

# Computer Graphics Fundamentals

NOS237

**B**asford  
Systems

[www.basford.com.au](http://www.basford.com.au)

©Basford Systems

This documentation and accompanying files are copyrighted. Other than for the purposes of and subject to the conditions prescribed under the Copyright Act, no part of it may in any form or by any means (electronic, mechanical, microcopying, photocopying, recording or otherwise) be reproduced, stored in a retrieval system or transmitted without permission.  
Made in Australia.

COMPUTER GRAPHICS FUNDAMENTALS  
ISBN 1 876455 19 5

## Table of Contents

<b>Introduction .....</b>	<b>4</b>
<b>Microsoft Paint .....</b>	<b>5</b>
Starting a New Drawing .....	7
Saving a Drawing .....	7
<b>Undoing a Mistake.....</b>	<b>8</b>
<b>The Crosshair.....</b>	<b>8</b>
<b>Using the Drawing Tools.....</b>	<b>8</b>
Changing the Width of Lines .....	8
Changing the Colour of Foreground and Background. ....	9
Drawing in foreground and background Colours.....	9
Drawing a Straight Line, Circle or Square .....	9
To Draw an Arc .....	9
Drawing a Polygon .....	10
<b>Using the Colour Tools from the Tool Box.....</b>	<b>12</b>
Using the Fill Tool .....	12
Using the Brush Tool .....	12
Using the Airbrush Tool.....	12
<b>Copying and Pasting Objects.....</b>	<b>14</b>
<b>Zooming the Drawing.....</b>	<b>14</b>
<b>Adding Text to a Drawing .....</b>	<b>18</b>
<b>Flipping and Rotating Drawing Objects .....</b>	<b>18</b>
<b>Using On-Line Help.....</b>	<b>22</b>
<b>Setting the Size of the Drawing Screen.....</b>	<b>24</b>
<b>Stretching and Skewing Objects in a Drawing .....</b>	<b>24</b>
<b>Edit a Clip Art Object in Paint.....</b>	<b>28</b>
<b>Creating an Image of the Screen .....</b>	<b>30</b>
<b>Removing Unnecessary White Space from around an Image .....</b>	<b>30</b>
<b>Importing Paint Drawings into Other Packages.....</b>	<b>31</b>
<b>Drawing Software Packages .....</b>	<b>33</b>
<b>Drawing in Microsoft Word 97 .....</b>	<b>34</b>

# Computer Graphics Fundamentals

---

Drawing Lines, Ellipses and Rectangles .....	34
Drawing Objects to Scale .....	34
Positioning the Object on the Page in an Exact Location .....	36
Formatting the Drawing Object.....	37
<b>Grouping Drawing Objects Together .....</b>	<b>40</b>
Placing Text in a Text Box.....	40
To insert a text box: .....	40
To remove the line from the outside of the text box.....	41
<b>Drawing Other Autoshapes .....</b>	<b>41</b>
<b>Turning off the Grid.....</b>	<b>42</b>
<b>Aligning Objects on a Page.....</b>	<b>42</b>
<b>Rotating Objects .....</b>	<b>45</b>
<b>Changing the Wrapping of Objects and Text.....</b>	<b>47</b>
<b>Managing Electronic Files .....</b>	<b>52</b>
<b>Competencies.....</b>	<b>54</b>
NOS237 – Computer Graphics Fundamentals .....	54
Learning Outcome 1.....	54
Learning Outcome 2.....	54
Learning Outcome 3.....	54
Learning Outcome 4.....	54
Learning Outcome 5.....	55
Learning Outcome 6.....	55
Learning Outcome 7.....	55

## Introduction

This module will provide the participant with the knowledge and skills to produce simple documents using drawing and graphics software.

The following learning outcomes will be covered:

1. Use Help and manuals to solve operational problems.
2. Use a 'paint' software package to create, edit and print simple graphic images.
3. Use a 'drawing' software package to create, edit and print simple graphic images.
4. Produce single page documents incorporating graphic images to meet required specifications.
5. Manage electronic files.

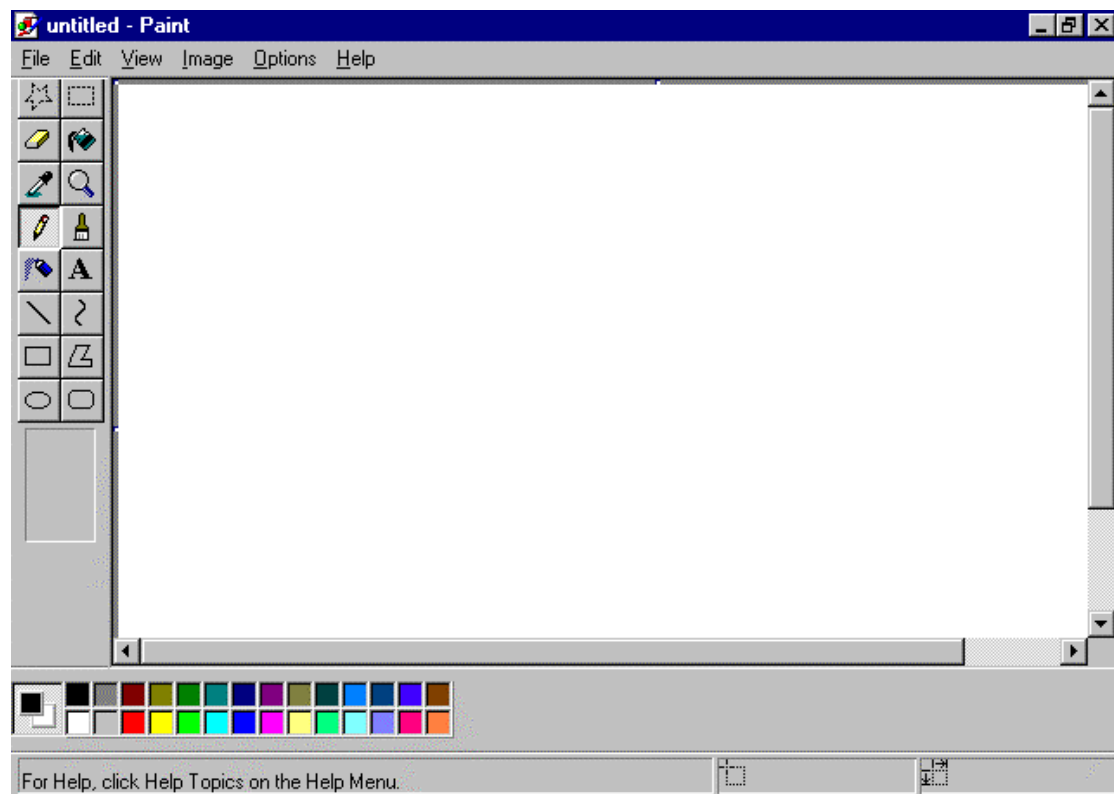
**NOTE:** This booklet uses Microsoft Paint and Microsoft Word 97 and all formatting measurements are metric.

## Microsoft Paint

Microsoft Paint is a painting package used to create and edit bitmap images. A bitmap image consists of a series of pixels (or coloured dots) to represent the picture. To open Microsoft Paint:

- Click on **Start**
- Select **Programs**
- Select **Accessories**
- Select **Paint**

The following screen appears:



The top of the screen shows the menu for the package. The centre of the screen is the drawing palette and there are two toolbars visible – the **Tool Box** on the left of the screen and the **Colour Box** on the bottom of the screen.

The menu consists of the following options:

- File – which contains options for handling files on disk and sending information to the printer.
- Edit – which is used to cut, copy and paste objects, as well as undo mistakes and repeat operations

## Computer Graphics Fundamentals

---

- View – this option is used to zoom in and out of the picture, as well as open or close various toolbars
- Image – has options for rotations, skewing and changing the look and size of pictures.
- Options – deals mainly with the colour palettes available for drawing, as well as the ability to draw opaquely.
- Help – provides menu driven assistance with Paint.

