**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TERM:  | WEEK:  | STRAND: Measurement & Geometry | **SUB-STRAND:** 3D Space 1 | **WORKING MATHEMATICALLY:** MA3-1WM & MA3-3WM |
| 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 prisms and pyramids*** Describe similarities and differences between prisms and pyramids, e.g. between a triangular prism and a hexagonal prism, between a rectangular prism and a rectangular (-based) pyramid

**Construct simple prisms and pyramids (Three-Dimensional Space 1 & 2)*** Describe to another student how to construct or draw a three-dimensional object
 |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | Pre-Assessment**Worksheet – 3D Space Assessment** (If link below doesn’t work, please refer to embedded document on next page.)<http://www.studyladder.com.au/resources/teacher/mathematics?section=41&grade=8>  |
| WARM UP / DRILL | **3D Object Memory Game –** Have a bag that has a variety of different 3D objects inside it. Empty all the objects onto the floor for the students to study. Without the students looking, remove one or more of the objects. The students then have to determine what 3D object is missing. The students have to name the missing object by the correct name. For example if a die is removed from the bag the students need to state that the die is missing and it is a cube. |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | Ava made 4 square pyramids, 9 cubes and 5 hexagonal prisms using 1 straw for each edge. How many straws did Ava use altogether? |
| 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
 |
| RESOURCES | Set of 3D objects, IWB presentation on 3D objects, Video on identifying bases to determine if object is a prism or pyramid <http://on.aol.com/video/how-to-identify-prisms-275615142> , plasticine, unifix cubes, fishing line, pipe cleaners, straws, bubble mixture, white boards, paper. |

**TEACHING AND LEARNING EXPERIENCES**

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

Revise metalanguage used in this unit e.g. three-dimensional object (3D), prism, cube, pyramid, base, uniform cross-section, face, edge, vertex (vertices), apex, top view, front view, side view, depth and net. Have students create or add to existing maths glossary. Revision of three-dimensional objects: Revise as a class the various properties of prisms and pyramids. Look at how they are similar and how they differ. Drawing 3D objects revision: Look back over the steps of how to draw three-dimensional objects. Also look at the various nets for constructing 3D objects. What similarities do they have with one another.Dissecting three-dimensional objects: As a class, dissect multiple 3D objects and have the students explain what kind of cross-sections the particular three-dimensional object has. | LEARNING SEQUENCERemediationS2 or Early S3 | Investigate and revise 2D shapes and their properties.Review nets of various 3D objects and terminology. Review the properties of a prism and a pyramid. |
| LEARNING SEQUENCES3 | Creating 3D bubble wands: Students construct various 3D bubble wands following the directions at the following website. <http://babbledabbledo.com/> Students then experiment with creating their own 3D bubble wand using their prior knowledge of 3D objects.3D Monster: Students work in pairs or individually to construct a monster or a robot out of as many three-dimensional objects as they can construct using various materials. Three-Dimensional World: Students collect photos from all different aspects of their life and create a poster displaying the many ways that three-dimensional objects occupy our world. 3D Comparison: Split students into pairs and give students two different three-dimensional objects. Students then take their time to draw both the 3D objects and list their similarities and differences. Students can swap 3D objects with other groups once completed. Prism/Pyramid Worksheet: Students individually complete the following worksheet that looks at both pyramids and prisms and their properties. <http://www.studyladder.com.au/resources/teacher/mathematics?section=41&grade=8> Have students create their own Newman’s problem involving 3D objects and the information they have learnt.* **Assessment: –** 3D Space Assessment <http://www.studyladder.com.au/resources/teacher/mathematics?section=41&grade=8>

Give students a list of different 3D objects and have them draw the object using isometric paper. |
| LEARNING SEQUENCEExtension Early S4 | Extension: Teach students how to draw a city using two point perspective. There is an online tutorial of how to draw the 3D city on YouTube. Students complete this activity as a fast finisher’s activity if need be. <https://www.youtube.com/watch?v=yNq78n02fMQ> <https://www.youtube.com/watch?v=xplwjW2ynH4>  |
| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow Up:** |