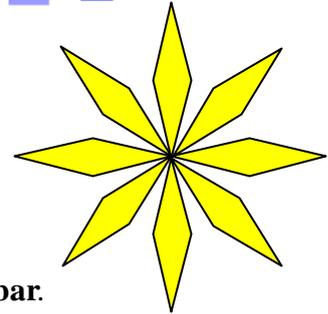
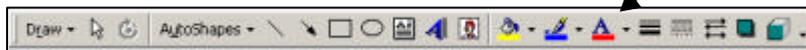


# Symmetry in Word



You can use Word to draw symmetrical shapes. This activity shows how.

- Open a new **Word** document and look for the **Drawing Toolbar**.

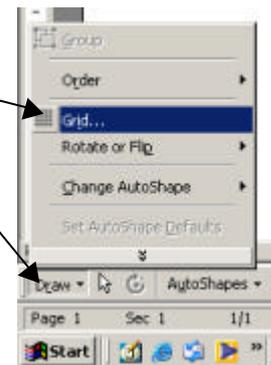


If it is not there, *left click* on the **Drawing** button (or **View** then **Toolbars**, then **Drawing**) to make it appear.



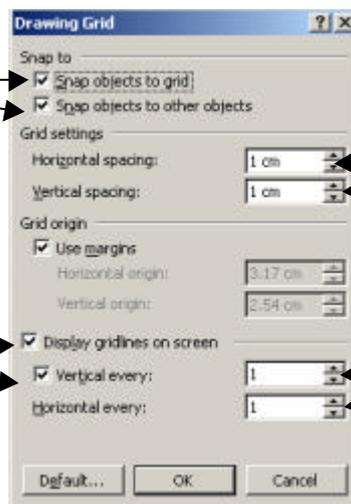
Some shapes are easier to draw if you use gridlines.

- **To show the gridlines** left click on **Draw** then **Grid**. The **Drawing Grid** menu shown below will appear.
- Set the **Grid settings** to 1 cm as shown and check that the **Snap objects to grid**, the **Snap objects to other objects** and the **Display gridlines on screen** boxes are ticked. (If not, *left click on the boxes* and ticks will appear.)



Make sure these boxes are ticked.

To show the gridlines, make sure these are ticked.



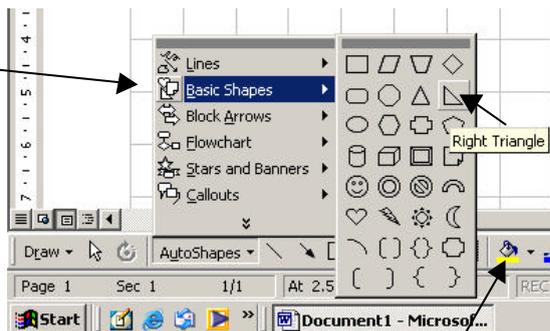
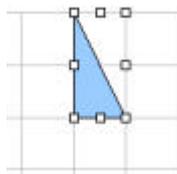
These grid settings set the spacing between the gridlines

These allow you to show all the gridlines, or only some of them.

- *Left Click OK* and the gridlines will appear.



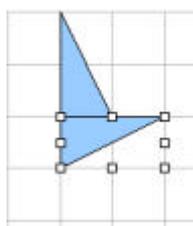
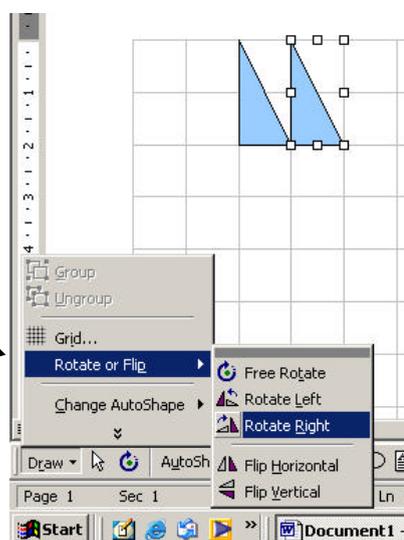
- Now use the **Right Triangle** option in **Autoshapes** on the **Drawing Tool bar** to draw a triangle with base 1 cm and height 2 cm as shown below. Use **Fill Colour** on the Drawing Tool bar to shade it in a colour of your choice.



