DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES

Number and Algebra: Patterns and Relationships Level 1 (Year O/NE) Teacher Booklet

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Task 1	Marise likes to eat her jellybeans like this:					
	Use the jellybeans to copy how Marise eats them.					
	Draw the jellybeans and colour them in. What is the unit of repeat?					
	How many jellybeans did she eat? How many red jellybeans? How many blue jellybeans?					
	What colours would the missing jellybeans be?					
Big ideas	Patterns are sequences (repeating or growing) made of numeric or					
	spatial elements governed by a rule.					
	Patterns exist both in the world and in mathematics. The same					
	pattern structure can be found in many different forms (e.g.,					
	numbers, snapes, colours, and rnythm).					
	from a rule. To find the rule for a pattern, you need to identify the					
	unit of the pattern (what is repeated or what grows)					
	Identifying the rule of a pattern brings predictability and allows					
	generalisations to be developed.					
Curriculum links	NA-1-1: Use a range of counting, grouping, and equal-sharing					
	strategies with whole numbers and fractions.					
	NA-1-2: Know the forward and backward counting sequences of					
	whole numbers to 100.					
	NA-1-4: Communicate and explain counting, grouping, and equal sharing strategies, using words, numbers, and nictures					
	NA-1-5: Generalise that the next counting number gives the result					
	of adding one.					
	NA-1-6: Create and continue sequential patterns.					
Learning Outcomes:	Reproduce a pattern using objects, drawings, or symbols.					
Students will be able	• Continue patterns.					
to:	• Explain and justify the pattern in relation to ordinal					
	aspects of counting.					
	• Explain that a pattern has consistency.					
Mathematical	Unit of repeat, pattern, sequence.					
language						

Sharing back/Connect	 Select students to share who can recognise and explain the <i>ABABAB</i> structure of the unit of repeat. Facilitate students to notice this pattern structure and use this to solve the questions. Connect: Ask students to make the same pattern sequence using different materials. Give them concrete material (e.g., counters, shapes, teddy-bears, etc) and ask them to build two different versions. Then ask them to create the same pattern using either sound or actions. 				
Teacher Notes	 What is the same about all of these pattern sequences? Have plastic jellybeans, counters, shapes, and teddy-bears, available. If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the same and what is different. Facilitate the students to notice the pattern is made of chunks (unit of repeat). This could be linked to multiplication when identifying the number of elements in the pattern. Introduce the term <i>unit of repeat</i> to the students. Support the students to use the unit of repeat and grouping to work out the number of jellybeans rather than counting individually. After students have drawn the jellybean pattern, ask them to circle the unit of repeat or chunks of the pattern. Support students to notice that each unit of repeat should be the same and all jellybeans should be included. For the independent task, provide students with material to 				
Independent Tasks	Copy the pattern. What is the unit of repeat? Circle this. How many blocks are there altogether? How many yellow blocks? How many green blocks?				



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Task 2	Kaiser likes making trains with cubes. This is his first train:						
	Conv the pattern						
	Copy the pattern. Represent the train using letters and circle the unit of repeat						
	How many cubes in his first train?						
	This is his second train:						
	Copy the pattern.						
	Represent the train using letters and circle the unit of repeat.						
	How many cubes in his second train?						
	This is his third train:						
	Copy the pattern.						
	Represent the train using letters and circle the unit of repeat.						
	How many cubes in his third train?						
Big ideas	Patterns are sequences (repeating or growing) made of numeric or						
	spatial elements governed by a rule.						
	Patterns exist both in the world and in mathematics. The same						
	pattern structure can be found in many different forms (e.g.,						
	A pattern can be described using a rule or you can create a pattern						
	from a rule. To find the rule for a pattern, you need to identify the						
	unit of the pattern (what is repeated or what grows).						
	Identifying the rule of a pattern brings predictability and allows						
	generalisations to be developed.						
Cumiosland Lasta	Generalisations can be expressed with both words and symbols.						
	NA-1-1: Use a range of counting, grouping, and equal-sharing						
	NA-1-2: Know the forward and backward counting sequences of						
	whole numbers to 100.						
	NA-1-4: Communicate and explain counting, grouping, and						
	equal-sharing strategies, using words, numbers, and pictures.						
	NA-1-6: Create and continue sequential patterns.						

