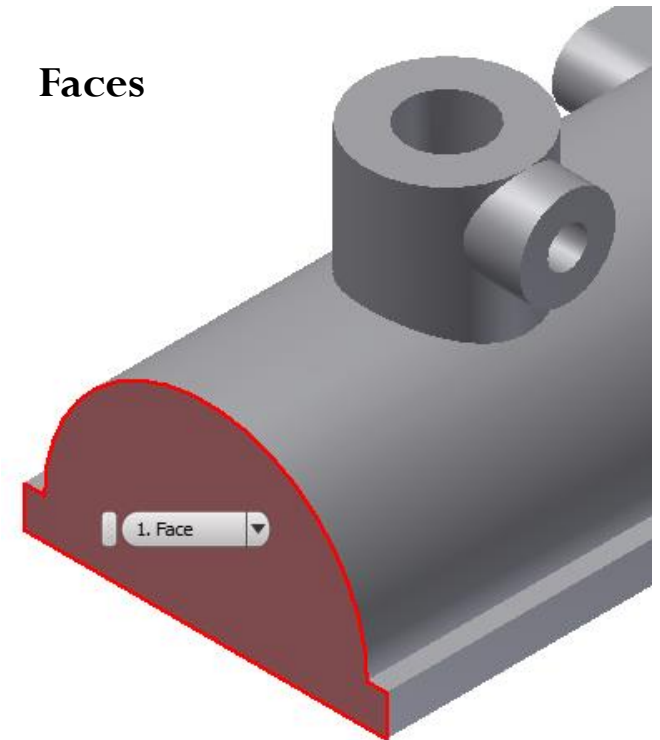
Vertices

The two most common sources of 3D models are those that an artist or engineer originates on the computer with some kind of 3D modelling tool. Basically, a 3D model is formed from points called *vertices* that define the shape and form *polygons*. A polygon is an area formed from at least three vertices (a triangle). A four-point polygon is a *quad*, and a polygon of more than four points is an *n-gon*.

Edges



Faces



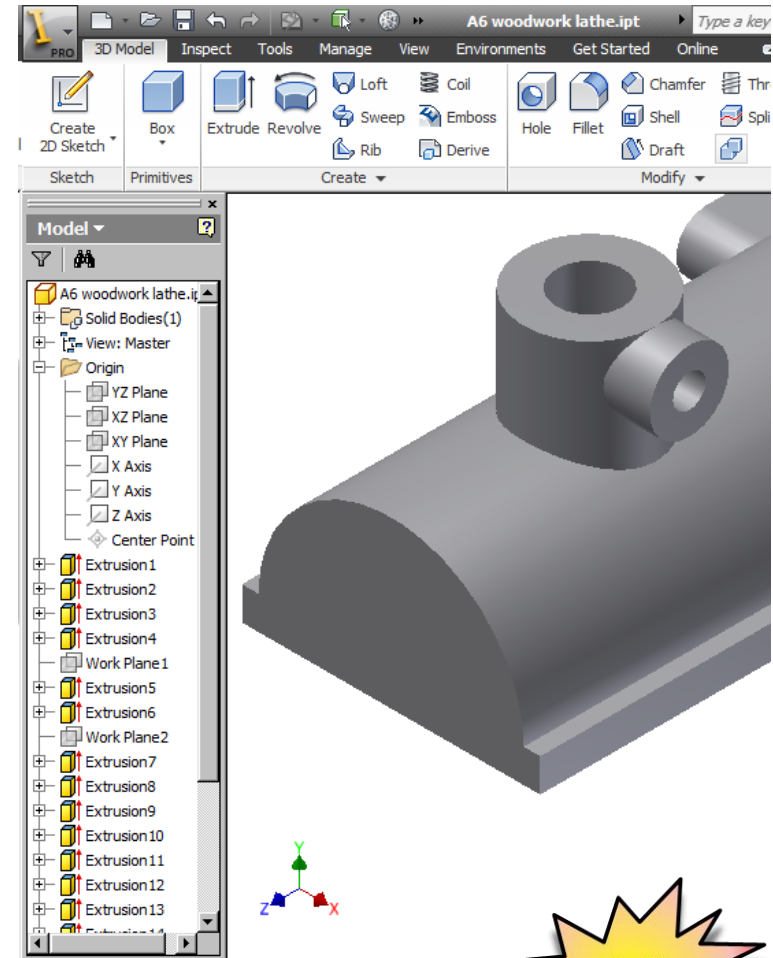
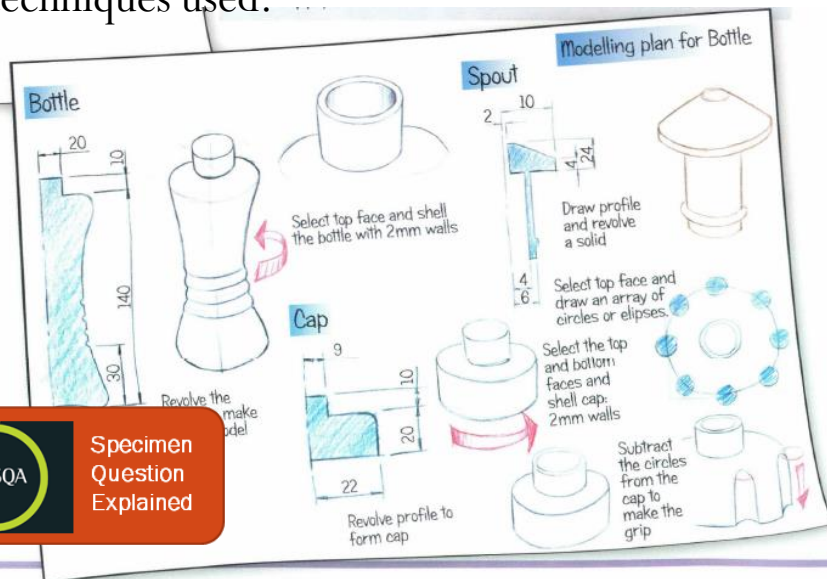




Modelling Tree/ Modelling Plan:

Modelling tree/hierarchy

Modelling plan – quite simply a plan of how you are going to go about modelling your product. It will detail sizes and techniques used.



Further Reading...



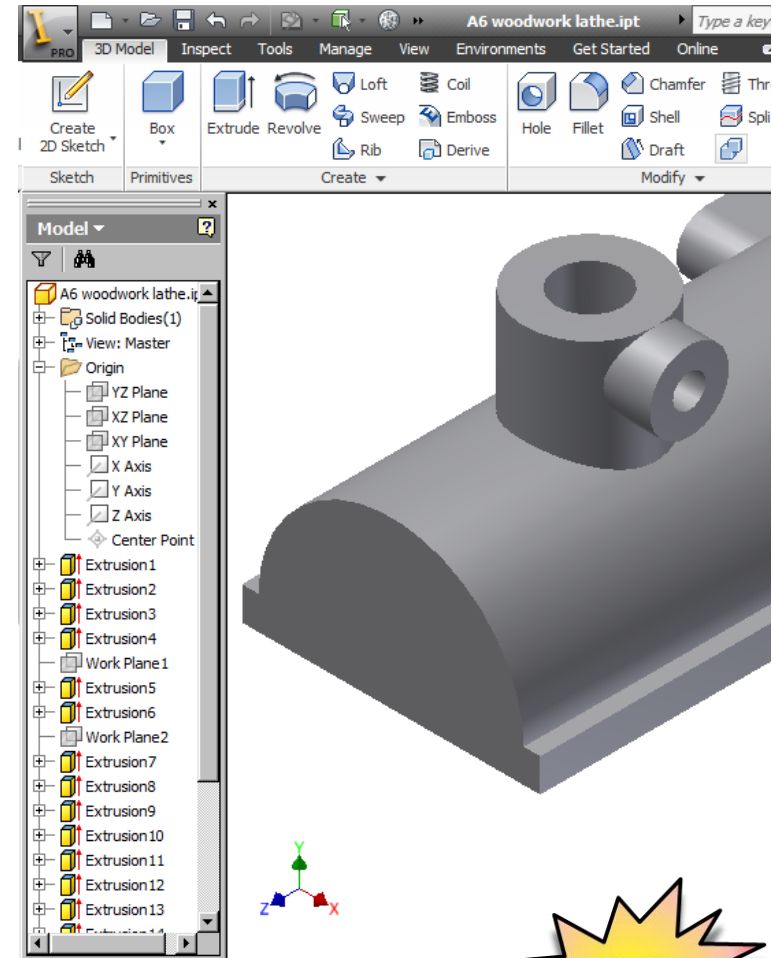
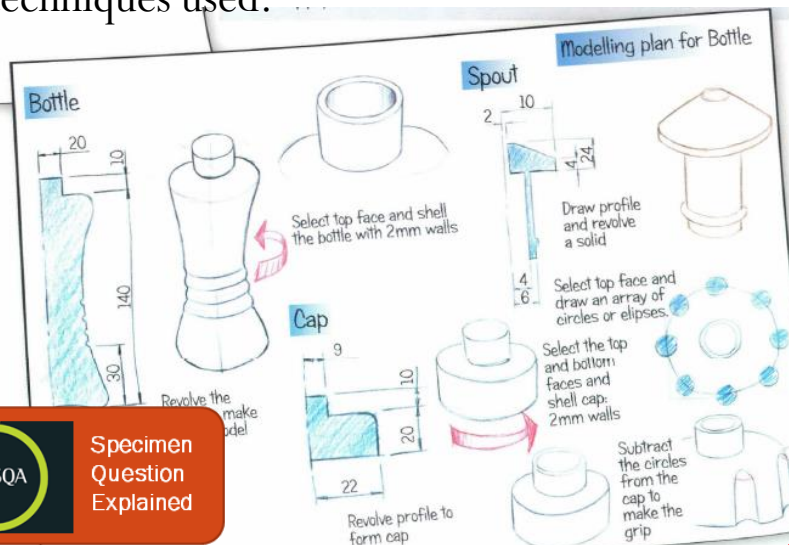
Specimen
Question
Explained



