Stage 3 Maths Program
Term 2 Week 3

NSW K-10 Mathematics Syllabus Outcomes

Patterns and Algebra (1)

MA3-8NA - Analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane

- Find missing numbers in number sentences involving multiplication or division on one or both sides of the equals sign

2D Space

MS3-15MG - Manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties

- Identify, name and draw right-angled, equilateral, isosceles and scalene triangles
- Explore angle properties of the special quadrilaterals and special triangles

Working Mathematically

- MA3-1WM - Describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions
- MA3-2WM - Selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations
- MA3-3WM - Gives a valid reason for supporting one possible solution over another.

Learning Goal - (refer to outcome)

Success Criteria - (refer to indicators)

TIB -

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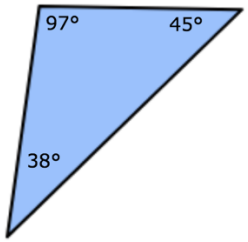
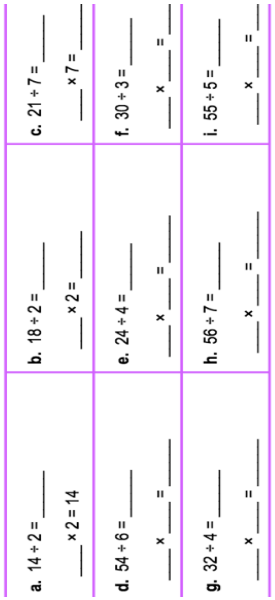
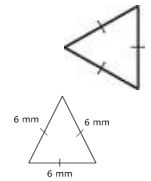
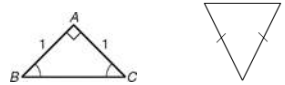
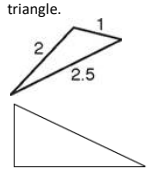
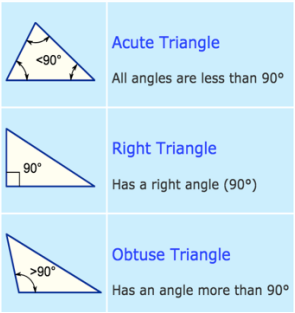
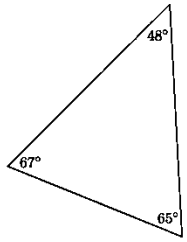
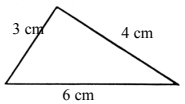
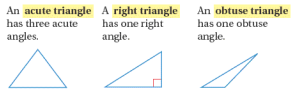
TIB -

Mathematics Weekly Plan

Term – 1 2 3 4 **Week** – 1 2 3 4 5 6 7 8 9 10 11 **Strands** – Patterns & Algebra (1)/ 2D Space (1)

		Monday	Tuesday	Wednesday	Thursday	Friday
Key Ideas:		**Patterns & Algebra**			**2D Space**	
Warm Up	**Additional warm up activities: TEN:** Using your PLAN Data, students will work on **TEN** based activities for 10 minutes. Activities are differentiated based on group needs (view PLAN Data/Clusters).	**Mark Pre-test as a whole class and provide immediate feedback.**	**TEN/ Ninja Numeracy/ Quick Revision Mentals**	**TEN/ Five Minute Frenzy/ Quick Revision Mentals**	**TEN/ Five Minute Frenzy/ Quick Revision Mentals**	**Mark Post-test as a whole class and provide immediate feedback.**
Problem of the Day		**Pre-Test:** Patterns & Algebra & 2D Shapes	Inverse operation: Multiplication & Division quick mentals: 2 x ____ = 18 18/2 =_____ 4 x ___ = 32 32/4 = _____ 8 x ____ = 96 96/8=_____ 9 x ____ = 54 54/9= _____	*I multiplied 9 and another number and got 63. What was the other number?* *Answer using division: 63/9 = 7* *7 x 9 = 63.* *Peter is buying baseball cards for his collection. Cards come in packs of 8. How many cards will he get if he buys 5 packs of cards?* *8 x 5 = 45 45/5 = 4.*	*What kind of triangle is this?*  In an acute triangle, all three angles are less than 90°. In a right triangle, one angle is exactly 90°. In an obtuse triangle, one angle is greater than 90°. This triangle is an obtuse triangle. The 97° angle is greater than 90°.	**Post-Test:** Patterns & Algebra & 2D Shapes

