JUNIOR ASSESSMENT OF MATHEMATICS (JAM) TEACHERS' GUIDE
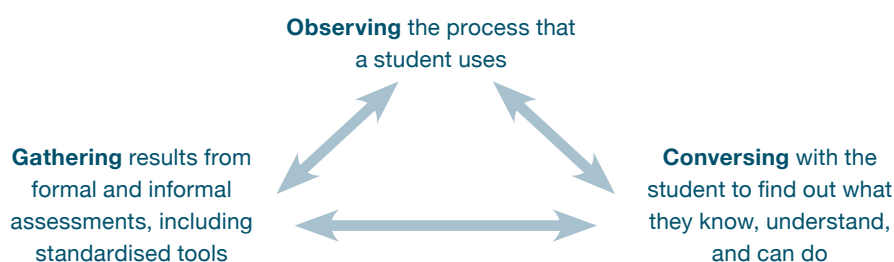
Purpose

Junior Assessment of Mathematics (JAM) is designed to be used with students in their first three years at school. It provides tasks that will allow you to assess the achievement of a student in relation to levels one and two of **The New Zealand Curriculum** (NZC) and the mathematics standards for years 1–3. The tasks are grouped into a series of modules (outlined below).

The number modules of JAM replace the diagnostic interview (NumPA). If a student shows achievement beyond the tasks of JAM, use other Numeracy Development Project (NDP) tools, such as Global Strategy Stage (GloSS) and Individual Knowledge Assessment of Number (IKAN), to assess their strategies and knowledge for the number strand. For the other strands, tools such as the Assessment Resource Bank (ARB) or Progressive Achievement Tests (PAT) can be used.

The NZC levels are organised as a learning trajectory and cover two years of learning, so it should be possible to identify an appropriate sub-level (Number Framework stage or mathematics standards year group), for each module of the assessment. Student responses, rather than their year of schooling, should be the basis for judging which Number Framework stage or mathematics standard is most appropriate. Students will not necessarily be consistent in their achievement across each strand of the NZC. This means they may meet the expectations for a given sub-level in one module but meet the expectations for a different sub-level in another module.

Note: JAM does not assess all strands or all concepts in the knowledge domains or strands.

JAM is designed to inform the teaching and learning process. It may be used to assist teachers to make an **overall teacher judgment** – it is only **one source** of evidence. Ongoing formative assessment and evidence may be gathered in the following three ways:

Observing the process that a student uses

Gathering results from formal and informal assessments, including standardised tools

Conversing with the student to find out what they know, understand, and can do

The assessment consists of 11 modules. Each module can be used as a separate assessment, or the modules can be combined to provide a broader assessment. Teachers will need to select the modules that are relevant to the needs of the students. ***Note: It is not expected that a student will complete all modules in one sitting.***

NUMBER STRATEGIES	NUMBER KNOWLEDGE	OTHER STRANDS
Module One: Number (Additive Strategies)	Module Three: Number (Numeral Identification)	Module Nine: Algebra (Patterns)
Module Two: Number (Multiplicative Strategies)	Module Four: Number (Forward Sequences Knowledge)	Module Ten: Geometry (Shape)
	Module Five: Number (Backward Sequences Knowledge)	Module Eleven: Measurement (Length)
	Module Six: Number (Fraction Knowledge)	
	Module Seven: Number (Grouping and Place Value Knowledge)	
	Module Eight: Number (Basic Facts Knowledge)	

Administering the Assessment

You do not need to start the assessment at the beginning; you can start at any module, and at any point within that module depending on what you know about the student.

This assessment provides "moment in time" information. If you have evidence that the student is able to demonstrate that they can usually solve this type of question independently and most of the time, you might ask them another similar question to enable you to find out what the student knows.

If a student successfully completes a task, the instruction "**proceed**" suggests that you move to later tasks in that module of the assessment. Further tasks extend the thinking of the student and may result in a student exhibiting higher level strategies or knowledge. If a student is unsuccessful with a task, the instruction "**proceed to module** …" indicates that you stop that section of the assessment and move on to the next module.

