

Assessing students' work

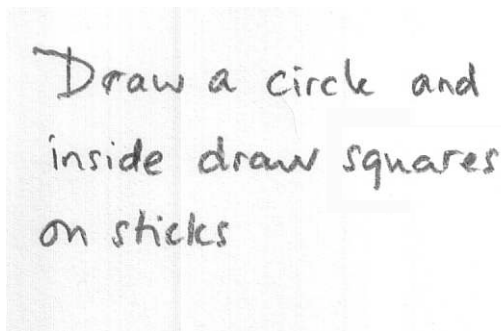
The following descriptions indicate typical levels of performance. After each description is an example of some work at this level.

Little progress

- **Representing:** Chooses some appropriate mathematical language to describe one or two shapes in the pattern.
- **Analysing:** Identifies some geometric objects in the mosaic, but this is incomplete and there is little or no analysis of the relative positions of shapes.
- **Interpreting and evaluating:** Describes shapes, but not symmetries or angles.
- **Communicating and reflecting:** Communicates in general terms the shape they have identified in the mosaic. Uses informal, inefficient and/or imprecise language.

Sample response: Sonia

Sonia correctly identifies a circle and some squares. The relative positions of the squares and the circle are not described. The “sticks” illustrate imprecise language.



Questions for Sonia:

Sonia could be encouraged to improve his response by asking the following questions:

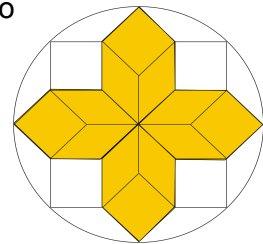
- *What other shapes do you see in the mosaic?*
- *Can you describe the positions of the squares more precisely?*
- *If I asked someone to draw a stick, what different things might they draw? What would be a better word to use?*
- *Does the mosaic have any symmetry?*
- *What angles do the shapes make in the mosaic?*

Some progress

- **Representing:** Chooses appropriate mathematical language to describe a few shapes and gives some indication of their positions in the mosaic.
- **Analysing:** Identifies some geometrical patterns within the mosaic and an attempt is made to describe their relative positions, but this is incomplete and ambiguous.
- **Interpreting and evaluating:** Describes a few of the shapes or symmetries of the mosaic and quantifies these.
- **Communicating and reflecting:** Communicates in geometrical terms the shapes and symmetries identified in the mosaic. Uses informal, inefficient and/or imprecise language.

Sample response: Isaac

Isaac describes the large circle touching 4 cubes. By this he appears to mean the shaded figures shown. The use of the term 'cubes', while evocative, is ambiguous as this is open to many alternative interpretations when drawn in 2D.



He then describes the remaining four squares and the circle. Some attempt is made to describe the relative positions of objects, though this is imprecise.

there are 4 cubes coming out of a centre in a cross shape (1 north, 1 south, 1 east, 1 west) and in between each cube (northwest, north east etc) there is a square. there is a circle going round it touching the tip of each square and cube.

Questions for Isaac:

Isaac could be encouraged to improve his response by asking the following questions:

