

Note: This unit contains many significant **multiplication and division** concepts. You may wish to *spread these sessions across a Semester*, or repeat some lessons across the year. Of course, you may wish to use it as a base on which to add your own ideas, based on your student's needs.

Topic: Multiplication and Division		Year Level: 3			
KEY CONCEPTS: (please insert your relevant curriculum outcomes here)					
*Recall multiplication facts and related division facts.					
*Represent and solve problems involving multiplication using efficient mental and written strategies.					
*Investigate number sequences.					
*Recognise and represent multiplication as repeated addition, groups of and arrays.					
Equipment/Resources: Arrays , games printed (links provided in sessions), printed pre-assessment task sheets (link provided), Mfacts121 Practise Cards printed (link below), 10 sided dice, counters, individual whiteboards and markers, growth mindset activities			Vocabulary: ‘rows of’, array, double, product, multiple, factor, divisible		
SESSION & LEARNING INTENTION (L.I.)	TOOLS/ WARM UP	WHOLE GROUP LEARNING	INDEPENDENT LEARNING	REFLECTION/ SUMMARY	ASSESSMENT and FEEDBACK
Session 1 L.I: We are finding out what we know about multiplication and what we don’t know yet .	Whole class- each student will be given one minute to write down the multiples of 3 (skip count by 3s) (or could be multiples of 4- teacher chooses based on class needs). How far can each student get in one minute ? Students write in their books/whiteboards. After the one minute concludes, the class calls out the list of multiples and students correct their own work. Teacher briefly draws attention to patterns/ strategies . Asks students to look at their own work- what was tricky for you? What strategies can help	Teacher explains: ‘We will be finding out what we already know about multiplication and what we don’t know yet , with this task. Let’s do that now.’	Pre-Assessment Task & Assessment Teacher Talk & Marking Guide Teacher explains- students are to answer the questions and explain their thinking. Teacher to rove and question the students on their thinking- record any observations on the student work. Try to question the students in order to get more information. Students may be reluctant to record their thinking- it’s very useful to rove and gain better insights.	Teacher summarises- ‘Today we were thinking about what we know about multiplication. In the next few sessions, we will be working on strategies for learning our multiplication facts (times tables)’	Collect pre-assessment task and sort into groups according to <i>level of understanding</i> . Notice trends to inform teaching practice for this unit. Assessment Teacher Talk & Marking Guide

	<p>you when counting by 3s? Then, repeat- can students go further and improve on their personal best? Provide one more minute for students to count as far as they can by 3s. <i>Becoming proficient at anything takes effort and practise.</i> Teacher Talk Video: 'Skip Counting and Multiples'</p>				
<p>Session 2 L.I: We are thinking about what multiplication means.</p>	<p>Repeat from session 1: Whole class- each student will be given one minute to write down the multiples of 3 (skip count by 3s) (or could be multiples of 4- teacher chooses based on class needs). How far can each student get in one minute? Students write in their books/whiteboards. After the one minute concludes, the class calls out the list of multiples and students correct their own work. Teacher briefly draws attention to patterns/strategies. Asks students to look at their own work- what was tricky for you? What strategies can help you when counting by 3s? Then, repeat- can students go further and improve on their personal best? Provide one more minute for students to count as far</p>	<p>Ask students to brainstorm the meaning of the 'X' sign. What does it mean? Accept ideas: <i>Times, groups of, multiply, lots of.</i></p> <p>Write '3 x 2' on the board as an example and ask- 'How would you <i>read</i> this number sentence?'</p> <p>Record student variations- '3 times 2', '3 groups of 2', '3 multiplied by 2'</p> <p>Introduce the idea that this sign 'X' also means 'rows of'. Add '3 rows of 2' to the list of variations above.</p> <p>Teacher Talk Video: 'Using Arrays & meaning of the X sign'</p>	<p>Explain to the class: 'We are going to be making rows in our class.' Ask the class to arrange themselves into rows of 6.</p> <p>Observe how they go about it. Reinforce the concept: 'Yes, I can see <i>1 row of 6</i> at the front, now I can see <i>2 rows of 6</i> (pointing it out)...' Etc.</p> <p>'How how many rows of 6 did we make as a class?' e.g. '4 rows of 6'. Were there any 'left overs' to discuss? 'Can anybody write 4 rows of 6 as a number sentence/equation?' (4 x 6) 'That's right, we can read that number sentence/equation as 4 rows of 6.'</p> <p>Independent: Give each student 20 counters/blocks and ask them to make equal 'rows', using up all 20 counters. Rows must be equal. How many different arrays, with equal rows, can they make using all 20 counters? Can they record the</p>	<p>When do we see rows in real life?</p>	