Modelling Tree/ Modelling Plan:

Modelling tree/hierarchy

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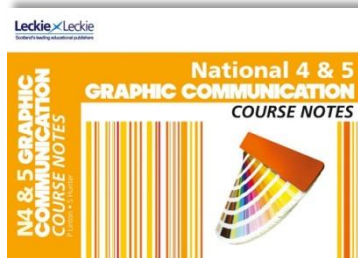
Further Reading...



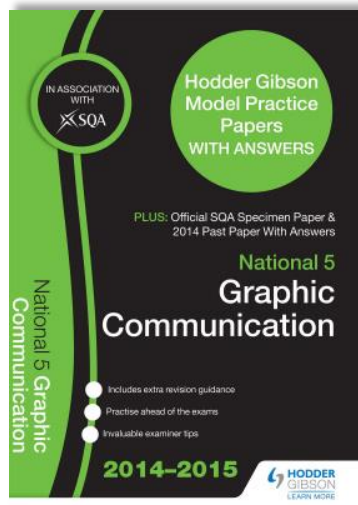
Specimen Question Explained



Further Study:



- Page 93 - Read
- Page 94 & 95 - Read



- Page 16 Q2c
- (2013 Specimen Paper)
- Page 38 Q2a
- (Model Paper 1)
- Page 77 Q2a
- (Model Paper 3)
- Page 86 Q5a
- (Model Paper 3)
- Page 91 Q7a
- (Model Paper 3)





AutoCAD DXF (Drawing Interchange Format, or Drawing Exchange Format) is a CAD data file format developed by Autodesk to allow data exchange between AutoCAD and other programs. CAD data exchange allows data to be exchanged and translated from one computer-aided system to another CAD file format.

3DS is one of the file formats used by the Autodesk 3ds Max 3D modelling, animation and rendering software. While the 3DS format aims to provide an import/export format, retaining only essential geometry, texture and lighting data, the related MAX format (now superseded by the PRJ format) also contains extra information specific to Autodesk 3ds Max, to allow a scene to be completely saved/loaded.

Step/iges file formats are generic file format that can be used and opened using any 3D modelling software. There are three common methods for importing these file types: File, Import, or File, Insert, or by adding the STEP file as an assembly component in the assembly menu.





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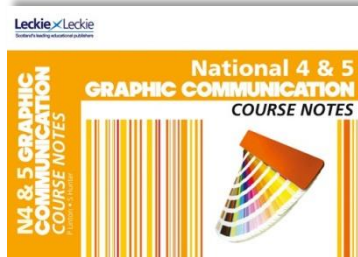
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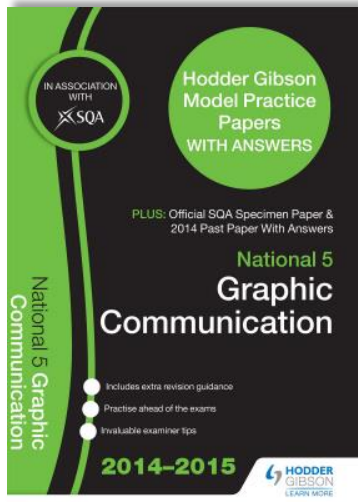




Further Study:

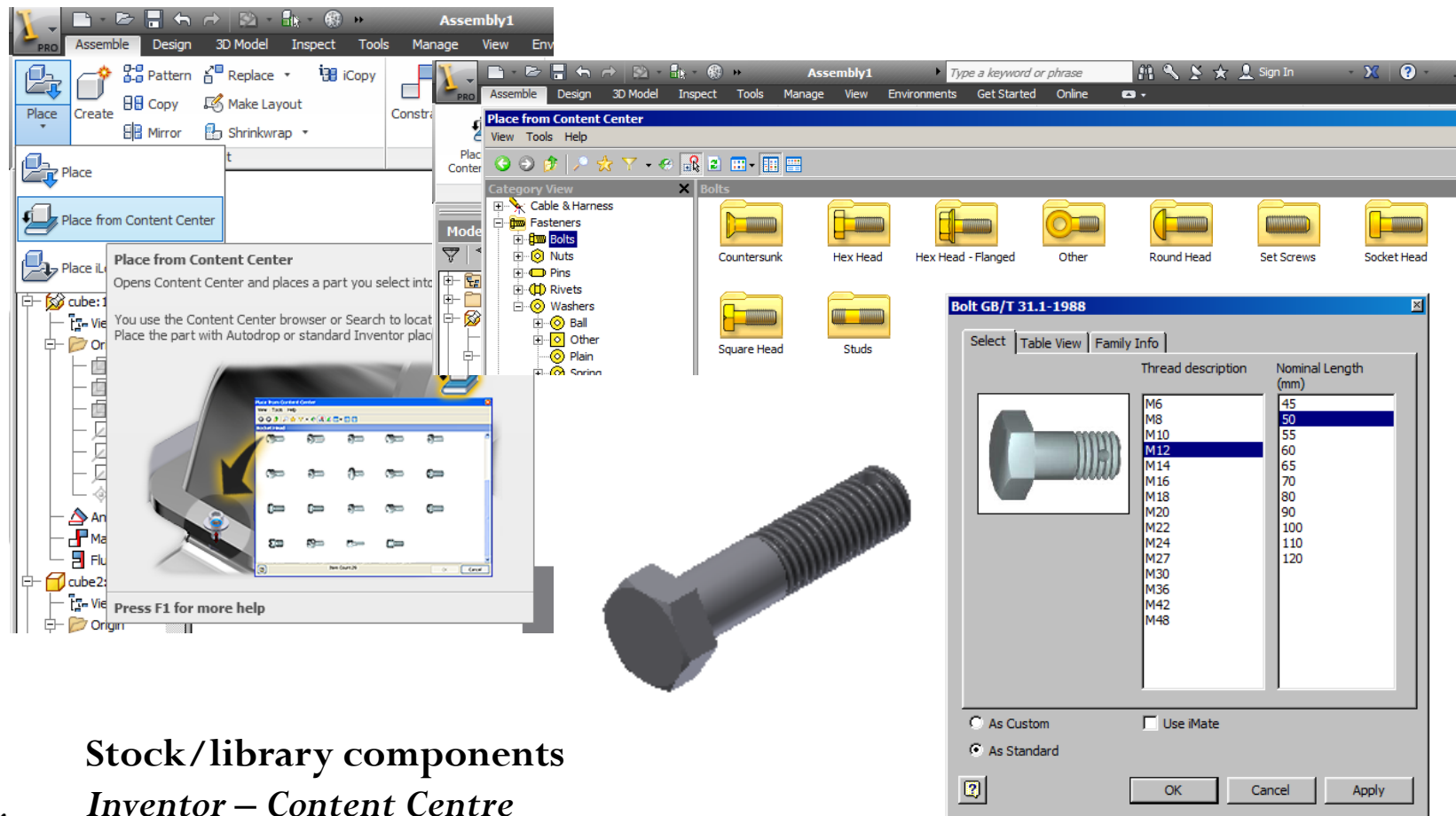


•Page77 - Read



•N/A





Stock/library components

Inventor – Content Centre

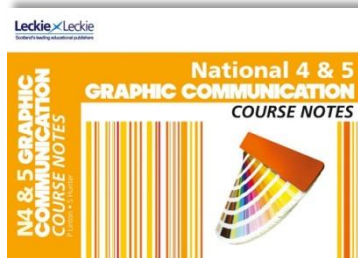
This is where frequently used components are kept ready to use. Items such as nuts, bolts, washers, etc. These can be made and inserted to any standard size.

Saves time, standardises the components and speeds up the assembly process.

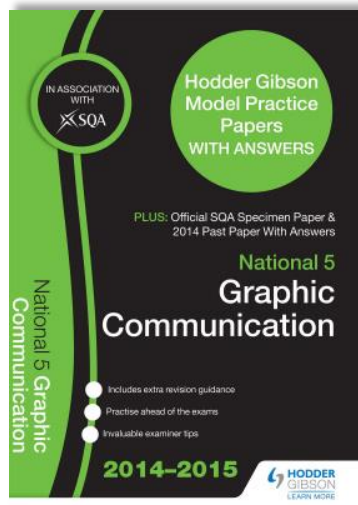
Further Reading...



