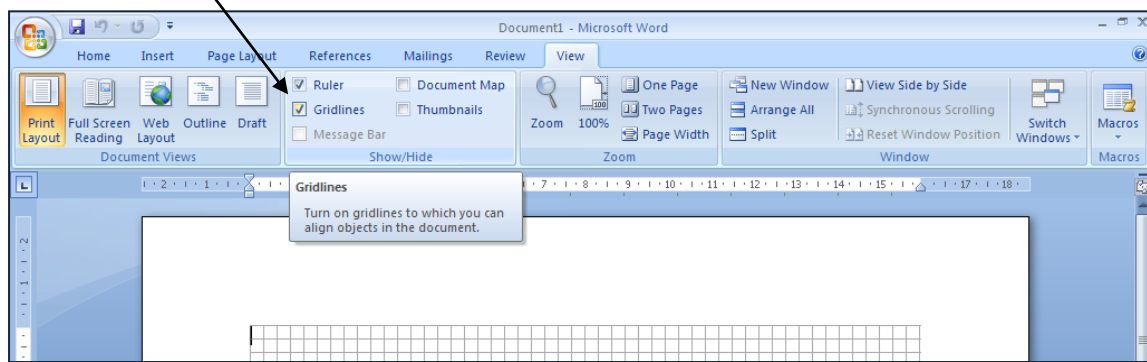# Symmetry in Word

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

- Open a new Word document.

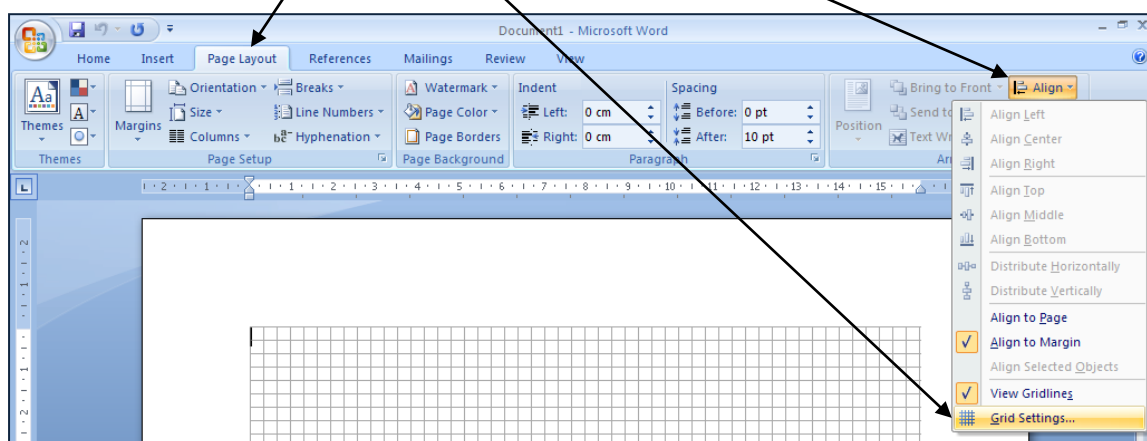Sometimes drawing is easier if you use gridlines.