	<p>as they can by 3s. <i>Becoming proficient at anything takes effort and practise.</i> Teacher Talk Video: 'Skip Counting and Multiples'</p>		<p>matching number sentence for each array they make? (10 x 2 = 20, that means 10 rows of 2)</p> <p>*Enabling prompt- students who need support can write the matching equation using words, rather than numbers and symbols (e.g write words to match their arrays: 10 rows of 2 makes 20)</p> <p>*Extending prompt- students who require additional extension can record four facts related to each array they create- <i>two multiplication and two division facts</i>. They can also be given a larger number of counters.</p> <p>*Click here Intro into 'Rows of' & 'Arrays' for further practical ideas which may be used, if your class needs further development of arrays and rows concepts. Or you may use these ideas at another time.</p>		
<p>Session 3 L.I.: We are learning about arrays.</p>	<p>Count aloud as a class, by 3s or 4s. Note patterns or strategies. Reiterate that these are the <i>multiples of 3 or 4</i>.</p>	<p>Each student to have an individual whiteboard/ workbook in front of them</p> <p>Teacher writes 3 x 5 on board. 'Can you read it to me?' Accept various responses: '3 times 5', '3 groups of 5', '3 multiplied by 5' etc.</p> <p>'Today we're thinking about 'rows of'. So let's read it as- 3 rows of 5.' Ask students to draw 3 rows of 5.</p> <p><u>Teacher note-</u> many children will</p>	<p>Use a pack of commercially bought, multiplication fact (times tables), playing cards. Share them around on the student's tables. Students choose a card, write the multiplication fact and draw the matching array. They can also write the matching turn around fact.</p> <p>*Enable: students needing extra support can draw the 'groups of' model initially, until they start to understand the link to arrays, then draw both. Also direct</p>	<p>Why could it be useful to use arrays instead of 'groups of' as a model for multiplication?</p>	

		draw 5 rows of 3 . This is not the array they were asked to draw. Discuss with class. Does it matter? If you needed to set out <i>3 rows of 5 chairs</i> for a concert, would it be the same if you set out <i>5 rows of 3 chairs</i> instead? You will get the same answer/product, but <u>3 rows of 5</u> is the <i>turn around fact</i> for <u>5 rows of 3</u> . Teacher note: you can literally turn the array around 90°, to show the two arrays.	*Extend: for high attainers- introduce the ' Making Arrays ' game ('Paired Game' or 'Individual Game' version)- see if they can read the instructions and begin independently.		
Session 4 L.I. We are learning about arrays .	Play 'Multiples Game' (Teacher chooses which multiple they would like to focus on- perhaps 3 or 4).	Discuss- What is an array? Search 'kids maths dictionary' online and find a definition of array . Teacher summarises: 'It's a neat way to show multiplication. It can be easier to see and clearer than drawing 'groups of'.' Now ask the students to draw the matching array for: 3 x 5 (3 rows of 5), 6 x 4 (6 rows of 4)- have they got the rows and columns correct? Does it matter which way around we draw the array? Teacher note: <i>it does matter, as we want the students to create a clear mental image of each multiplication fact. Having these images in their mind's eye, helps develop flexible strategies.</i>	Play the ' Making Arrays ' game in pairs (see 'Paired Game' instructions). *Enable: See Online Practise section Multiplication Beginner Level for those needing further explanation of concepts. There is practise, an explainer video and activities which can be printed.	Why could it be useful to use arrays instead of 'groups of', as a model for multiplication?	

<p>Session 5 L.I: We are investigating efficient strategies for the multiplication facts.</p>	<p>Show a short Growth Mindset video to help students understand effort and persistence are key to success when learning new things, such as multiplication facts. Our minds are malleable. E.g. Growth Mindset- Tortoise and the Hare. There are plenty more growth mindset clips for kids available!</p>	<p>View - '2 x Strategy' video</p> <p>Ask students to do the examples at the end of the video.</p> <p><i>Draw their attention to the idea that we are moving away from skip counting by 2s to work these out.</i></p> <p><i>It is more efficient when you see 2 x _ or _ x 2, to use the doubling strategy. There are less steps involved!</i></p>	<p>In pairs, students play '2 x Game'</p> <p>*Extend- play an adjusted version of the '2 x _ Game', increasing the number range, so that high attainers are multiplying 2 x 2-digit numbers (refer to instructions on game).</p> <p>*See 'Teacher Talk' for ideas and tips on teaching the Twos Facts. You will also find ideas about student prerequisite skills required for learning this strategy.</p>	<p>How do you double numbers? <i>Strategy chat.</i></p> <p>E.g. how would you solve double 9? Double 12? Double 35?</p> <p><i>Look for efficient strategies such as double the tens, then the ones, then add together for the total.</i></p>	
<p>Session 6 L.I: We are investigating strategies for the multiplication facts.</p>	<p>Count aloud as a class, by 3s or 4s. Note patterns or strategies. Reiterate that these are the <i>multiples of 3 or 4</i>.</p>	<p>Teacher writes some basic multiplication facts on the board and asks students to share ideas/strategies for solving (2 x 6, 3 x 4, 2 x 5, 3 x 6)</p> <p>Begin recording on a class chart- E.g. <u>'Multiplication Facts – Our Strategy List'</u></p> <ul style="list-style-type: none"> 2 x anything- means you can double it <p>View '3 x Strategy' video</p> <p><i>(It's a good idea to start with the class building up their own strategy list, rather than giving them the pre-determined list of strategies.</i></p> <p><i>The Mfacts121 Strategy List can be brought in later and linked to</i></p>	<p>Game- '3 X Game' in pairs.</p> <p>*See 'Teacher Talk' for ideas and tips on teaching the Threes Facts. You will also find ideas about student prerequisite skills required for learning this strategy.</p> <p>*Extend- play an adjusted version of the '3 x _ Game', increasing the number range, so that high attainers are multiplying 3 x 2-digit numbers (refer to instructions on game).</p>	<p>Had you ever thought of using the 3 x _ strategy before?</p>	

