Stage 3 Maths Program

Term 1   Week 8

NSW K-10 Mathematics Syllabus Outcomes

Addition and Subtraction (1)

MA3-5NA – Selects and applies appropriate strategies for addition and subtraction with counting numbers of any size

- Solve word problems and record the strategy used, including problems involving money
- Create a simple budget

2D Space (1) – relate to Area

MA3-15MG - Manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties

- Compare and describe side properties of the special quadrilaterals and special triangles
- Classify and draw regular and irregular two-dimensional shapes from descriptions of their features

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

Assessment

Pre Test - See Attachment

Post Test - See Attachment

https://numeracyskills.com.au/resources/Stage_3_Diagnostics_Task_Job.pdf

Learning Goal - Addition and Subtraction

(refer to outcome)

Success Criteria - Addition and Subtraction (refer to indicators)

TIB - You will need to problem solve using money in real life situations. This includes: calculating your total bill at a store, how much you owe someone, or how much money you have in total. You will need to use subtraction skills to figure out how much someone owes you, or how much money you have left after you've been shopping. Being able to add and subtract money is very important.

Learning Goal - Angles (refer to outcome)

Success Criteria -Angles (refer to indictors)

TIB - Understanding shapes will enable students to be more in tune to the world around them and see the connections between objects, as well as being better able to appreciate artistic works.

Homework - iMaths - Week 7 - 11

Mathematics Weekly Plan

Term – `1` 2 3 4   **Week –** 1 2 3 4 5 6 7 `8` 9 10 11   **Strands** – Addition and Subtraction, 2D Shapes

		Monday	Tuesday	Wednesday	Thursday	Friday
Key Ideas:		Whole Number			Data	
Warm Up		Maths Game	Ninja Maths	Ninja Maths	5 Minute Frenzy	5 Minute Frenzy
Problem of the Day		**Pre-Test: Addition and Subtraction: Solve each of the problems below. Show your working out:** *If a computer costs $599.98 and its price was increased by $96.87, how much is the new price?* *Sara spent $256.86 on her grocery shopping this week. She paid $300.00 in cash, how much change did Sara have?* **Pre-Test: 2D Space:** https://numeracyskills.com.au/resources/Stage_3_Diagnostics_Task_Job.pdf **What is a Quadrilateral?** **Name ONE Quadrilateral?** Identify and name the following triangles and list their properties. TRIANGLE NAME PROPERTIES	*Matthew pays $24 each month for a health club membership. What is the total yearly amount to be budgeted for the membership?*	*Marshall spent the day at a funfair. The admission ticket cost $6.48, and Marshall spent $8.67 on food. How much did Marshall spend in altogether?*	*Vicky spends $3.68 on her morning coffee. How much change will she get is she pays with a $10 note.*	**Post-Test: Addition and Subtraction: Open Ended:** Students create an addition and a subtraction money word problem and solve it using one of the strategies they have learnt this week. **Post-Test: 2D Space: Open Ended:** Students draw a quadrilateral and a triangle and classify them by their name as well as marking e.g. mark if a shape have matching parallel lines or equal sides etc.

Explicit Teaching

Whole class discussions:
What is a budget? *An estimate of income and spending for a certain period of time.*

Example: *Sam has a weekly budget to make sure there is enough money at the end of the week to buy his favourite toys and lollies.*

Explain: **Needs** are the very basic things that people must have to survive. **Wants** are the things that make life more interesting and fun. In other words, you could live without them if you had to. For example, you need food to eat, but you want to eat out with your friends rather than at home. You need a place to live, but you want a TV in your room. You need some clothes to wear, but you want those designer jeans.
A **budget** is a savings plan or a record of actual and estimated income and expenses over a set period of time. Estimated **income** is money that you anticipate earning or receiving for chore completion or special occasions. Budgets contain financial goals. Some **goals** are short-term or long-term while others can be intermediate goals.
Examples of Savings Goals:
Short-term – Saving $10 by the 16th of next month to buy grandma a birthday gift.
Intermediate-term – Save $3 a week for the next three months to buy a new video game.
Long-term – Save $4 per week for the next six months to buy a new bike.