The various tools in the Tool Box are explained below:

Selects a free-form section for copy, move or edit

Erases a section of the picture

Picks up the colour from a drawing

Draws a free-form line one pixel wide

Draws using an airbrush

Draws a straight line

Draws a rectangle

Draws an ellipse



Selects a rectangular section for copy, move or edit

Fills an area with the current colour

Changes the magnification

Draws using a brush

Inserts Text into a picture

Draws a curved line

Draw a polygon

Draws a rounded rectangle

## Starting a New Drawing

Each document in Paint becomes a new drawing or bitmap image. To start a new drawing choose:

- **File**
- **New**

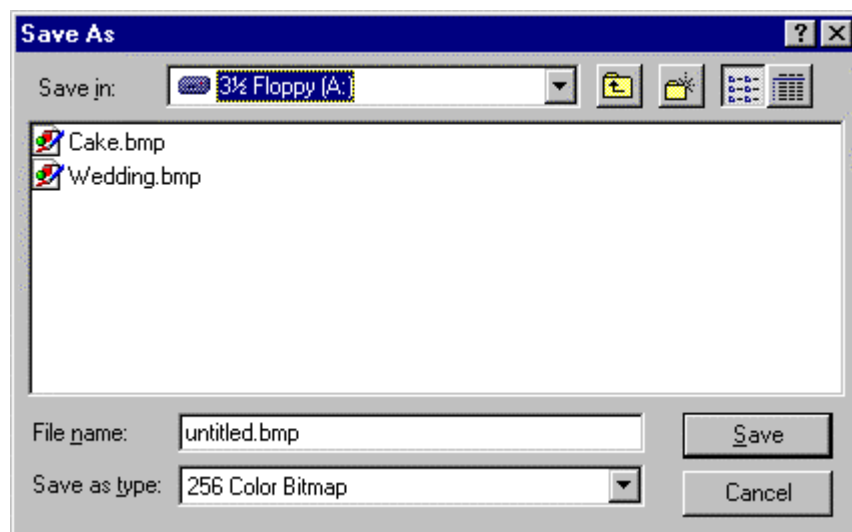
If anything has been previously drawn on the drawing palette Paint will ask do you wish to save the picture. Answer appropriately and a new drawing screen will appear.

## Saving a Drawing

To save a drawing choose:

- **File**
- **Save**

The following dialog box will appear:



- Check that the drive is correct
- Enter the name for the drawing in the File name text box
- Click on Save

Notice that all Paint files have the extension .bmp, which stands for Bitmap.

It is also important to realise that the full screen will be saved including the white rectangle that was displayed as the drawing screen. Later an explanation will be given on how to save a section of a drawing as a new file.

## Undoing a Mistake

Since the pictures produced with Paint are bitmaps it is very difficult to select an object and remove it. It is possible to select a part of the bitmap image and remove it. Once an object is drawn it is no longer an entity such as a rectangle or circle but a series of dots on the screen. To undo a mistake:

- As soon as the error occurs
- Choose **Edit | Undo** from the menu

Each successive Edit | Undo will undo the previous action. It is possible to undo the last three operations in this manner.

## The Crosshair

The cursor in most drawing packages changes to what is called a crosshair when certain operations are performed. The crosshair is useful for lining up objects in a drawing. The centre of the crosshair is the position where drawing will begin.



## Using the Drawing Tools

As described earlier, Paint has a number of drawing tools in the Tool Box. Using these tools it is possible to draw lines, arcs, ellipse, rectangles and polygons. In simplistic terms drawing any drawing object requires the appropriate tool to be selected from the Tool Box. The mouse is then pressed where the object is to begin and held while the object draws. It is then released when the object is complete.

## Changing the Width of Lines

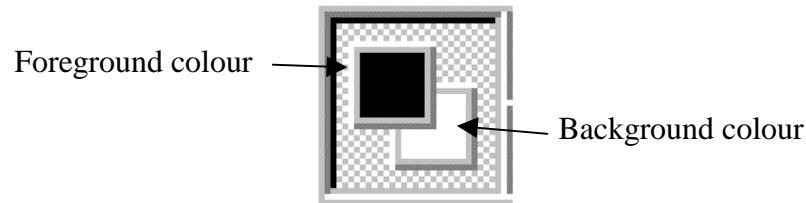
When the line or arc tool is chosen from the Tool Box the following menu of line widths appears at the bottom of the Box:



To change the width of the line click on one of the widths displayed.

### Changing the Colour of Foreground and Background.

The Colour Box shows the colour of both the foreground and background, as shown below:



To change the foreground colour click on any of the colours in the colour palette with the left mouse button. To change the background colour click on colours in the palette with the right mouse button.

### Drawing in foreground and background Colours

To draw an object using the foreground colour hold the left mouse button down as the object is drawn. To draw using the background colour hold the right mouse button down while drawing.

### Drawing a Straight Line, Circle or Square

To draw any of these objects:

- Click on the line, ellipse or rectangle tool from the Tool Box
- Hold the SHIFT key down
- Draw the required shape.

Using the SHIFT key the object is constrained to a horizontal or vertical line, circle or square.

### To Draw an Arc

Click on the arc tool in the Tool box. Draw a straight line the length of the arc. Click the mouse on the line where the arc is required and drag the mouse to curve the line. If a second curve is required repeat the process. No more than two curves can be placed in any arc. Double click the mouse to complete the arc.

### Drawing a Polygon

A polygon is a figure with three or more sides. To draw a polygon:

- Click on the Polygon tool in the Tool Box
- Hold the left mouse button down while drawing the first line of the polygon
- Click the mouse at the corner of the next line of the polygon
- Continue to click the mouse to add additional lines to the figure
- To complete the figure and close it double click the mouse

To fill the polygon with colour:

- Select the Polygon tool from the Tool Box
- Use the Right Mouse Button to choose a colour from the colour palette
- Draw the Polygon as explained above
- The Polygon will fill on the double click to close the figure.

### Exercise 1

Open a new drawing in Paint. Using the drawing tools, the Colour Palette and your imagination create an image that uses arcs, lines, circles and squares. The objects must have different width lines and include both outline only and filled with colour.

When complete, print a copy of your picture. Save the picture as MASTERPIECE.  
BMP.

## Using the Colour Tools from the Tool Box

Once an image has been drawn it is possible to add colour to various parts of the picture using the Fill, Brush and Airbrush tools.

### Using the Fill Tool

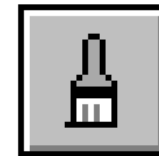


To fill an object with colour:

- Select the fill tool
- Choose a colour from the Colour Palette
- Click inside the object

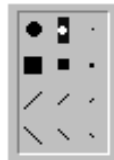
If the colour fills outside the object use Edit|Undo to remove the colour, zoom the picture to find the break in the line and close the break using the Pencil tool.

### Using the Brush Tool



To choose a shape for the brush before painting:

- Click on the Brush tool in the Tool Box
- Choose the shape of the brush from the menu displayed under the Tool Box:



- Choose a colour from the Palette
- Hold the mouse as the brush is moved over the picture.

### Using the Airbrush Tool



To draw with the Airbrush:

- Select the Airbrush tool
- Change the size of the spray and the spray colour in the same way as the Brush is altered
- Drag the mouse to airbrush onto the picture.

### Exercise 2

Open a new picture in Paint. Use the Brush tool to write your name in Fancy lettering. The example shown below uses the first brush type in the third row of options but you may use any of the brush types:



My Name

Place a border around your name and save the picture as NAME.BMP. Print a copy of your picture.

## Copying and Pasting Objects

To copy an object, lasso the object using either the free-form select tool



or

Rectangle select tool positioned at the top of the Tool Box.



Select

- Edit | Copy from the menu
- Then Edit | Paste
- While the object is still selected move it to its new location

## Zooming the Drawing

In order to change individual pixels in the picture it is necessary to make the picture much larger and work on a small part of the drawing at a time. To zoom the picture choose:

- **View**
- **Zoom**
- **Large Size**

Or press CTRL PgDn

The picture will magnify and two scroll bars along the edge of the drawing palette will scroll the screen so that all sections of the picture can be viewed.

