**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK:  | STRAND: MEASUREMENT & GEOMETRY | **SUB-STRAND:** 2D SPACE 1 | **WORKING MATHEMATICALLY:** MA3-1WM & MA3-2WM |
| OUTCOMES: MA2-15MG  | **Manipulates, identifies and sketches two dimensional shapes, including special quadrilaterals, and describes their features.** |
| **CONTENT:**  |  **Compare and describe features of two-dimensional shapes, including quadrilaterals** * Determine that a triangle cannot be constructed from three straws if the sum of the lengths of the two shorter straws is less than the length of the longest straw
* Compare the rigidity of two-dimensional frames of three sides with the rigidity of those of four or more sides
* Construct and manipulate a four-sided frame and explain how adding a brace can make a four-sided frame rigid
 |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Pre-Assessment**Students complete rigid and non-rigid shapes worksheet.  |
| WARM UP / DRILL | Give students a worksheet broken up into rigid and non-rigid columns. Get students to walk around the room and create a list of shapes in the classroom that are rigid and non-rigid. |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | Liz cut two strips of cardboard of different lengths. She joined them at their centres and twisted them. She then drew lines to join corners. What shape has she drawn?  |
| 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 | Worksheets, Notebook file, drinking straws/ paddle pop sticks, online resources as referenced |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| Explicitly communicate lesson outcomes and expectations of work quality* **Define and reinforce metalanguage used in the unit.** Students should be able to communicate using the following language: **Teach and review** the definition and meaning of the term rigidity.
* **Use notebook file** to explain the definition of rigid objects.

* Use rigidity online link to explain what rigidity means.

<http://www.geom.uiuc.edu/~wanous/rigidityoftriangles.html> | LEARNING SEQUENCERemediationS1 or Early S2 | * Rigid and non-rigid shapes worksheet

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| LEARNING SEQUENCES2 | * **Investigation**: Class discussion on rigidity. Use questions such as: What do you know now about **rigid** and **non-rigid** shapes? Can you give any examples of buildings that use rigid shapes? Can you think of any example of rigidity around your house?
* **Practical Activity:** Students view the practical demonstration at <http://www.pbslearningmedia.org/resource/phy03.sci.phys.mfe.zstrawbridge/triangles-designing-a-straw-bridge/>
* **Assessment:** Students work in small groups using paddle pop sticks/drinking straws to construct the “strongest” bridge. They develop an understanding of how to construct a strong bridge from the video clip:
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| LEARNING SEQUENCEExtension Late S2 or Early S3 | **Extension*** Students can make a short video explaining how they made their bridge and why it is strong/weak. They can research famous bridges around the world and investigate their design features.

<http://www.technologystudent.com/struct1/model1.htm>  |
| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow Up:** |