Explicitly model simple budgeting to whole class using link. Use sheet A to model:
http://moneyandstuff.info/wp-content/uploads/2016/12/2BBudgetingLesson_Allowance1.pdf
1. Determine the monthly total allowance **A.**
2. Demonstrate the adding of the birthday money and other money totals together to get their spending total before making a savings deposit.
3. Examine the savings component and discuss the importance of saving for future goals and activities. Subtract the savings total from the subtotal above to learn the amount of money have to spend during the activity.
4. Put the final dollar amount on the Money to Spend line. Completed example below for A:

A Money Allowance - $5.00 a week ($5.00 x 4 = $20.00 per month.)
Birthday Money - $20.00
Other Money - $4.50
$20.00 + $20.00 + $4.50 = Subtotal $44.50
Place 20% in Savings - $8.90
$44.50 - $8.90 = Money to Spend $35.60

5. Place shopping items from activity A on the board. Based upon their needs and wants, as a class, circle items on the handout and total up the dollar amount spent. Explain that we cannot spend more than the dollar amount discussed above.
6. Model budgeting sheet by creating a table for the activity:

Budgeting Money:

Item:	Cost:	Quantity:	Total Cost:
		Overall Cost:	

7. As a class, work out the following: the amount of money spent, how we decided to make our spending choices, and the dollar amount left over (if any).
8. Explain to students that the remaining spending money they have would rollover to the next month and be listed as "other money", if they were to repeat the activity again. **Example:** In activity A, we had $4.50 as **Other Money**, if we were to have money left over, it would be added to this.

Explicitly model how to solve addition and word problems (*involving money/decimals*) using mental and written strategies:

Column Algorithm:
Example:
After buying some marbles for $60.91, Julie has $57.36 left. How much money did Julie have to begin with?
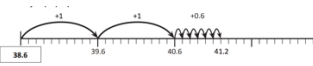
Remember to carry over.

$\begin{array}{r} 1 \\ \$ 60.91 \\ \underline{\$ 57.36 \ +} \\ \$118.27 \end{array}$

Julie had $118.27 to begin with.

Jump Strategy:
First, we jump up by the whole numbers. Then we jump up by the tenths.
Example:
After buying some peanuts for $2.60, Stephen has $38.60 left. How much money did Stephen have to begin with?

38.6 + 2.6 = 41.2

Stephen had $41.20.

Split Strategy:
We split the numbers into whole numbers and decimals.
We then rearrange the problem, adding the whole numbers and decimals separately.
We add the 2 answers.
Example:
After buying some toys for $21.20, Wanda has $3.80 left. How much money did Wanda have to begin with?

21 2 + 3 8 = (21 + 3) + (0.2 + 0.8)
= 24 + 1
= 25

Wanda had $25.00 to begin with.

Compensation Strategy:
Firstly, we round the number closest to a whole number. Then we compensate for the rounding.
Example:
After buying some groceries for $25.36, Richard has $4.58 left. How much money did Richard have to begin with?

31.4 + 5.8 → 31.4 + 6   *I rounded up by 0.2,*
= 37.4 − 0.2   *which means I*
= 37.2   *added extra so I*
need to subtract 0.2

Richard had $37.20 to begin with.

Explicitly model how to solve subtraction word problems (*involving money/decimals*) using mental and written strategies:

Column Algorithm:
Example:
The regular price of a pink T-shirt is $8.45. Sam has a coupon for $7.35 off. How much will Sam pay for the T-shirt?

$\begin{array}{r} \$ 8.45 \\ \underline{- \ \$ 7.35} \\ \$ 1.10 \end{array}$

Sam will pay only $1.10 for the shirt after the coupon is applied.

Jump Strategy:
First, we jump back by the whole numbers. Then we jump back by the tenths.
Example:
Anne has $36 and wants to buy a salad for lunch. A tuna salad costs $3.30. How much change will Anne have?

36 - 3.3
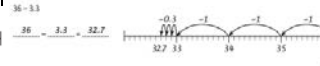
Anne has $32.70 change.

Split Strategy:
We split the numbers into whole numbers and decimals.
We then rearrange the problem, subtracting the whole numbers and decimals separately.
We add the 2 answers.
Example:
Stacey had $31.40 and bought her little sister an ice-cream for $2.30. How much money does Stacey still have?

(31) (4) − (2) (3) = (31 − 2) + (0.4 − 0.3)
= 29 + 0.1
= 29.1

Stacey has $29.10 left

Compensation Strategy:
First, we must round the number closest to the whole number. We must then compensate for the rounding.
Example:
Gary starts with $52.50 and spends $3.90 on lollies. How much money does Gary have left?

52.5 − 3.9 → 52.5 − 4   *We rounded up by 0.1,*
= 48.5 + 0.1   *which means we*
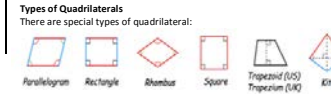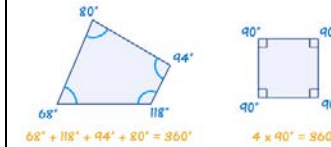= 48.6   *subtracted extra so*
we need to add 0.1

Gary has $48.60 left.