Note: If you are unsure of the stage that a student is at because of their response to a question, ask another similar question. Probing questions may be required to determine the student's strategy stage.

If you are working with a student who has difficulty with the English language, you may need to rephrase questions in a way that they will understand; however do not change the intent of the question. For example do not alter a change unknown question (6 + ? = 13) to a result unknown (6 + 7 = ?)

You will need to make a decision as to whether the student is still working at the stage indicated or is ready to be transitioned to the next stage; for example, a student who demonstrates that they can count on forwards and backwards (stage 4) to solve problems would need to be transitioned into stage 5. However, if the student is able only to count on, they need further work at stage 4, focusing on counting backwards to solve subtraction problems.
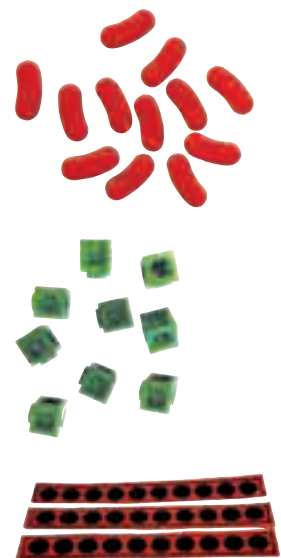
The **number strategy stages** achieved in JAM align with the **strategy stages** in the **NumPA** and **GloSS** assessments.

NEW ZEALAND CURRICULUM	MATHEMATICS STANDARDS	NUMBER FRAMEWORK
Beginning level one		Stages 0 and 1
Early level one	After one year at school	Stages 2 and 3 (counting all)
At level one	After two years at school	Stage 4 (advanced counting)
Early level two	After three years at school	Early stage 5 (early additive)

MATERIALS NEEDED

You should have the following materials in your kit:

- JAM Teachers' Guide

- a copy of the assessment booklet

- copies of the student response recording sheet (one for each student)

- two pieces of card (half A4 size) for masking

- 20 counters (two colours)

- 20 beans (or use counters)

- 20 interlocking cubes (if possible, one colour only)

- fraction cards made from copymaster one (relates to module six)

- dot strips made from copymaster two (relates to module seven)

- strips made from copymaster three (relates to module eleven)

- two sets of attribute blocks or similar, e.g., a variety of different-shaped and different-coloured tiles or blocks (see modules nine and ten – in particular, what you need for tasks 9A and 9C)

- objects for measuring such as counters, A4 paper, paper clips, string, pencil, rulers, tape measure, Cuisenaire blocks, and so on (see module eleven).

MODULE ONE: NUMBER (ADDITIVE STRATEGIES)

TASK 1A — FORMING A SET AND UNDERSTANDING ONE MORE

Actions	Provide the student with a set of counters.
Say	*Please get nine counters for me.* If successful: *Here is one more counter. How many counters do you have now?*
Decision	If the student is unable to form a set of up to nine objects, ask them to get you five counters. If they are unable to form a set of five, rate them as **stage 0** and **proceed to module three**. If they are able to do this, **proceed to task 1B**.

