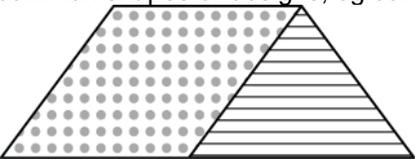


Booragul Public School NSW Syllabus for the Australian Curriculum – Measurement and Geometry

Sub Strand – Two Dimensional Space 2

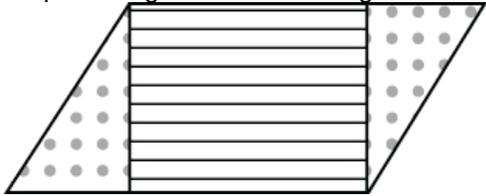
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date
Stage 2 A student: <ul style="list-style-type: none"> › uses appropriate terminology to describe, and symbols to represent, mathematical ideas MA2-1WM › checks the accuracy of a statement and explains the reasoning used MA2-3WM › selects and uses appropriate mental or written strategies, or technology, to solve problems MA2-2WM › manipulates, identifies and sketches two-dimensional shapes, including special quadrilaterals, and describes their features MA2-15MG 		Language Students should be able to communicate using the following language: shape, two-dimensional shape (2D shape), triangle, quadrilateral, parallelogram, rectangle, rhombus, square, trapezium, kite, pentagon, hexagon, octagon, line (axis) of symmetry, reflect (flip) , translate (slide) , rotate (turn) , tessellate , clockwise, anti-clockwise, half-turn, quarter-turn, threequarter- turn . In Stage 1, students referred to the transformations of shapes using the terms 'slide', 'flip' and 'turn'. In Stage 2, they are expected to progress to the use of the terms 'translate', 'reflect' and 'rotate', respectively.	

2D Shapes

<p><u>Ignition Activities</u> Students are given multiples of the one shape and are to make as many other shapes as possible using only this shape. Students are to record their different combinations of common shapes and display to the class.</p>		 Information and communication technology capability  Literacy  Critical and creative thinking
<p><u>Explicit Mathematical Teaching</u> Compare and describe two-dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies (ACMMG088) • combine common two-dimensional shapes, including special quadrilaterals, to form other common shapes or designs, eg combine a rhombus and a triangle to form a trapezium</p> <div style="text-align: center;">  </div> <p>• describe and/or name the shape formed from a combination of common shapes (Communicating) • follow written or verbal instructions to create a common shape using a specified set of two or more common shapes, eg create an octagon from five squares and four triangles (Communicating, Problem Solving)</p> <p style="text-align: right;">~ 1 ~</p>		

. use digital technologies to construct a design or logo by combining common shapes
(Communicating)

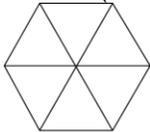
- split a given shape into two or more common shapes and describe the result, eg 'I split the parallelogram into a rectangle and two equal-sized triangles'



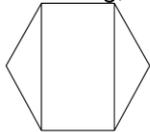
. compare the area of the given shape with the area of each of the shapes it is split into, eg if a pentagon is split into five equal triangles, describe the area of the pentagon as five times the area of one triangle, or the area of one triangle as of the area of the pentagon
(Communicating, Reasoning)

- record the arrangements of common shapes used to create other shapes, and the arrangement of shapes formed after splitting a shape, in diagrammatic form, with and without the use of digital technologies

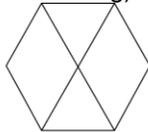
. record different combinations of common shapes that can be used to form a particular regular polygon, eg a hexagon can be created from, or split into, many different arrangements, such as (Communicating, Problem Solving)



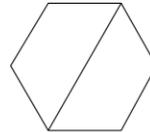
6 triangles



2 triangles
and 1 rectangle



2 triangles
and 2 rhombuses



2 trapeziums

Whole Class and Group Teaching

Digital technologies

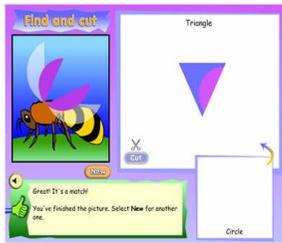
Students use a range of digital technologies to combine common 2D shapes to form other common shapes. Students make these shapes into an art work using programs like tux paint, draw, paint, word etc. Students can also do this by splitting given shapes.

Computer Learning Objects

SHAPE OVERLAYS -STAGES 1-3

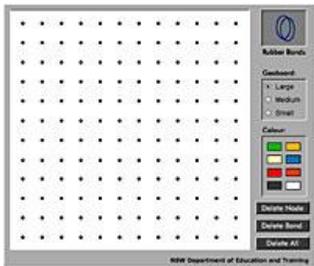
The Shape overlays series of learning objects requires the student to manipulate 2D shapes, by sliding and overlapping, to create

other 2D shapes.



DIGITAL GEOBOARD -STAGES 1-3

A digital version of a geoboard which enables a band to stretch around the pegs on the geoboard to form a coloured shape.