Learning Outcomes: Students will be able to: Mathematical	 Reproduce a pattern using objects, drawings, or symbols. Continue patterns. Explain and justify the pattern in relation to ordinal aspects of counting. Predict a point in a sequential pattern. Explain that a pattern has consistency. 					
language	Unit of repeat, pattern, sequence.					
Sharing back/Connect	Select students to share who use the unit of repeat to group the cubes to work out the total and use numbers to record this (e.g., 4 chunks/unit of repeats makes 8 cubes). Otherwise, model this to the students. Ask students how they could use the unit of repeat to find the total number of items, support them to generalise that the total number of cubes is double the number of units of repeat.					
	Use a hundred board and ask the student to say which numbers to turn to cover the number that the white cubes match (up to 20). Ask the students: what do you notice about these numbers? Support students to see the relationship between the colours and the numbers, e.g., white cubes will fall on even numbers or multiples of two and blue cubes on odd numbers.					
	Ask students to predict what colour cubes would be for numbers: 28, 31, 35, 40.					
Teacher Notes	 Have cubes or multi-link cubes, and a hundred board. If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the same and what is different. Facilitate the students to use the term <i>unit of repeat</i> or chunks. Support students to notice that each unit of repeat should be the same and all cubes should be included. Expect students to represent using numbers and words and help them make links to multiplication. For the independent task, have cubes or multi-link cubes available. 					
Independent Tasks	Kaiser likes making trains with cubes. This is his first train: Copy the train. Represent the train using letters and circle the unit of repeat. How many cubes in his first train?					

	This is his second train:						
	Copy the train.						
	Represent the train using letters and circle the unit of repeat.						
	How many cubes in his second train?						
	Make your own train.						
	What is your own train. What is your unit of repeat?						
	what is your unit of repeat?						
	Ask a friend to copy your train.						
Anticipations							

Task 3	Lilianne is making a snake with cubes. This is her first snake:						
	Copy the pattern. What is the unit of repeat? How many cubes in the unit of repeat? How many cubes are there altogether? Draw a picture of the snake and colour it.						
	What colours would the missing cubes be?						
	Use the equipment to make a second snake that matches but uses different colours. Extend this by one unit of repeat.						
	Use the equipment to make another pattern that matches and extend this by one unit of repeat.						
	Make another pattern that matches using sounds or actions and extend this by one unit of repeat.						
Big ideas	Patterns are sequences (repeating or growing) made of numeric or spatial elements governed by a rule.						
	Patterns exist both in the world and in mathematics. The same						
	numbers, shapes, colours, and rhythm).						
	A pattern can be described using a rule or you can create a pattern						
	from a rule. To find the rule for a pattern, you need to identify the						
	Identifying the rule of a pattern brings predictability and allows						
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	Generalisations can be expressed with both words and symbols.						
Curriculum links	NA-1-1: Use a range of counting, grouping, and equal-sharing						
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	NA-1-6: Create and continue sequential patterns.						
Learning Outcomes:	• Reproduce a pattern using objects, drawings, or symbols.						
Students will be able	Continue a repeating pattern.						
to:	• Explain and justify the pattern in relation to ordinal						
	aspects of counting.						

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How many blocks are there altogether?	How many blocks are there altogether?						
now many red blocks?	How many block blocks?	How many red blocks?					





