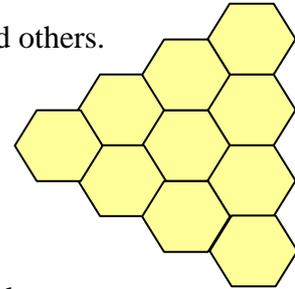


Tessellations in Word

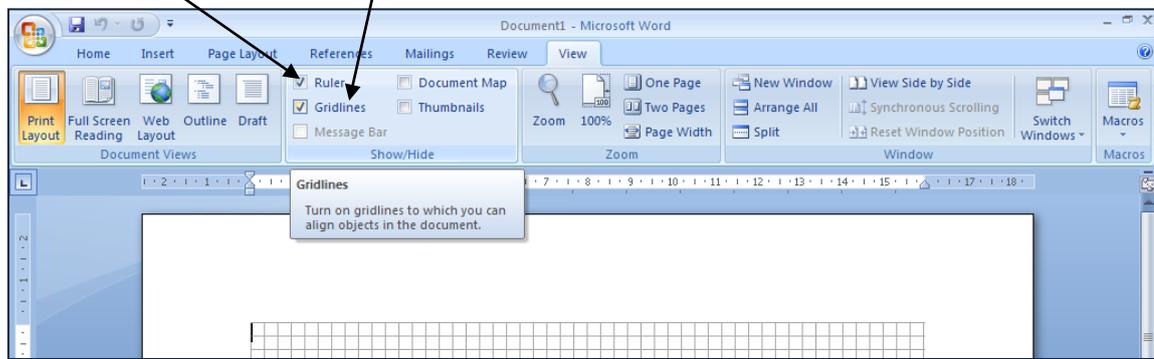
Tessellations are patterns of shapes that cover the whole surface.
This activity shows how to use Word to draw this tessellation and others.

- Open a new Word document.



Often it is useful to use a grid and ruler.

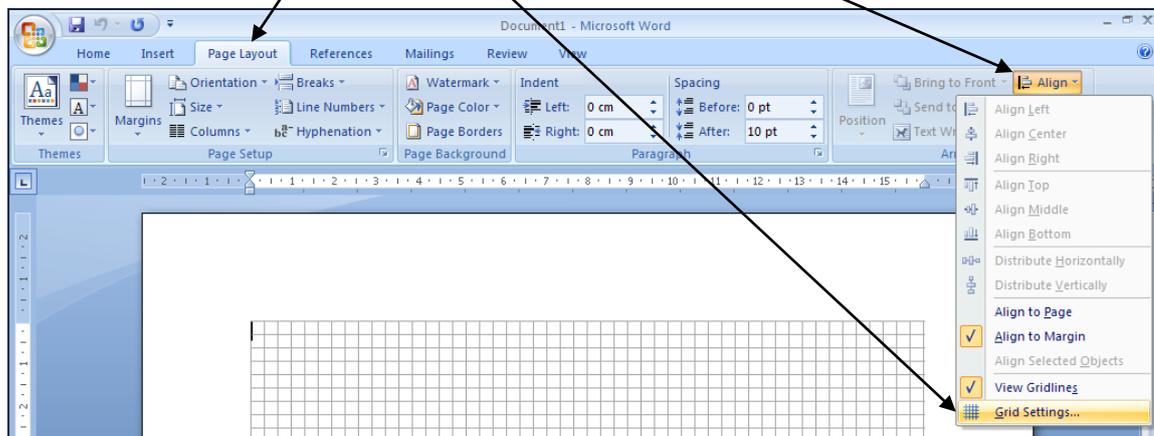
- **To show the gridlines** left click **View** then the small boxes next to **Ruler** and **Gridlines** (if necessary), so both are ticked.



Gridlines should appear on the page.