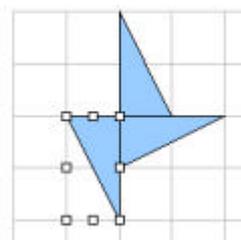
Fill Colour button

- To copy your triangle, *press the Control key and at the same time use the mouse to drag the triangle across the page* so that it snaps into place alongside the other triangle as shown.

- Left click on **Draw**, then **Rotate or Flip**, then **Rotate Right**. The triangle will rotate 90° clockwise.
- Move the second triangle so that it lies below the first as shown below.



- Make a copy of the second triangle and again use **Rotate Right** to rotate it 90° clockwise. Then move it to lie as shown below.



- Finally copy the third triangle and use **Rotate Right** to rotate it. Move it to complete Figure 1 as shown below.

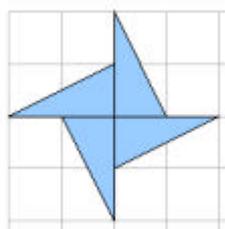
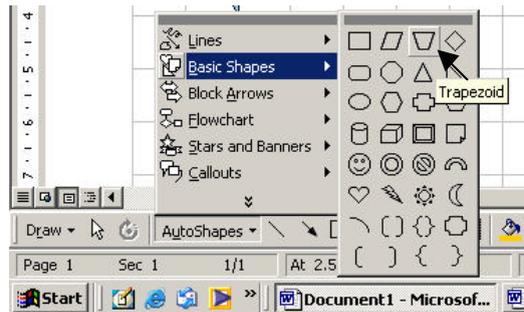
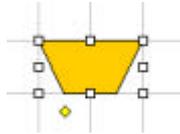


Figure 1

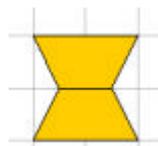
- What is the order of rotational symmetry of Figure 1?  
.....
- How many lines of symmetry does Figure 1 have?  
.....



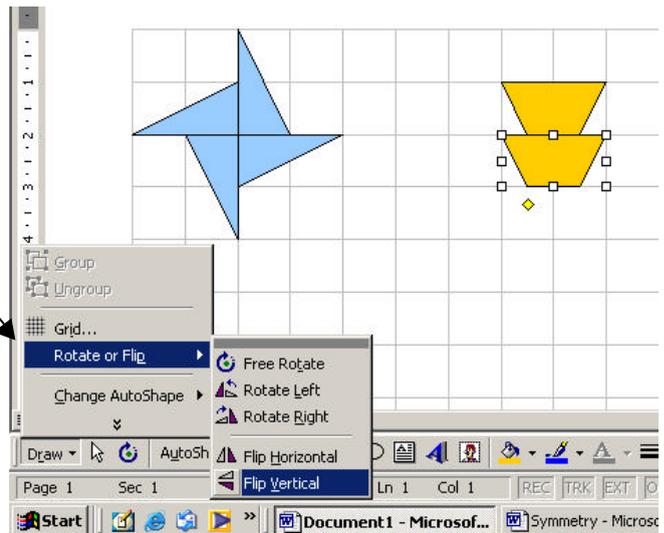
- Now use the **Trapezoid** option in **Autoshapes** to **draw a trapezium** as shown below. Use **Fill Colour** to shade it in a colour of your choice.



- Copy the trapezium as shown.
- Left click on **Draw**, then **Rotate or Flip**, then **Flip Vertical**. The trapezium will be reflected.
- If necessary move the second trapezium to give Figure 2 as shown below.



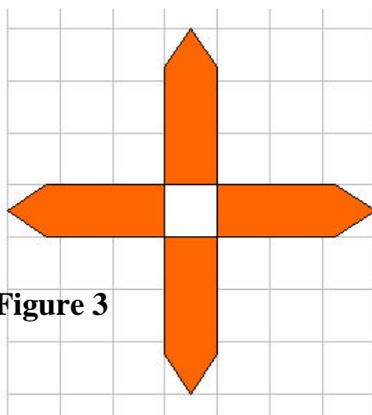
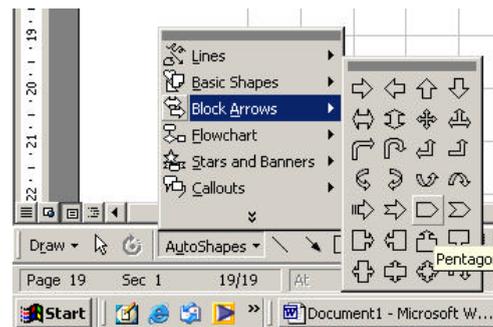
**Figure 2**