	Patterns exist both in the world and in mathematics. The same					
	pattern structure can be found in many different forms (e.g.,					
	numbers, shapes, colours, and rhythm).					
	A pattern can be described using a rule or you can create a pattern					
	from a rule. To find the rule for a pattern, you need to identify the					
	unit of the pattern (what is repeated or what grows).					
	Identifying the rule of a pattern brings predictability and allows					
	generalisations to be developed.					
	Generalisations can be expressed with both words and symbols.					
Curriculum links	NA-1-1: Use a range of counting, grouping, and equal-sharing					
	strategies with whole numbers and fractions					
	NA-1-2. Know the forward and backward counting sequences of					
	whole numbers to 100					
	NA-1-3: Know groupings with five, within ten and with ten					
	NA-1-4: Communicate and explain counting grouping and					
	equal sharing strategies using words numbers and nictures					
	NA-1-6 . Create and continue sequential patterns					
Loorning Outcomos	Depreduce a pottern using chicate drawings or symbols					
Students will be able	• Reproduce a pattern using objects, drawings, or symbols.					
students will be able	• Continue a repeating pattern and identify missing elements					
	in the sequence.					
	• Explain and justify the pattern in relation to ordinal aspects of counting					
	aspects of counting.					
	• Predict far elements in a sequential pattern.					
	• Explain that a pattern has consistency.					
Mathematical	Unit of repeat, pattern, sequence, element, rule.					
Mathematical language	Unit of repeat, pattern, sequence, element, rule.					
Mathematical language Sharing	Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to					
Mathematical language Sharing back/Connect	Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and					
Mathematical language Sharing back/Connect	Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them.					
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Mathematical language Sharing back/Connect Teacher Notes	 Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them. Connect: Use a hundred board and ask students to colour the blue pegs and pink pegs in relation to the numbers (two different colours). What patterns do you notice? What rule could you use to predict which number the blue peg would be? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. 					
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Mathematical language Sharing back/Connect Teacher Notes	 Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them. Connect: Use a hundred board and ask students to colour the blue pegs and pink pegs in relation to the numbers (two different colours). What patterns do you notice? What rule could you use to predict which number the blue peg would be? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. Have pegs, and a hundred board available. If students have difficulty making the pattern, support 					
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Mathematical language Sharing back/Connect Teacher Notes	 Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them. Connect: Use a hundred board and ask students to colour the blue pegs and pink pegs in relation to the numbers (two different colours). What patterns do you notice? What rule could you use to predict which number the blue peg would be? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. Have pegs, and a hundred board available. If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the 					
Mathematical language Sharing back/Connect Teacher Notes	 Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them. Connect: Use a hundred board and ask students to colour the blue pegs and pink pegs in relation to the numbers (two different colours). What patterns do you notice? What rule could you use to predict which number the blue peg would be? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. Have pegs, and a hundred board available. If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the same and what is different 					
Mathematical language Sharing back/Connect Teacher Notes	 Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them. Connect: Use a hundred board and ask students to colour the blue pegs and pink pegs in relation to the numbers (two different colours). What patterns do you notice? What rule could you use to predict which number the blue peg would be? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. Have pegs, and a hundred board available. If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the same and what is different. 					
Mathematical language Sharing back/Connect Teacher Notes	 Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them. Connect: Use a hundred board and ask students to colour the blue pegs and pink pegs in relation to the numbers (two different colours). What patterns do you notice? What rule could you use to predict which number the blue peg would be? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. Have pegs, and a hundred board available. If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the same and what is different. Facilitate the students to notice the pattern is made of chunks (unit of repeat). Use the term unit of repeat with 					
Mathematical language Sharing back/Connect Teacher Notes	 Unit of repeat, pattern, sequence, element, rule. Select students to share who use patterns and multiplication to work out the far elements. If students do not use patterns and multiplication, then model this to them. Connect: Use a hundred board and ask students to colour the blue pegs and pink pegs in relation to the numbers (two different colours). What patterns do you notice? What rule could you use to predict which number the blue peg would be? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. Have pegs, and a hundred board available. If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the same and what is different. Facilitate the students to notice the pattern is made of chunks (unit of repeat). Use the term <i>unit of repeat</i> with the students. 					

	• Facilitate the students to notice that elements in the pattern					
	can be found without creating the whole pattern by instead					
	noticing and using relationships and patterns.					
	• For the independent task, have pegs or concrete material					
	for the students to use.					
Independent Tasks	Talia is playing with the washing pegs and makes this pattern:					
	Use the picture cards to copy the pattern.					
	What is the unit of repeat?					
	Draw the missing pegs.					
	Talia continues the pattern using the pegs.					
	What colour would the 15th peg be?					
	What colour would the 19 th peg be?					
	What colour would the 30th peg be?					
Anticipations						