Explicit Teaching	**Main Focus + Language**	• Ask students what the opposite operation to multiplication is. Explain this is called the 'inverse' operation. What are Inverse Operations? The word **'inverse'** means reverse in direction or position. In mathematics, an **inverse operation** is an operation that undoes what was done by the previous operation. • The four main mathematical operations are addition, subtraction, multiplication, division. The inverse of addition is subtraction and vice versa. The inverse of multiplication is division and vice versa. Let's look at some examples to show how inversion works. • Multiplication and division: 2 x 8 = 16 and 16 / 8 = 2. • Ask students to use their multiplication knowledge to check 144 divided by 12 =12 and then 12 x 12=144. • Repeat modelling using examples: 192 divided by 4 = 48 and for 6 x 37=222 and 8 x18 =144. • Ask children to discuss with a friend how they could find the missing digits. Choose pairs to demonstrate how multiplying 67x8 will give the missing number. After children have multiplied [67 x 8 = 536] ask them to check answer by dividing to see if they get 67.	• Place the following problems on the board for students to solve. Students need to identify and use inverse operations to assist with the solution of number sentences, e.g. 125 ÷ 5=□ becomes □ × 5=125. • Additional examples to model by missing some numbers and using inverse operations to solve: 54/6 = 9 9 x 6 = 54 110/11 = 10 10 x 11 = 110 72/9 = 8 8 x 9 = 72 84 / 12 = 7 7 x 12 = 84 • Write some of the following questions on the board. Students will complete the corresponding multiplication or division problem to solve the question.  	•Continue modelling how to write multiplication and division facts to problems. Examples: 6 x 7 = 42 42/7 = 6. Further examples on the board: ___ × 8 = 56 56 ÷ 8 = ___ ___× 8 = 64 64 ÷ 8 = ___ ___ × 3 = 21 21 ÷ 3 = ___ • Model how to use inverse operation to solve the following word problems. Demonstrate how to check the answer by competing the inverse operation: •The teacher had 32 students and wanted to divide them into equal groups of 4. How many equal groups are there? 32/4 = 8 8 x 4 = 32 •Peter is buying baseball cards for his collection. Cards come in packs of 8. How many cards will he get if he buys 5 packs of cards? 8 x 5 = 40 40/5=8 •The 4th graders are having an assembly. There are 135 students and they need to sit in rows of 15. How many rows will there be? 135/15 = 9 9 x 15 = 135 •Jacob has a job mowing lawns. He mows 6 of his neighbours' lawns. They each pay him $126 per year. How much money does Jacob make per year? 126 x 6 = 756 756/6 = 126	• Revision: Triangles: • **Classifying Triangles by Sides:** • Triangles can be classified either according to their sides. All of each may be of different or the same sizes; any two sides may be of the same size; there may be one distinctive angle. • **How to Classify Triangles:** To classify a triangle by its sides means that we look at the side lengths of the triangle and make a determination as to whether it is an: **Equilateral, Isosceles and Scalene.** To be an equilateral triangle all three-side length must be exactly the same. An Isosceles triangle will have at least 2 side lengths that are the same. If all three sides of the triangle are different then the triangle is scalene. • Model examples by placing similar images of each on the board for students to take notes of: **1.** If all the sides are equal (the same length) then the triangle is **EQUILATERAL.**  **Example 1**: All the sides have a length • **Example 2**: The "marks" indicate of 6 mm. that each of the three sides have the same length. **2.** If 2 sides of the triangle are the same length then the triangles is an **ISOSCELES** triangle.  **Example 1**: Two sides have a length of 1 • **Example 2**: The "marks" indicate that 2 and a 3rd side has a different side have the same length. length of 1.4. **3.** If all three sides of the triangle are a different length then the triangle is a **SCALENE** triangle.  **Example 1**: All three sides have a different length. • **Example 2**: If there are no "marks" and no numbers indicating length then all the sides have a different length. **HINT:** Classifying a triangle is as simple as comparing the sides. If all three sides have the same length then it is	• Quick revision questions; naming triangles based on sides e.g. I am a triangle with all equal sides = equilateral. • I am a triangle with all different sides = scalene. • I have two sides that equal 4 cm and one side that equals 5 cm = isosceles. • Explain to students that triangles can also have names that tell you what **type of angle** is inside:  • Model how to find the angle and name of triangles by using a protractor to measure an angle: • Place the midpoint of the protractor on the VERTEX of the angle. • Line up one side of the angle with the zero line of the protractor (where you see the number 0). • Read the degrees where the other side crosses the number scale. • Take care to read from the right set of numbers. A protractor has two sets of numbers: one set goes from 0 to 180, the other set from 180 to 0. Which one you read depends on how you place the protractor: place it so that one side of the angle lines up with one of the zeros, and read that set of numbers. • Using hovercam, draw a triangle and measure angles using protractor. Example:  • All angles are less than 90 = Acute Triangle. • Model more examples on the board, ensuring to cover all types on angled triangles.