Further Study:



- Page72 - Read
- Page 77 - Read



- Page 22 Q5b (i)
- (2013 Specimen Paper)
- Page 61
- (Model Paper 2)





Pull Quote

- One of the page elements that brings visual power to the page is the pull-quote. Pull-quote is a display element which is used to attract the reader and to break up long blocks of text. The effect of pull-quotes depends on their attractiveness, both visual and textual.

Te volentibus expetere lismo non restibus, conem si volentibus alitum terrorum autem extrum repudat nist aut que invelis qua debet carceret ped maximolore dolor accus core natorum qui am vent ipsam remperio corest pa coredand, ut in et an arum, sunt quam, cupit existet volentes qui aut tus, acceptat inuliorio omnimperibea con cusum sin et harum exples cientes asperati consensit veriosum rendicatenet re eos ipsuamque corporeis re odici conseqno endi con pliguent sequeatris diquis conetumsum fugiate quam, cum aut ut eliquam, consendi ulligent mos moluptatet ac caboreos corpus nonsequo dest id unt, quatuam dolores et quam, con restio et re listem aut extrum faciescint alicimi nitaquate nos in re rectaque alicimici sunt: dolatur atremquia exliquia quas

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1 of 12 images



Poppy

Speaks out...

As I walk into the 02 festival level I notice a young woman get sitting on a modern sofa. Ohops I'm late.

As I walk over she gets up turn to face me and smiles. I can't believe I'm meeting Poppy.

"It's she greets me with a high-pitched excited voice. Wow she's nothing like the tabloids make out. We started by talking about her latest album which is about the release. "I'm really excited about this album. I remember a while back writing the songs in the studio and how everybody has the chance to hear them. My music is inspired by everything."

On April 20th Poppy's third tour kicks off at the London 02 arena. "The second time world tour is going to be the biggest yet. everybody is so much more and excited to see me live and I might just have a big collaboration in the pipeline as well."

Poppy's tour "Sweet & Savage" kicks off in London on the 20th April. To get your tickets go to www.ticketmaster.com

Ever since becoming a mom in 2005 at the tender age of eighteen Poppy has since been a mom of 2007. "Of course the page don't let me have a private life but you can let that destiny something you love (music). If they wanted the photo so bad they can have it. They don't need to get aggressive. It's got to be said I must have body guards with me all the time."

"My music is inspired by everything!"

STYLED BY





Footers and Folios



Folio

- A printed page number in a publication.

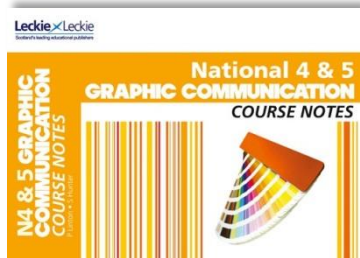
Footer

- A line of text/or page number (folio) placed at the bottom of the page which is repeated throughout the main body of the document.

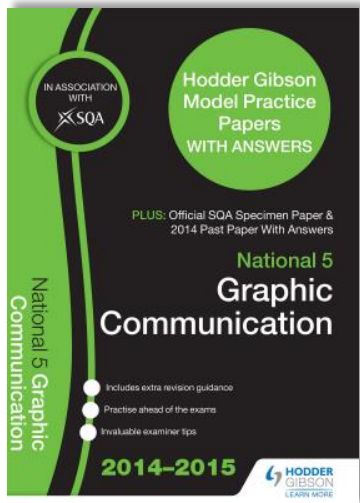
SHOW ME MORE



Further Study:



- Page 115 & 116 - Read



- Page 58 Q1g
- (Model Paper 2)
- Page 75 Q1f
- (Model Paper 3)





Proofs

- A trial printing of a piece of printed material for the purposes of checking and marking alterations for revision prior to the final print run taking place.





Registration Marks

The little circle with a cross through it is printed using every colour of the four-colour printing process, **CMYK**. If they're being printed accurately, they should overlap precisely so the mark looks entirely black. Therefore if any of the colours are slightly offset (out of register) then they'll be displayed, showing the job isn't being printed correctly.

Colour Bar



Crop Marks



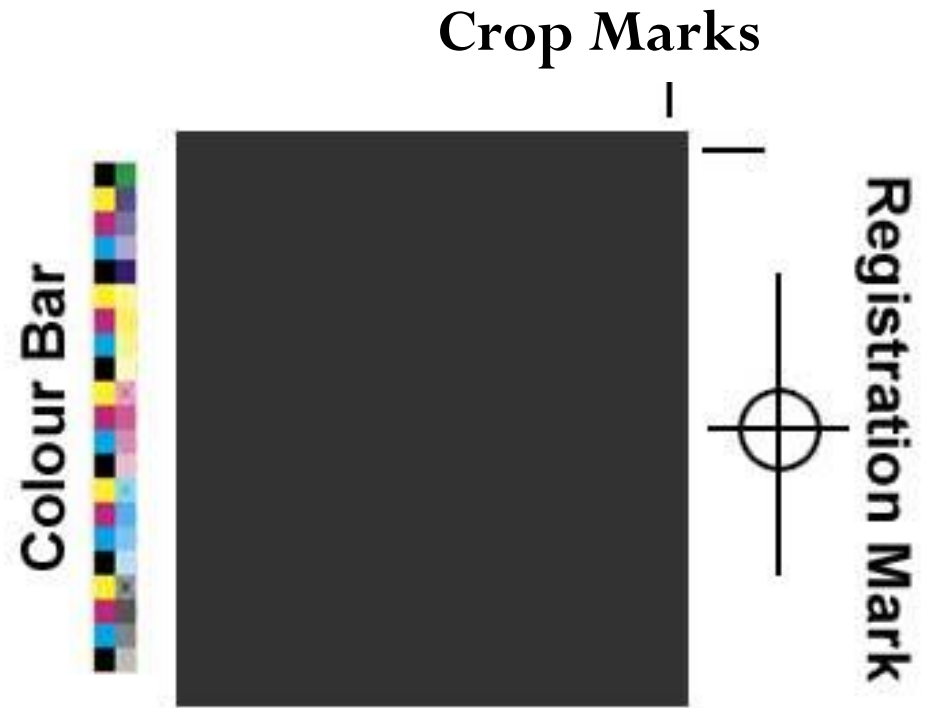
Registration Mark



Exaggerated example of a mismatch of CMYK registration



Crop Marks



These are small lines which show exactly where the finished page will be cut during the finishing process. They should display at the edge of each margin.

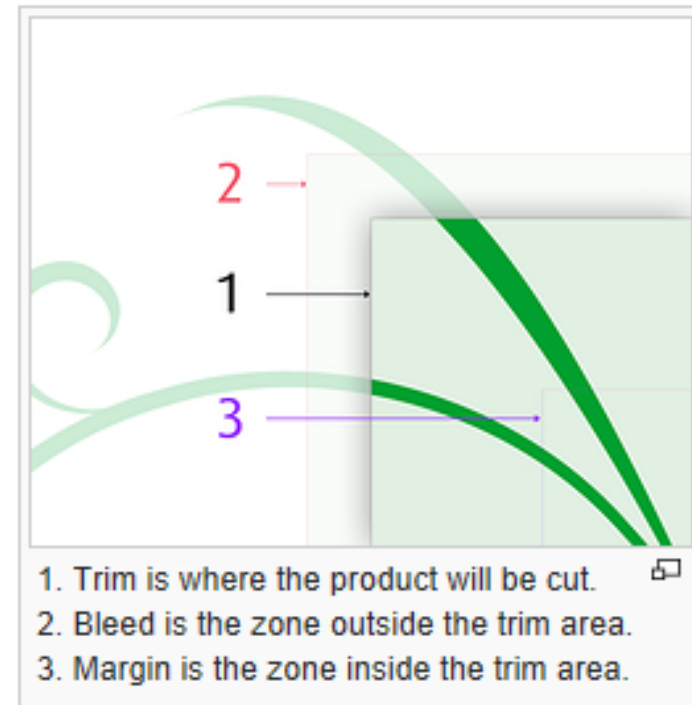
Finishing is a general term printers use for anything that happens to a job after it's been printed. That means things like cutting, folding, binding and so on are all finishing processes.





Run-off

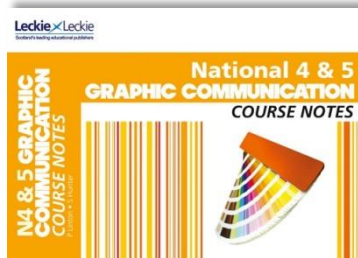
- Runoff or **run-off**, another name for bleed, printing that lies beyond the edges to which a printed sheet is trimmed
- **Bleed** is a printing term that refers to printing that goes beyond the edge of the sheet before trimming. In other words, the bleed is the area to be trimmed off. The bleed is the part on the side of a document that gives the printer a small amount of space to account for movement of the paper, and design inconsistencies. Artwork and background colours can extend into the bleed area. After trimming, the bleed ensures that no unprinted edges occur in the final trimmed document.
- It is very difficult to print exactly to the edge of a sheet of paper/card so, to achieve this, it is necessary to print a slightly larger area than is needed and then trim the paper/card down to the required finished size. Images, background images and fills which are intended to extend to the edge of the page must be extended beyond the trim line to give a bleed.



