**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK:  | STRAND: Measurement & Geometry | **SUB-STRAND:** 2D Space 2 | **WORKING MATHEMATICALLY:** MA3-1WM & MA3-2WM |
| OUTCOMES: MA2-15MG  | **Create symmetrical patterns, pictures and shapes, with and without the use of digital technologies** |
| **CONTENT:**  | **Compare and describe two-dimensional that result from combining and splitting common shapes, with and without the use of digital technologies*** Determine which of the special quadrilaterals can be used to create tessellating designs
* Explain why tessellating shapes are best for measuring area
* Identify shapes that do and do not tessellate
* Explain why a shape does or does not tessellate
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Pre-Assessment**Students are given a range of shapes to classify according to whether they tessellate or not. If they tessellate, students use one to create a pattern, recording which transformations they used. |
| WARM UP / DRILL | **Student play on-line tessellation game**. Students choose a shape, colours and designs. The computer tessellates the shapes for them. This is great introduction for students to gain an understanding of what tessellation is.<http://www.pbs.org/parents/education/math/games/first-second-grade/tessellation/>**Student splay on-line tessellation game:** Students manipulate shapes to create tessellations. <http://illuminations.nctm.org/Activity.aspx?id=3533> |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | What tessellating pattern can you make using 3 different 2D shapes and 3 colours? |
| 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 | Tessellation definition poster, posters with tessellation examples, online games and activities as referenced, worksheets and A4 paper or art paper coloured shape tiles |

**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 tessellation

<http://www.mathsisfun.com/geometry/tessellation.html>* **Online Games & Activities:** Students create a tessellating pattern using the links below;

<http://www.pbs.org/parents/education/math/games/first-second-grade/tessellation/><http://gwydir.demon.co.uk/jo/tess/grids.htm><http://www.saskschools.ca/curr_content/mathcatch/geometry/geometry_b/tessellations/polygons/polygons.html> | LEARNING SEQUENCERemediationS1 or Early S2 | * **Tessellating patterns using coloured blocks:** Show an example of a simple tessellation and ask students to copy the tessellating pattern using pattern blocks.
* Students then attempt to create their own tessellating pattern using the coloured tiles.

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| LEARNING SEQUENCES2 | * **Tessellation Town:** Students move and link shapes to create tessellations.

<http://www.mathcats.com/explore/tessellations/tesspeople.html>* **Tessellation Investigation:** Give students four shapes on a grid and ask them to reflect, translate and rotate the shapes to create tessellations. Draw in all lines of symmetry.
* **Tessellation worksheet**: Students determine if the shapes on the worksheet will tessellate.
* **Tessellating patterns using coloured blocks:** Students use pattern blocks to create tessellating tiling patterns. Point out to students that they can create these tessellating patterns by flipping, sliding and turning. When patterns are created, they draw them on grid paper (or in books) and write an explanation to justify why their pattern is tessellating.

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| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **Tessellations in the Environmen**t: Look at magazines, wallpaper samples, old dress materials etc to find tessellating patterns. Make a collection of tessellations to display. Discuss what makes them tessellating patterns. Write the definition of tessellating pattern under the display for students to refer to.
* **Tessellation Town:** Students solve the real life problem presented on the attached worksheet.
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| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow Up:** |