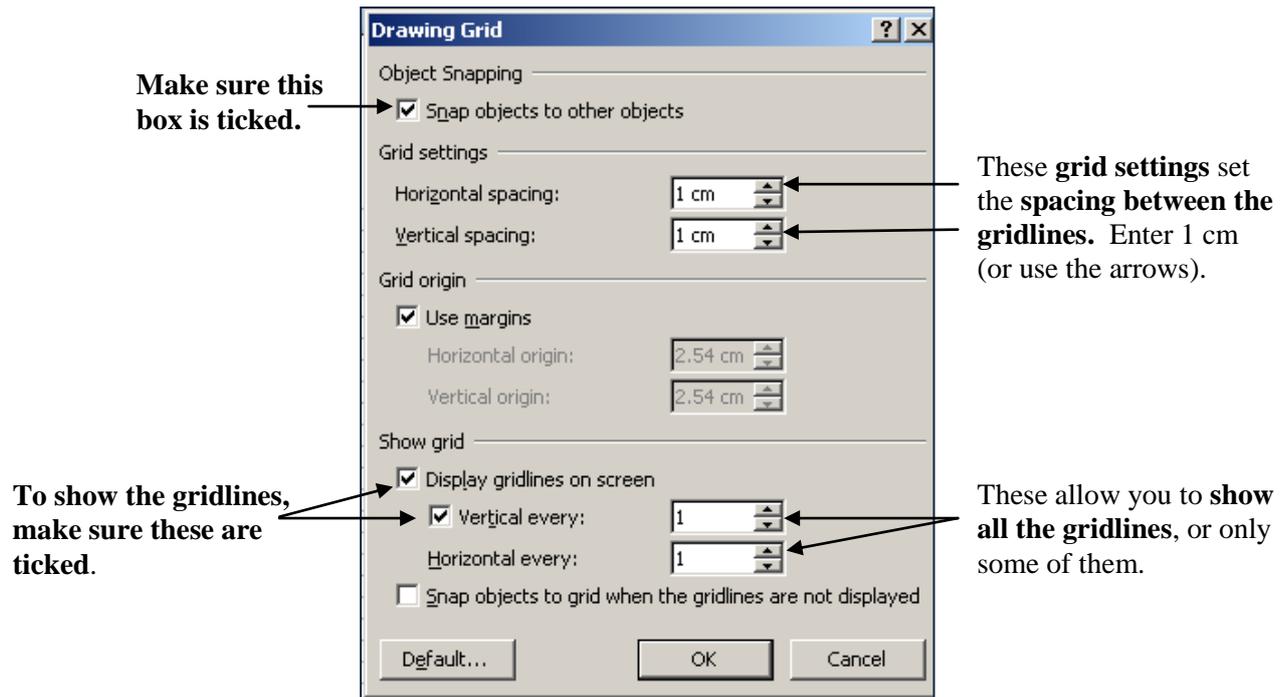
If not, the settings may need to be altered – go on to the next step which does this.

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

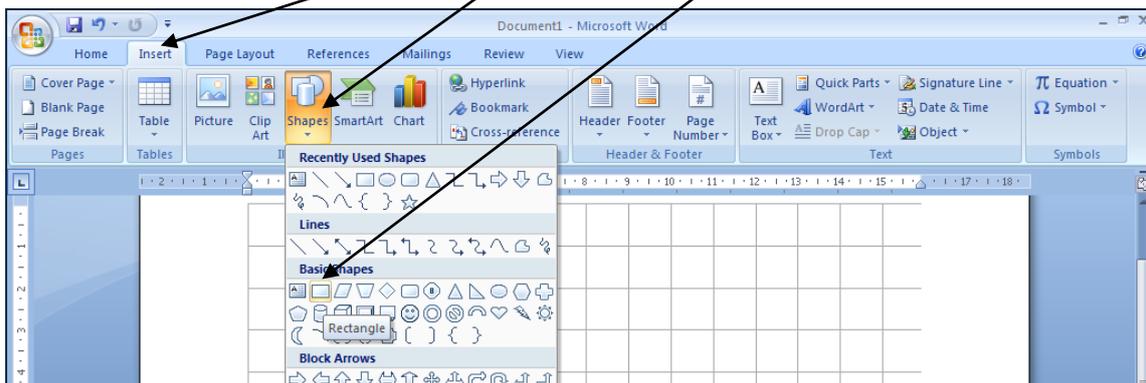


The **Drawing Grid** menu will appear, as shown on the next page.