Level 1 Year 0/NE: Number and Algebra: Patterns and Relationships

	NA-1-6: Create and continue sequential patterns.					
Learning Outcomes:	• Reproduce a pattern using objects, drawings, or symbols.					
Students will be able	• Continue a repeating pattern and identify missing elements					
to:	in the sequence.					
	• Explain and justify the pattern in relation to ordinal					
	aspects of counting.					
	• Predict far elements in a sequential pattern.					
	• Explain that a pattern has consistency.					
Mathematical	Unit of repeat, pattern, sequence, element, rule.					
language						
Sharing	Select students to share who use patterns and multiplication to					
back/Connect	work out the far elements. If students do not use patterns and					
	multiplication, then model this to them.					
	Connect:					
	Use the flower cards to show each garland vertically and write the					
	Use the flower cards to show each garland vertically and write the corresponding numbers.					
	corresponding numbers.					
	7 1					
	- <u>~ 3</u>					
	4					
	C 🔊					
	6					
	27					
	* 8					
	Etc up to 20					
	W/hard mattheway and the 2					
	What patterns do you notice?					
	What colour would the 40 th flower be?					
	What colour would the 41 st flower be?					
Teacher Notes	Have flower pictures available.					

	 If students have difficulty making the pattern, support them to notice by putting their pattern next to a picture of the correct pattern and ask them to identify what is the same and what is different. Facilitate the students to notice the pattern is made of chunks (unit of repeat). Use the term <i>unit of repeat</i> with the students. Facilitate the students to notice that elements in the pattern can be found without creating the whole pattern by instead noticing and using relationships and patterns. For the independent task, have flowers and other concrete material (e.g., counters, cubes, teddies) for the students to use. 						
Independent Tasks	Anshuma is helping to make mala for her cousin's wedding. Each garland uses the following pattern:						
	garland uses the following pattern:						
	Use the picture cards to copy the pattern.						
	What is the unit of repeat?						
	└───ぷ ∻∻∻ ♀́ ○∻∻∻ ∻ ◇◇◇□◇□◇◇◇◇◇◇						
	Draw the missing flowers.						
	Use different material and make the same pattern.						
Anticipations	•						

Task 6	Kiriwai is lookin	ng at the piwaka	waka in her garde	en.		
	She decides to count all the tails for the piwakawaka that she sees. If there was one piwakawaka, how many tails would there be? If there was two piwakawaka? If there was four piwakawaka?					
	She decides to count all the eyes for the piwakawaka that she sees. If there was one piwakawaka, how many eyes would there be? If there was two piwakawaka? If there was four piwakawaka?					
	Now she decides to count all the eyes and tails for the piwakawaka that she sees.					
	If there was one piwakawaka, how many eyes and tails would there be? If there was two piwakawaka? If there was four piwakawaka?					
	Complete the tal	ble				
	Number of piwakawakaTailsEyesTails and eyes					
	1					
	2					
Big ideas	Patterns are sequences (repeating or growing) made of numeric or					
	spatial elements	governed by a r	ule.			
	Patterns exist both in the world and in mathematics. The same					
	pattern structure can be found in many different forms (e.g.,					
	numbers, shapes, colours, and rhythm).					
	from a rule. To find the rule for a pattern, you need to identify the					
	unit of the pattern (what is repeated or what grows).					
	Identifying the rule of a pattern brings predictability and allows					
	generalisations to be developed.					
Cuminulum links	Generalisations can be expressed with both words and symbols.					
	NA-1-1: Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions					
	NA-1-2: Know	the forward and	backward countil	ng sequences of		
	whole numbers to 100.					
	NA-1-4: Communicate and explain counting, grouping, and					
	equal-sharing strategies, using words, numbers, and pictures.					

	NA-1-6: Create and continue sequential patterns.				
Learning Outcomes:	• Reproduce a pattern using objects, drawings, or symbols.				
Students will be able	• Continue repeating patterns.				
to:	• Explain and justify the pattern in relation to ordinal				
	aspects of counting.				
	• Generalise the number of elements in a repeating pattern				
	for certain points.				
	• Explain that a pattern has consistency.				
Mathematical language	Unit of repeat, pattern, sequence.				
Sharing	Select students to share who use grouping/multiplication or				
back/Connect	patterns and relationships to work out the number of eyes or tails				
	and eyes together.				
	Connect:				
	Find three patterns across the table and three patterns down the				
	table. If Kiriwai saw 10 piwakawaka, how many tails would she see? If Kiriwai saw 30 tails, how many eyes would she see?				
	If Kiriwai saw 40 eyes, how many tails would she see?				
Teacher Notes	• Have the pictures of piwakawaka printed onto individual				
	cards for students to use if necessary.				
	• To complete the table, show the corresponding number of				
	piwakawaka cards, continue to use this process for the five				
	piwakawaka.				
	• Facilitate the students to notice the relationship between				
	the number of piwakawaka and total number of eyes and				
	also total number of eyes and tails. This can be connected				
	back to the relationship to multiplication as illustrated in				
	Task 2.				
	• Notice students who use grouping of multiplication to				
	and 3 elements so 12 in total) OP relational reasoning				
	$(e \sigma)$ the number of tails matches the number of the unit of				
	piwakawaka)				
	• For the connect, patterns in the table vertically may				
	include sequential or single variational thinking (e.g., the				
	number of tails increase by one, the total increases by 3				
	each time) or horizontally co-variational or relational				
	thinking (e.g., the eyes are double the number of tails).				
Independent Tasks	Roman sees some children riding tricycles at the park				
	Roman sees some emilien frame uteyetes at the park.				