To return to normal mode choose:

- **View**
- **Zoom**
- **Normal Size**

In order to see where the Zoomed section fits into the whole image a thumbnail can be displayed. To see the thumbnail choose:

- **View**
- **Zoom**
- **Show Thumbnail**

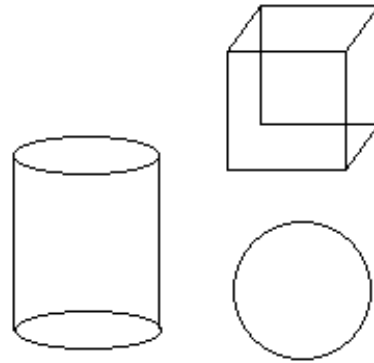
A small window similar to the following will appear on the screen:



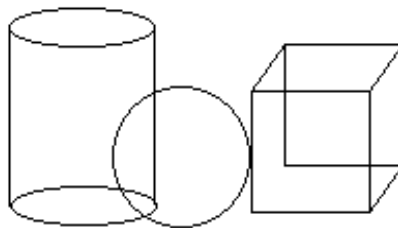
As the scroll bars are moved the thumbnail will show the image in miniature.

### Exercise 3

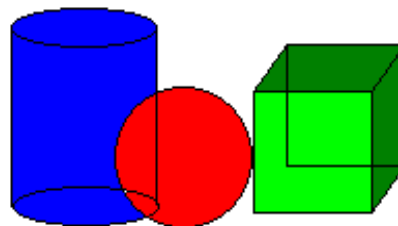
Open a new drawing in Paint and draw the following three shapes. Begin the drawing by making the outside shapes of each figure:



Next move the shapes so they overlap as shown. To move each figure, lasso the shape, then place the mouse in the middle of the object, hold the left mouse button down while dragging the figure to its correct location:



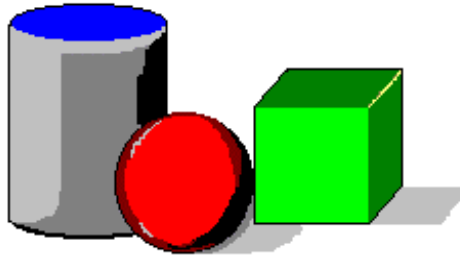
Using the Fill tool from the Tool Box and the Colour box, colour the cylinder blue, the sphere red and the cube green.



## Computer Graphics Fundamentals

---

Using the Zoom feature of the package and the various tools, shade the three objects to give them depth. Also remove any unnecessary lines from each object:



Save the picture calling it SHAPES.BMP. Print a copy of your drawing.

..... *End of Exercise 1* .....

## Adding Text to a Drawing

The A-tool is used to add text to a drawing. Again it is better if the text is placed away from the drawing and then positioned afterwards. To add text to a drawing:

- Click on the A-tool in the Tool Box
- Drag out a rectangle to hold the text
- The following toolbar appears:



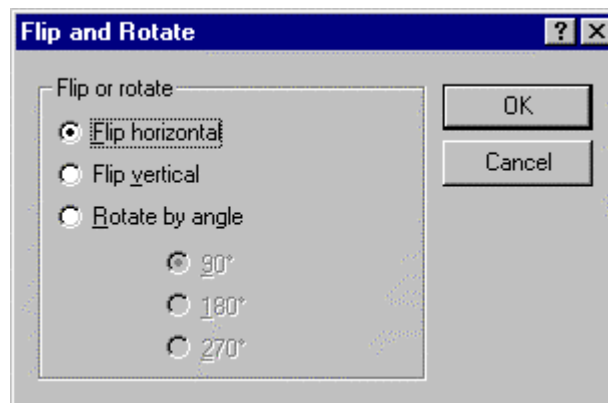
- Choose the correct font, size and format for the text
- Type the text into the text box

Lasso the text and move it to its correct location.

## Flipping and Rotating Drawing Objects

Elements of a drawing can be flipped either horizontally or vertically or rotated 90°, 180° or 270°. To flip or rotate an object:

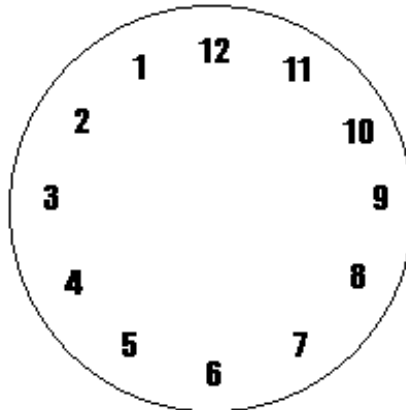
- Lasso the object
- Choose Image | Flip/Rotate from the menu
- The following dialog box will appear:



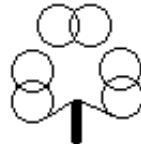
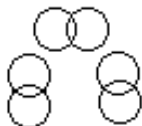
- Click on either Flip horizontal or Flip vertical to flip the object or Rotate by angle to choose the angle of rotation.
- Click on OK

## Exercise 4

Open a new drawing in Paint. Draw the following clock. Start by drawing a circle (holding the Shift key down while drawing produces circles instead of ellipses) and then add a separate text box for each of the figures on the clock. The numbers are written using Impact 12 point bolded text.



The Shamrock in the centre of the clock is drawn using 6 circles and a number of lines. Draw all objects in deep green. The stages for drawing the Shamrock are shown below:



Fill all the shapes in the drawing to produce the Shamrock shown below:



Add the hands to the clock to produce the completed drawing shown over the page:



Save the drawing calling it CLOCK.BMP. Print a copy of the picture with your name underneath the clock.

### Exercise 5

Open a new picture in Paint and create the following letterhead for British Soccer. To create the letterhead:

- Type in a B using Times New Roman 72 point bolded text
- Copy the B and paste a second letter on the picture
- Move beside the first B and flip as shown.
- Colour the flipped letter grey
- Next type in an S using Times New Roman 72 point bolded text
- Copy the letter and flip as shown
- Colour the flipped letter grey

Enter British Soccer using 36 point Times New Roman text and position as shown.  
Draw a circle around the Logo:

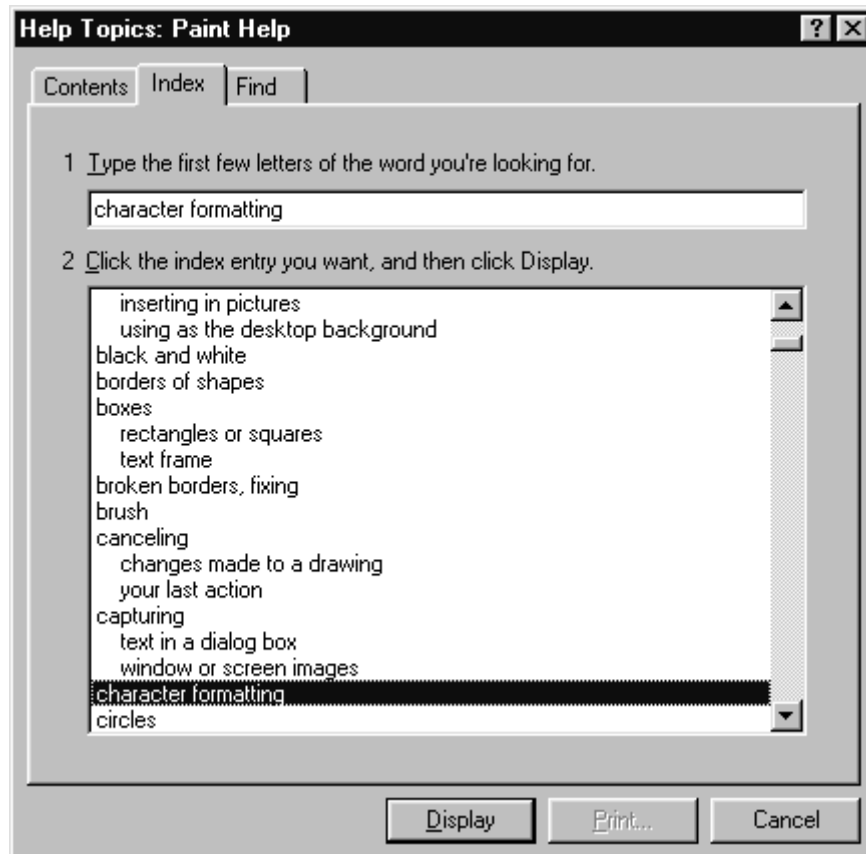


Save the image as SOCCER.BMP and print a copy of the image.

