UNIT 3 LESSON 4

<u>START</u> (10')

Children count up in 9s and then back to zero.
Ask children what is a good strategy for counting up in 9s:
> *What is a good strategy for counting up in 9s?*

Identify the increase in the 10s and the decrease in the units.

Children count up in 90s.

Establish the link to counting up in 90 degrees.

Draw a circle on the board and count around in 90 degrees both clockwise and anticlockwise.

Get the children to stand up and give them instructions like:
"Rotate 90 degrees clockwise" "Rotate 270 degrees anticlockwise".

Establish that a quarter turn is 90 degrees, a half turn is 180 degrees, and a full turn is 360 degrees.

Get the children to count in 90s again, this time turning a quarter turn clockwise at each state.

Stop at a point and ask how many complete turns they have made:
> *How many complete turns have you done?*

<u>MAIN TEACHING</u> (40')

Show sheet 1. Using each of the triangles in turn, demonstrate rotation of a triangle through 90 degrees, clockwise and anticlockwise, about each of its vertices. Each time identify the centre of rotation, and emphasize the angle and direction.

Ask children to come out and show various rotations. Demonstrate rotation of 180 and 270 degrees.

Ask what a 90 degrees clockwise rotation followed by a 90 degrees clockwise rotation is equivalent to :
> *What is a 90 degrees clockwise rotation followed by a 90 degrees clockwise rotation equivalent to?*

Establish other equivalences and the effect of a clockwise rotation followed by an anticlockwise rotation.

Show sheet 2. Use the same two triangles to rotate about the origin.

Ask how to describe this rotation:
> *How would you describe this rotation?*

Accept anticlockwise 90 degrees and clockwise 270 degrees about the origin. Repeat using the triangles at other positions on the grid and other shapes.

Ask what they notice about the coordinates of the shape before and after rotation:
> *What do you notice about the coordinates of the shape before and after rotation?*

Highlight the interchanges in the coordinates and the signs.

Give out worksheet 3.8 to work through. Hand out tracing paper, and show children how they might use it. Collect answers and correct any mistakes and misunderstandings.

<u>ENDING</u> (10')

Ask what rotational symmetry is:
> *What is rotational symmetry?*

Agree that a figure has rotational symmetry when it can be rotated less than 360° around a point of rotation and still match the original figure.

Give out worksheet 3.9. Discuss the tasks and ensure children understand the explanation. Show on the boards how the rectangle fits.

Ask how many times they think the hexagon is going to fit its outline.
> *How many times is the hexagon going to fit its outline?*

They finish at home. Children fill a table about the results.

"The action of turning a figure around a point or a vertex is called **rotation**."

"A figure has **rotational symmetry** when it can be rotated less than 360° around a point of rotation and still matches the original figure."
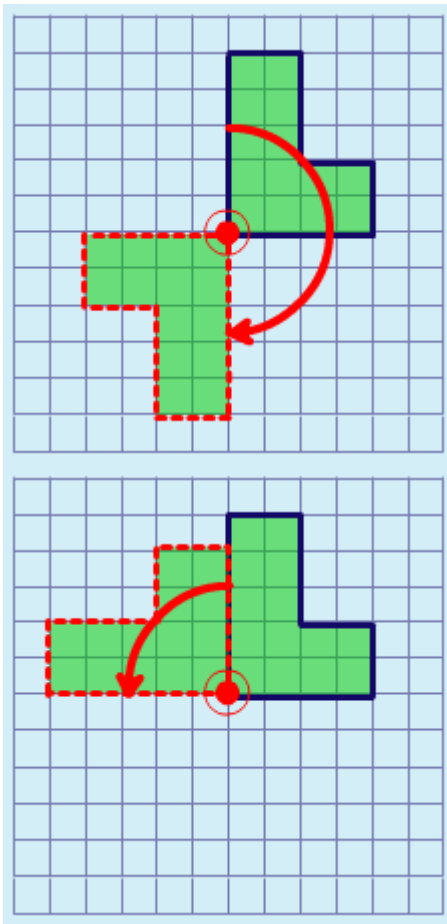
Transformation

Rotation

- A shape can be rotated (turned) clockwise or anticlockwise about a point, called the centre of rotation.