		<i>what students have developed themselves).</i>			
Session 7 L.I: We are investigating strategies for the multiplication facts.	<p>Mfacts121 Practise Cards- students use a Red practise card. (either Apprentice or Master level)</p> <p>These cards should be photocopied <i>back-to-back</i> so that you have questions on the front and <i>questions with answers</i> on the back. Best to do it on <i>coloured card</i> and keep sets in the classroom for regular use.</p> <p>Students will be given two minutes to see how many they can answer. <i>They must write each question and the answer in their book.</i></p> <p>When time is up, students turn their Practise Card over and self correct (answers will be on the back of their card).</p> <p>Next, teacher picks out a multiplication question to discuss- E.g. 2 x 4 ask: <i>what is your strategy?</i> or <i>'How did you know the answer?'</i> Discuss ideas.</p> <p>Now repeat the practise</p>	<p>View the '0 X Strategy' video</p> <p>Teacher chooses facts from the Red Mfacts121 Practise Cards and asks students to share their strategies.</p> <p>Continue recording on a class chart-</p> <p>'Multiplication Facts – Our Strategy List'</p> <ul style="list-style-type: none"> ● 0 x anything- always equals 0 	Rotational Activities: <ol style="list-style-type: none"> 1) Multiplication Facts Online Practise: Students login to mfacts121.com and practise recall of facts, starting at 'Red' level or Multiplication Beginner Level for those needing further explanation of concepts OR Self-Directed Tasks, starting at Red (differentiate according to student need) 2) Game- '3 X Game' or '2 X Game' from last sessions 3) Worksheet- 2 x and 3 x facts 	What helps you learn your multiplication facts?	

	<p>cards. Provide two minutes again. Can the students improve on their score?</p> <p>Aim is to continue to improve on personal best, Teacher Talk Video: 'Practise Cards'.</p> <p>*Note: if your students have already logged into mfacts121.com with their personal logins and have begun working through the coloured levels of facts, you can have a class set of all colours of practise cards ready for your classroom. Students can practise whichever level they are working on or wish to revise.</p>				
<p>Session 8</p> <p>L.I: We are investigating strategies for the multiplication facts.</p>	<p>Play 'Multiples Game' (Teacher chooses which multiple they would like to focus on).</p>	<p>View '3 X Strategy Video' (View again. These concepts and strategies need to revisited often).</p> <p>Consider introducing the Mfacts121 Strategy List , identifying which ideas the class has already thought of themselves.</p> <p>*See 'Teacher Talk' for ideas and tips on teaching the Threes Facts. You will also find ideas about student prerequisite skills required for learning this strategy.</p>	<p>Game- 'Double' or 'Double, plus one more group' game.</p> <p>*Enable: Set students who need help with learning their doubles facts to work on a tablet or desktop, preferably with headphones. Complete assigned Self-Directed Task, 'Red' level.</p> <p>*Extend: Set high attainers up on a tablet or desktop, preferably with headphones. Complete assigned Self-Directed Task.</p>	<p>Growth Mindset Reflection: How have you grown your maths brain? Growing Your Maths Brain, reflection sheet</p>	
Session 9	Play 'Multiples Game'	<i>Once multiplication facts are</i>	2 options for activities:	Have you used	Assessment-