				Encourage students to model answers on the board.	an **EQUILATERAL** triangle, if only two sides have the same length then it is an **ISOSCELES** triangle and if there are no sides that have the same length then it is a **SCALENE** triangle. Hint: *Remember to look at the "marks" because they represent congruent sides*. • After defining each triangle, model how to classify each by using their 'sides' using a ruler and similar examples of triangles like below. Additionally, you can cut out a range of triangles to model as well. • This can be placed on board or using the hovercam:  • After measuring each side using a ruler, all sides were different and none were the same. This could only be classified as a 'scalene' triangle.	• Students write the following notes in thebooks to refer to: • If all the angles of the triangle are all less than 90° then the triangle is classified as an **ACUTE TRIANGLE.** • If one of the angles is 90° then the triangle is a **RIGHT TRIANGLE.** • If one of the angles is greater than 90° then the triangle is classified as an **OBTUSE TRIANGLE.** • Students may also draw examples of triangles named by their angle: 
Group Activities	**Revision Group - Names**	Work with these students. Determine if they all have a common time table fact that they need revision on e.g. 6-time table facts. Using a whiteboard, write some multiplication facts and continue scaffolding the inverse operation e.g. 6 x ___ = 48. 48/6 = 8.	Use the following examples to provide further scaffolding of inverse operations: division to multiplication: http://www.k5learning.com/worksheets/math/grade-3-division-facts-missing-number-1-12-a.pdf	Use the following examples to provide further scaffolding of inverse operations: multiplication to division: http://www.k5learning.com/worksheets/math/grade-3-multiplication-table-2to12-missing-number-a.pdf	**5/6M Town Groups - Based on Continuum Clusters**	Work with students to classify triangles: https://www.teacherspayteachers.com/Product/Classifying-Triangles-Task-Cards-547786 Students also draw a range of triangles in their books and using a protractor, find the degrees of each angle. Classify by angle.
Group Activities	**Middle Group- Names**	Make some cards with sets of incomplete multiplication or division number sentences. Students complete the number sentences and discuss their strategies. Examples: 56/____=8 = 8 x_____ 56 9 x____=81 = 81/9=_____	Students create a range of multiplication and division problems for a partner to solve. Students may do this by using deck of cards or rolling dice. Whatever question they make for their partner, they need to answer and then complete the inverse operation.	Students complete the following worksheet: https://www.math-drills.com/algebra/alg_inverse_multdiv_1025_001.pdf?v=1360935642	**5/6M Town Groups - Based on Continuum Clusters**	Students work in small groups to classify triangles: https://www.teacherspayteachers.com/Product/Classifying-Triangles-Task-Cards-547786 Students also draw a range of triangles in their books and using a protractor, find the degrees of each angle. Classify by angle.