- **To show the gridlines** left click **View** then the small boxes next to **Ruler** and **Gridlines**, so that both are ticked.
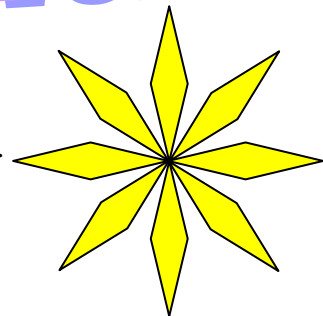
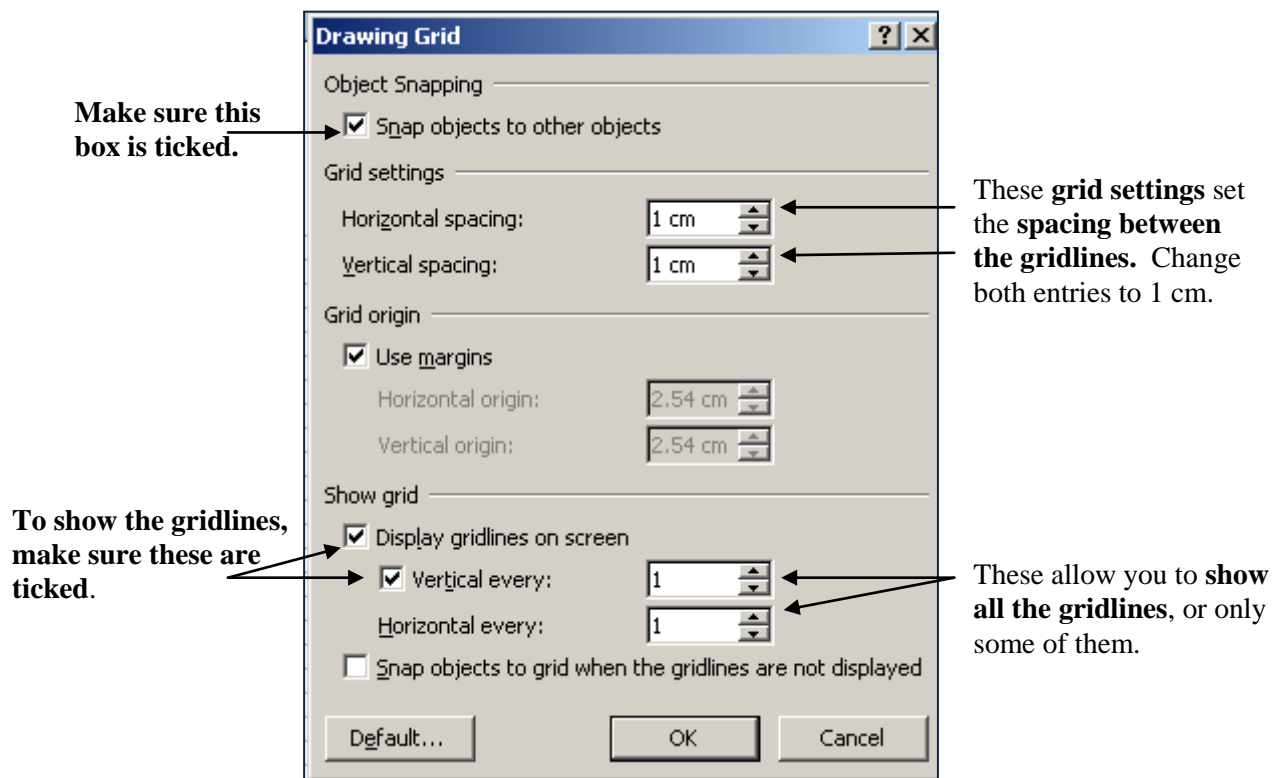Gridlines should appear on the page.
If not, the settings may need to be altered – go on to the next step which does this.

- **To change the distance between the gridlines**
  left click **Page Layout**, then **Grid Settings** in the **Align** menu**.**

The **Drawing Grid** menu will appear, as shown on the next page.

Make sure this box is ticked.

These **grid settings** set the **spacing between the gridlines.** Change both entries to 1 cm.

To show the gridlines, make sure these are ticked.