<p>L.I: We are using multiplication to help with division.</p>	<p>(Teacher chooses which multiple/strategy they would like to focus on).</p>	<p><i>consolidated, division facts can be introduced, by relating them to multiplication.</i></p> <p>‘Fact families’ - write a multiplication fact on the board e.g. 3 x 5 = 15</p> <p>Ask students to draw the array; 3 rows of 5. Use the array to explore these facts-</p> <p>*3 rows of 5 is 15 ($3 \times 5 = 15$) *5 rows of 3 is 15 ($5 \times 3 = 15$) (turn the array 90 degrees to illustrate this).</p> <p>The array also helps with division. Let’s think about:</p> <p>*$15 \div 3 = ?$ Encourage students to ‘<i>think multiplication</i>’ to solve division facts- i.e. think: <i>3 whats are 15?</i> Or $3 \times ? = 15$ 3 fives are 15. Highlight or ring each row of five. 3 fives are 15 (or 3 rows of 5 is 15) Now turn the array 90 degrees around so it’s showing 5 rows of 3. *$15 \div 5 = ?$</p>	<p>Developing the concept with arrays: (modified from Session 3) Use a pack of commercially bought, multiplication fact (times tables), playing cards (or make your own). Share them around on the student’s tables. Students choose a card and draw the matching array. They then write the division and multiplication facts matching that array- i.e. the ‘fact family’ for that array.</p> <p>Worksheets: (students who don’t need the array model) Fact Families- Connecting Multiplication and Division</p> <p>*Extend/Early Finishers: Play online division games. <i>Teacher to search for free games online.</i></p>	<p>multiplication facts to help with your division facts before?</p>	<p>Teacher logs onto mfacts121.com to check where each student is up to, on their fact levels. Click on ‘results’ button to see.</p>
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<p>Session 10</p> <p>REPEAT SESSION 9</p> <p>(modify and consolidate based on class's needs)</p> <p>L.I: We are using multiplication to help with division.</p>	<p>Play 'Multiples Game' (Teacher chooses which multiple/strategy they would like to focus on).</p>	<p>'Fact families' - give a X fact on the board e.g.</p> <p>$2 \times 6 = 12$</p> <p>Students to draw the array, 2 rows of 6. Use the array to discuss and illustrate these facts-</p> <p>*2 rows of 6 is 12 ($2 \times 6 = 12$)</p> <p>*6 rows of 2 is 12 ($6 \times 2 = 12$) ('Turn around fact')</p> <p>*$12 \div 6 = ?$</p> <p>Encourage students to '<i>think multiplication</i>' to solve division facts- i.e. think: <i>6 whats are 12?</i></p> <p>Or $6 \times ? = 12$</p> <p>6 twos are 12.</p> <p>Highlight or ring each row of two.</p> <p>6 twos are 12 (or 6 rows of 2 is</p>	<p>Complete or modify the 2 options for activities, as per previous session:</p> <p>Developing the concept with arrays: (modified from Session 3) Use a pack of commercially bought, multiplication fact (times tables), playing cards (or make your own). Share them around on the student's tables. They must choose a card and draw the matching array. They then write the division and multiplication facts matching the array- i.e. the 'fact family' for that array.</p> <p>Worksheets: (students who don't need the array model)</p> <p>Fact Families- Connecting Multiplication and Division</p>	<p>Are you using your multiplication facts, to help with your division facts?</p>	

		<p>12)</p> <p>Now turn the array 90 degrees around so it's showing 2 rows of 6.</p> <p>*$12 \div 2 = ?$</p> <p>Encourage students to 'think multiplication' to solve division- i.e. think: 2 <i>whats are 12?</i></p> <p>Or $2 \times ? = 12$</p> <p>2 sixes are 12.</p> <p>Next, highlight or ring each row of six. 2 sixes are 12 (or 2 rows of 6 is 12)</p> <p>Students then write the 4 facts in the fact family</p> <p>$2 \times 6 = 12$</p> <p>$6 \times 2 = 12$</p> <p>$12 \div 6 = 2$</p> <p>$12 \div 2 = 6$</p>	<p>*Extend/Early Finishers:</p> <p>Play online division games.</p> <p><i>Teacher to search for free games online.</i></p>		
<p>Session 11</p> <p>L.I: We are reflecting on what we have learnt about multiplication.</p>	<p>Game- ‘Double’ or ‘Double, plus one more group’ game.</p> <p>(Introduced in session 8)</p>		<p>Pre/ Post Assessment Task</p> <p>Students are given back their original assessment task and they now add to /change their answers based on their new learnings (using a different colour pen/pencil).</p> <p>Teacher to rove and question the students on their thinking- record any observations on the student work.</p> <p><i>Question the students to get more information.</i></p>	<p>Students look at their results and reflect on what they have learnt or improved on.</p>	<p>Correct the Post Assessment as a class.</p> <p>Collect and look for new learnings and improvement for each student.</p>

Other Strategy Videos suggested for this year level:

(to use across the year, in 'Tools/Warm Up time'- add to your *bank of strategies* etc.)

- 1 x _ = Think 'the product* will be the other factor*'
- 10 x _ = Think 'make it 10 times bigger with a zero'
- Commutativity: Think 'use your turn around facts'
- Extension/challenge: Fives Facts: 5 x _ = Think '10 x _ then halve it'