**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK:  | STRAND: Measurement and Geometry | **SUB-STRAND:** 3D Space 1 | **WORKING MATHEMATICALLY:** MA3-1WM |
| OUTCOMES: MA3-14MG | **Identifies three-dimensional objects, including prisms and pyramids, on the basis of their properties, and visualises, sketches and constructs them given drawings of different views.** |
| **CONTENT:**  | **Compare, Describe and Name Prism and Pyramids**Identify, describe and compare the properties of prisms and pyramids including:* Number and shape of faces
* Number and type of identical faces
* Number of vertices and edges
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Pre-Assessment:** Using a spreadsheet, students independently complete a table of properties for the 3D objects covered (including: number of faces, edges and vertices for each given object) |
| WARM UP / DRILL | **Shape Review** – Castle shapes<http://resources.hwb.wales.gov.uk/VTC/castle_shapes/eng/Introduction/default.htm> |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | Work out the least number of unit cubes needed to turn this object into a cuboid. |
| QUALITY TEACHING ELEMENTS | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge
* Deep understanding
* Problematic knowledge
* Higher-order thinking
* Metalanguage
* Substantive communication
 | * Explicit quality criteria
* Engagement
* High expectations
* Social support
* Students’ self-regulation
* Student direction
 | * Background knowledge
* Cultural knowledge
* Knowledge integration
* Inclusivity
* Connectedness
* Narrative
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| RESOURCES | Set of 3D objects, metalanguage signage (faces, vertices, edges, various types of pyramids and prisms), IWB visual presentation on 3D objects, spreadsheet file, internet access (using computers or iPads), straws, blue-tac, iPads or cameras, variety of real objects that represent regular 3D objects (e.g. boxes, ice cream cones, witches hats, toblerone box etc.) |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * **Explicitly communicate lesson outcomes and work quality.**

Define and reinforce metalanguage in the unit:e.g. pyramid, prism, face, edge, vertex, vertices, triangular prism, square prism, cube, rectangular prism, pentagonal prism, triangular pyramid, square pyramid, rectangular pyramid, cross-section, surface, curved, flat and perspective Also include regular 2D shapes. (square, triangle, rectangle, pentagon, hexagon and octagon) * Teach and review the names of regular three dimensional objects and review the terms faces, edges and vertices.

Three-Dimensional Viewpoints In groups, students are given a 3D object. They are asked to identify as many attributes as they can in 3 minutes. Share with the group and discuss any additional attributes identified. Make a 3D object “wall” identify each object and its attributes. | LEARNING SEQUENCERemediationS2 or Early S3 |  3D object – match object to label <http://www.math-play.com/3d-shapes-game/3d-shapes-concentration.html>* Review properties of 3d objects http://www.bgfl.org/bgfl/custom/resources\_ftp/client\_ftp/ks2/maths/3d/index.htm
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| LEARNING SEQUENCES3 | Investigate the properties of 3D objects using: <http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/3d/index.htm>Construct a 3D model, given a set number of straws and blue tac. Students photograph their object and describe their properties (faces, edges and vertices). Vary the number of straws given.Who Am I? In pairs, students are given a 3D object and make up “Who Am I” clues using appropriate terminology. Place the object in a bag then share with another group or the class. Who can guess the correct object?* **Investigation:** Sketch a variety of everyday objects (eg: buildings). Sketch from the front, top and side. Recreate these objects using clay and cut to identify the cross sections.

 Assessment: Ask students to: Look at a drawing/photograph and make a reasonable model of the object using various materials and draw different viewpoints of a given object |
| LEARNING SEQUENCEExtension Early S4 | * Create as many prisms as possible given a number of interconnecting cubes.
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| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:****Resources:** **Follow Up:** |