BST/NAPLAN Questions to practise

3. Colour the pentagon.



2003 BST-YR 3

5. Which one of these shapes is an octagon?



2006 BST Yr 5

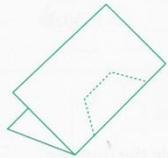
G Mai drew this octagon.

Draw a square next to the octagon.



2006 BST-YR 3 and Yr 5 question

21 Carl folded a piece of paper like this



and cut along the dotted line.

What shape did he see when the paper was unfolded?

- trapezium
- hexagon
- pentagon
- octagon

Planned assessment

Pre Assessment –

Sort a group of shapes based on given criteria eg, number of lines of symmetry, regular/irregular shape, at least one pair

of parallel sides (remember that in mathematics 'regular' shapes have all sides equal, and all internal angles equal).

Pre Assessment

Match up- match the shape name and number of sides to the picture of the shape.

Teaching Space and Geometry CD ROM-Stage Two –Exploring Quadrilaterals Unit -

Lesson Five-(assessment activity)

Parallelograms on the Geoboard *Using computer drawing tools to create a variety of quadrilaterals*

QT focus-Deep Knowledge

(refer to attached lesson)

Symmetry/Tessellation

Rich Task

A town in your area has experienced a flood which has destroyed the carpet in the children's book section of the town library. The local council has decided that it will replace the floor covering by using tiles instead of carpet. The council has announced a competition which will involve people in designing a new tile pattern that could be used to cover the floor in this section of the library. You have decided to enter this competition as the council is offering a prize of \$2 000 for the winning design.

Before creating your design you will need to investigate the following and draw examples to help you:

- how to make tessellations using regular polygons by themselves
- how to make tessellations using circles and more than one regular polygon
- how to make tessellations using polyominoes (dominoes, trominoes, tetrominoes, pentominoes etc)
- how to make tessellations using the work of the artist MC Escher
- how to make tessellations by creating your own design beginning with a square

practice making a range of designs from which you can choose your best one

Your Presentation

You can make your design using a range of materials

- draw the design, by hand or computer, on plain or grid paper and colour it OR
- create your design using pieces of coloured paper or cardboard; wooden blocks etc OR
- create your own method of presenting your design

When you have completed your design, write a brief explanation including the following:

- why you chose the design you have made

<ul style="list-style-type: none"> • why you chose the colours you have used • why you think it will be the best design for the children's book section of the council library <p>Source: Country Areas Program CAP website http://www.cap.nsw.edu.au/bb_site_intro/stage2_Modules/tesselations/tesselations.htm</p>		
<h2><u>Explicit Teaching</u></h2> <p>Create symmetrical patterns, pictures and shapes, with and without the use of digital technologies (ACMMG091)</p> <ul style="list-style-type: none"> • create symmetrical patterns, designs, pictures and shapes by translating (sliding), reflecting (flipping) and rotating (turning) one or more common shapes ▮ use different types of graph paper to assist in creating symmetrical designs (Communicating) ▮ use digital technologies to create designs by copying, pasting, reflecting, translating and rotating common shapes (Communicating, Problem Solving) ▮ apply and describe amounts of rotation, in both 'clockwise' and 'anti-clockwise' directions, including half-turns, quarter-turns and three-quarter-turns, when creating designs (Communicating, Problem Solving) ▮ describe the creation of symmetrical designs using the terms 'reflect', 'translate' and 'rotate' (Communicating, Reasoning) • create and record tessellating designs by reflecting, translating and rotating common shapes ▮ use digital technologies to create tessellating designs (Communicating) ▮ determine which of the special quadrilaterals can be used to create tessellating designs (Reasoning) ▮ explain why tessellating shapes are best for measuring area (Communicating, Reasoning) • identify shapes that do and do not tessellate ▮ explain why a shape does or does not tessellate (Communicating, Reasoning) • draw the reflection (mirror image) to complete symmetrical pictures and shapes, given a line of symmetry, with and without the use of digital technologies 		
<h2><u>Whole Class Teaching Activities</u></h2> <h3>PATTERN BLOCKS</h3> <p>Children use pattern blocks to create tessellating tiling patterns. Point out to students they can create these tessellating patterns by reflecting, translate and rotate. When patterns are created they draw them on grid paper or in books and write an explanation to justify why their pattern is tessellating. Students can complete this task using a range of resource such as graph paper, digital technologies. Students apply and describe amounts of rotation, in both 'clockwise' and 'anti-clockwise' directions, including half-turns, quarter-turns and three-quarter-turns, when creating</p>		

designs

For additional activities see sample units of work.

Guided and Independent Activities

TESSELLATION

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.



MICROSOFT PAINT

Using Microsoft Paint students create a tessellating pattern using both regular and irregular shapes.

Previous NAPLAN Questions

Year 5 2008

22 Which flag has exactly two lines of symmetry?

Shade one bubble.



Refer to attached sheet at the end for examples of other BST questions