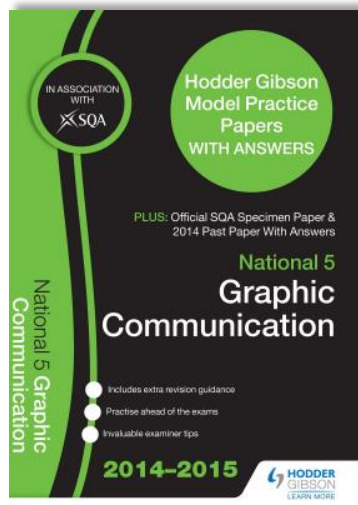
Bleed/ Run-off



Further Study:



- Page 126 – Read
- Page 129 – Complete Question 2



- Page 52 Q8f
- (Model Paper 1)



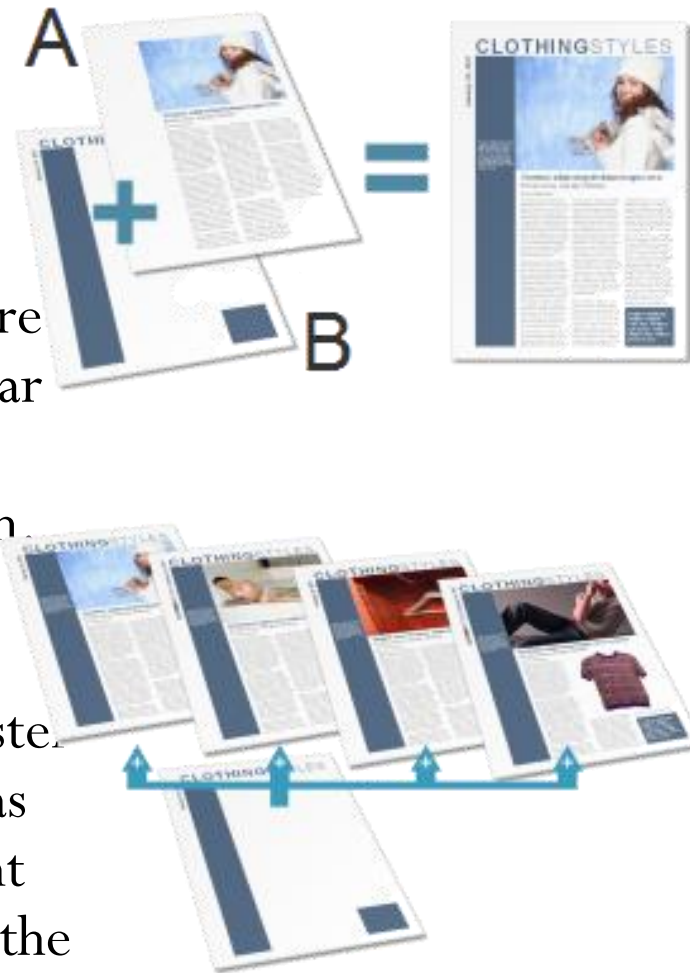


Master page layers

Master pages provide a flexible way to store background elements that you'd like to appear on more than one page - for example a logo, background, header/footer, or border design.

A - Page, B - Master Page

The key concept here is that a particular master page is typically **shared** by multiple pages, as illustrated below. By placing a design element on a master page and then you ensure that all the pages incorporate that element. Of course, each individual page can have its own "foreground" elements.



Layers



- **Layering is a design technique in** which one element is placed over another. The layers are placed carefully so that both elements are still clear to the reader. Layering is an anchoring technique that can tie together many parts of a page, creating a sense of page harmony.
- **When using layers it is important** to keep in mind the foreground and background elements. The background layer is sometimes locked to prevent it from being changed accidentally. This layer is the one on which all others are built. The foreground layer is the topmost layer.
- **You are not limited to just two layers.** You may create a multilayer document that stacks several layers. Often it is necessary to move one layer above or below another to get the effect you want.





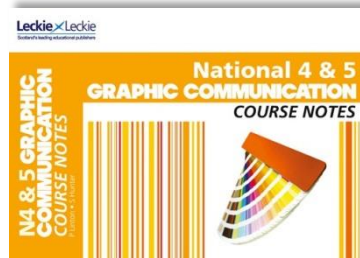
Layout Tools

- The term “layout tools” involves a range of tools that help to place and align objects accurately. Such tools include but are not limited to rulers, adjustable and automatic guides, object snapping, and object grouping. The guides and snapping options offer a point of reference when placing images and text in the document. Multiple editing layers keep the workspace more or less uncluttered which helps to prevent selecting and moving the unintended object. Object grouping helps in a similar way by making sure that multiple objects remain positioned proportionate to one another.
- The integration of “master pages” in a desktop publishing application saves you from having to create the same background multiple times for a multi-page document. This option creates a type of template that can be applied to every page of a document.

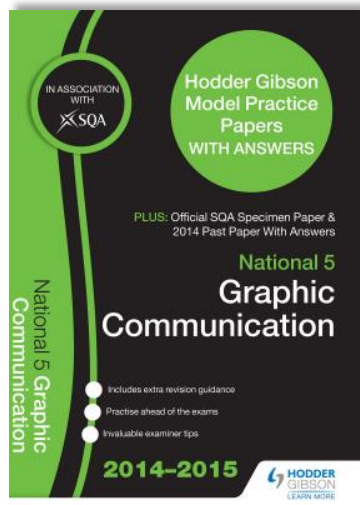




Further Study:



- Page 114 & 115 - Read
- Page 116 – Read
- Page 128 – Complete Question 1



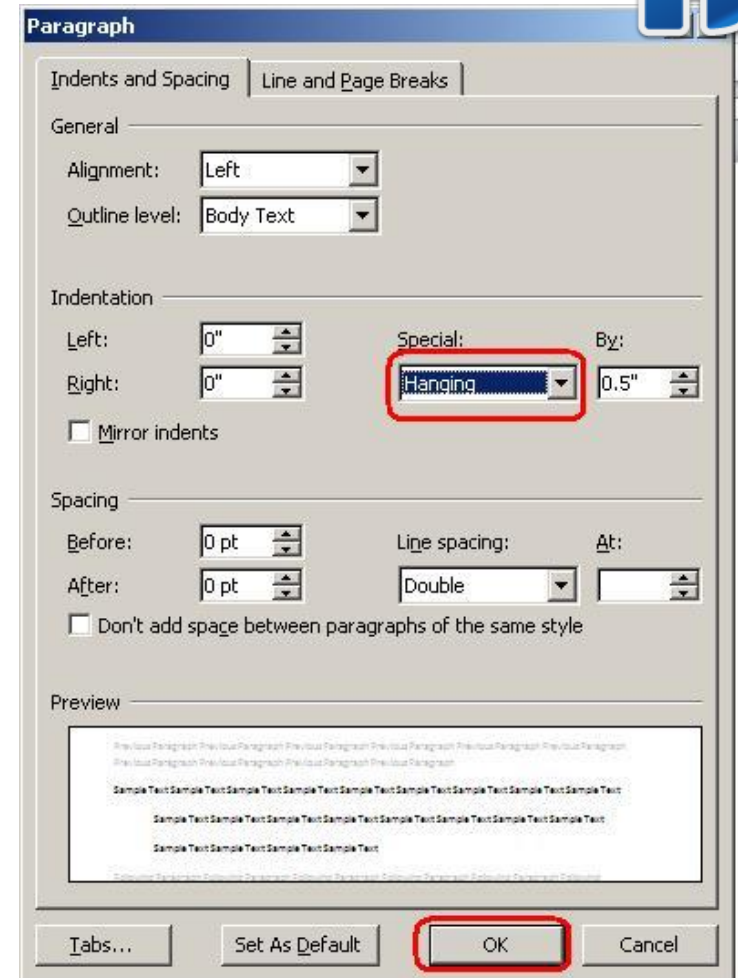
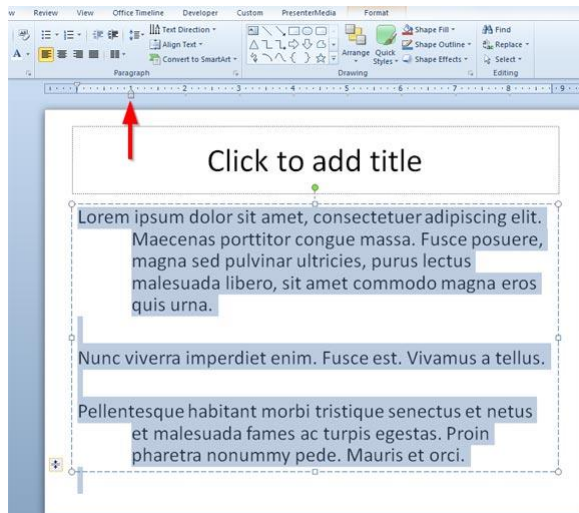
- N/A



Hanging Indent

Hanging indent

On the Insert tab, the galleries include it your document. You can use pages, and other document they also coordinate with yo





Running headlines

- A line of type appearing consistently in the top margin of each page or alternate left/right hand pages in printing.