Group Activities	**Main Group – Names** **Feedback –** Use the thumb method after explicit modelling to determine students understanding and where they will be placed for group activities. **Marking Exit Slips –** Next to each students Exit Slip, the teacher will check students answers and will either write an: A = Achieved N/Y = Not Yet N/Y students will become your target group.	Incomplete number sentences: Increase the difficulty of the inverse equations for these students to solve. Examples: 1) 17 864 ÷ ____ = 22 2) ____ ÷ 24 = 219 3) ____ x 26 = 23 426 4) 16 201 ÷ ____ = 17 5) ____ ÷ 26 = 266 6) ____ x 21 = 17 367 7) 6520 ÷ ____ = 20 8) ____ ÷ 12 = 813 11) ____ ÷ 27 = 509 12) ____ x 11 = 6611 13) 12 992 ÷ ____ = 14 14) ____ ÷ 15 = 584 15) ____ x 19 = 2603 16) 9405 ÷ ____ = 45 17) ____ ÷ 44 = 534 18) ____ x 59 = 29 441 If this is too complex, provide students simpler yet still challenging questions: Complete the multiplication problems and then write out its inverse equations. 1.) 339 x 13 = _____ 2.) 98 x 212 = _____ 3.) 610 x 65 = _____ 4.) 174 x 554 = _____ 5.) 7842 x 615 = _____	Students complete the following tasks independently and explain their answers: http://www.k5learning.com/worksheets/math/grade-6-division-missing-dividend-or-divisor-a.pdf	Students complete the following tasks independently and explain their answers: http://www.k5learning.com/worksheets/math/grade-6-division-missing-factors-long-division-a.pdf	**5/6M Town Groups - Based on Continuum Clusters**	Provide students with task questions: Stage 4 math's: http://www.kwiznet.com/p/takeQuiz.php?ChapterID=2571&CurriculumID=24&Num=7.6 Examples: Can you draw an obtuse right triangle? _____ If so, draw it. If not, explain why not. Can you draw a right isosceles triangle? _____ If so, draw it. If not, explain why not Classify triangles based on angles and sides: https://www.math-drills.com/geometry/triangles_classifying_mixed_001.pdf?v=1519736436
Feedback/ Exit Slip		**Revision:** ____ x 5 = 40 = 40/5 =____ **Middle:** 144/ ____ = 12 = 12x__=144 **Main:** 156/____ = 12 = 12 x ___ = 156	**Revision:** 36/____= 6 = 6 x 6 = 36 **Middle:** 104/8 = ____ =___x 8 = 104 **Main:** 8 x ___ = 184 = 184/8 =____	*Students create their own problems and write the inverse operation for their problem: multiplication and division.*	*Students draw a triangle and name it according to their sides; measurements.*	*Students draw 2 different triangles and measure the angles using a protractor. They name it according to its angle.*
Early Finishers/ Extension	• Students continue practicing their written and mental strategies for multiplication and division. • Groups extend themselves by completing the next groups activities e.g. middle complete main activities if they are ready. • Students continue practicing their learning goals: time table facts using whiteboards, five-minute frenzy. • Complete division and multiplication word problems and check answers using inverse operations. • iMaths activities based on topics.				• Using task cards or students can create their own by cutting out a range of triangles. Students can work in pairs to measure and name triangles based on their angles. • Matching game: match the triangle based on their angles. • Create an artwork (tessellation) using a range of triangles that covers the whole page. • iMaths activities based on topics.	
Reflection/ Registration/ Feedback						