## Using On-Line Help

On-line help is provided in Paint to assist with the use of the package. To gain help on a topic choose:

- Help from the menu
- Help Topics
- Click on the Index tab to bring up the following dialog box:



- Enter the topic for which help is required in the box labeled 1
- A list of help topics appears in the area labeled 2
- Select the exact topic from 2 and click on Display.

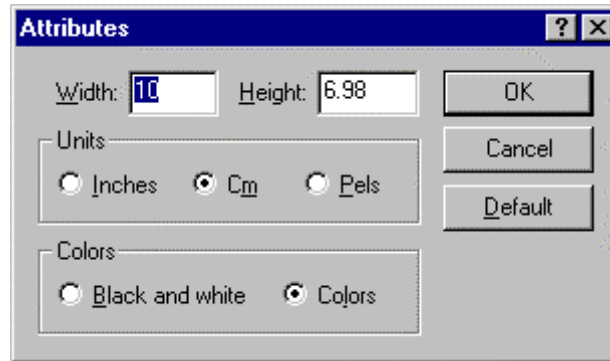
### Exercise 6

Use help to find out how to use a picture as the Desktop background. Open a new picture in paint and draw a new image. Using the details in help create a background of your picture. First tile the image on the background and then place it in the middle of the screen.

### Setting the Size of the Drawing Screen

The Drawing Screen in Paint can be sized by:

- Choosing Image | Attributes
- The following dialog box appears:

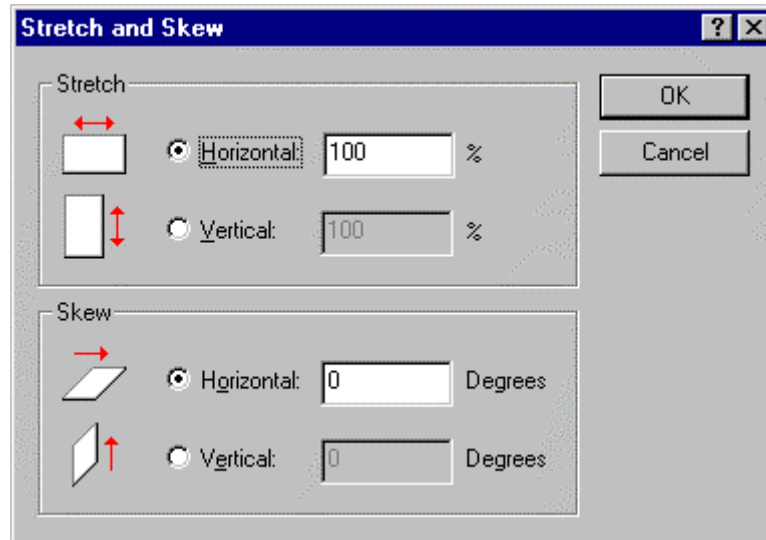


- Change the units of measurement as required
- Enter the width and height of the drawing screen
- Click on OK

### Stretching and Skewing Objects in a Drawing

Any object in Paint can be either stretched horizontally by a certain percentage or stretched vertically by a certain percentage. Also it is possible to skew an object horizontally or vertically by a set number of degrees. To stretch or skew an object:

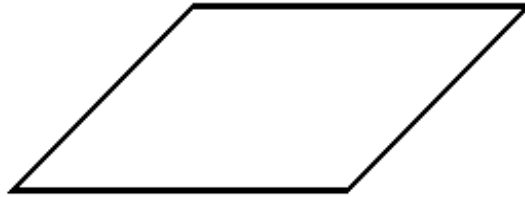
- Lasso the object
- Choose Image | Stretch/Skew
- The following dialog box appears



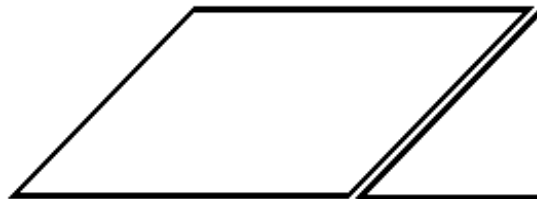
- Enter either the percentage for stretching or the number of degrees for skewing
- Press OK

## Exercise 7

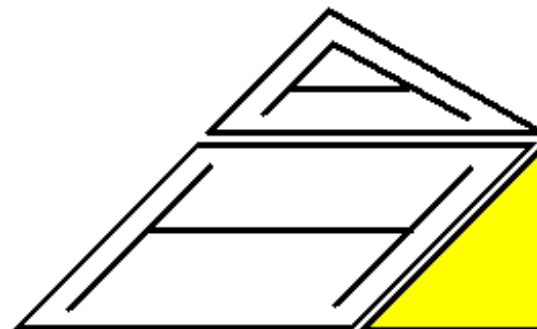
Create a new drawing in Paint. Change the drawing screen to 10cm wide and 7 cm high. Draw a rectangle in the middle of the screen. Lasso the Rectangle and Skew the object 45 degrees horizontally:



Draw a triangle along the edge of the Parallelogram as shown below:



Add the following triangles and lines to the Logo, then add the text underneath using Helvetica 12 point bolded font:



**Animal House Veterinary Centre**

Save the picture as LOGO.BMP and print a copy.

### Exercise 8

Using Paint draw a plan of the room you are presently studying in. Include in your plan:

- The outside walls of the room
- The door
- Furniture, such as tables, chairs etc
- Any equipment such as computer, TV etc

When complete save your picture as PLAN.BMP and print a copy.

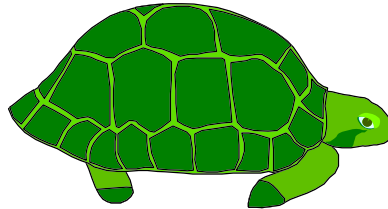
### Edit a Clip Art Object in Paint

Often an image in a Clip Art gallery is not exactly what may be required. Since these images are not in Bitmap form they cannot be directly opened by Paint. In order to edit such images through a Paint package, they must be placed in the clipboard and pasted into the Paint package. Once in Paint the tools in the Toolbox can be used to alter the picture appropriately.

A similar method can be used for most objects that can be placed in the Clipboard. This can include both images and text. The text of course will come into Paint as a bitmap image and no longer be text. If the object is saved, then it will be placed on the disk as a bitmap image. If it is copied and pasted using the Clipboard, irrespective of the type of image it was when placed into the Clipboard, it will be pasted as a bitmap image.

### Exercise 9

Open Paint and Microsoft Word. In Word place the Clip Art image called Tortoise Slow onto a page and resize so that it isn't too large:



Place a copy of the image into the Clipboard using Edit|Copy.

Return to Paint and paste the image onto a new screen. Immediately move the image into the middle of the screen. Using the Fill tool from the Toolbox change the shell of the tortoise so that it is multi-coloured. Lasso the tortoise and copy and paste it back to Word:



### Creating an Image of the Screen

Most instruction manuals require pictures to explain key operations. With computer manuals many of these are in fact pictures of sections of the screen. Paint is an excellent package for both capturing and customising such screen images.

To capture the full image of the screen:

- Display the image to capture in the visible window
- Press the Print Screen button usually located near the top right of the keyboard. This places the screen image in the clipboard
- Return to Paint
- Choose Edit|Paste
- If the image is large, Paint will ask do you wish to enlarge the bitmap, answer Yes.

The Image will appear. Using the Lasso tool it is possible to select sections of the object and cut and paste these again into other packages.

To capture only the current Dialog Box:

- Display the dialog box on the screen
- Press ALT+ PRINT SCREEN

Only the image of the dialog box will be placed into the Clipboard.

### Removing Unnecessary White Space from around an Image

When a Picture is saved the entire drawing screen is saved. This is not always desirable and so Paint has within it the ability to select a section of a picture and save it to a separate file. To save a section of a picture:

- Lasso the section of the picture to save
- Choose Edit|Copy to from the menu
- A Copy To dialog box will appear
- Edit the save name and check drives and folders in a similar way to a normal save
- Click on Save

### Importing Paint Drawings into Other Packages

There are two methods for importing Paint drawings into other packages. If the package is a Windows package then to import the drawing:

- Lasso the drawing
- Choose **Edit | Copy** from the menu

Move to the other package and choose

- **Edit | Paste**

If the other package is not a Window's package or the drawing is to be saved on disk and imported at a later date then either save the whole picture or section of picture to disk as explained earlier.