	A				
	He decides to co	ount the numbe	er of wheels and c	children that he	
	sees.				
	Complete the ta	ble:			
	Number of	Wheels	Children	Wheels and	
	tricycles			children	
	1				
	2				
	4				
	5				
	Write three patt	erns that you n	otice going down	l.	
	Write three natt	erns that you n	otice going acros	s	
Anticipations		erns that you h	otice going deros	5.	
Ĩ					

Level 1 Year 0/NE: Number and Algebra: Patterns and Relationships





Learning Outcomes: Students will be able to: Mathematical language Sharing back/Connect	 Reproduce a pattern using objects, drawings, or symbols. Continue repeating patterns. Explain and justify the pattern in relation to ordinal aspects of counting. Generalise the number of elements in a repeating pattern for certain points. Explain that a pattern has consistency. Unit of repeat, pattern, sequence. Select students to share who use grouping/multiplication or patterns and relationships to work out the number of flowers.
Dack/Connect	Connect: Find three patterns across the table and three patterns down the table. If Mereana had 4 yellow flowers, how many pink flowers would there be?
Teacher Notes	 If Mereana had 5 yellow flowers, how many flowers would there be altogether? During the launch, ask students to share where they see patterns in their lives. Reinforce discussion that patterns have repeating elements. To complete the table, use a piece of card and cover up the flowers so only one unit of repeat is visible, for the second set, use the card to show only two units of repeat, continue to use this process for the three units of repeat. Facilitate the students to notice the relationship between the number of the unit of repeat and total number of flowers. This can be connected back to the relationship to multiplication as illustrated in Task 2. Notice students who use grouping or multiplication to work out the number of flowers in total) OR relational reasoning (e.g., the number of yellow flowers matches the number of the unit of repeats). For the connect, patterns in the table vertically may include sequential or single variational thinking (e.g., the yellow flowers increase by one, the total flowers increases by 5 each time) or horizontally co-variational or relational thinking (e.g., the pink flowers are four times the number of students who relational thinking (e.g., the pink flowers are four times the number of students who have are provided and the number of the total flowers increases by 5 each time) or horizontally co-variational or relational thinking (e.g., the pink flowers are four times the number of the unit flowers increases by 5 each time) or horizontally co-variational thinking (e.g., the pink flowers are four times the number of the unit flowers increases by 5 each time) or horizontally co-variational or relational thinking (e.g., the pink flowers are four times the number of the unit flowers flowers increases by 5 each time) or horizontally co-variational or relational thinking (e.g., the pink flowers are four times the number of the unit flowers flowers).
Independent Tasks	Mereana is making an 'ei katu with leaves and flowers She is making this pattern:

Level 1 Year 0/NE: Number and Algebra: Patterns and Relationships

	Use the picture of What is the unit	ards to copy the of repeat?	pattern.	
	Number of	Yellow	Pink flowers	Total number
	units of repeat	flowers		of flowers
	1			
	2			
	5			
Anticipations				