Serif

The small decorative pieces on the ends of each character are called Serifs

Serif and Sans Serif

Serif

- The small terminal stroke at the end of a main stroke of a letter. Typefaces which have serifs are derived from hand-cut letters or calligraphic lettering styles.
- e.g. Times Roman is a serif font.

San Serif

Sans serif

- A typeface with no serifs - i.e. with no terminal strokes on the letters.
- Examples include: Arial, Franklin Gothic,

Further Reading...

Font Styles

Serif Type Styles

Old Style
Transitional
Neoclassical & Didone
Slab
Clarendon
Glyphic

Sans Serif Type Styles

Grotesque
Square
Geometric
Humanistic

Script Type Styles

Formal
Casual
Calligraphic
Blackletter & Lombardic

Decorative

OLD STYLE

Bembo
ITC Berkeley Oldstyle
Centaur
ITC Legacy Serif

R e n

SLAB

ITC Lubalin Graph
Rockwell
Egyptian Slate
Soho

R e n

GROTESQUE

ITC Franklin Gothic
Helvetica
News Gothic
Univers

R g e

HUMANISTIC

Frutiger
Gill Sans
ITC Goudy Sans
Mentor Sans

R e n

Further
Reading...



Font Styles

Script Type Styles

Old Style
Transitional
Neoclassical & Didone
Slab
Clarendon
Glyphic

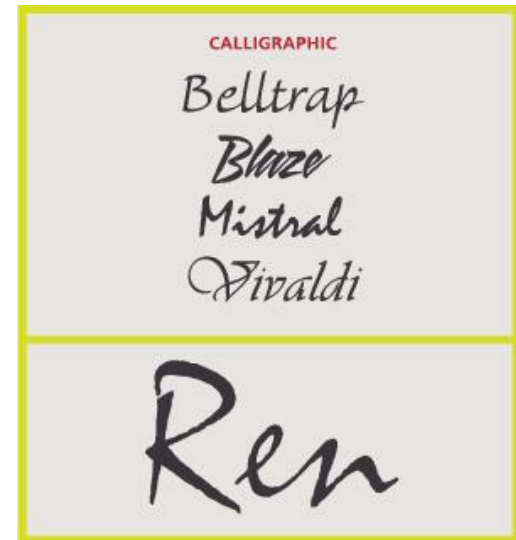
Sans Script Type Styles

Grotesque
Square
Geometric
Humanistic

Script Type Styles

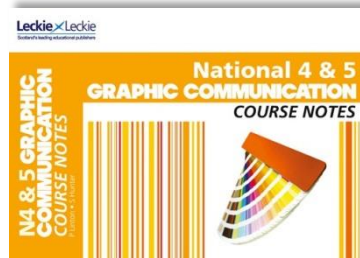
Formal
Casual
Calligraphic
Blackletter & Lombardic

Decorative

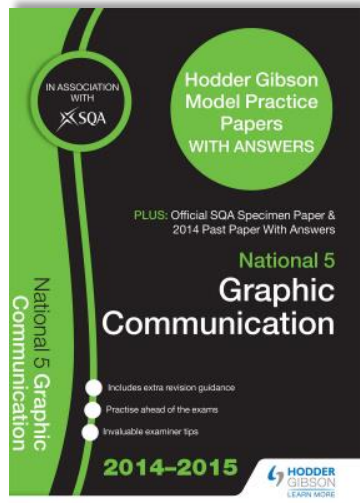




Further Study:



- Page 119 - Read
- Page 120 & 121
- Page 120 – Complete Activity



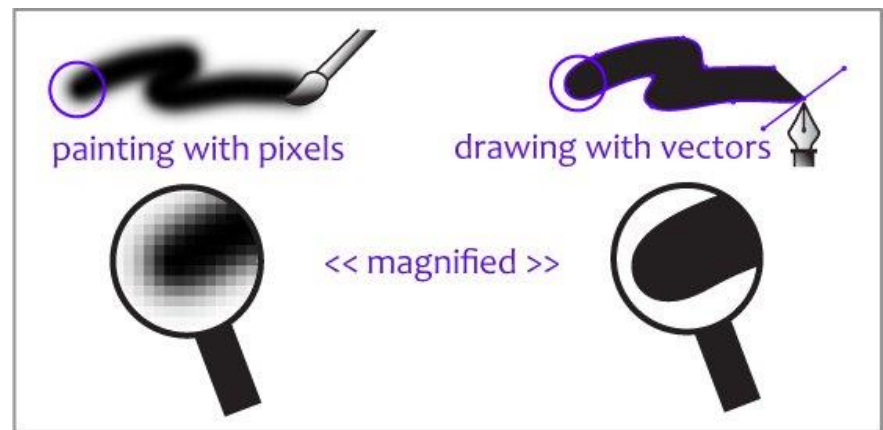
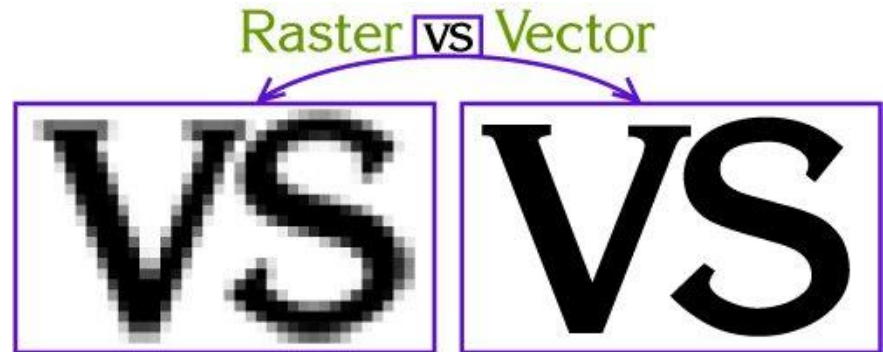
- Page 45 Q4b
- (Model Paper 1)
- Page 66 Q4d
- (Model Paper 2)

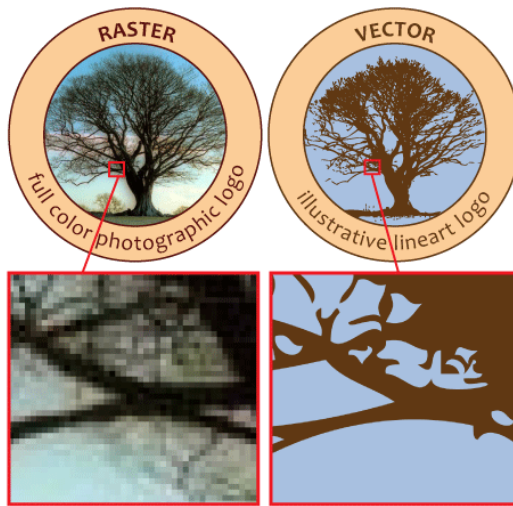




Raster & Vector file types

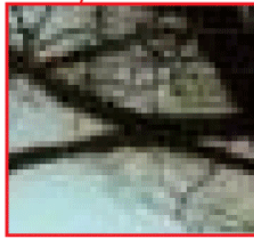
- Raster images are made of pixels. A pixel is a single point or the smallest single element in a display device.
- Vector images are mathematical calculations from one point to another that form geometrical shapes.
- **When a raster image is scaled up, it usually loses quality.** A raster image can be enlarged by either adding more pixels or enlarging the size of the pixel. Either way you are spreading the original data over a larger area at the risk of losing clarity.
- **A vector program** will use a mathematical formula to build an image that can **be scaled to any size without losing quality.**





Raster (Bitmap)

- Made of pixels
- Represents and edits programs with the use of continuous tones. The use of different colour pixels allows for smooth blends of colours.



an vector

Disadvantages

- Is bound by the number of pixels in the image. It cannot be scaled up without losing quality.
- Large dimensions & detailed images equal large file size.
- Some service providers like engravers, stencil-cut signs, etc, must have vector art.
- It is more difficult to print raster images using a limited amount of spot colours.
- Depending on the complexity of the image, conversion to vector may be time consuming.

Vector

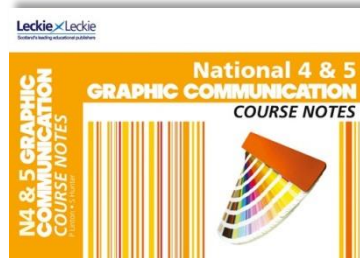
- Made of mathematical calculations that form objects and lines.
- Can be scaled to any size without losing quality.
- Resolution-independent: Can be printed at any size/resolution.
- Number of colours can be easily increased or reduced to adjust printing budget.
- A large dimension vector graphic can maintain a small file size.
- Vector art is required by many service providers.
- Can be easily converted to raster

Disadvantages

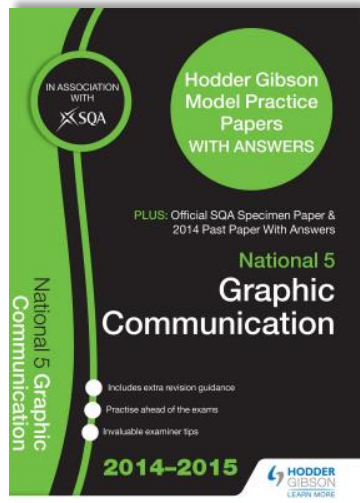
- It is not the best format for photographs or photo-like elements with blends of colour.