To import the picture in Word 97 choose

- Insert
- Picture
- From File

Locate the file from the directory and click on OK

A similar method for importing pictures from file is available in most Windows 95 packages.

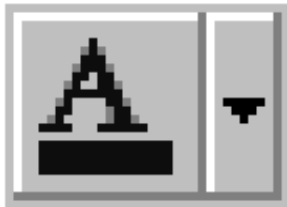
## Exercise 10

Using the Drawing Toolbar in Word 97 capture an image of the Font Colour tool from this Toolbar and save just the tool itself in a file called FONT.BMP. Next capture an image of the option box which opens when the down arrow beside the tool is clicked. Save this image as OPTIONS.BMP.

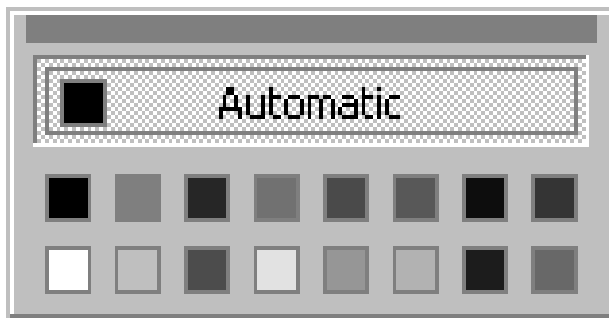
Place both objects in a new Word document and add the text shown below. Save the document as SCREENS.DOC then print the document:

### FONT COLOUR IN MICROSOFT WORD 97

Font Tool



Option Screen



### Drawing Software Packages

As indicated earlier a paint package such as Microsoft Paint produces bitmap images. In other words the picture consists of a series of coloured pixels. If the file for such an image was examined it would consist of a series of binary numbers representing the colour of each spot on the screen. Even if the image isn't coloured a series of numbers representing the scales of grey for the image would be saved. Once an object has been drawn in the Paint package it no longer exists as an entity but becomes a series of dots on the screen.

However, many drawing packages produce images based on the actual location and size of the elements of the image. Also, these packages provide actual measurements that allow objects to be drawn to scale. For example if a circle is placed in the drawing then the location of the centre of the circle and its radius are stored in the image file. Microsoft do not provide a separate drawing package in their Suite, but do provide some drawing facilities within each of their packages. Thus Word 97 has a drawing facility, as does Publisher and PowerPoint. More specialised programs known as Computer Aided Design (CAD) provide extensive capabilities in this way.

Since a drawing package sees a circle as a circle and a rectangle as a rectangle and not just dots on the page, it is possible to select the individual objects and move, resize or change them. It is also possible using a drawing package to group items together so that they can be moved, resized or changed as a group.

While Paint creates Bitmap images called Raster images, a Drawing Package creates what are called Vector images. As a result a transformation program is required to change from one format to another. Many packages provide the ability to change from vector format to raster format, but generally speaking none provide the ability to go the other way. In other words a drawing made in Paint and brought into Word will remain a bitmap image.

## Drawing in Microsoft Word 97

In order to use any of the drawing facilities in *Word* it is necessary to display the drawing toolbar. To bring up the toolbar, if it is not visible at the bottom of the screen, move up into one of the toolbars at the top of the document and press the right mouse button. A list of available toolbars will appear - choose the Drawing toolbar. The following toolbar appears across the bottom of the screen above the status bar.



### Drawing Lines, Ellipses and Rectangles

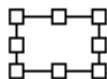
To draw a line, ellipse or rectangle click on the appropriate button from the toolbar. Move to the required position on the screen and hold down the left mouse button whilst drawing the object. Release the mouse when the object is complete

To draw vertical or horizontal lines, circles and squares hold the SHIFT key down while drawing the object.

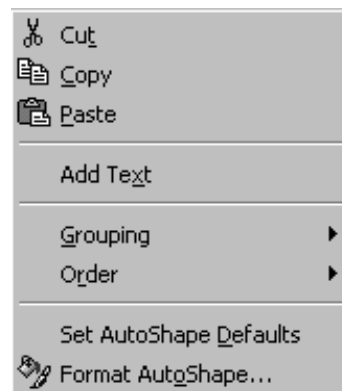
### Drawing Objects to Scale

To size a drawing object once drawn:

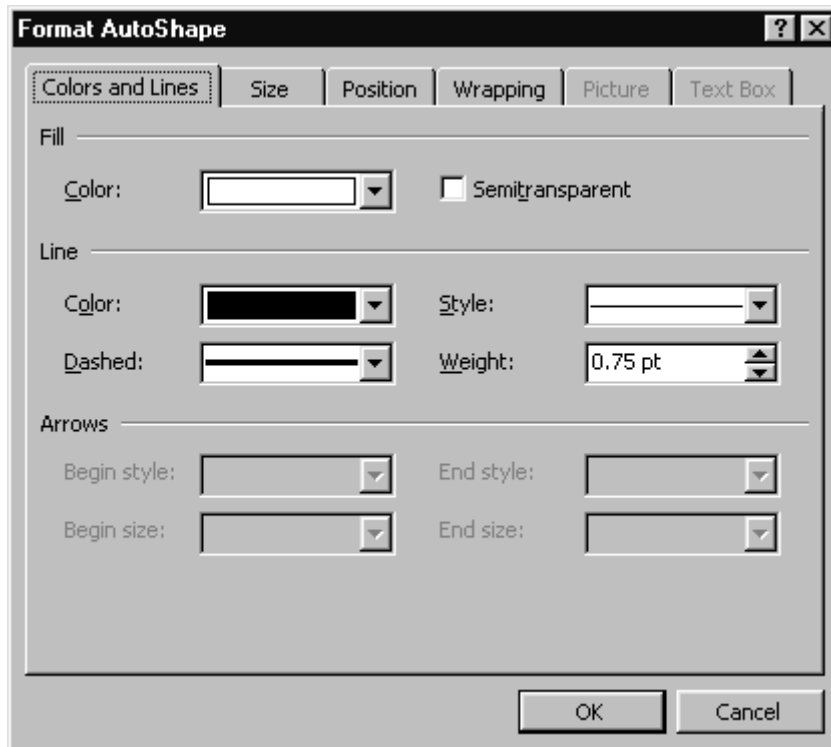
- Select the object to size by clicking on it
- Handles will appear on the edge of the object as shown below:



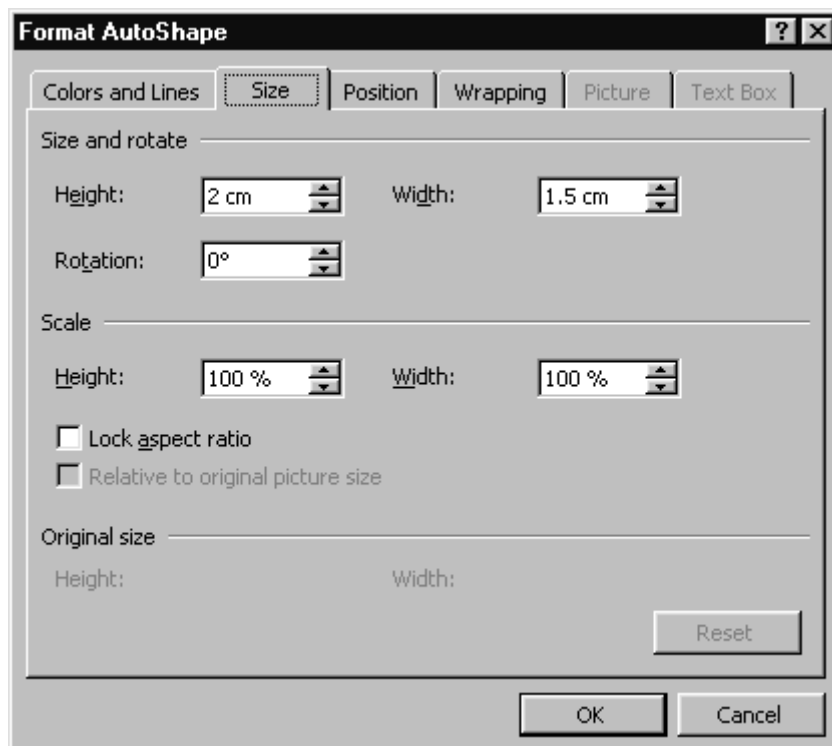
- Click the Right Mouse Button when the mouse pointer is over the object
- The following menu will appear:



