

Visual Maths

“Drawing Mathematical Figures Using MSWord” –24 April 2004

- Customise your needed ‘instruments’

Steps:

1. Go to **Tools**
2. Click at **Options**
3. Select **General**
4. Change ‘**Measurement Units**’ to centimetres



- Activate your Drawing Toolbar

Steps:

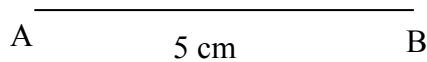
1. Go to **View**
2. Click at **Toolbars**
3. Put a ‘tick’ beside **Drawing**
4. You will see the drawing toolbar on your screen.

- Customise your toolbar to include ‘freeform’ & ‘arc’

Steps:

1. Go to **Tools**
2. Click at **Customise**
3. Select **Commands**
4. Scroll down the left scrollbar until you see ‘Autoshapes’
5. Click at **Autoshapes**
6. Scroll down the right scrollbar till you see the ‘freeform’ icon – 
7. Drag this icon onto your Draw toolbar.
8. Repeat Step (6) and drag the ‘arc’ icon –  onto the same Draw toolbar.

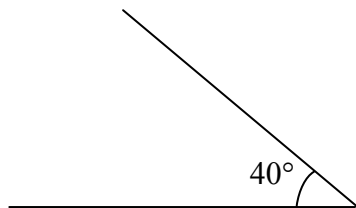
1. **Draw a line AB measuring 5 cm (or any measurement in cm)**



From the Draw Toolbar,

1. Select icon that shows a line.
2. Bring it to the document and draw a line. (Press the shift key at the same time to have a perfectly straight line.)
3. Double click at the drawn line. (A dialogue box opens)
4. Select **Size**
5. Change **Width to 5** (Height should be '0'). Click OK.
6. Activate the textbox from the Draw toolbar. Bring the cursor (+) to the screen and type capitalized A. now drag the entire text box to the beginning of the line. Do the same for 'B'.
7. Select **Order** from the Draw toolbar and click '**Bring to back**' if Line is blocked by the textbox.

2. **Draw an angle of 40°**

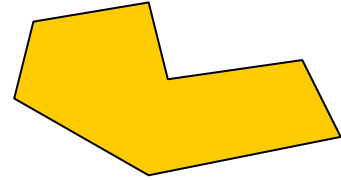


1. Draw a straight line and double click on it.
2. Select **Size**
3. Scroll the **Rotation** until you see 40°. Click OK. The straight line drawn earlier will tilt to 40°.
4. To complete the angle, draw a horizontal line, in alignment with the tilted line.
5. Select the 'arc' icon. Magnify your screen to at least 200%. Draw your angle with the 'arc' icon. To perfect it, use the 'Free Rotate' icon from the toolbar.
6. Press **Ctrl 'arrows keys'** to move the arc to the position you want.
7. On the Draw Toolbar, select icon of the white arrow. Draw an 'invisible box' trapping the entire 2 lines. Click **Group**.

3. **Draw regular perfect Mathematical figures**

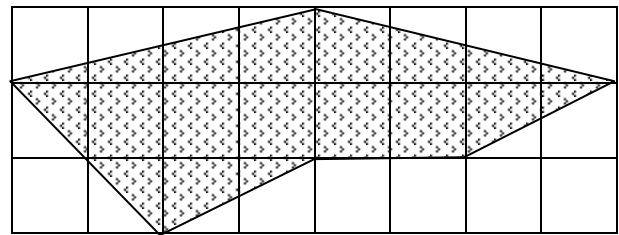
1. Choose the shape from either the Draw Toolbar or **Autoshapes**.
2. Click on the selected shape and bring it to the document. 'Drag' the mouse and press the **Shift** key at the same time.

4. **Draw a polygon and fill it with colour**



1. From the Draw Toolbar, select the **Freeform** icon.
2. Go to your document. Click mouse **Once and LET GO.**
3. Holding onto the mouse, move it to required point and **click once and let go.**
4. Continue Step (3) until you get the shape you want and end at the same point that you began. **Now double-click.**
5. From Toolbar, click at the Fill icon. Choose the colour or pattern you want.