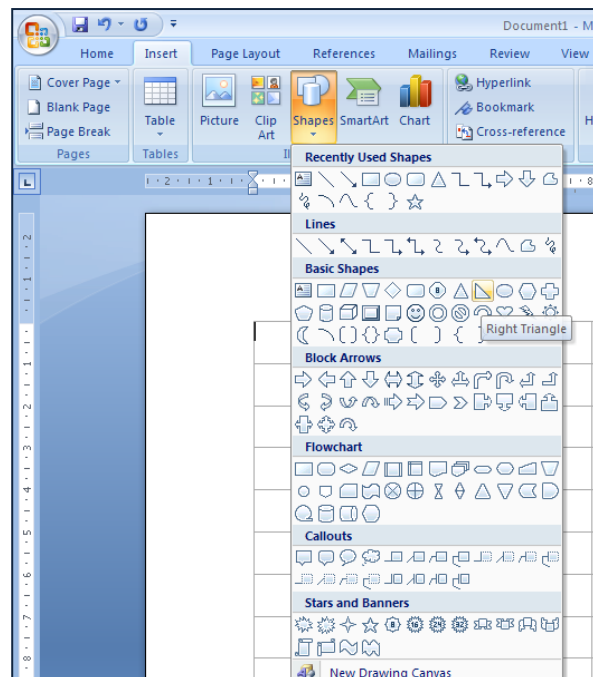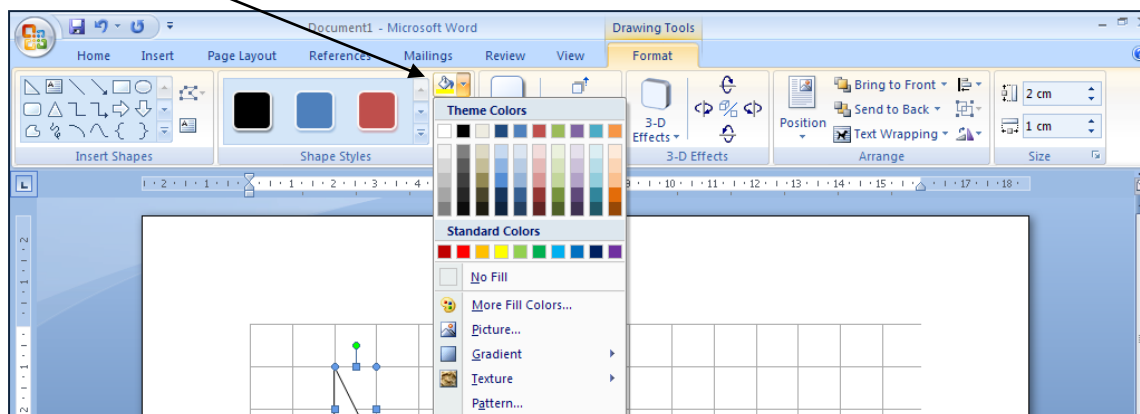These allow you to **show all the gridlines**, or only some of them.

- Left Click **OK** and the gridlines will be 1 cm apart.

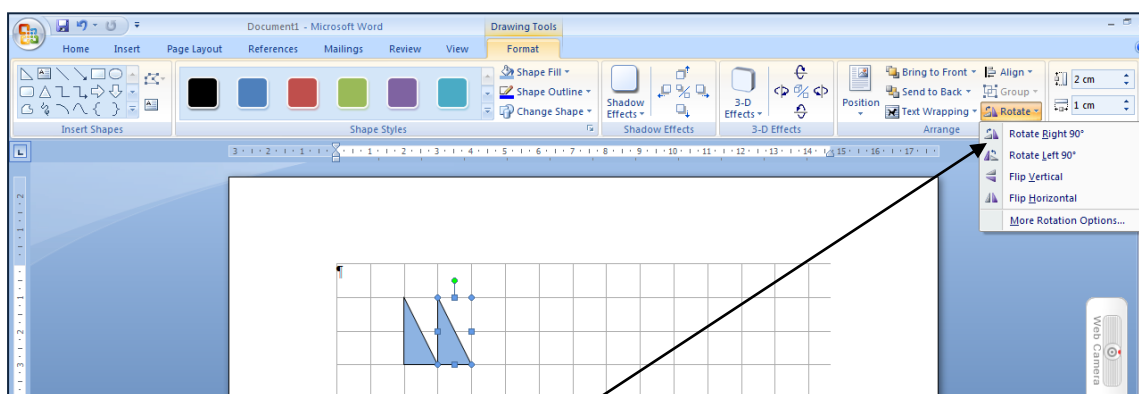- Now left click **Inser**t, then **Shapes**.

- Left click the **Right Triangle.** *Left click again* and *drag the mouse* to **draw a triangle** with base 1 cm and height 2 cm (as shown below).
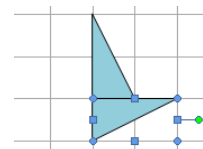

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- Use **Shade Fill** to colour the triangle.

- **To copy the triangle**, *press the Control key* and *use the mouse to drag the new triangle* until it 'snaps' into place beside the first triangle (as shown below).

- Left click on **Rotate**, then **Rotate Right 90°.**
  Move the second triangle so that it lies below the first (as shown).

