

LEVEL: Year 5	CONTENT: Number & Algebra	FOCUS: Pattern														
In the Classroom																
<b>PURPOSE</b>	<ul style="list-style-type: none"> <li>Count forwards and backwards using fractions, e.g. <math>\frac{1}{2}</math>, 1, <math>1\frac{1}{2}</math>, 2, etc.</li> <li>Use fractions to represent information</li> <li>Identify, continue and create simple number patterns involving addition and subtraction</li> <li>Solve word problems that involve addition and subtraction of fractions with the same denominator</li> <li>Begin to represent and recognise equivalent fractions</li> <li>Use what is known about a pattern to predict missing or future terms</li> </ul>															
<b>WARM UP</b>	<p><b>Pass the Count</b>                      Students get into groups of 4 or 5. A starting number is chosen, as well as a number to count forwards (or backwards) by. Students stand in a circle and use “pass the count” around the circle. The direction of the count travels is determined by students placing their hand on their opposite shoulder. To pass the count left you place your right hand across your body on your left shoulder. To pass the count right you place your left hand across your body and onto your right shoulder. Introduce the game by playing with whole numbers and familiar counting patterns, then move to fractions.</p>															
<b>INTRODUCTION</b>	<p>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 and learning from mistakes.</p>															
<b>EXPLICIT TEACHING &amp; LEARNING</b>	<p><b>Pizza Party</b>                      Marvin is having a pizza party. He has asked his friends how much pizza they would usually eat. They all responded differently.</p> <table border="1" data-bbox="730 958 1166 1350"> <thead> <tr> <th>Friend</th> <th>Amount of pizza</th> </tr> </thead> <tbody> <tr> <td>Adam</td> <td>Half a pizza</td> </tr> <tr> <td>Ben</td> <td>3 slices</td> </tr> <tr> <td>Charlotte</td> <td><math>\frac{2}{8}</math></td> </tr> <tr> <td>Daisy</td> <td>One quarter of a pizza</td> </tr> <tr> <td>Evan</td> <td><math>\frac{7}{8}</math></td> </tr> <tr> <td>Marvin</td> <td>4 slices</td> </tr> </tbody> </table> <p>Marvin knows that his local shop cuts large pizzas into 8 slices. How can Marvin use his friend’s information, so he orders the correct number of large pizzas?</p> <p><b>Challenge</b>                      Use fractions to represent all the information in the table. Write an equation using fractions with the same denominator to show the total.</p> <p><b>Extension</b>                      At another party Marvin bought 7 large pizzas. Everything was eaten. He created this equation to show how much each person ate. How many slices did Marvin eat?</p> $\frac{5}{8} + \frac{4}{8} + \frac{9}{8} + \frac{7}{8} + \frac{4}{8} + \frac{6}{8} + \frac{2}{8} + \frac{3}{8} + \frac{5}{8} + \frac{4}{8} + M = 7 \text{ large pizzas}$		Friend	Amount of pizza	Adam	Half a pizza	Ben	3 slices	Charlotte	$\frac{2}{8}$	Daisy	One quarter of a pizza	Evan	$\frac{7}{8}$	Marvin	4 slices
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<b>DISCUSSION/KEY QUESTIONS</b>	<ul style="list-style-type: none"> <li>What do you notice about the information in this table?</li> <li>How many slices of pizza will each person eat?</li> <li>How many large pizzas will Marvin need to buy?</li> <li>Can you use fractions to represent the information in this table?</li> <li>Is there another way to represent some fractions?</li> <li>How could we represent the amounts as a diagram? Is a circle the best representation?</li> <li>What happens when we add fractions?</li> <li>Why is the denominator important?</li> <li>How can we find out what Marvin ate at the second party?</li> </ul>															