TASK 1B — COMBINING SETS

Actions	Place four counters (of one colour) in the student's left hand and three counters (of another colour) in the student's right hand. Close the student's hands.
Say	*You have four (say colour) counters and three (say other colour) counters. How many counters do you have altogether?* Allow the student to open their hands and manipulate the counters **only** if they are unable to solve the problem.
Decision	If the student counts each set of counters from one (1, 2, 3, 4; 1, 2, 3) and is unable to provide a total number, rate them as **stage 1**. (Note: The student is **just about** to begin level one.) **Proceed to module three**. If the student counts from one (1, 2, 3, … 7), either by using the materials or by imaging, ask 7 + 4 to establish if the student is able to count on smaller numbers. If the student is unable to do this, rate them as **at stages 2–3** and **proceed to module three**. Note: Some students will start counting from 1 when both numbers are less than 5. However, they may be able to hold a larger number (7) in their head and count on a number less than 5 (4). If the student counts on from either set 3 or 4 (e.g., 4, 5, 6, 7), or the set of 7, rate them as **stage 4** and **proceed to task 1C** for confirmation. If the student uses additive strategies (e.g., 3 + 3 = 6, so 4 + 3 = 7; or 4 + 4 = 8, so 4 + 3 = 7), which **could** indicate early stage 5, **proceed to task 1C** for confirmation of strategy stage. If it is a known fact for the student, **proceed to task 1C**.

TASK 1C — COMBINE TWO SETS WITH A TOTAL OVER TEN

Actions	Place eight counters under one masking card and seven counters under another masking card. Show the first expression (8 + 7) on page 1 of the Assessment Booklet.
Say	*There are eight counters under this card and seven counters under this card. How many counters do I have altogether?* Allow the student to remove **one card only** and repeat the question if they are unable to solve the problem.
Decision	If the student is unable to count on (9, 10, … 15), rate them as **stage 4** (as indicated from task 1B) and **proceed to module two**. If the student counts on from eight (9, 10, … 15), rate them as **stage 4** and **proceed to task 1D** for confirmation. If the student uses additive strategies (7 + 7 = 14, so 8 + 7 = 15; or 8 + 8 = 16, so 8 + 7 = 15; or 8 + 7 = 8 + 2 + 5), rate them as **early stage 5** and **proceed to task 1D** for confirmation. If the student states that they just know it, ask another similar question to confirm that they know these basic facts, then **proceed to task 1D**.

TASK 1D	SEPARATE TWO SETS BACK THROUGH TEN
Actions	Place 14 counters under one masking card. Remove five counters but mask them in your hand. Show the second expression (14 - 5) on page 1 of the Assessment Booklet.
Say	*There were 14 counters under this card. I have taken away five counters.* *How many counters are left under the card?*
Decision	If the student is unable to count back (14, 13, 12, 11, 10, 9), note the problem with counting backwards and rate them as **stage 4** (as indicated from task 1C). **Proceed to module two**. If the student counts back (14, 13, 12, 11, 10, 9), rate them as **stage 4** and **proceed to task 1E** for confirmation. If the student uses additive strategies (14 – 4 = 10, so 14 – 5 = 9; or 9 + 5 = 14, so 14 – 5 = 9), rate them as **early stage 5** and **proceed to task 1E** for confirmation. If the student states that they just know it, ask another similar question to confirm that they know these basic facts, then **proceed to task 1E**.

TASK 1E	USING PLACE VALUE FOR ADDITION PROBLEMS
Actions	Show page 2 of the Assessment Booklet.
Say	*There are 42 sheep in one paddock and 30 sheep in the other paddock.* *How many sheep are there altogether?*
Decision	If the student attempts to count on in ones (42, 43, 44, …), **stop** and note that they do not apply place value. Rate them at the **highest stage** demonstrated in **tasks 1C–1D** and **proceed to module two**. If the student counts on in tens (42, 52, 62, 72), note that they are able to use increments of ten. Rate them at the **highest stage** demonstrated in **tasks 1C–1D** and **proceed to module two**. If the student uses additive strategies (40 + 30 = 70, 70 + 2 = 72), rate them as **early stage 5** and **proceed to module two**. If the student shows quick recall of 42 + 30 = 72, or says 4 + 3 = 7 so 70 + 2 = 72, go to the addition and subtraction tasks in **GloSS** to determine their strategy stage.