- Choose Format AutoShape and the following tabbed dialog box appears:



- Choose the Size tab and the following choices appear:



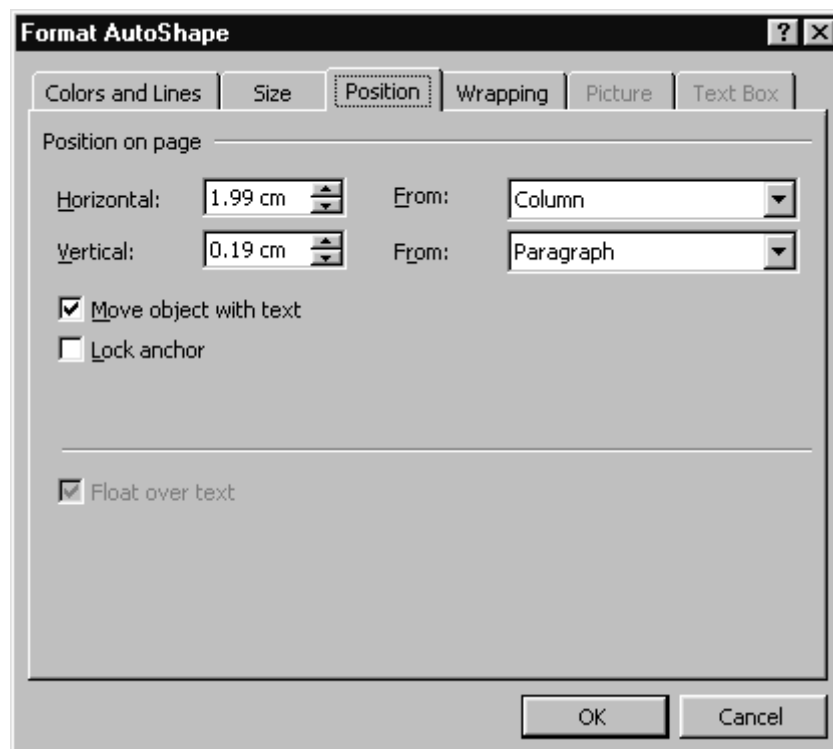
- The object can be exactly sized using the Height and Width boxes and have its scale altered in the Scale area. If the Lock aspect ratio check button is checked then the object cannot have its height and width proportions altered when the object is resized.

When the object has been correctly sized click on OK.

### Positioning the Object on the Page in an Exact Location

To position the object on the Page:

- Select the object
- Click the Right Mouse Button over the object
- Choose Format AutoShape
- Click on the Position tab and the following dialog box appears:



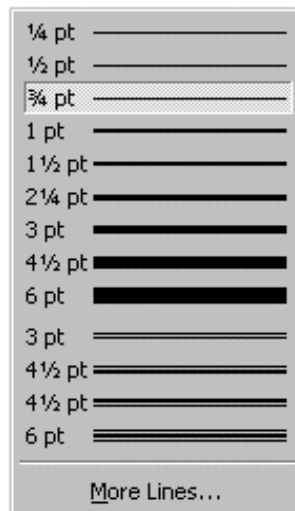
- Change the horizontal and vertical position of the object as required. It is also possible to locate the object in relation to the page, paragraph or column in which it is located using the drop-down list boxes next to From.

When positioned correctly click on OK

## Formatting the Drawing Object

To change the format of the drawing object, in other words to change the line style or fill of the box or circle, select the object which has been drawn by clicking the left mouse button over the object. To change line thickness:

- Click on the Line tool on the toolbar
- The following list of line sizes appears



- Select the line size if shown or click on More Lines to enter the required size of line

To change the type of line drawn and the style of arrowheads if required choose either of the following tools as appropriate:

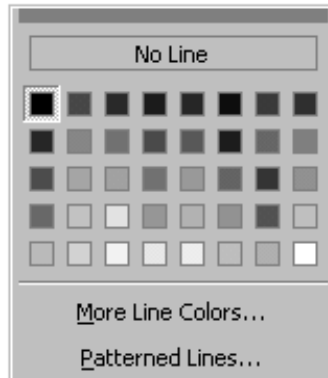


To change the colour of the line or fill an object with colour:

- Select the object
- Click on the down arrow beside either the line colour tool or fill colour tool from the toolbar



- A palette similar to that shown below appears:



- Choose either the colour required or more colours and patterns to get further options. If no line or fill is required click on the top button.

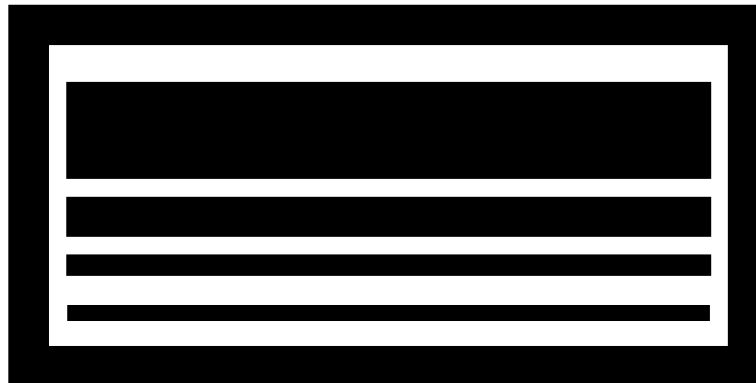
### Exercise 11

Open a new document in Word and ensure that the Drawing Toolbar is visible. Produce the following drawing of a business card. The text hasn't as yet been placed on the card. The sizes and locations for each object on the card are as follows:

- The outer black rectangle is 5 cms by 10 cms and placed horizontally 5 cm from the page and vertically 7 cms from page.
- The white rectangle is 4 cms by 9 cms and placed 5.5 cms horizontally from page and 7.5 cms vertically from page.
- The inner rectangles are 1.25 cms by 8.5 cms, 0.5cms by 8.5 cms and 0.25 cms by 8.5 cms. The position of each is 5.75 horizontal and 8, 9.5 and 10.3 vertically.
- The bottom rectangle is actually a 6 point line which is also 8.5 cms in length. It is positioned horizontally 5.75 from the page and vertically 11 cms from the page.

If an object disappears but the handles are still visible bring it to the front by choosing:

- Draw
- Order
- Bring to Front



Save the drawing as CARD.DOC and print a copy.

## Grouping Drawing Objects Together

In contrast to the Paint Package that merges each object into the one image as it is placed on the page, a Drawing package keeps each object separate. Once a set of objects is drawn however, it is often a good idea to group these into a single object. This then allows the group of objects to be copied, moved or sized as a single object. To select a number of items to group together:

- Click on the first object in the group
- Hold the SHIFT key down
- Click on the other objects in the group
- Release the SHIFT key

Or

- Click on the Select Objects tool
- Lasso the group of items



To group the selected objects:

- Click on the word Draw on the Drawing Toolbar
- Choose Group from the menu displayed

A single set of handles will appear around the grouped objects. To ungroup the objects to edit a section of the image select the grouped object then choose:

- Draw
- Ungroup

Once a set of objects have been grouped and ungrouped, then to regroup them, select an object in the group and choose:

- Draw
- Regroup

## Placing Text in a Text Box

Normal text is very difficult to move around on the screen. In order to freely move text in a diagram it must first be placed in a text box.