- Make a copy of the second triangle and again use **Rotate Right 90°**. Then move it to lie as shown.
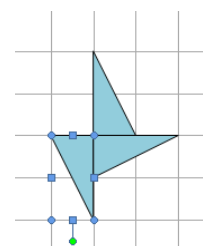
- Finally copy the third triangle and use **Rotate Right 90°** to rotate it. Move it to complete Figure 1 (as shown below).
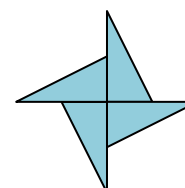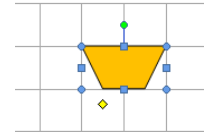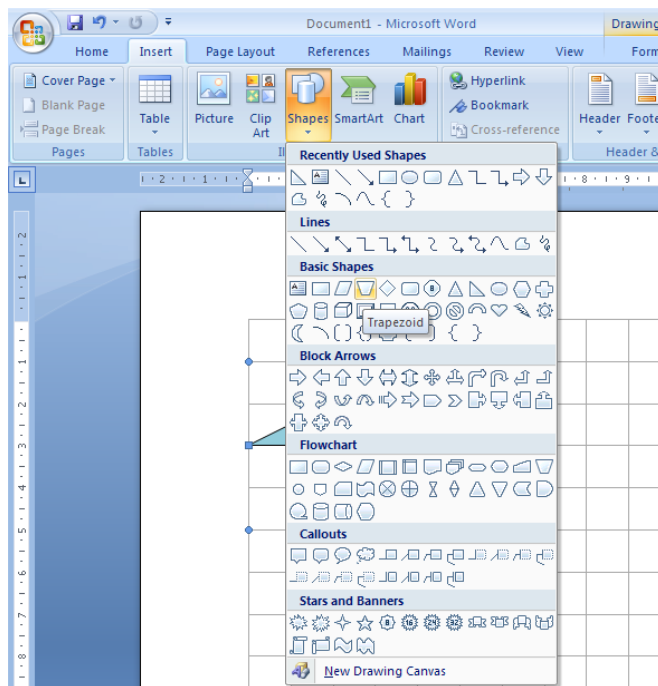
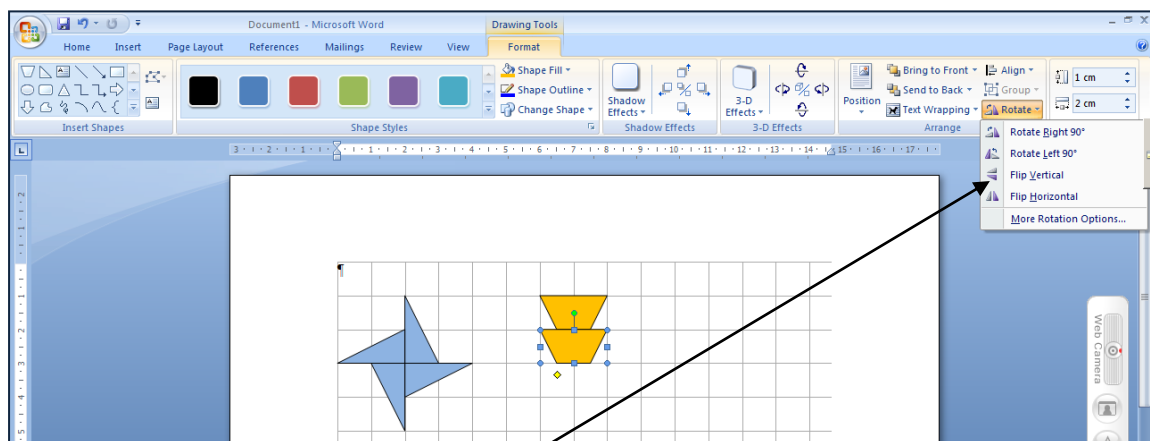- What is the order of rotational symmetry of Figure 1?………

Figure 1

- How many lines of symmetry does Figure 1 have?……………

- Now use the **Trapezoid** option in **Shapes** to **draw a trapezium (**as shown below). Use **Shape Fill** to colour it.

- Copy the trapezium (as shown below).