Further Study:



- Page 98 - Read
- Page 127 - Read



- N/A



DESK TOP PUBLISHING



MagazineLayout_03:Magazine_Spread 22/10/06 1:15 AM Page 2

10 Risk

Headings

Digital Illustration: Creating A Cover

Drop Cap

Image

Header

Vivamus Non Adipiscing
Purus Dolor Dictum Eu
Lobortis Velit.

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Body Text

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“ Every artist dips his brush into his own soul, and paints his own nature into his pictures. ”

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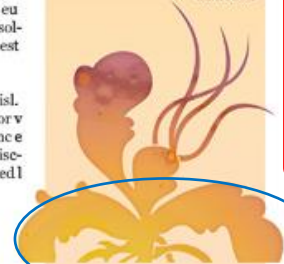
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Risk 11

Be Sneaky: Turn Designs Into Cash

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- Janet Saxe



Margin

Footer

Bleed

**White
Space**



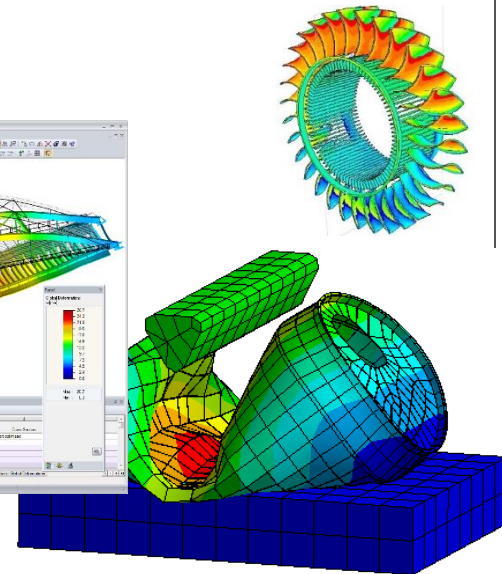
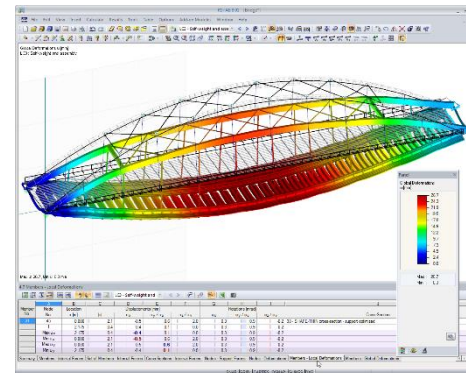
Technology



Remember!
Simulation - you interact
with it, you change the
outcome.

- Training – used to model real life situations so people learn and practice before taking activity on for real. Far safer and far more cost effective. Easy to adapt conditions so different situations can be experienced
 - Simulators – surgery, flight simulator, weather, etc
- Testing – designing new products can be very costly especially if found not to be fit for purpose following manufacture. By testing computer generated models of products early on, prior to manufacture/construction, it is far more cost effective.
 - Test for strength, aerodynamics, elasticity, heat flow, ventilation, etc
- Predicting – weather, stock market fluctuations, etc

**Further
Reading...**



Technology

- Films and animation – Computer generated models can be manipulated far easier than conventional cartoons.
- Gaming – Huge advances in gaming in recent years. Massive industry, new jobs created in software engineering and games design. Constantly developing.
- Product visualisation – easy to create realistic renderings of objects, rooms and buildings that look as if they have been photographed. Ikea use this technique extensively throughout their catalogues. This allows them to change lights, shadows materials at the



Remember!
Animations you watch,
you cannot change the
outcome.



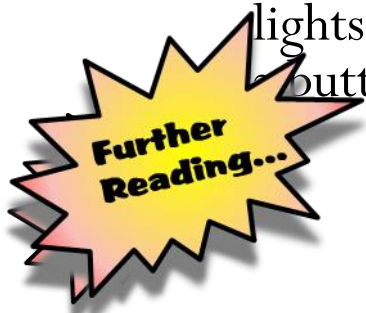
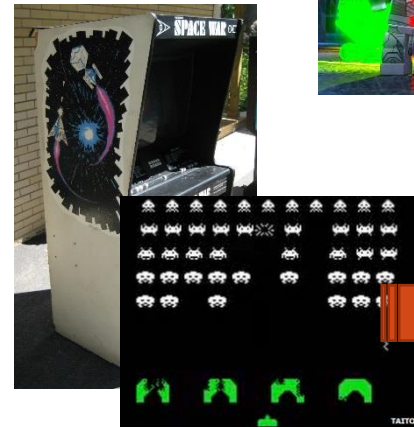
Further
Reading...

Technology

- Films and animation – Computer generated models can be manipulated far easier than conventional cartoons.
- Gaming – Huge advances in gaming in recent years. Massive industry, new jobs created in software engineering and games design. Constantly developing.
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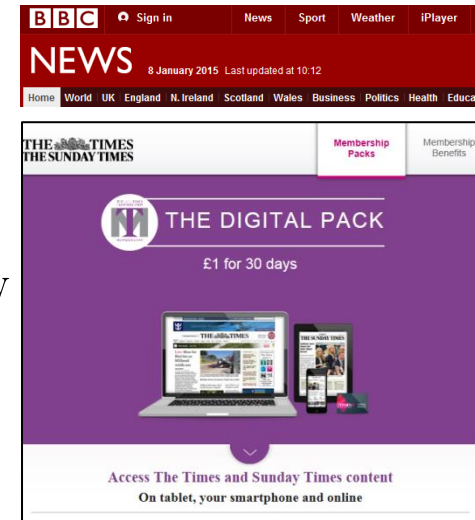
Remember!
Animations you watch,
you cannot change the
outcome.



Society

- Environment:

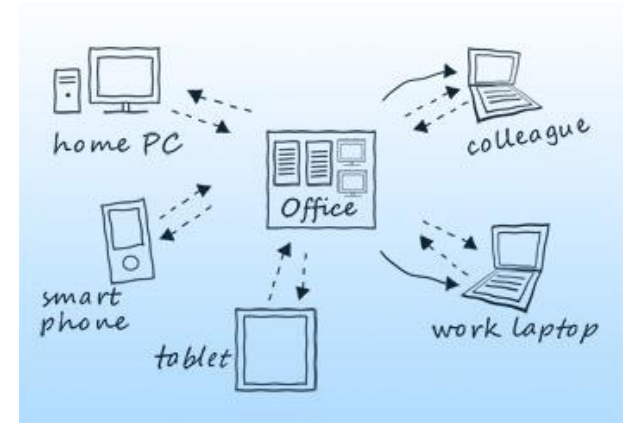
- Paperless office
- Digital methods for delivering information, for example websites, blogs, digital billboards, facebook, twitter, etc
- Environmentally friendly printing methods & inks. Many inks are now based on vegetable oils rather than being petroleum-based.
- Recycled paper. This can now be produced at a high quality which has broadened the number of areas where it could be utilised.
- Printing used to be very labour intensive, however, in recent years, changes to digital printing has made the industry far more efficient. These improvements have made a significant difference to the size of the workforces employed in the industry. Modern printing methods are now far more energy efficient.



Society

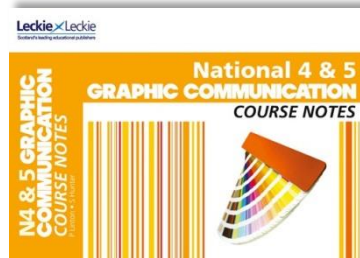
Further
Reading...

- Working environment:
 - Remote working, ie working from home. You could live in the Outer Hebrides and work for a London based organisation.
 - Time taken to produce graphics greatly reduced. This is often referred to as the 'lead time'. Far easier to make modifications and changes.
 - Easier to collaborate with colleagues that may work in a different country, building or organisation.
 - Far easier and quicker to send electronic versions of graphics via the internet. These could be formal working drawings for a component or an advert for a new product. These could be sent directly to the publisher or manufacturer.