5. **Draw a 1cm grid and format it**

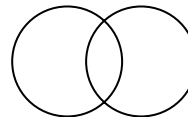


1. Select a one cell table.
2. Click at **Table** from the Toolbar.
Choose **Cell Height and Width.**
3. For Rows, change measurement to 1 cm (or 28.2pts if yours is Word 97)
For Column, change to 1cm.
4. Click OK. You will see a square cell.
5. Extend that cell to desired number of columns.
6. At the end of last column (outside the column), press Enter. You get a new row of 1cm cells.
7. Highlight the entire row (of many columns of 1cm cells)
8. From Toolbar, click at **Tools.**
9. Click at **Autocorrect.**
10. On the left window, type 1cm1 - whenever you type this, the table will appear.

Draw a shape on the grid and fill the area.

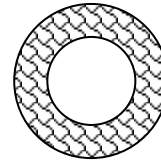
11. Choose **Freeform**
12. Go to **Draw** and select **Grid.** Make sure it is not activated.
13. Draw the shape you want (Follow the steps in drawing polygons)
14. From Toolbar, click **Draw** and choose **Order/Send behind Text.**

6. **Draw overlapping circles in Venn diagrams.**



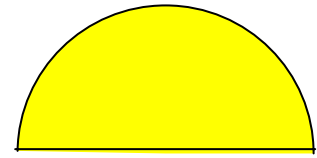
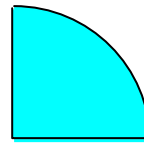
1. Draw 2 regular circles. (Use the shift key)
2. Activate the circles one at a time. Click **Fill Colour** on the Toolbar and choose **No Fill.**
3. Activate the circle you need to move and using your mouse, drag it to the other circle to overlap.

7. **Draw concentric circles using Align and Distribute.**



1. Draw 2 complete circles with different radii.
2. Activate both circles at the same time by pressing the **Shift key** to choose simultaneously.
3. From the Draw Toolbar, click at **Draw** and select **Align and Distribute**.
4. Select **Align Centre**.
5. Select **Align Middle**
6. Activate the larger circle. Go to **Fill colour** on the Toolbar. Select **Fill Effects**. Select **Patterns** . Click OK.

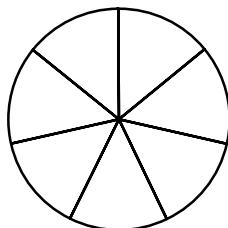
8. **Draw a perfect quadrant & semi-circle**



1. Click at **Autoshapes** on the Toolbar.
2. Select **Basic Shapes**
3. Select the **arc**. Press and HOLD the **Shift key** for regularity.
4. Use **Autoshapes/Freeform** to complete the right-angled lines.
5. Use the white arrow on Toolbar to select the whole figure so that you can group them for shading.
6. For semi-circle, follow steps 1 to 3.
7. Draw a line at the base of the arc.
8. Activate the arc and pull at the *Yellow* indicator until it meets the straight line. Group them.

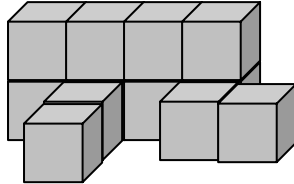
9. **Draw a circle and divide into equal parts**

1. On the Toolbar, click at **Insert Chart**. (or **Object - Chart**)
2. Delete all data in the table leaving only '**defaulted 20.4**'.
3. Replace **20.4 with the number 1**.
4. Repeat 1 vertically down 7 times (for 7 parts)
5. From the top Toolbar, select **Chart Type/Pie Chart**
6. From the top Toolbar, select **Data/Series in Columns**.
7. To remove legend, right click at the legend and select Clear.
8. To remove the square box, double click on the figure.
9. When activated, right-click on the corner of the square and select **Format Plot Area/Border-none/Area-none**.
10. Point mouse at the parts and double click to select **Format Data Series/Border-automatic/Area- none**.