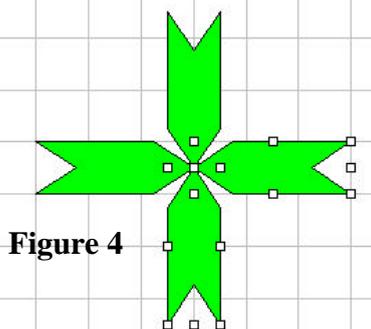
- What is the order of rotational symmetry of Figure 2? .....
- How many lines of symmetry does Figure 2 have? .....

**Autoshapes** has other shapes you can use. Look at those in **Block Arrows**.

- Use the **Pentagon** and the **Rotate** and **Flip** options to draw Figure 3 as shown below.
- Use the **Chevron** and the **Rotate** and **Flip** options to draw Figure 4 as shown below.



**Figure 3**



**Figure 4**

- For each figure write down the
  - a) order of rotational symmetry
  - b) number of lines of symmetry.

Figure 3 a) .....

b) .....

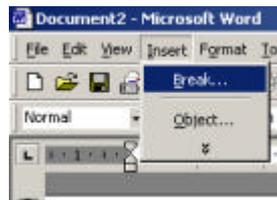
Figure 4 a) .....

b) .....



You can rotate shapes in Word through angles other than right angles. This allows you to draw figures with different orders of rotational symmetry.

- First **start a new page** by left clicking on **Insert**, then **Break**. On the **Break** menu left click on **Page Break** (if necessary), then left click OK.



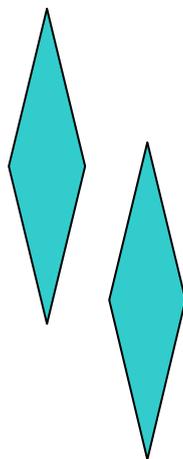
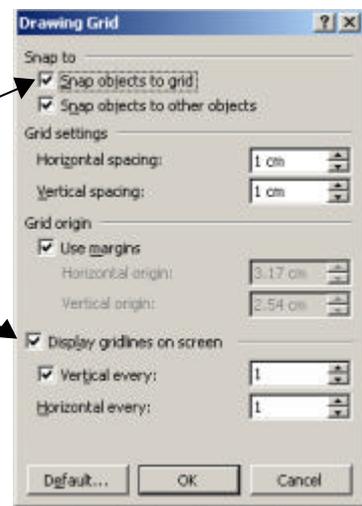
You should now have a new page to work on.

This time we will draw shapes without the grid.

- Left click on **Draw** then **Grid** - the **Drawing Grid** menu shown below will appear.

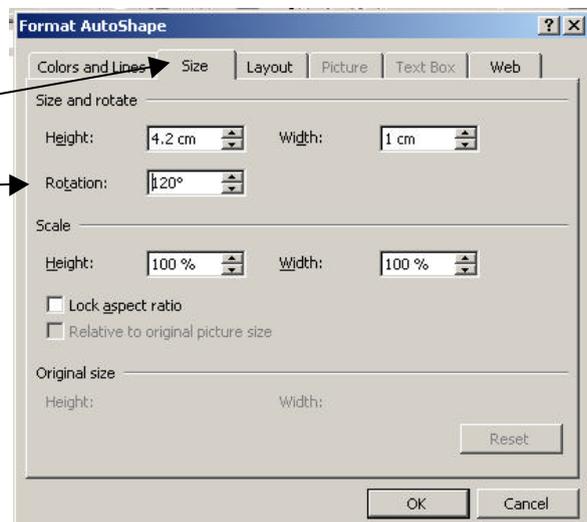
To make the gridlines disappear, left click on the **Snap objects to grid** and **Display gridlines on screen** boxes to make the ticks disappear.