BEHAVIOURAL INDICATORS: NUMBER STRATEGIES

NEW ZEALAND CURRICULUM			NUMBER FRAMEWORK		MATHEMATICS STANDARDS	
In solving problems and modelling situations, students will:					*In solving problems and modelling situations, students will:*	
Beginning	• learn to count objects by assigning one number to one object			**Stage 0**	**Beginning**	• learn to count objects
	• be able to count a collection of five objects by assigning one number to one object. (They are learning to count ten objects.)			**Stage 1**		• counts objects one to one
Level One	• use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions		**Early**	**Stages 2–3**	**Year 1**	• apply **counting-all** strategies
			At	**Stage 4**	**Year 2**	• apply **counting-on**, **counting-back**, **skip-counting, and simple grouping strategies**
Level Two	• use simple additive strategies with whole numbers and fractions		**Early**	**Early stage 5**	**Year 3**	• apply **basic addition facts** and **knowledge of place value and symmetry** to: – combine or partition whole numbers

MODULE TWO: NUMBER (MULTIPLICATIVE STRATEGIES)

TASK 2A	SIMPLE MULTIPLICATION
Actions	Show page 3 of the Assessment Booklet.
Say	*There are eight monkeys. If each monkey eats two bananas for lunch, how many bananas will have been eaten?*
Decision	If the student does not understand the problem, rate them as **stages 0–1** and **proceed to module three**.
	If the student tries to count from one (1, 2, 3, 4, 5, 6, 7, 8, 9, **10**, 11, …), **stop**. Rate them as **stages 2–3** and **proceed to task 2B**.
	If the student skip-counts in twos (2, 4, 6, … 16), rate them as **stage 4** and **proceed to task 2B** for confirmation.
	If the student uses addition (4 + 4 = 8; 8 + 4 = 12 and counts on to 16, or 4 + 4 = 8; 8 + 8 = 16), rate them as **early stage 5** and **proceed to task 2B** for confirmation.
	If the student knows 8 x 2 = 16 as a known fact, rate them as **early stage 5** and **proceed to task 2B** for confirmation.

TASK 2B	EQUAL PARTITIONING (DIVISION)
Actions	Show page 4 of the Assessment Booklet and put out 12 beans (or counters).
Say	*How many pieces are there in this circle? Do you know what the shaded (coloured) piece is called?* (Either fourth or quarter is acceptable). *If you have 12 beans to spread evenly on the circle, how many beans would be on each piece of the circle?* (Give the student time to solve the problem. If the student is unable to answer the question, allow them to manipulate the beans to solve it.)
Decision	If the student solves the beans problem by equal sharing one at a time, note whether the student uses the materials or images the sharing in their head. Rate them **at stages 2–3** and **proceed to module three**.
	If the student solves the beans problem by sharing in groups, note whether the student uses the materials or images the sharing in their head. Rate them **at stage 4** and **proceed to task 2C** for confirmation.
	If the student uses additive strategies (3 + 3 = 6, so 6 + 6 = 12; 2 + 2 + 2 + 2 = 8, so 3 + 3 + 3 + 3 = 12; or half of 12 is 6, so half of 6 is 3), rate them as **early stage 5** for fractions and **proceed to task 2C** for confirmation.
	If the student knows 4 x 3 = 12 as a known fact, rate them as at least **early stage 5** and go to the fraction tasks in GloSS to determine their strategy stage. Then **proceed to module three**.

TASK 2C	INTERPRETING ARRAYS
Actions	Show page 5 of the Assessment Booklet.
Say	*In this box of tennis balls, there are six rows. Each row has five tennis balls.* Use horizontal and vertical sweeps with the index finger. Mask all but one of the horizontal and one vertical edge of the array. *How many tennis balls are there altogether?* If the student is unable to give an answer, uncover the rest of the sheet.
Decision	If the student tries to count from one (1, 2, 3, 4, 5…) stop. Rate them at their highest stage indicated in task 2A or 2B.
	If the student skip counts in fives (5, 10, 15, 20…30) rate them as **stage 4** and **proceed to module three**.
	If the student uses additive strategies (5 + 5 = 10 and 10 + 10 = 20 and 20 + 5 + 5 = 30, or 2 x 5 = 10, 2 x 5=10, 2 x 5=10 and 10 + 10 + 10 = 30, or 10 + 10 + 10 = 30 rate them as **early stage 5** and **proceed to module 3.**
	If the student knows 6 x 5 = 30 as a known fact, rate them as at least **early stage 5** and go to the multiplication tasks in **GloSS** to determine their strategy stage. Then **proceed to module three**.