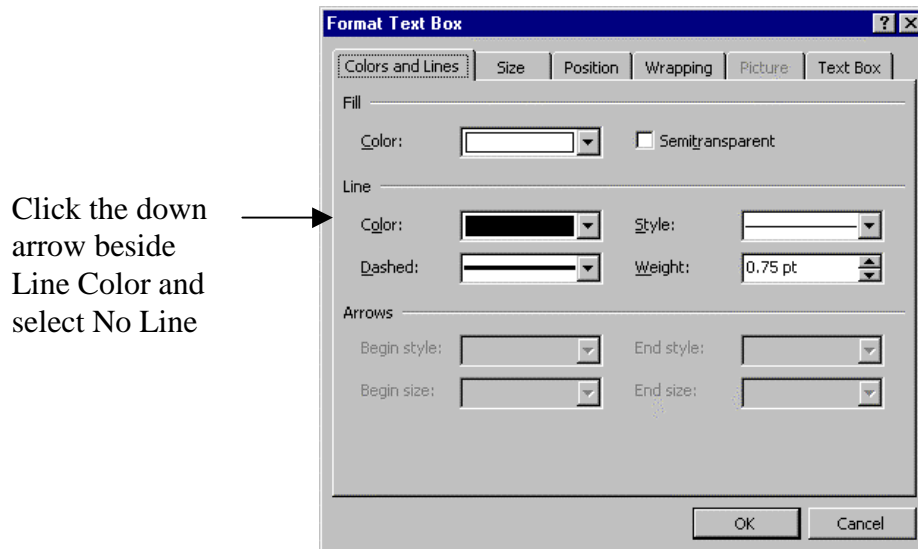
**To insert a text box:**

- Click on the Text Box tool on the Drawing Toolbar
- Draw a rectangle for the text on the page
- Type in the text required. (If the text doesn't fit pull the handles out to increase the size of the text box)



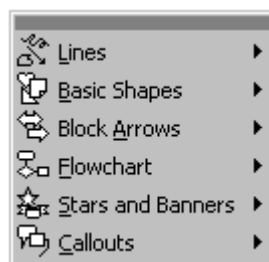
### To remove the line from the outside of the text box

- Click on the text box to ensure the handles are visible.
- Click the Right Mouse Button with the mouse over the top of the text box
- Select Format Text Box from the menu displayed then the following dialog box will appear:



### Drawing Other AutoShapes

The Drawing facility in Word has an extensive menu of AutoShapes in addition to the line, ellipse and rectangle. To view the menu click on the AutoShapes button on the toolbar and the following list appears:



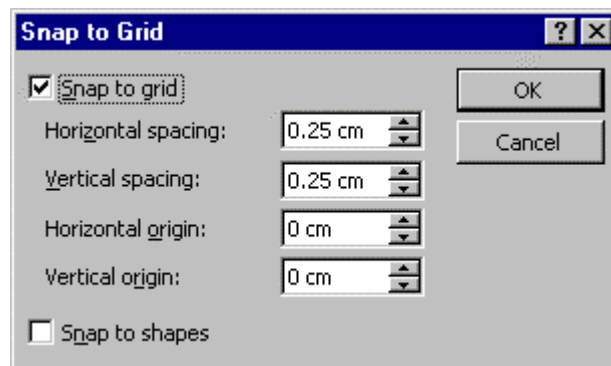
Each option in the menu has a range of drawing facilities within it. To use any of the AutoShapes select the shape to draw and then draw the shape on the page using the left mouse button.

### Turning off the Grid

To make drawing easier a Drawing grid exists on the page. The grid consists of tiny dots all over the page. As an object is drawn it will snap to the grid. This is very useful for lining up objects but can be very annoying if objects need to be placed in an exact location. To turn off the grid choose:

- Draw
- Grid

The following dialog box appears with the spacing for the grid shown and a check box for snapping or not snapping to the grid:



To turn off the grid remove the tick from the Snap to Grid check box then click on OK.

### Aligning Objects on a Page

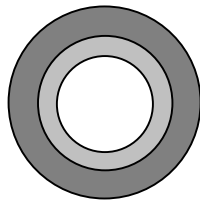
Once the grid is off, it is possible to freely move objects on the page. To align a group of objects:

- Select the objects to align
- Click on the Draw button on the toolbar
- Choose Align or Distribute
- Choose the alignment option for the group.

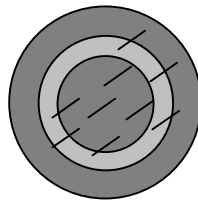
## Exercise 12

Open a new document in Word and draw the following diagram. Group the ideal picture of fibre optic cable and then use copy and paste to make additional pictures of the cable. Edit each as shown and add text boxes to describe the pictures. Use align to line up drawings and text:

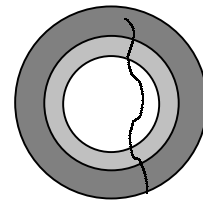
### FIBRE OPTIC CROSS SECTIONS



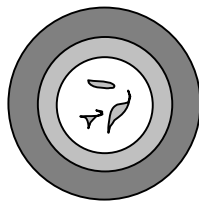
Ideal cross section



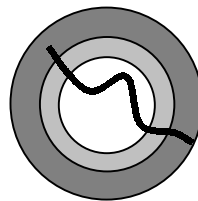
Heavy scoring or scratching



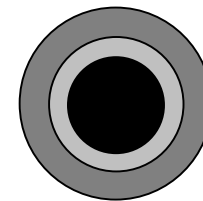
Chipped core



Chipped face



Cracked fibre



Broken fibre

### Exercise 13

Re-open the Business card called CARD.DOC. Using a Text Box place white text over the black inner rectangles to produce your own business card. Resave the file and print a copy of your business card.

### Rotating Objects

Since an object is known by its position on the screen, size and shape, it is possible to easily rotate objects on the page. To rotate a single object:

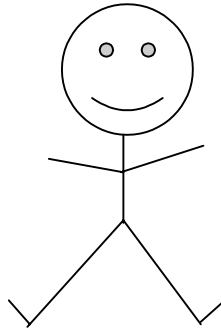
- Select the object
- Click on the Rotate tool on the toolbar
- The handles on the object will change to green and the mouse pointer will change to a circular arrow similar to the one on the face of the button.
- Place the mouse icon over one of the four green corner handles and holding the mouse down rotate the picture as required.



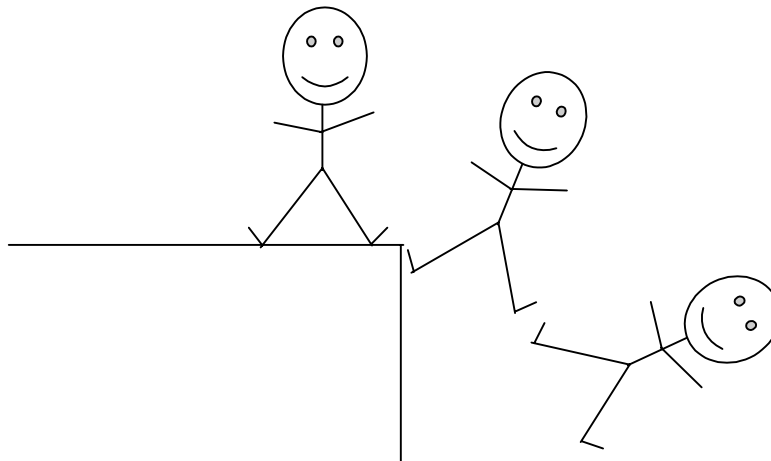
If a group of objects is to be rotated at once, select all objects and group together before choosing the Rotation tool.

## Exercise 14

Open a new Word Document and draw the following group of objects



Select or lasso all objects and group them together. Size and rotate the object to produce the following drawing:

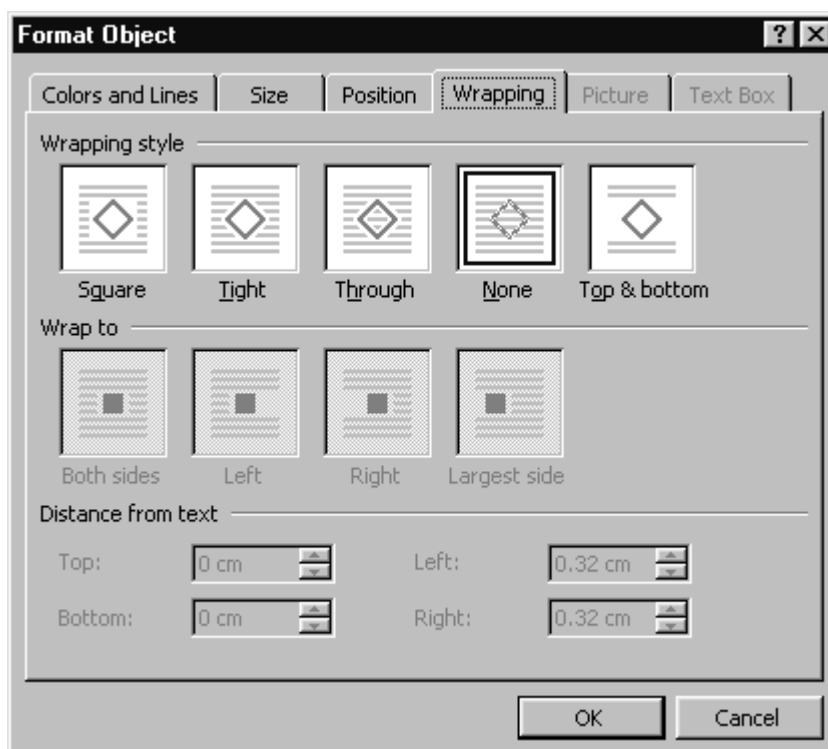


Save the file as MAN.DOC and print a copy.