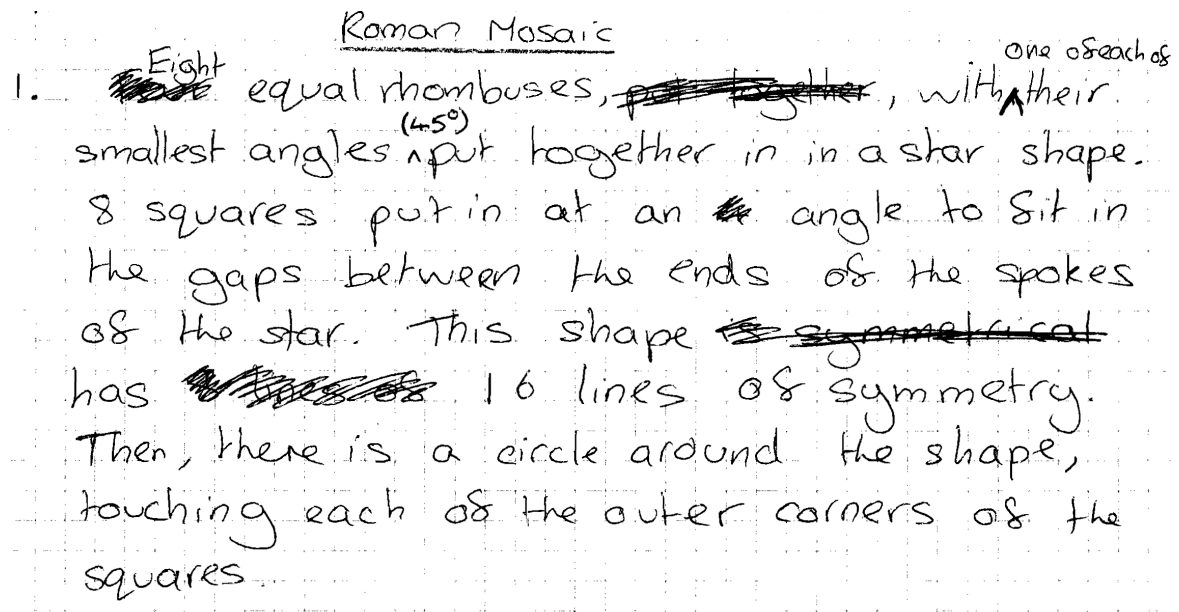
- *Can you draw me a different mosaic that fits your own description?*
- *How else could you describe the "cubes"?*
- *Are there any symmetries you can recognise?*
- *What angles can you see in the shapes in the mosaic?*

Substantial progress

- **Representing:** Chooses appropriate mathematical language to describe the mosaic pattern in an organised, succinct manner.
- **Analysing:** Identifies geometric patterns in the mosaic and uses mostly precise, unambiguous language.
- **Interpreting and evaluating:** Interprets the diagram and identifies most shapes, symmetries and angles.
- **Communicating and reflecting:** Communicates the description effectively in a mostly accurate, efficient, unambiguous manner. Some inaccuracies or ambiguities remain.

Sample response: Lauren

Lauren correctly describes most of the features of the design. She is still using some imprecise language, such as 'ends of the spokes'. She correctly identifies shapes, symmetries and angles, but she incorrectly states that the design has 16 lines of symmetry.



Questions for Lauren:

Lauren could be encouraged to improve her response by asking the following questions:

- *Can you describe to me the 16 lines of symmetry in the mosaic? Can you see any other symmetries in the shape?*
- *If you followed your own description of the mosaic how accurate would your picture be of this? Could you refine your description to make it easier to draw the mosaic?*
- *What shapes in the mosaic would be the most difficult to describe and why?*

Task accomplished

- **Representing:** Chooses appropriate mathematical language to describe the complete mosaic pattern in an organised, succinct manner.
- **Analysing:** Identifies geometric patterns in the mosaic and uses precise, unambiguous language.
- **Interpreting and evaluating:** Interprets the diagram identifying shapes, symmetries and angles. The description is checked for completeness.
- **Communicating and reflecting:** Communicates the description effectively in an accurate, efficient, unambiguous manner.

Sample response: Tom

Tom correctly describes all of the features of the design. Though some small ambiguities remain, (if the circle is drawn before the rhombuses, it is hard to see how big to draw the sides of each rhombus, and the circle would have to be redrawn at the end). It would, however, be possible for someone to reconstruct the mosaic correctly from this description.

You have a large circle. From the centre of the circle are 8 rhombuses with the small angle being 45° . ~~Between~~ Where the rhombus touch at the sides is a 90° angle, so there is a 90° angle between them. Two lines are drawn from the top of the rhombus to make a square. Now we have 8 squares touching the edge of the circle. The design is completely symmetrical with rotational symmetry order 8 with a pretty 8 pointed star in the middle.

Questions for Tom:

Tom could be encouraged to improve his response by asking the following questions:

- *If you followed your own description of the mosaic how accurate would your picture be?*
- *Can you improve the order in which you ask the person to draw the shapes?*
- *Could you refine your description to make it completely unambiguous?*
- *Do you see any other symmetries in the shape?*
- *What shapes in the mosaic would be the most difficult to describe and why?*