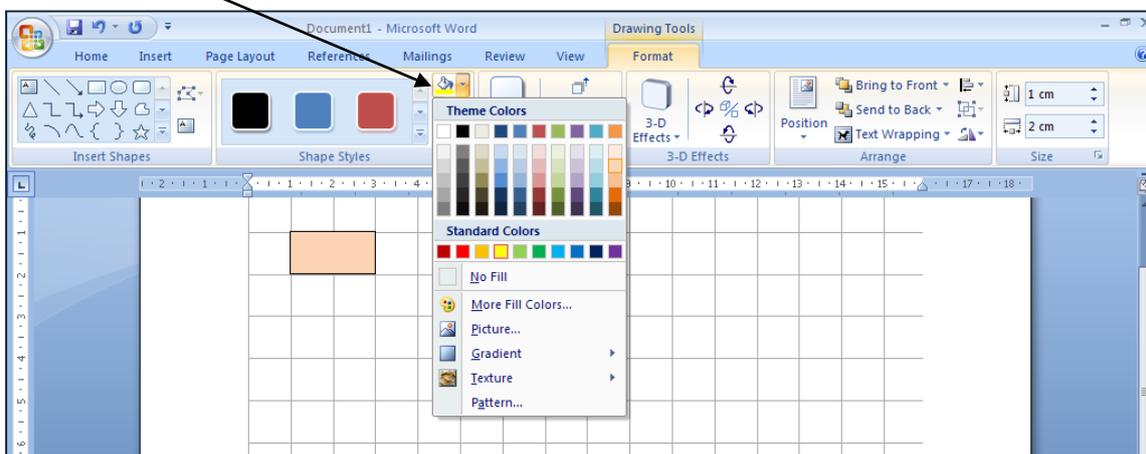




- Left Click **OK** and the gridlines will be 1 cm apart.
- Now left click on **Insert**, then **Shapes**, then the **Rectangle**.



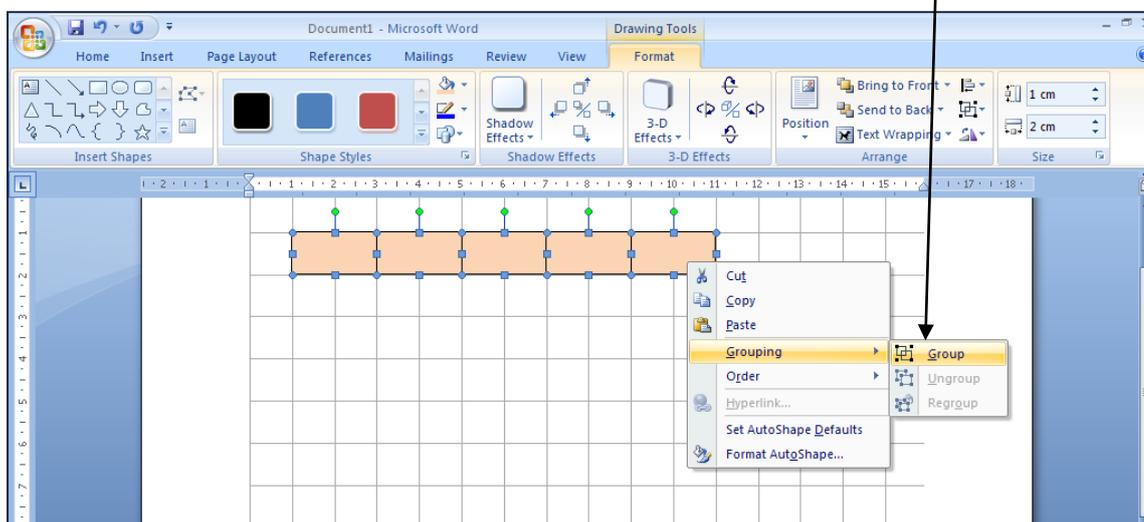
- Left click and drag the mouse so a rectangle appears. When you lift your finger from the mouse the rectangle will ‘snap to the gridlines’ – this means the length of its sides will be whole centimetres. Draw a rectangle 2 cm by 1 cm, then use **Shape Fill** to shade the rectangle (as shown below).