- The distance from any point on the shape to the centre of rotation never changes.
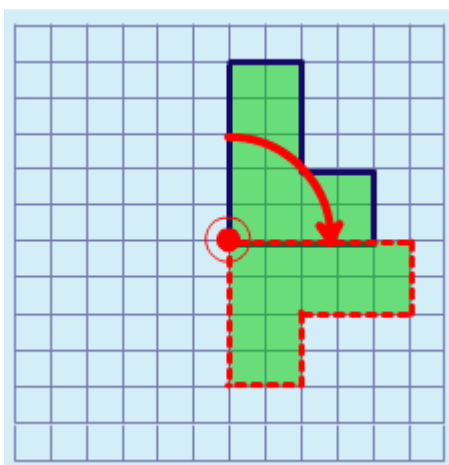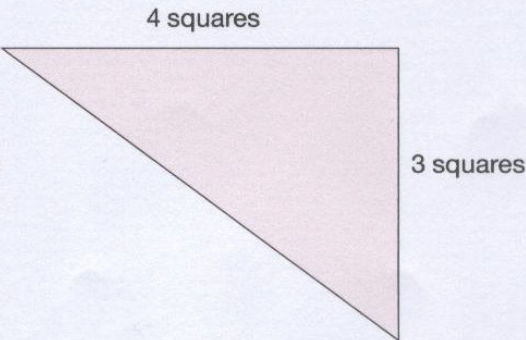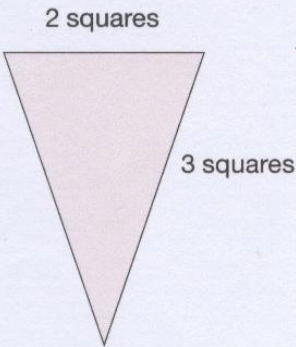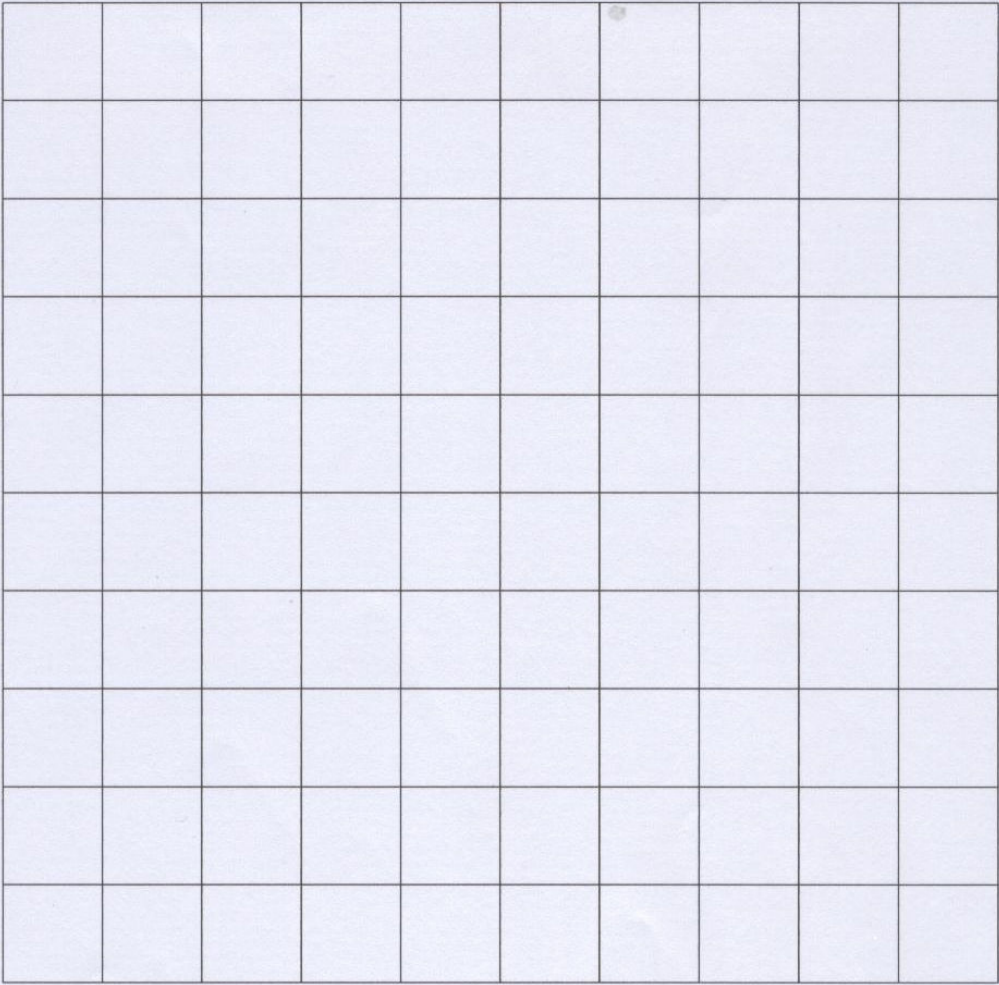

90° clockwise

180° (doesn't matter if it is clockwise or anticlockwise)

90° anticlockwise

RESOURCES

Sheet 1 and 2, worksheet 3.8 and 3.9, tracing paper, plastic or cardboard triangles and trapezium from sheets 1 and 2, P.Point rotation U3 L4, http://www.mystery-productions.info/hyper/Hypermedia_1999/BENTON/index.htm

WORKSHEET 1

2 squares

3 squares

4 squares

3 squares

SHEET 2