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

- What is the order of rotational symmetry of Figure 2?………

- How many lines of symmetry does Figure 2 have?……………

Figure 2

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There are many other shapes in the **Shapes** menu. Look at those in **Block Arrows**.

- Use the **Pentagon** and **Rotate** and/or **Flip** to draw Figure 3 (shown below).
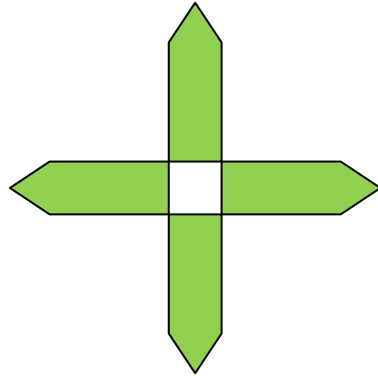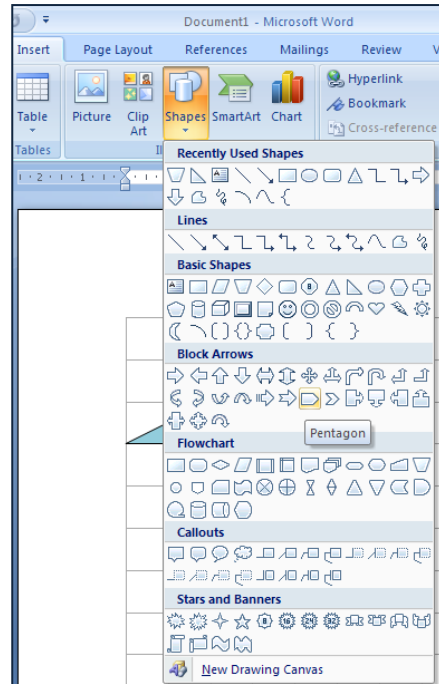
Figure 3

- What is the order of rotational symmetry of Figure 3?………

- How many lines of symmetry does Figure 3 have?……………

- Use the **Chevron** and **Rotate** and/or **Flip** to draw Figure 4.
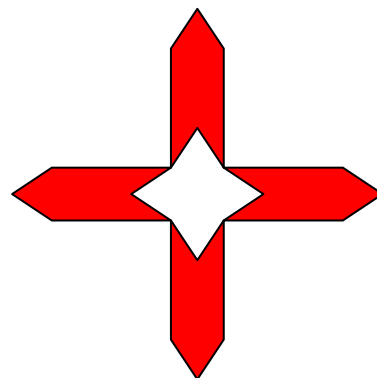
Figure 4

- What is the order of rotational symmetry of Figure 4?………

- How many lines of symmetry does Figure 4 have?……………

Draw patterns with other shapes.
Describe the symmetry of each pattern you make.

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You can rotate shapes in Word through different angles to draw patterns with different orders of rotational symmetry.
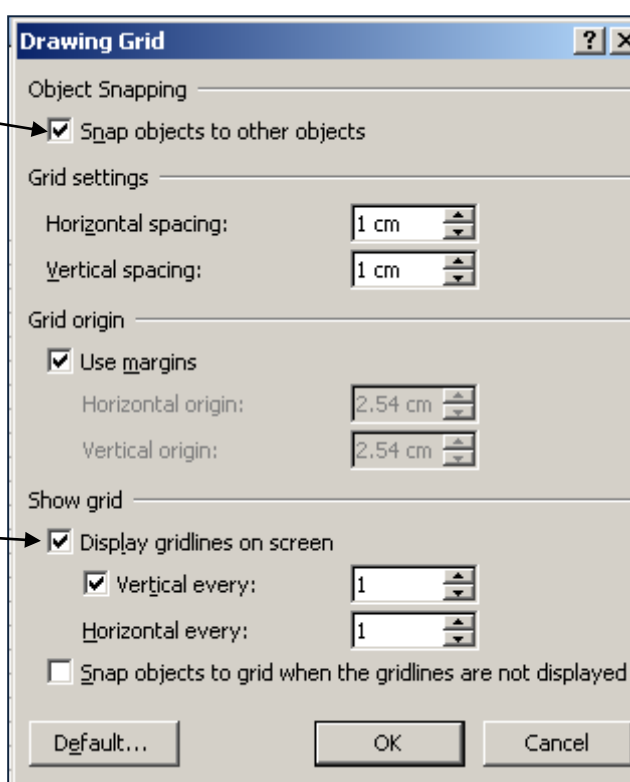
- Left click on **Insert**, then **Page Break.** This gives a new page to work on.
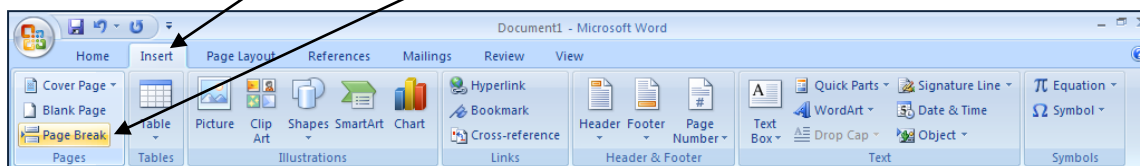

