**Task 30 – Shapes**

**Information about the task**

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| **Question** | **Level of difficulty** | **National curriculum mathematical context** | **Text type** | **Question types** |
| 30. Shapes | Trial:  Medium (Q30.1)  Low (Q30.2)  Low (Q30.3) | Shape, understand and use measures, area, perimeter, estimation, calculate in a variety of ways. | Short text and pictures to interpret. | Open ended longer length written response to explain reasoning. |

**Skills assessed by the task**

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| **Thinking skills** | **Literacy & communication skills** |
| **Plan**   * Asking questions * Activating prior skills, knowledge and understanding * Gathering information * Determining the process/method and strategy   **Develop**   * Generating and developing ideas * Thinking about cause and effect and making inferences * Considering evidence, information and ideas * Forming opinions and making decisions   **Reflect**   * Reviewing outcomes and success criteria * Reviewing the process/method * Evaluate own learning and thinking * Linking and lateral thinking | **Reading**   * Responding to what has been read   **Writing**   * Organising ideas and information * Writing accurately   **Wider communication skills**   * Communicating information |
| **Numeracy Skills** |
| **Using mathematical information**   * Using numbers * Measuring * Gathering information   **Calculate**   * Using a variety of methods   **Interpret & present findings**   * Talking about and explaining work |

**Scoring**

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| Shapes SCORING 30.1  Full credit: Shape B, supported with plausible reasoning.  *•* It’s the largest area because the others will fit inside it.  *•* B. It doesn’t have indents in it which decreases the area. A and C have gaps.  *•* B, because it’s a full circle, and the others are like circles with bits taken out.  *•* B, because it has no open areas:    No credit: Shape B, without plausible support.  *•* B. because it has the largest surface area  *•* The circle. It’s pretty obvious.  *•* B, because it is bigger.  Other responses and missing.  To answer the question correctly students have to draw on skills from the reproduction competency cluster. |
| Shapes SCORING 30.2  Full credit: Reasonable method:  *•* Draw a grid of squares over the shape and count the squares that are more than half filled by the shape.  *•* Cut the arms off the shape and rearrange the pieces so that they fill a square then measure the side of the square.  *•* Build a 3D model based on the shape and fill it with water. Measure the amount of water used and the depth of the water in the model. Derive the area from the information.  *•* You could fill the shape with lots of circles, squares and other basic shapes so there is not a gap. Work out the area of all of the shapes and add together.  *•* Redraw the shape onto graph paper and count all of the squares it takes up.  *•* Drawing and counting equal size boxes. Smaller boxes = better accuracy  *(Here the student’s description is brief, but we will be lenient about student’s writing skills and regard the method offered by the student as correct)*  *•* Make it into a 3D model and filling it with exactly 1cm of water and then measure the volume of water required to fill it up.  Partial credit:  *•* The student suggests to find the area of the circle and subtract the area of the cut out pieces. However, the student does not mention about how to find out the area of the cut out pieces.  *•* Add up the area of each individual arm of the shape  *•* Find the area of B then find the areas of the cut out pieces and subtract them from the main area.  *•* Minus the shape from the circle  *•* Add up the area of each individual piece e.g.,  *•* Use a shape like that and pour a liquid into it.  *•* Use graph  *•* Half of the area of shape B  *•* Figure out how many mm² are in one little leg things and times it by 8.    No credit: Other responses and missing.  To answer the question correctly students have to draw on skills from the connections competency cluster. |
| Shapes SCORING 30.3  Full credit: Reasonable method:  *•* Lay a piece of string over the outline of the shape then measure the length of string used.  *•* Cut the shape up into short, nearly straight pieces and join them together in a line, then measure the length of the line.  *•* Measure the length of some of the arms to find an average arm length then multiply by 8 (number of arms) X 2.  *•* Wool or string!!!  *(Here although the answer is brief, the student did offer a METHOD for measuring the perimeter)*  *•* Cut the side of the shape into sections. Measure each then add them together.  (Here the student did not explicitly say that each section needs to be approximately straight, but we will give the benefit of the doubt, that is, by offering the METHOD of cutting the shape into pieces, each piece is assumed to be easily measurable)  No credit: Other responses and missing.  To answer the question correctly students have to draw on skills from the connections competency cluster. |