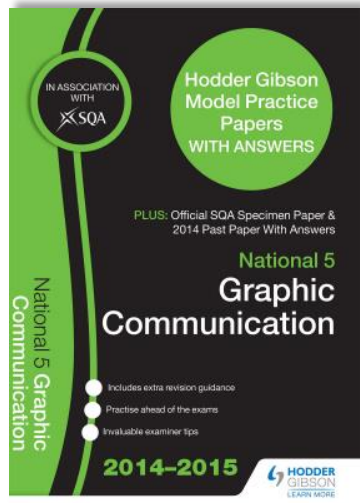




Further Study:



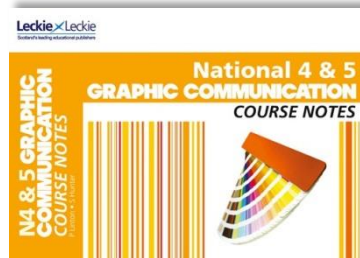
- Page 67 - Read
- Page 76 & 77 - Read
- Page 90 & 91 - Read
- Page 97 - Read



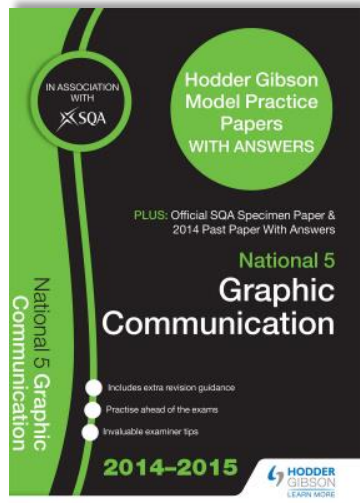
- Page 43 – Q3d
- (model paper 1)



Further Study:



- Page 17 - Read
- Page 63 to 65 - Read
- Page 66 & 67 - Read
- Page 68 to 70 - Read



- Page 84 – Q4b
- (model paper 3)



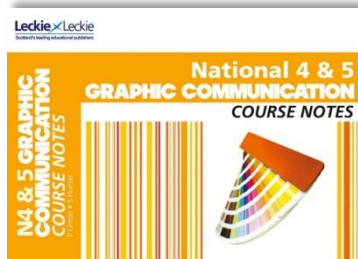
Software



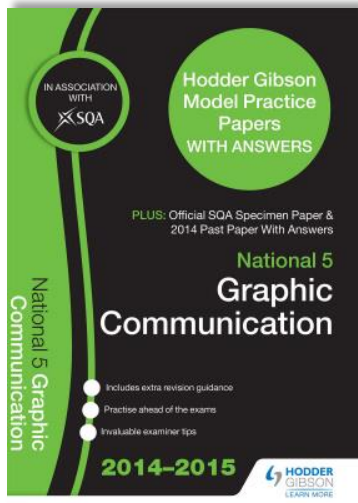
- 2D CAD – AutoCAD 2013
 - Allows for the creation of simple 2D drawings, essentially doing on a computer what was previously done on a drawing board.
- **3D Modelling – Autodesk Inventor Professional 2013**
 - Products are designed in 3D. These 3D models can then be used for animations, simulation or testing for strength, etc.
- **3D Rendering – Inventor Studio**, 3D Studio Max
 - Allows the designer to add materials, lights, etc, to make an object look realistic.
- **Desktop Publishing – Microsoft Publisher**, Serif Page Plus
 - Integration of text and graphics.
- Photo editing – Serif Photo Plus
 - Allows you to enhance or modify images.
- Spreadsheets – Microsoft Excel
 - To display information on tables and make calculations. Also allows graphs to be created from data.
- Video Editing – Serif Movie plus, Movie Maker
 - Allows for videos to be edited – parts cut out, order changed and others added in.
- Website Building – Serif Web Plus
 - Similar in many ways to DTP but allows for pages to be uploaded to the internet
- Word Processing – Microsoft Word
 - Simple word processing with the benefits of features such as spell check, etc



Further Study:



- Page 65 - Read



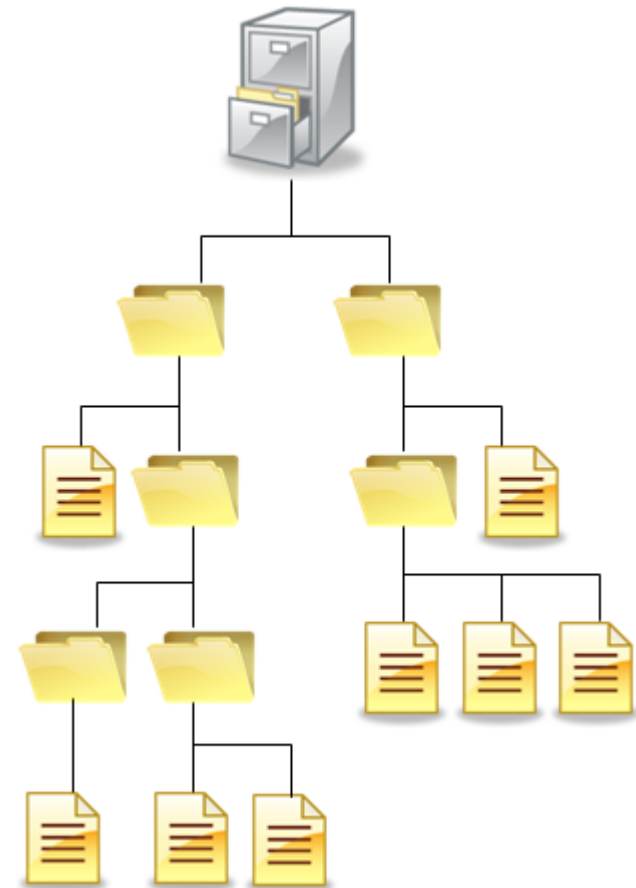
- N/A





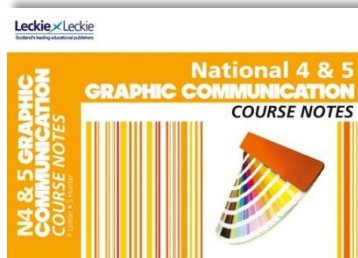
File Management

- The data that we work with on computers is kept in a hierarchical file system in which directories have files and subdirectories beneath them. Although we use the computer operating system to keep our image data organised, how we name files and folders, how we arrange these nested folders, and how we handle the files in these folders are the fundamental aspects of file management.
- The work you do to manage your files will be much more valuable if you do it consistently. While this can take some work to develop a system and train yourself to stick to it, you'll be paid back in the long term. You should make some effort to standardise file naming and folder structure.

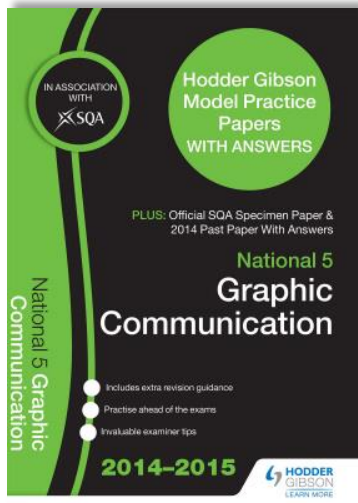




Further Study:



- Page 67 - Read



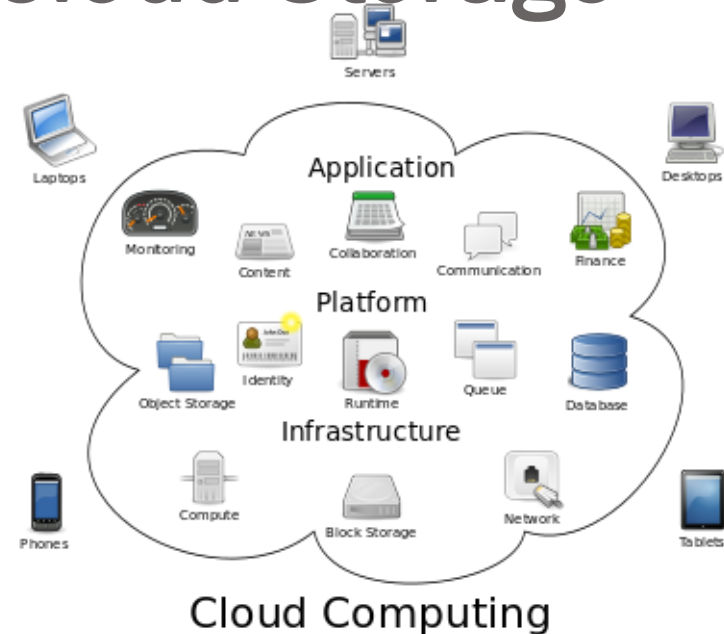
- N/A





Cloud Computing & Cloud Storage

- **Cloud Computing** is a recently evolved computing term based on the use of computing resources. Cloud computing involves using groups of remote servers and software networks that allow centralised data storage and online access to computer services or resources.
- **Cloud Storage** is a facility for internet storage of files. These websites use file transfer protocol (ftp) so you can upload or download your files from any computer, smart phone or tablet. However, cloud storage requires an internet connection and the speed of that connection affects how quickly files are loaded or saved.