Task 8						
	At Te Oro the Siva Samoa group is learning a maulu'ulu. As part of the dance, they used these movements:					
	tap, tap, arm, arm, clap					
	They repeat thes	e moves lots of t	imes throughout	the dance.		
	If they repeat the moves two times, how many taps would there be? How many arms would there be? How many claps would there be?					
	Complete the tab	ble below:				
	Number of movementTapArmClapsequence					
	1					
	4					
	5					
Big ideas	Patterns are sequences (repeating or growing) made of numeric or spatial elements governed by a rule. Patterns exist both in the world and in mathematics. The same					
	pattern structure can be found in many different forms (e.g.,					
	numbers, shapes	, colours, and rh	ythm).			
	A pattern can be	described using	a rule or you car	n create a pattern		
	unit of the patter	mu the rule for a more than the rule for a	ed or what grow	(s)		
	Identifying the rule of a pattern brings predictability and allows					
	generalisations to be developed.					
Cumioulum links	Generalisations can be expressed with both words and symbols.					
	strategies with w	whole numbers ar	, grouping, and e	equal-sharing		
	NA-1-2: Know	the forward and l	backward countin	ng sequences of		
	whole numbers t	to 100.				
	NA-1-4: Comm	unicate and expla	ain counting, gro	uping, and		
	equal-snaring sti	and continue see	orus, numbers, a mential patterns	na pictures.		

Learning Outcomes: Students will be able to: Mathematical language Sharing back/Connect	 Reproduce a pattern using objects, drawings, or symbols. Continue repeating patterns. Explain and justify the pattern in relation to ordinal aspects of counting. Generalise the number of elements in a repeating pattern for certain points. Explain that a pattern has consistency. Unit of repeat, pattern, sequence. Select students to share who use grouping/multiplication or patterns and relationships to work out the number of different types of movements.
	 Connect: Find three patterns across the table and three patterns down the table. If the movement sequence was used 10 times in the ma'uluulu, how many claps would there be? If the movement sequence was used 10 times in the ma'uluulu, how many taps would there be? If the movement sequence was used 10 times in the ma'uluulu, how many taps would there be?
Teacher Notes	 Have pictures of movements printed onto individual cards for students to use if necessary. (See Copy Master Task 8) To complete the table, support the students to work with a buddy to complete the movement sequence and count if needed. Facilitate the students to notice the relationship between the number of movement sequences and the total number of the different types of movements. This can be connected back to the relationship to multiplication. For the connect, patterns in the table vertically may include sequential or single variational thinking (e.g., the number of tails increase by one, the total increases by 3 each time) or horizontally co-variational or relational thinking. For the independent task have different types of concrete material available to make patterns.
Independent Tasks	Use the shapes to make a pattern. Draw the pattern and circle the unit of repeat.
	Choose a different material and make the same pattern.

	Use letters to make your pattern.
	Use actions to make your pattern.
	Show your pattern to a friend and ask them to copy it
Anticipations	

Task 9	Karlos is eating	M & Ms. He like	e to eat his two fa	avourite colours			
(optional task)	in a pattern:						
	THE THE THE						
	mmm	mmn	n m m	m			
	mmm	m m m m m					
	Complete the table below:						
	Number of Blue M & Ms Red M & Ms Total number						
	units of repeat			of M & Ms			
	1						
	2						
	3						
	4						
	5						
	What patterns do	you notice in th	e table?				
Big ideas	Patterns are sequences (repeating or growing) made of numeric or						
_	spatial elements governed by a rule.						
	Patterns exist both in the world and in mathematics. The same						
	pattern structure can be found in many different forms (e.g.,						
	numbers, shapes, colours, and rhythm).						
	A pattern can be	described using	a rule or you car	n create a pattern			
	from a rule. To f	ind the rule for a	pattern, you nee	ed to identify the			
	unit of the patter	n (what is repeat	ed or what grow	s).			
	Identifying the r	ule of a pattern b	rings predictabil	ity and allows			
	generalisations to	o be developed.					
	Generalisations of	can be expressed	with both words	s and symbols.			
Curriculum links	NA-1-1: Use a r	ange of counting	, grouping, and e	equal-sharing			
	strategies with w	hole numbers ar	nd fractions.				
	NA-1-2: Know t	the forward and b	backward countin	ng sequences of			
	whole numbers to 100.						
	NA-1-4: Communicate and explain counting, grouping, and						
	equal-sharing strategies, using words, numbers, and pictures.						
-	NA-1-6: Create	and continue seq	uential patterns.				
Learning Outcomes:	• Explain a	and justify the pa	ttern in relation	to ordinal			
Students will be able	aspects o	f counting.					
to:	Generalis	se the number of	elements in a re	peating pattern			
	for certai	n points.					
	Explain t	• Explain that a pattern has consistency.					
Mathematical	Unit of repeat in	attern sequence					
		attern, sequence.					
Sharing	Select students to	o share who use	grouping/multin	lication or			
back/Connect	natterns and relationships to work out the number of M & Ms						
	Putterno una rola			51 IVE & 1915.			