This time we will draw shapes without the grid.

- Left click on **Page Layout** then **Align** and **Grid Settings**.
  The **Drawing Grid** menu will appear.

Left click on this box to make the tick disappear - then you will be able to put objects wherever you like.

Left click on this box to make the tick disappear - this removes the gridlines when you left click OK.
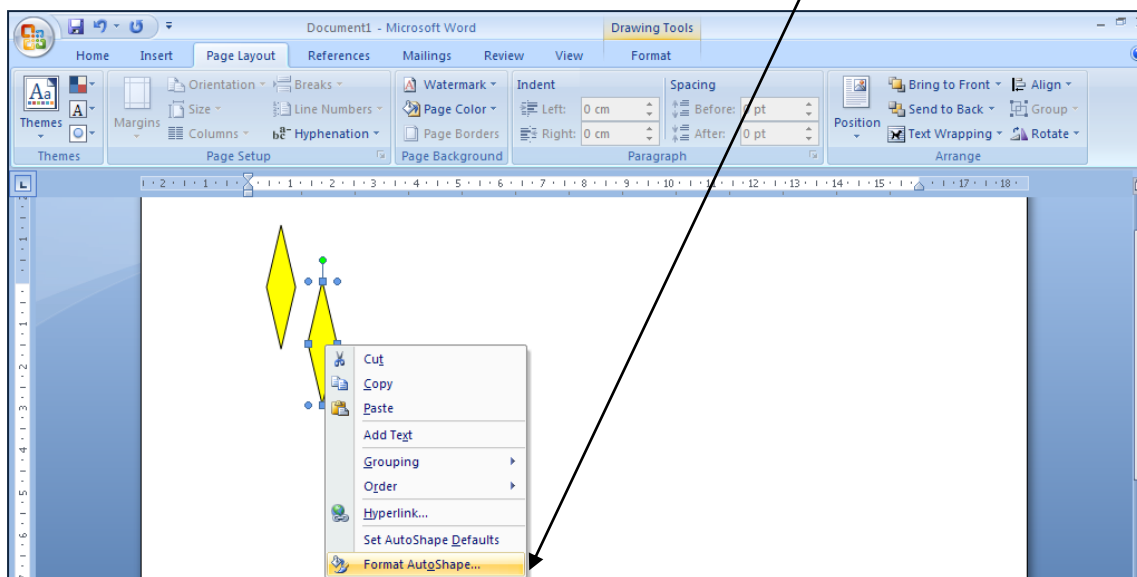