- **To copy your rectangle**, left click on it. Then **press the Control key** and **at the same time use the mouse to drag the rectangle horizontally across the page**. Another rectangle with a dotted boundary should appear. Drag it alongside the first rectangle, then release the mouse button. The second rectangle should ‘snap’ into place beside the first one. Copy rectangles until you have a row of five.

You can copy more than one ‘brick’ at a time. First you need to **group the bricks**.

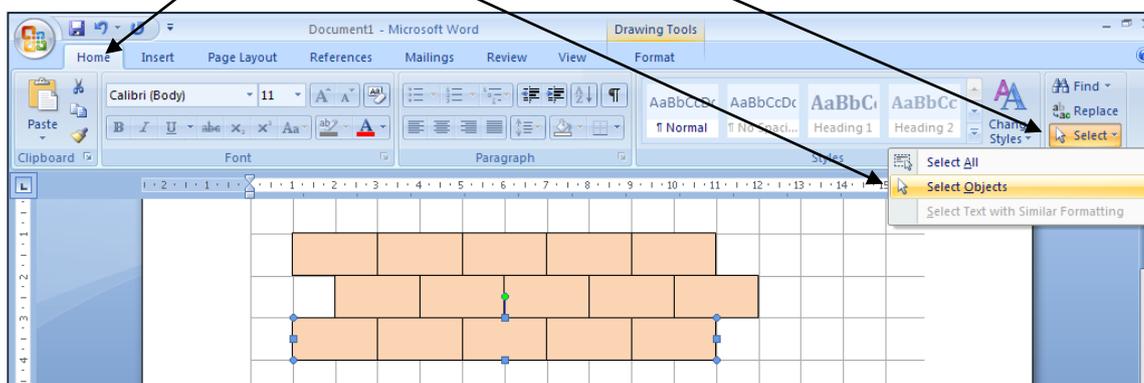
- **Hold down the SHIFT key** while you left click on each brick in the row. They will all be highlighted (as shown below).
- **To group the bricks as a single object** right click, then left click on **Group** in the **Grouping** menu.



- To copy the whole row of bricks, **press the Control key** and **at the same time use the mouse to drag the row of bricks down the page**. Make 3 rows of bricks.

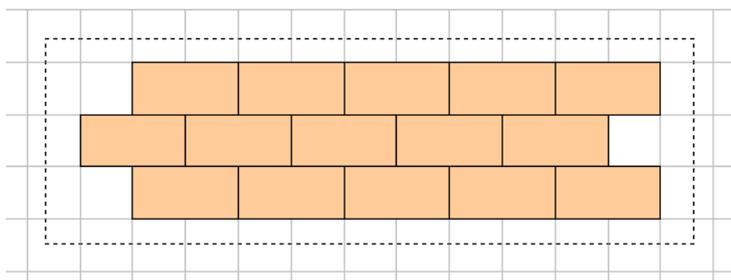
There is another way to group objects.

- **Left click on Home**, then **Select Objects** in the **Select** menu.



- The cursor will change to an arrow. **Move the arrow to a point above left of the bricks.**