What are Quadrilaterals? *Ask this question to the students to access prior knowledge.*
Students note the definition down in their books:
Defining a Quadrilateral:
Quadrilateral just means "four sides"
Quadrilaterals are a special type of polygon. Quadrilaterals have special properties and can be
(*quad* means four, *lateral* means side).
A **Quadrilateral has four-sides**, it is **2-dimensional** (a flat shape), **closed** (the lines join up), and has **straight** sides. Since it is a **polygon**, you know that it is a two-dimensional figure made up of straight sides. A quadrilateral also has four angles formed by its four sides.

Properties:
A quadrilateral has:
• four sides (edges)
• four vertices (corners)
• interior angles that add to **360 degrees**.
• Model this by drawing examples on the board or using the hovercam to demonstrate that they should equal to 360 degrees.
**Examples:**

68° + 118° + 94° + 80° = 360°   4 × 90° = 360°

Types of Quadrilaterals
There are special types of quadrilateral:

Parallelogram   Rectangle   Rhombus   Square   Trapezoid (US) Trapezium (UK)   Kite

https://www.mathsisfun.com/quadrilaterals.html
- Additional website to explain each quadrilateral in detail.
How to Classify Quadrilaterals:
- Students take notes in their books so they can refer to it throughout the modelling session:
• **Parallel lines:**
Always the same distance apart and never touching.
• **Congruent lines:**
Exactly equal in size and shape. Congruent sides or segments have the exact same length and angles.
• A **trapezium** is a quadrilateral with one pair of parallel sides.
• A **parallelogram** is a quadrilateral with both pairs of opposite sides parallel and congruent.
• A **rectangle** is a parallelogram with 4 right angles.
• A **rhombus** is a parallelogram with 4 sides that are congruent.
• A **kite** is a quadrilateral with two pairs of sides that are congruent and adjacent.
• A **square** is a parallelogram with 4 right angles and 4 congruent sides.
•

Explicit modelling: based on properties.
- Use the above notes to model how to classify the quadrilaterals.
**Examples:**
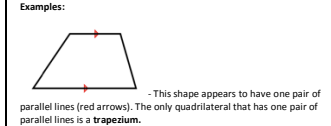
- This shape appears to have one pair of parallel lines (red arrows). The only quadrilateral that has one pair of parallel lines is a **trapezium**.
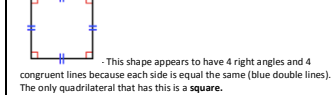
- This shape appears to have 4 right angles and 4 congruent lines because each side is equal the same (blue double lines). The only quadrilateral that has this is a **square**.
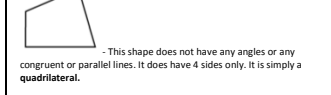
- This shape does not have any angles or any congruent or parallel lines. It does have 4 sides only. It is simply a **quadrilateral**.
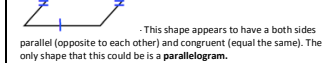
- This shape appears to have a both sides parallel (opposite to each other) and congruent (equal the same). The only shape that this could be is a **parallelogram**.

Access students prior knowledge on the types of 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.

6 mm   6 mm   6 mm
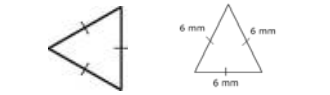
Example 1: All the sides have a length
Example 2: The "marks" indicate of 6 mm. that each of the three sides have the same length.

2. If 2 sides of the triangle are the same length then the triangles is an ISOSCELES triangle.

A   1   1   B   C

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.

2   1   2.5

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 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.

Classify Triangles Worksheet
Classify the triangles by their sides (equilateral, isosceles, scalene).

Example of modelling:

3 cm   4 cm   6 cm
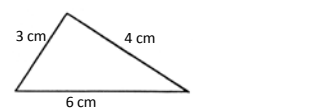
- After measuring each side using a ruler, all sides were different and none were the same. This could only be classified as a 'scalene' triangle.
- Model more examples until students understand

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| | Revision Group - Names | Students will work in mixed ability groups. Provide each group with a different activity sheet from the above link to work out and create a simple budget for their different mounts. Students will draw up a simple budget sheet like the one modelled and write their spending's using their budgets. Additionally, provide each group with a random budget and allow students to use a range of catalogues to budget their **wants** and **needs.** | If groups have not finished their budgeting activity, allow them to continue.

Additional Activity:
Work with this group. Using a range of money word problems, work through the answers by using strategies learnt in modeling lesson (addition problems). | Work with this group. Using a range of money word problems, work through the answers by using strategies learnt in modelling lesson (subtraction problems).

Additionally, group can complete: **Money and Financial Mathematics Worksheets - Year 4 (must have access to Teach Starter account)** | **5/6M Town Groups- Based on Continuum Clusters** | Work with this group. Provide students with a range of triangles already cut out. Using a ruler, work with the students to classify each triangle correctly. Students can then sketch/trace the triangle in their books and label the sides and classify it by name. |
|---|---|---|---|---|---|---|
| **Group Activities** (Revision) | | | | | | |
| **Group Activities** (Middle) | **Middle Group- Names** | | Students are provided with a range of money word problems (extended from Revision Group) and must solve using strategies learnt in modelling session (addition problems). | Students are provided with a range of money word problems (extended from Revision Group) and must solve using strategies learnt in modelling session (subtraction problems).