	Connect:			
	Find three patterns across the table and three patterns down the table.			
	How can Karlos work out the number of red M & Ms if he knows the number of blue M & Ms?			
Teacher Notes	 If necessary, to complete the table, use a piece of card and cover up the M&Ms so only one unit of repeat is visible, for the second set, use the card to show only two units of repeat, continue to use this process. Facilitate the students to notice the relationship between the number of the unit of repeat and total number of M & Ms. Notice students who use grouping or multiplication to work out the number of M & Ms OR relational reasoning. For the connect, patterns in the table vertically may include sequential or single variational thinking or horizontally co-variational or relational thinking. 			
Independent Tasks	Complete the patterns.			
	$ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$			
Anticipations				

Task 10 (optional task)	Leilani is building a Lego tower: What is the unit of repeat? What colour would the 20 th brick be? What colour would the 31 st brick be?							
	Number	Red	Blue	Yellow	Green	Total		
	of units of repeat	of units of bricks bricks bricks bricks of of						
	1					DITCKS		
	2							
	4							
Big ideas	Patterns are sequences (repeating or growing) made of numeric or							
	spatial eleme	ents govern	ed by a rule	e.				
	Patterns exis	t both in th	e world and	d in mathema	atics. The	same		
	pattern struct	numbers, shapes, colours, and rhythm)						
	A pattern can be described using a rule or you can create a pattern							
	from a rule. To find the rule for a pattern, you need to identify the							
	unit of the pattern (what is repeated or what grows).							
	Identifying the rule of a pattern brings predictability and allows							
	generalisations to be developed.							
Curriculum links		ons can be e	expressed v	arouping an	d equal-s	/mbols.		
	NA-1-1: Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions							
	NA-1-2: Know the forward and backward counting sequences of							
	whole number	ers to 100.			0 1			
	NA-1-4: Con	nmunicate	and explain	n counting, g	rouping,	and		
	equal-sharing	g strategies	, using woi	ds, numbers,	, and pict	ures.		
Learning Outcomes	• Fynle	ain and just	ifv the natt	ern in relatio	n to ordir	nal		
Students will be able	aspec	ts of count	ing.			141		
to:	• Gene	ralise the n	umber of e	lements in a	repeating	pattern		
	for certain points.							

	• Explain that a pattern has consistency.					
Mathematical language	Unit of repeat, pattern, sequence.					
Sharing back/Connect	Select students to share who use grouping/multiplication or patterns and relationships to work out the number of M & Ms.					
	Connect:					
	Find three patterns across the table and three patterns down the table.					
	How can Leilani work out the total number of bricks if she knows the number of blue bricks?					
Teacher Notes	 If necessary, to complete the table, use a piece of card and cover up the Lego bricks so only one unit of repeat is visible, for the second set, use the card to show only two units of repeat, continue to use this process. Facilitate the students to notice the relationship between the number of the unit of repeat and total number of bricks. Notice students who use grouping or multiplication to work out the number of bricks OR relational reasoning. For the connect, patterns in the table vertically may include sequential or single variational thinking or horizontally co-variational or relational thinking. 					
Independent Tasks	Complete the following assessment tasks (attached at the end of the document) as the independent activity:					
	A1: Shell patterns					
Anticipations	A2: Jellybean patterns					

DMIC DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES ASSESSMENT TASK

ALGEBRA: LEVEL 1

Task A1

Nevaeh made a pattern with shells she collected from the beach. Her pattern looked like this:



What shape would the 15th shell be?

What about the 19th?

What about the 29th?

Complete the table below:

Number of	Pipi shell	Fan shell	Total number of
units of repeat			shells
1			
2			
3			
4			
5			

What patterns do you notice?

DMIC DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES ASSESSMENT TASK

ALGEBRA: LEVEL 1

Task A2

Nevaeh is eating jellybeans and she likes to eat them in this order:



What colour would the 8th jellybean be?

What about the 15th?

What about the 31st?

Complete the table below:

Number of	Purple jellybean	Green jellybean	Total number of
units of repeat			jellybeans
1			
2			
3			
4			
5			

What patterns do you notice?