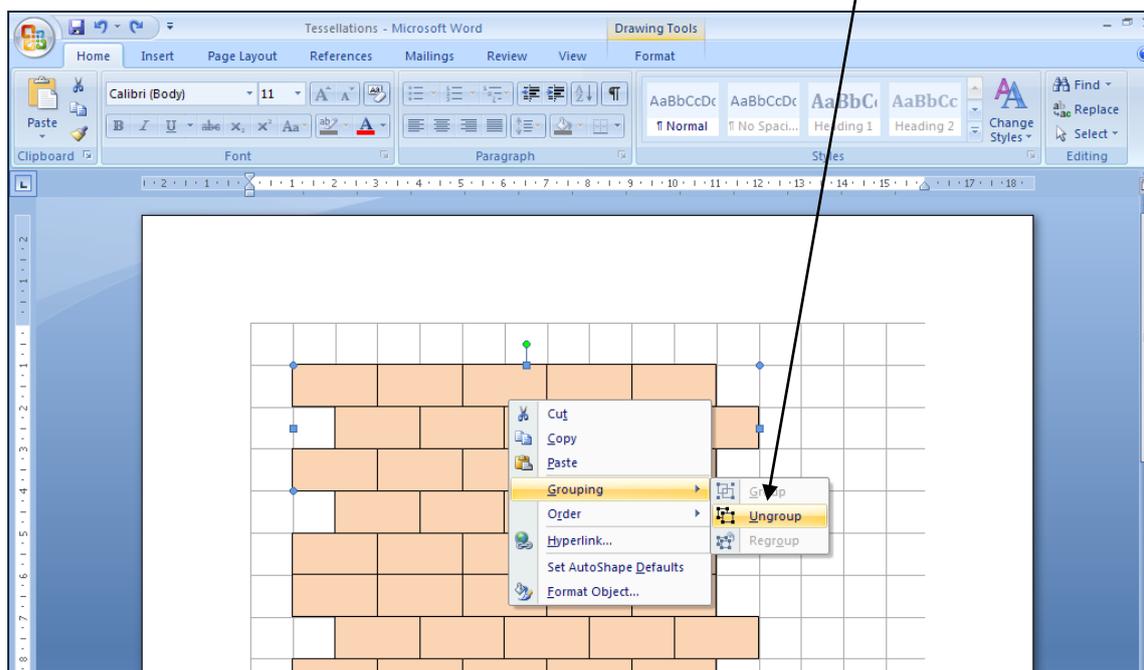
- **Left click** and **at the same time drag the mouse** down and to the right. A dotted box will appear. Make it large enough to surround the bricks, then release the mouse. All the bricks will be highlighted. **Right click**, then **left click** on **Group** in the **Grouping** menu to group them as one object.



- **Copy the grouped bricks until the page is almost filled.**

You will have some gaps left around the edges. You can copy single bricks again to fill some of these gaps, but first you need to **Ungroup** the bricks.

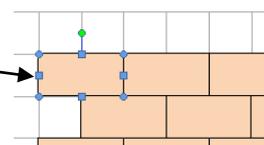
- **Right click** on one of your groups of bricks, then **left click** on **Ungroup** in the **Grouping** menu. You will then have separate rows of bricks again.



- To get single bricks, **right click** on one row then **left click** on **Ungroup** in the **Grouping** menu again. Select a single brick and copy it to fill gaps round the edge of the page.

To completely fill the page, you will need to add some half bricks.

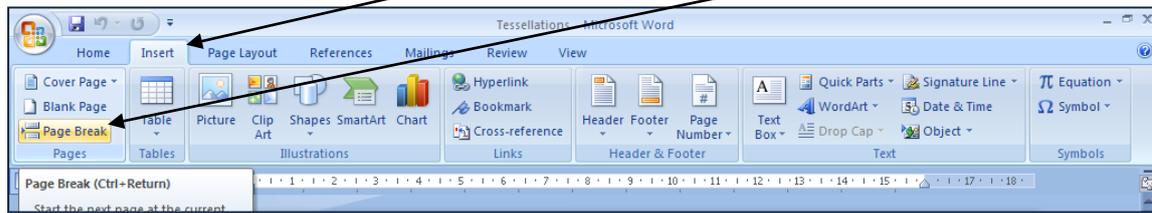
- To make a full brick into a half brick, left click on a **side handle** while you drag the mouse to make a half brick. When you release the mouse the brick should 'snap' into position on the grid.



- Copy the half bricks to fill the page completely.

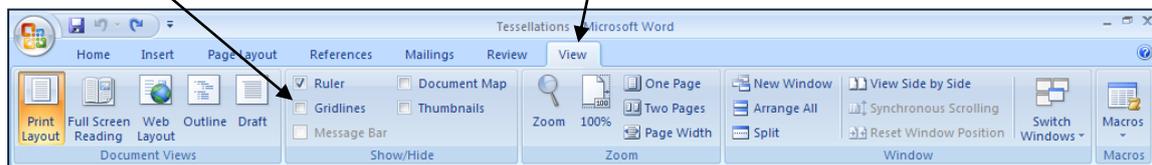


- To start a new page left click on **Insert**, then **Blank Page** or **Page Break**.