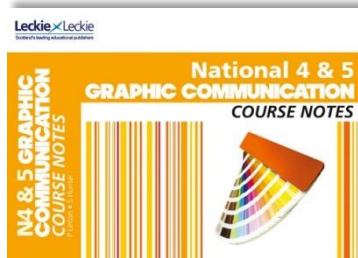
Cloud Computing

Cloud computing metaphor:
For a user, the network elements representing the provider-rendered services are invisible, as if obscured by a cloud

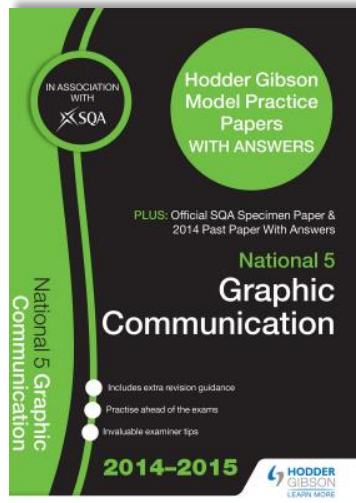




Further Study:



- Page 68 – Read
- Page 70 - Read



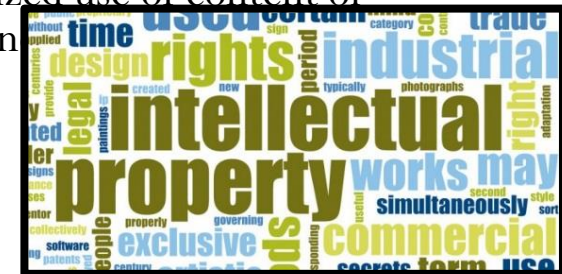
- Page 42 Q2c
- (Model Paper 1)





Digital Rights Management

- The advent of digital media and analogue-to-digital conversion technologies has vastly increased the concerns of **copyright-dependent** individuals and organizations. These concerns are particularly prevalent within the music and movie industries, because these sectors are partly or wholly dependent on the revenue generated from such works.
- The advent of house-hold PCs has made it **convenient for consumers** to convert media (which may or may not be copyrighted) originally in a physical, analogue or broadcast form into a digital form for portability or viewing later. This, combined with the internet and popular file sharing tools, has made **unauthorised distribution** of copies of copyright digital media much easier.
- **Digital rights management (DRM)** is a class of technologies that are used by hardware manufacturers, publishers, copyright holders, and individuals with the intent to **control the use of digital content and devices after sale**.
- Some content providers claim that DRM is necessary to fight copyright infringement and that it can help the copyright holder maintain artist control or ensure continued revenue streams.
- DRM is in common use by the entertainment (e.g., audio and video publishers). Many online music stores, such as Apple's iTunes Store and e-book publishers also use DRM, as do cable and satellite service operators, to prevent unauthorized use of content or services. However, Apple quietly dropped DRM from all iTunes







Digital Output Devices



- Laser Printer
- Ink-jet Printer
- Wide format Printer
- Drum Plotter
- Flat-bed Plotter
- Monitor
- Projector
- Laser Cutter





Digital Input Devices

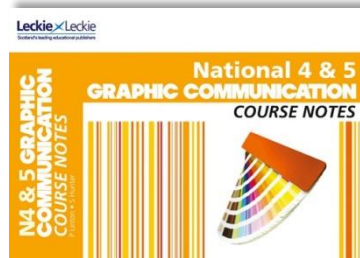


- Digital Camera
- Drawing Tablet
- Hand-held Scanner
- 3D Scanner
- Flatbed Scanner
- Mouse
- Keyboard

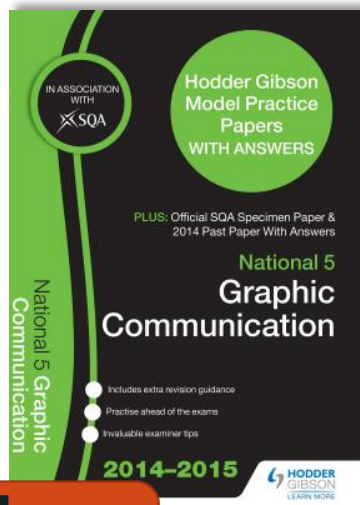




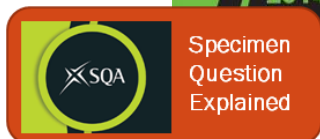
Further Study:



- Page 69 – Read
- Page 70 - Read



- N/A





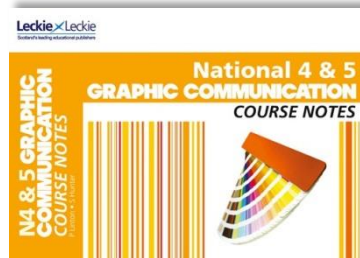
Advantages of Computer Aided Design/Draughting



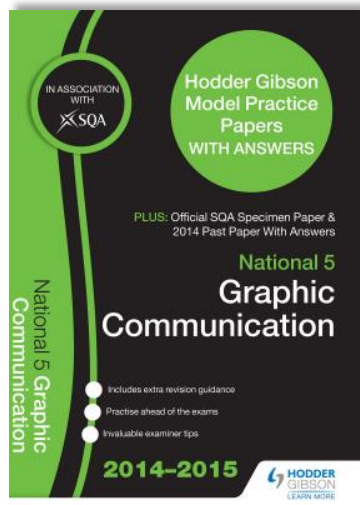
- **Standardisation** – everybody follows the same rules
- **Speed & Quality** – once staff are trained they can produce drawing at a far faster speed and to a higher standard
- **Ease of Modification** – mistakes easy to sort
- **Storage & Retrieval** – digital versions of drawing take up far less storage space, they can be reprinted as many times as you like and they are ease to send via e-mail for example
- **Ease of formatting and scaling** – drawing scale and orientation can be changed easily
- **The use of library components** – saves time and effort and all parts are standardised
- **Drawings** can be linked to **manufacturing** machinery in **CAD/CAM** (Computer Aided Manufacture)
- Use of **layers** – allows drawings to be split into different parts, makes it easier to organise and edit your work. Layers can be locked or ‘switched off’ to make editing easier.



Further Study:



- Page 72 – Read
- Page 73 – Read
- Page 74 – Read



- Page 67 Q5a
- (Model Paper 2)



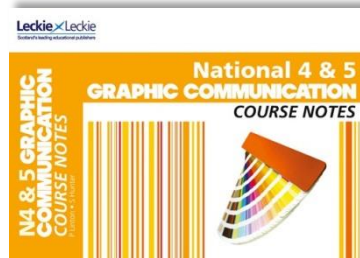
Advantages of Computer Aided Design/Draughting – 3D Modelling



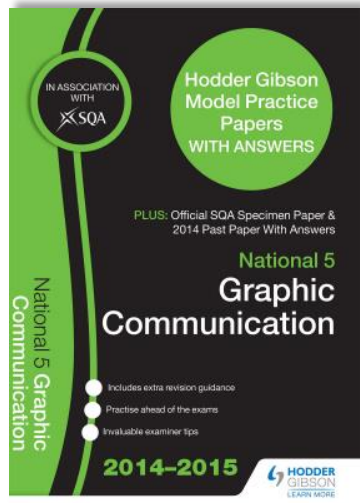
- Models can be produced **quickly** and **accurately**,
- **Easy to modify** – materials, sizes, colours, surface finish, etc,
- Models can be used to **test for strength**. Potential to save considerable amounts of money as compared with physical testing,
- **Quick to send** via e-mail
- Models take up very **little storage space** as compared with physical models,
- Models can be linked to **manufacturing machinery** (3D Printers) in **CAD/CAM** (Computer Aided Manufacture)
- Models can then go on to be used in **animations** or **simulations**.



Further Study:



- Page 76 – Read
- Page 77 – Read



- Page 67 Q5a
- (Model Paper 2)



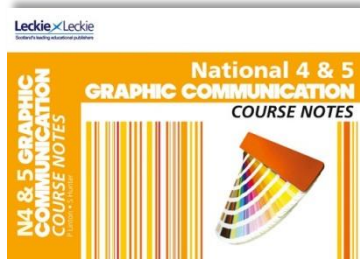
Disadvantages/Limitations of Computer Aided Design/Draughting



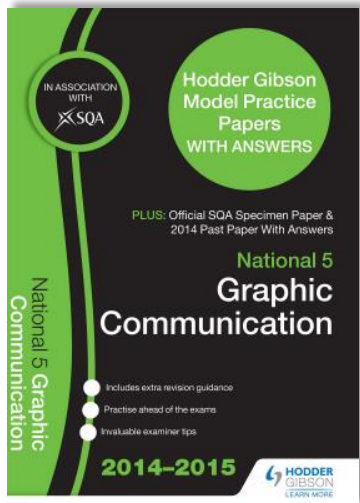
- **Cost:**
 - Set up – Hardware & Software,
 - Keeping hardware up to date and capable of running latest versions of software,
 - Keeping software up to date – versions are constantly changing,
 - Staff training
- **Security** – hackers, it can be easier to steal electronic files than hard copies, etc
- **IT problems** – Computers can fall victim to viruses or system failure, work gets corrupted, etc.



Further Study:



- Page 17 – Read



- Page 84 Q4b
- (Model Paper 3)





Specimen Paper Questions Explained



Q1



Q2



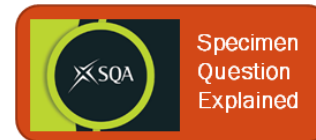
Q3



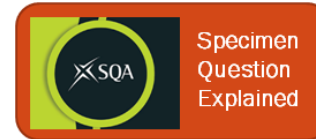
Q4



Q5



Q6



Q7



Q8



Q9