Additionally, group can complete: **Money and Financial Mathematics Worksheets - Year 5 (must have access to Teach Starter account)** | **5/6M Town Groups- Based on Continuum Clusters** | Provide this group with a range of task cards e.g. https://www.teacherspayteachers.com/Product/Classifying-Triangles-Math-Center-1828123
Students will use the answer sheet to answer each numbered task card relating to classifying triangles.
If some students are ready, they can extend themselves by naming the triangle according to its angle using a protractor: *modelling will be required.* |

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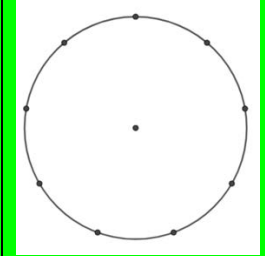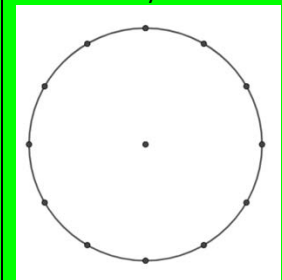| Group Activities | Main Group - Names | Extension: Students in this group will extend themselves by solving a range of budgeting word problems and solve in their books. Example of budgeting questions: http://www.bath.kyschools.us/userfiles/65/Classes/4640/budgeting%20follow%20up.docx | Extension Question/Challenge: https://nrich.maths.org/13541 **Charlie's Money** **Stage: 3 Short** Charlie spent 1/4 of his money on a book and then gave his brother 2/3 of what was left. He then had $9. How much money did he start off with? **Solution:** https://nrich.maths.org/13541/solution | This group works independently solving a range of problems using a range of strategies. Use power point slides to create task cards: **Money and Financial Mathematics - Upper Years Interactive PowerPoint** (*must have access to Teach Starter account*) Additionally, group can complete: **Money and Financial Mathematics Worksheets - Year 6** *(must have access to Teach Starter account)* | **5/6M Town Groups- Based on Continuum Clusters** | *If technology available use, otherwise this lesson provides an alternative to using technology:* Provide each student with the sheet above with 9 points. https://nrich.maths.org/2847 **Right Angles** **Stage: 3** Can you make a right-angled triangle on this peg-board by joining up three points round the edge? Can you work systematically to prove this? **Extension:** Provide a circle with 12 points and complete same activity: **Solution:** https://nrich.maths.org/2847/solution |

Feedback/ Exit Slip	**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.	*Students will write something that they have **learnt** about budgets and something they still **want to know**.*	*Students must use strategies learnt from today's lesson to solve problems:* **Revision:** $13.67 + $3.85 **Middle:** $34.98 + $47.63 **Main:** $8732.98 + $276.87 + $63.98	*Students must use strategies learnt from today's lesson to solve problems:* **Revision:** $26.00 - $12.65 **Middle:** $100.00 - $46.75 **Main:** $50 000 - $ 7 895 – 4 $65.38	**Revision:** Draw a quadrilateral with 2 congruent sides. **Middle:** Draw a quadrilateral with 2 parallel lines. **Main:** Draw and label a parallelogram.	*Each group will draw a type of triangle and classify it by its name and meaning e.g. equilateral triangle; all sides are equal.*
Early Finishes/ Extension	**Extension Question/challenge:** https://nrich.maths.org/13541 **Charlie's Money:** Charlie spent 1/4 of his money on a book and then gave his brother 2/3 of what was left. He then had $9. How much money did he start off with? **Solution:** https://nrich.maths.org/13541/solution • Students complete budgets if not completed. • Provide students with a range of catalogues. They create a simple budget by coming up with their own monthly allowance to buy the things that they **want** and **need.** • Students create a range of money problems for a partner and they will have to solve it in their books. • Students play 'How much is it worth?' using Australian money. They play with a partner and each will have the same budget. The person who creates the most words using their budget/ the closet one who spend all their budget or close to it wins: https://www.teacherspayteachers.com/Product/How-much-is-your-word-worth-Australian-Money-1638407 • Students complete a range of **Mathletics tasks sheets** related to topic.				• Using protractors, classify triangles based on their angles; acute, obtuse, right etc. • Draw a number of triangles for a partner and they have to classify them. • Print game board and question cards: Students play 'Slide and Climb': https://www.tes.com/teaching-resource/types-of-triangles-11259645 • Students complete a range of **Mathletics tasks sheets** related to topic.	
Reflection/ Registration						