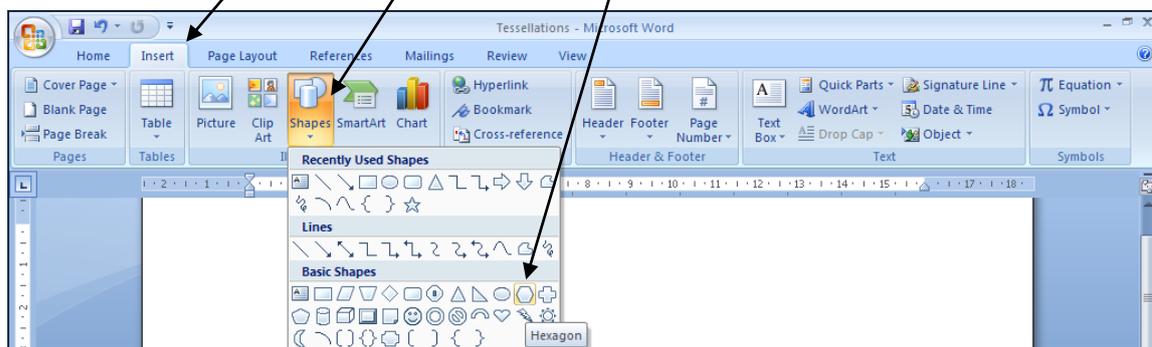


Either of these will give a new page to work on.
This time we will draw a tessellation without the grid.

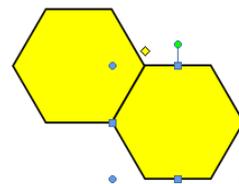
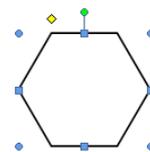
- To remove the gridlines left click **View** then the small box next to **Gridlines** so it is no longer ticked.



- Left click **Insert** then **Shapes** then the **Hexagon**.



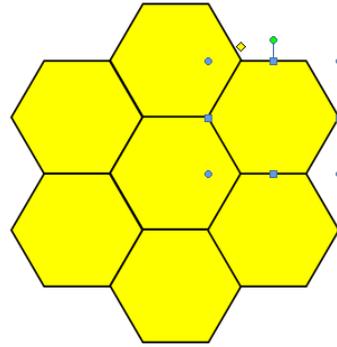
- Press the **SHIFT** key whilst drawing the hexagon.
This will give a regular hexagon with equal sides.
- Use **Shape Fill** to colour it.
- To copy your hexagon *press the Control key* and *use the mouse* to drag a second hexagon alongside the first one (as shown).



This time the shape may not 'snap' into place.
You can use the arrow keys on the computer to 'nudge' it into place.
Try this now.



- **Copy** more hexagons to start a tessellation.



- **Group** hexagons together to do this more quickly.
Cover as much of the page as you can with hexagons.

If you have time, try one or more of the following suggestions.
Try some using the gridlines and some without.

- Draw a tessellation using the Parallelogram, Diamond or Cross shape.
Use more than one colour of shape in your tessellation if you wish.
- Experiment with the Regular Pentagon and Octagon.
Why do they not tessellate without leaving gaps?
- Draw patterns using more than one shape.



Teacher Notes**Skills used in this activity:**

- drawing tessellations in Word

Preparation

Students will need to have previously learnt how to draw shapes in Word. Ideally they should have worked through the **Drawing Shapes in Word** activity.

Notes

Although tessellations are not listed in the specification for *Working in 2 and 3 dimensions*, students studying this FSMQ are likely to enjoy learning how to create tiling patterns in Word. Such patterns can also provide a valuable resource for use in discussions involving regular shapes and symmetry.

Other drawing techniques will be covered in other activities.