10. **Draw stacking cubes**

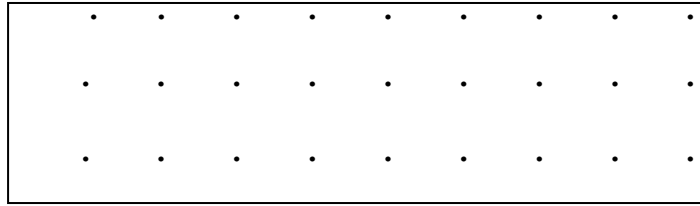
1. Click at **Autoshapes**
2. Select **Basic Shapes / Cubes** (Shift key for perfect cube)
3. Use **Fill colour** and select very light grey.
4. Make use of **Draw/Order** to position cubes accordingly.
5. Group them by using the white arrow on the toolbar.



11. **Drawing a fraction bar accurately to show relationships**

1. Go to the top toolbar and create a one cell table.
2. Pull the lower line to enlarge the bar.
3. Outside the right end of the bar, press **Enter**.
4. Highlight this '2nd' bar and go to the top toolbar
5. Choose **Table**. Select '**Split Cells**' Customise to '2' **Columns** section.
6. Now you have 2 halves.
7. Outside the right end of the 2nd bar, press **Enter** to get the 3rd bar.
8. Repeat Nos. 4 and 5 but customise to 3 in the **Columns** section. This will divide the bar into thirds.
9. Continue with as many fractional parts as you like.
10. If you want to shade, highlight the part and go to **Format / Borders and Shading**.

12. **1cm isometric dots.**



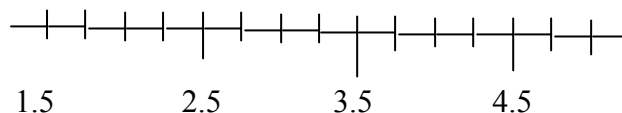
1. Right-click on the mouse and select '**Paragraph.**'
2. At the space '**line spacing**', scroll until '**exactly**' and select it.
3. Type '**1 cm**' (or 28.2 pts for Word 97)
4. At the bottom left of the box, select '**Tabs**'.
5. Type '**1 cm**' at the **Tab stop position**' and '**1 cm**' at the '**Default tab stops**'.
6. Press '**Set**' and '**OK**'.
7. Start on your document with a 'full-stop' on the keyboard and tab and 'full-stop' alternately until the end. Press **Enter**.
8. The next line will be 1 cm away. Repeat. You may bold the full-stops.

13. **Insert Graph into Word Document**

1. Select **Insert / Object / Microsoft Graph** or **Insert Chart** icon.
2. You will get a defaulted table and a graph.
3. On the defaulted table, make the necessary changes.
4. In the Chart platform, select **Chart Type/Column Graph** from the top Toolbar.
5. Activate graph with a double-click. Right click at the background and select **Format Plot Area / Border - none / Area - none**.
6. Double-click graph to activate. Right click at the bar and select **Format Data Series/ Border - automatic / Area- none**.
7. To include title, y-axis, x-axis, double on the graph to activate it. Right-click at the background and select **Chart Options** and fill in the necessary details. Press OK.

14. **Draw number and decimal lines**

1. Draw a horizontal short line.
2. Draw a vertical short line at the end on (1). Group them.
3. **Copy and Paste** (2). Repeat the amount of times needed.
4. For the longer vertical lines, you may want to ungroup and activate the short vertical line and elongate it.
5. Using the **Text Box** icon, insert text and drag into position.



15. **Fractions and mathematical symbols**

1. Go to **Insert / Object / Equation**
2. Select fraction and type in numerator and denominator. Double-click to go back to document.
3. Go to **Insert/ Symbol** for other symbols or pictures.