- Left click on **Insert**, then **Shapes.**
  Use **Diamond** to draw a **rhombus** (as shown below).
  Fill it with a colour of your choice.
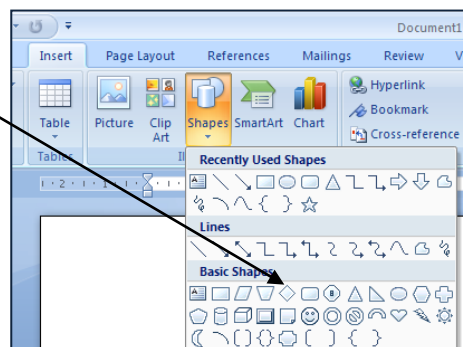
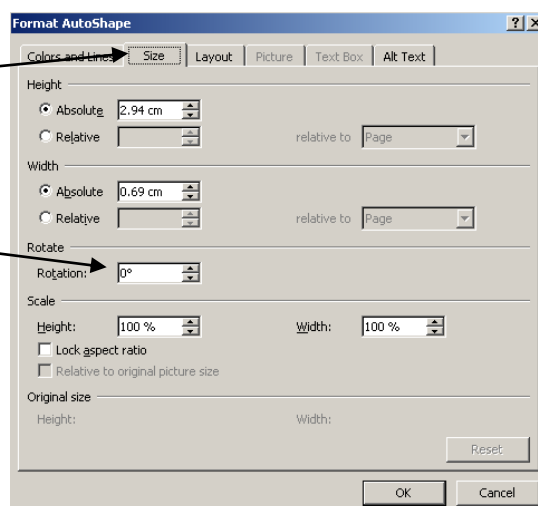- Use the **Control** key to make a copy of the rhombus.

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- ***Right click*** on the second rhombus then ***left click*** on **Format Autoshape**.

- Click on **Size** (if necessary).

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

- Drag the rhombus or use the arrow keys on the keyboard
  to put the second rhombus next to the first (as shown).

- Make another copy of the rhombus, then right click on it and
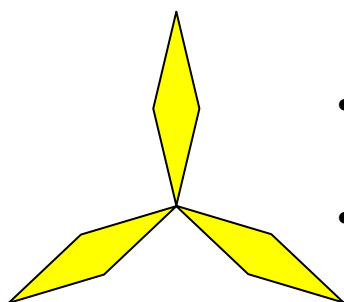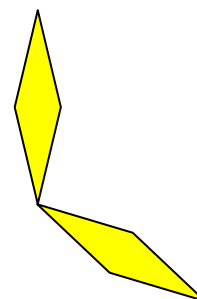 change the angle of rotation to 240°

- Move the third rhombus to give Figure 5 (as shown).

- What is the order of rotational symmetry of Figure 5? ………

Figure 5

- How many lines of symmetry does Figure 5 have? ……...

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

- Use Word to draw each of the figures shown below.
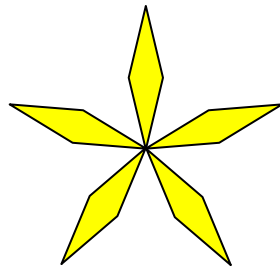

    Figure 6   **Figure 7**   **Figure 8**   **Figure 9**
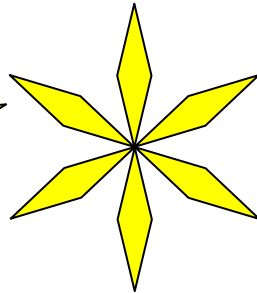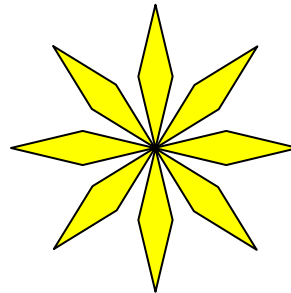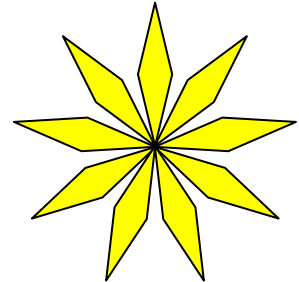
- For each figure write down the   a) order of rotational symmetry
                                         b) number of lines of symmetry.

Fig 6   a) ……………………….   b) ...…………………….

Fig 7   a) ……………………….   b) ...…………………….

Fig 8   a) ……………………….   b) ...…………………….

Fig 9   a) ……………………….   b) ...…………………….

Use other shapes to draw some other symmetrical patterns.

<div style="border:1px solid #000; display:inline-block; padding:4px; background:#7B9FD4">

Teacher Notes

</div>

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 3 or 4 pages.
The activity **Make your own shapes in Word** allows students to design their own shapes.

Answers

Figure	Order of rotational symmetry	Number of lines of symmetry
1	4	0
2	2	2
3	4	4
4	4	4
5	3	3
6	5	5
7	6	6
8	8	8
9	9	9

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