<b>DELIBERATIVE PRACTICE</b>	The focus of this activity is to discover if students can interpret information in a table and use fractions (with the same denominator) to represent different amounts. We want to encourage students to use what they know about to interpret the information in the table before applying their understanding of fractions.
<b>REFLECTION</b>	A discussion about the different ways to represent the information in the table is key. Fractions can help us to connect pieces of information, but in order to compare information it is often easier to put things in the same format. Also reflect as a class on students who were a Good Mathematician and why – have students nominate one another. Remind students of list created at the beginning of the lesson.
<b>RESOURCES</b>	1cm x 1cm grid paper (may be useful to represent the different amounts)

Curriculum Connections	
<b>CONTENT</b>	<p><b>NSW Syllabus Mathematics K-10 – Stage 3.1</b>  <b>Patterns &amp; Algebra 1</b>                      Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction (ACMNA107)</p> <ul style="list-style-type: none"> <li>• identify, continue and create simple number patterns involving addition and subtraction</li> <li>• describe patterns using the terms 'increase' and 'decrease', e.g. for the pattern 48, 41, 34, 27, ..., 'The terms decrease by seven'</li> <li>• create, with materials or digital technologies, a variety of patterns using whole numbers, fractions or decimals, e.g. 14, 24, 34, 44, 54, 64, ... or 2.2, 2.0, 1.8, 1.6, ...</li> <li>• use a number line or other diagram to create patterns involving fractions or decimals</li> </ul> <p><b>Fractions and Decimals 1</b>                      Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator (ACMNA103)</p> <ul style="list-style-type: none"> <li>• solve word problems that involve addition and subtraction of fractions with the same denominator, e.g. 'I eat 15 of a block of chocolate and you eat 35 of the same block. How much of the block of chocolate has been eaten?'</li> </ul>
<b>WHAT CAME BEFORE</b>	Students may be familiar with patterns with whole numbers and patterns with objects but may need further support with investigating patterns with fractions.
<b>WHAT COMES NEXT</b>	Moving from interpreting patterns with fractions, to generating their own fraction patterns with not just like denominators, but gradually to different denominators, as well as making links to multiplication and division, particularly when trying to make fractions equivalent.
<b>VOCABULARY</b>	Repeating pattern, growing pattern, next, before, after, ordinal numbers, first, second, last, copy, continue, create, explain, unit of repeat, objects, rule or function of the pattern (e.g. 2, 4, 6, 8 the function is add 2 or + 2), skip counting, table, analyse, systematic, fraction, numerator, denominator, equation, equivalent, represent, factors, multiplication and division.
<b>MISCONCEPTIONS</b>	Some students have difficulty naming fractions, particularly if they are less familiar. They may know halves and quarters, but eights are seen as being more difficult. Students may also have trouble with using symbols to record the fractions, sometimes confusing the numerators and the denominators.
<b>WHAT PROFICIENCIES ARE TO BE UTILISED?</b>	<p><b>Year 5 (Australian Curriculum)</b>  <b>Understanding</b> includes making connections between representations of numbers, using fractions to represent probabilities, comparing and ordering fractions and decimals and representing them in various ways, describing transformations and identifying line and rotational symmetry  <b>Fluency</b> includes choosing appropriate units of measurement for calculation of perimeter and area, using estimation to check the reasonableness of answers to calculations and using instruments to measure angles  <b>Problem-solving</b> includes formulating and solving authentic problems using whole numbers and measurements and creating financial plans  <b>Reasoning</b> includes investigating strategies to perform calculations efficiently, continuing patterns involving fractions and decimals, interpreting results of chance experiments, posing appropriate questions for data investigations and interpreting data sets</p> <p><b>NSW Syllabus Mathematics K-10 – Stage 3.1 Outcomes</b></p> <ul style="list-style-type: none"> <li>• describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions</li> <li>• selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations</li> <li>• gives a valid reason for supporting one possible solution over another</li> <li>• analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane</li> </ul>

**ASSESSMENT**

Checking to see if students can convert the information in the table into fractions and then use this information to create an equation. Interestingly, the answer to the initial problem is not a whole number so Marvin will have some left over slices of pizza. Hopefully students will make this connection to real life.