

LEVEL: Stage 3 (Year5/6)	CONTENT: Number & Algebra	FOCUS: Money
In the Classroom		
PURPOSE	<ul style="list-style-type: none"> Estimate solutions to problems Use the four operations and brackets to record a number sentence Apply knowledge of addition and subtraction to solve problems involving money Multiply decimals (money) by whole numbers Perform divisions of whole numbers where the result is a decimal Use calculations to compare options and explain which one is the best and why Show the strategy used to solve the problem Explain the strategy used to find a possible solution Check the solution to a problem using a model, visual method or calculations 	
INTRODUCTION	Brief introduction to Good Mathematicians – make a list and place on the board, include teamwork, asking questions, sharing ideas, recording ideas, explaining thinking, persistence, checking solutions, working systematically, learning from mistakes and believing in yourself	
WARM UP	<p>1 through 6 Challenge (Eddie Woo game) You must use the numbers 1 through 6 in order You may use any operation or brackets You may concatenate numbers (e.g. 1,2, 3 could be 12 or 123) Try to devise a pair of solutions whose sum will get you as close as possible to the target number. For example: Target Number 50 $1 \times 2 \times 3 + 4 + 5 + 6 = 21$; $12 + 3 + 4 + 5 + 6 = 30$; $21 + 30 = 51$</p>	
EXPLICIT TEACHING & LEARNING	<p>Pocket Money Imagine your family agreed to give you some pocket money every day for a month! You can choose from the following options:</p> <ol style="list-style-type: none"> \$10 every day \$3 on the first day, \$3.50 on the second, \$4 on the third, and so on, increasing by 50 cents per day \$1 on the first day, \$2 on the second, \$4 on the third, and so on, doubling each day. <p>Questions</p> <ul style="list-style-type: none"> Without doing any working out, which one would you choose, and why? In a month with 31 days, how much money would you have by the end of the month, under each system? <p>Challenge</p> <ul style="list-style-type: none"> In which months would Option 1 be better than Option 2? If your family stopped your pocket money on day 8, which option would give you the most? On which day of the month does Option 3 become the most fruitful? For Option 3, how many days would it be before you became a millionaire? If your parents had \$1000, how many days would it take each option to run out? 	
DISCUSSION/KEY QUESTIONS	<ul style="list-style-type: none"> How can we represent this problem? Which option do you think is better? Why? What strategy can you use to find a solution? Is there a more effective strategy? How can you check that your strategy is correct? Is there another method that could be used to find a solution to this problem? Could digital technology help? A calculator or a spreadsheet Can you use what you have discovered to explain which solution is better and why? 	
DELIBERATIVE PRACTICE	The focus of this activity to challenge students to apply their knowledge of the four operations to solve a problem involving money. Students also need to demonstrate their ability to explain using evidence which option is the best.	
REFLECTION	Help students unpack what they have discovered and encourage students to share what strategies were effective and what things they needed to change. Also reflect as a class on students who were a Good Mathematician and why – have students nominate one another	
RESOURCES	Plastic coins NRICH problems – Pocket Money https://nrich.maths.org/13687	

Curriculum Connections	
CONTENT	<p>NSW SYLLABUS K-10 – STAGE 3 WHOLE NUMBERS 1 Recognise, represent and order numbers to at least tens of millions</p> <ul style="list-style-type: none"> use numbers of any size in real-life situations, including in money problems interpret information from the internet, the media, the environment and other sources that use large numbers (Communicating, Reasoning) <p>ADDITION & SUBTRACTION 1 Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (ACMNA291)</p> <ul style="list-style-type: none"> select and apply efficient mental, written and calculator strategies to solve addition and subtraction word problems, including problems involving money <p>ADDITION & SUBTRACTION 2 Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving addition and subtraction with whole numbers (ACMNA123)</p> <ul style="list-style-type: none"> solve addition and subtraction word problems involving whole numbers of any size, including problems that require more than one operation, e.g. 'I have saved \$40 000 to buy a new car. The basic model costs \$36 118 and I add tinted windows for \$860 and Bluetooth connectivity for \$1376. How much money will I have left over?' <p>FRACTIONS & DECIMALS 2 Solve word problems involving the addition and subtraction of decimals, with and without the use of digital technologies, including those involving money</p> <ul style="list-style-type: none"> use selected words to describe each step of the solution process (Communicating, Problem Solving) <p>Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without the use of digital technologies (ACMNA129)</p> <ul style="list-style-type: none"> divide decimals by a one-digit whole number where the result is a terminating decimal, eg $5.25 \div 5 = 1.05$ • solve word problems involving the multiplication and division of decimals, including those involving money, e.g. determine the 'best buy' for different-sized cartons of cans of soft drink <p>Compare, order, add and subtract integers (ACMNA280)</p> <ul style="list-style-type: none"> add and subtract integers using mental and written strategies determine, by developing patterns or using a calculator, that subtracting a negative number is the same as adding a positive number (Reasoning) apply integers to problems involving money and temperature (Problem Solving)
WHAT CAME BEFORE	Students will be familiar using the four operations to solve problems involving whole numbers. This problem will check to see if students can apply this knowledge to a situation involving money.
WHAT COMES NEXT	Comparing the different options can be done using addition, the challenge will be to see if students can find a more effective method to find and compare the 3 options.
VOCABULARY	Analyse, systematic, addition, subtraction, multiplication, division, strategy, four operations, money, decimals, compare, efficient, table, pattern
MISCONCEPTIONS	Students may not initially identify Option 3 as the best option as they may relate it to multiplying by 2, rather than a doubling problem.
WHAT PROFICIENCIES ARE TO BE UTILISED? Understanding Fluency Problem Solving Reasoning Communicating (NSW) Justifying (NSW)	<p>Year 6 (Australian Curriculum) Understanding includes describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations Fluency includes representing integers on a number line, calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, measuring using metric units and interpreting timetables Problem-solving includes formulating and solving authentic problems using fractions, decimals, percentages and measurements, interpreting secondary data displays and finding the size of unknown angles Reasoning includes explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining the transformation of one shape into another and explaining why the actual results of chance experiments may differ from expected results.</p> <p>STAGE 3 NSW SYLLABUS OUTCOMES</p> <ul style="list-style-type: none"> describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations gives a valid reason for supporting one possible solution over another orders, reads and represents integers of any size and describes properties of whole numbers selects and applies appropriate strategies for addition and subtraction with counting numbers of any size compares, orders and calculates with fractions, decimals and percentages
ASSESSMENT	Reflect the strategies used by the students to find possible solutions to the problem – can students justify their thinking and support their explanation with evidence.