Left click OK and the gridlines will disappear from your screen.

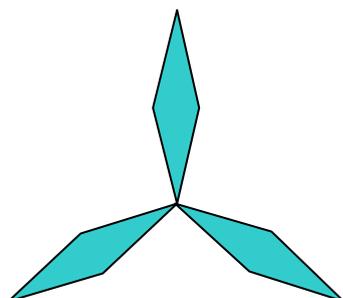
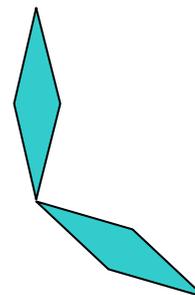


- Left click on **Autoshapes**, then **Basic Shapes** then use **Diamond** to draw a **rhombus** like that shown here. Fill it with a colour of your choice.
- Make a copy of the rhombus, then **double left click** on it to make the **Format AutoShape** box appear.

- Click on **Size** at the top.
- **Type 120°** in the **Rotation** box (or use the top arrow beside the box to alter the angle to 120°). **Left click OK** - the rhombus will be rotated 120° clockwise.



- Drag the rhombus to the position shown. You can use the arrow keys on the keyboard as well as the mouse to do this.
- Make another copy of the rhombus, left double click on it and change the angle of rotation to  $240^\circ$

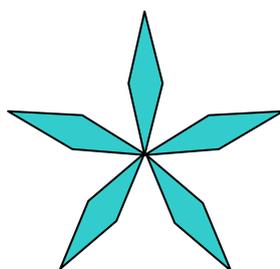


**Figure 5**

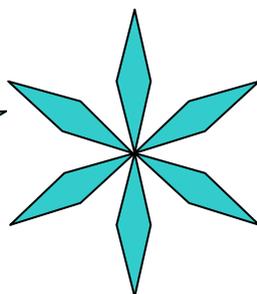
- Move the third rhombus to give Figure 5 as shown.
- What is the order of rotational symmetry of Figure 5?  
.....
- How many lines of symmetry does Figure 5 have?  
.....

N.B. For rotational symmetry of **order 3**, the angle between the parts is  $\frac{360^\circ}{3} = 120^\circ$   
 For rotational symmetry of **order  $n$** , the angle between the parts is  $\frac{360^\circ}{n}$ .

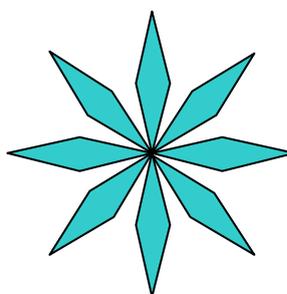
- For each figure write down the
  - a) order of rotational symmetry
  - b) number of lines of symmetry.



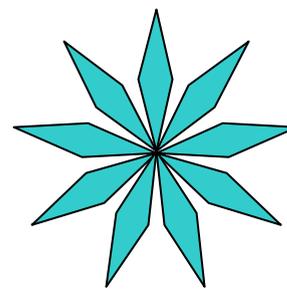
**Figure 6**



**Figure 7**



**Figure 8**



**Figure 9**

- |       |          |          |
|-------|----------|----------|
| Fig 6 | a) ..... | b) ..... |
| Fig 7 | a) ..... | b) ..... |
| Fig 8 | a) ..... | b) ..... |
| Fig 9 | a) ..... | b) ..... |

- Draw each figure in Word.
- If you have time, experiment with the other options in the **Rotate or Flip** menu and draw other symmetrical figures.



<b>Teacher Notes</b>
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**Units** Foundation Level, Working in 2 and 3 dimensions  
Intermediate Level, Solving problems in shape and space

**Skills used in this activity:**

- drawing symmetrical figures in Word

**Preparation**

Students will need to have previously learnt about line symmetry and rotational symmetry and also how to draw shapes in Word. Ideally they should have worked through the **Drawing Shapes in Word** and **Tessellations in Word** activities.

**Notes**

This activity can be shortened by using just the first 2 or 3 pages.

The activity **More shapes in Word** shows students how to design their own shapes.

**Answers**

Figure	Order of rotational symmetry	Number of lines of symmetry
1	4	1
2	2	2
3	4	4
4	4	4
5	3	3
6	5	5
7	6	6
8	8	8
9	9	9