### Changing the Wrapping of Objects and Text

When a drawing object is placed on a page it already has wrapping applied by Word. The wrapping option chosen affects the way that text will wrap in relation to the object. It is possible for the text to go over the picture or around the picture by using the options for wrapping provided by the Package. To look at or change the wrapping options for an object:

- Select the object (or for a number of objects, group and then select the group)
- Click the right mouse button over the object
- Choose Format AutoShape or Format Object whichever applies
- Click on the Wrapping tab and the following choices appear:



- Choose the Wrapping style required from the top section
- Any of the first three wrapping styles also allow a further selection from the Wrap to section.
- Once the wrapping options have been chosen click on OK.

### Exercise 15

Open a new document in Word and using the two images captured in Exercise 10 called Font.Bmp and Options.Bmp write a short description of how to change the font colour for text in Word. Use the help if necessary to find out how to do this yourself. Make sure that the images are placed on the right hand side of the text and not left on the left hand side.

Save the document as INSTRUCTIONS.DOC and print a copy.

### Exercise 16

#### Business scenario

'Liquor Land' is a large chain of liquor retailers opening stores across Australia. The managing director of the company Morgan Beer wishes you to design a new logo for the company that can be used on all their stationery. Before producing the logo on computer, draw at least four **freehand sketches** of different ideas for the logo.

Open Paint and draw one of your sketches as a new picture. Your logo must incorporate both text and drawing and be simple yet smart enough for the company to use for all their promotional material.

### Exercise 17

Using the logo designed in Paint create a business card for Morgan Beer and a letterhead for the company's stationery. The business card is to be designed and saved in Paint as CARD.BMP. The letterhead however will be produced in Word 97.

Specific details of each of these business documents is given below:

#### **Business Card**

The business card must be 55 x 90 mms and contain the company logo. The rest of the design is up to you. The address for Morgan Beer is 213 Collins Street, Melbourne, Vic 3000.

#### **Letterhead**

Using Word produce a single piece of A4 letterhead paper for the Liquor Land Business situated at 21 High Street, Richmond. You may make up any details that you wish to add to the letterhead, but it must contain the logo created earlier in paint.

### Exercise 18

To accompany any letters to clients Morgan Beer wishes to include a plan of his store. Using Paint draw a simple plan of the store showing the following:

- Entries and exits
- Sections for spirits, wines, beers etc
- Check outs

Save the plan as WINE.BMP and print a copy.

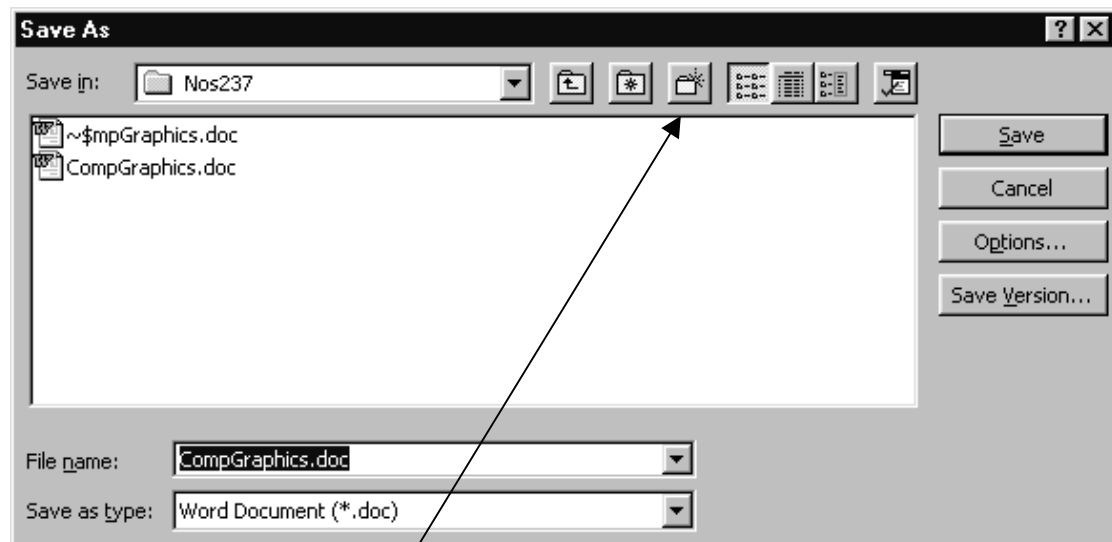
### Managing Electronic Files

Backing up is one of the most important operations for any computer organisation. It is just as important for an individual to be constantly making backups of files. Files are easily corrupted and once damaged almost impossible to recover. For this reason it is important to have a second copy in case of such a problem arising. The second copy of the file is best kept on a second disk or second disk drive if one is available.

When working on a project it is often handy to place two versions on the one disk, the backup one in a separate folder. To create a new folder on a disk in Word choose:

- File
- Save As

The following dialog box appears:



- Click on the new folder button
- Enter the name for the new folder
- Click on OK
- Double click to enter the new folder when it appears
- Save the file in this area.

### Exercise 19

Make a new folder on your data disk called BACKUP. Using File|Save As make a copy of each of the files for Liquor Land in this folder.

## Competencies

### NOS237 – Computer Graphics Fundamentals

#### Learning Outcome 1

	Date	Initials
Demonstrate correct power access procedures	<input type="text" value="/ /"/>	<input type="text"/>
Adjust furniture and demonstrate correct posture	<input type="text" value="/ /"/>	<input type="text"/>

#### Learning Outcome 2

On-line Help	Exercise 6	<input type="text" value="/ /"/>	<input type="text"/>
--------------	------------	----------------------------------	----------------------

#### Learning Outcome 3

Using Drawing Tools	Exercise 1	<input type="text" value="/ /"/>	<input type="text"/>
Customising Tools	Exercise 2	<input type="text" value="/ /"/>	<input type="text"/>
Copy and Paste	Exercise 3	<input type="text" value="/ /"/>	<input type="text"/>
Text and Graphics	Exercise 4	<input type="text" value="/ /"/>	<input type="text"/>
	Exercise 5	<input type="text" value="/ /"/>	<input type="text"/>
Adjusting the image size	Exercise 7	<input type="text" value="/ /"/>	<input type="text"/>
Drawing a Plan	Exercise 8	<input type="text" value="/ /"/>	<input type="text"/>
Editing Clip Art	Exercise 9	<input type="text" value="/ /"/>	<input type="text"/>
Screen Dumping	Exercise 10	<input type="text" value="/ /"/>	<input type="text"/>

#### Learning Outcome 4

Drawing to Scale in Word	Exercise 11	<input type="text" value="/ /"/>	<input type="text"/>
Grouping Objects	Exercise 12	<input type="text" value="/ /"/>	<input type="text"/>
Text Boxes	Exercise 13	<input type="text" value="/ /"/>	<input type="text"/>
Rotating Objects	Exercise 14	<input type="text" value="/ /"/>	<input type="text"/>
Wrapping Options	Exercise 15	<input type="text" value="/ /"/>	<input type="text"/>

# Computer Graphics Fundamentals

---

## Learning Outcome 5

Business Documents

Exercise 16

Exercise 17

Exercise 18

## Learning Outcome 6

Manage Electronic Files

Exercise 19

## Learning Outcome 7

Apply Recycling Techniques