BEHAVIOURAL INDICATORS: NUMBER STRATEGIES

NEW ZEALAND CURRICULUM		NUMBER FRAMEWORK		MATHEMATICS STANDARDS	
In solving problems and modelling situations, students will:				*In solving problems and modelling situations, students will:*	
Level One	• use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions	**Early**	**Stages 2–3**	**Beginning**	• learn to count objects
				Year 1	• apply **counting-all** strategies
		At	**Stage 4**	**Year 2**	• apply **counting-on**, **counting-back**, **skip-counting, and simple grouping strategies** • use equal sharing and symmetry to find fractions of sets …
Level Two	• use simple additive strategies with whole numbers and fractions	**Early**	**Early Stage 5**	**Year 3**	• apply **basic addition facts** and **knowledge of place value and symmetry** to: – combine or partition whole numbers – find fractions of sets … and quantities

NB. Fractions arise as a consequence of the act of dividing a whole into equal parts

MODULE THREE: NUMBER IDENTIFICATION

TASK 3A	NUMERAL IDENTIFICATION
Actions	These questions are all asked orally. You will need the cut out numbers from the copymaster for task 3A. Place the number cards one at a time in front of the student.
Say	**1) What is this number?** (The numbers are 3, 9, 5, 1, 8, 6, 0, 4, 2, 7.) Note the numbers they can identify. If the student is unable to identify most of the numbers in this set, **proceed to module 4.** If the student is successful in identifying most of the numbers in this set, **proceed to task 3A: 2.** **2) What is this number? (**The numbers are 13, 19, 11, 16, 12.) Listen carefully for confusion between 'teen' and 'ty'. Note the numbers they can identify. If the student is unable to identify most of the numbers in this set, **proceed to module 4.** If the student is successful in identifying most of the numbers in this set, **proceed to task 3A: 3.** **3) What is this number?** (The numbers are 66, 43, 80, 38, 137, 463, 695, 702, 899.) Note the numbers they can identify and **proceed to module 4.**
Decision	If the student is unable to recognise all numbers in the range 0 to 10 rate them at **stage 0.** If the student is able to recognise **all** of the numbers in the range 0 to 10 rate them as **stage 1.** If the student is able to recognise **most** of the numbers in the range 0 to 20 rate them as **stage 2.** If the student is able to recognise **all** of the numbers in the range 0 to 20 rate them as **stage 3.** If the student is able to recognise **all** of the 2-digit numbers rate them as **stage 4.** If the student is able to recognise **all** of the 2-digit and 3-digit numbers rate them as **early stage 5.**

BEHAVIOURAL INDICATORS: NUMBER IDENTIFICATION

NEW ZEALAND CURRICULUM			NUMBER FRAMEWORK	
Students will:			*The student:*	
NZC		Beginning	Stage 0	• is learning to read numbers **in the range 0–10**
Level One	• identify the numerals to 100	Beginning	Stage 1	• reads all of the numbers **in the range 0–10**
		Early	Stage 2	• reads most of the numbers **in the range 0–20**
			Stage 3	• reads all of the numbers **in the range 0–20**
		At	Stage 4	• reads all of the numbers **in the range 0–100**
Level Two	• identify the numerals to 1000	Early	Early Stage 5	• reads all of the numbers **in the range 0–1000**

MODULE FOUR: NUMBER (FORWARD SEQUENCES KNOWLEDGE)

TASK 4A	FORWARD SEQUENCES
Actions	These questions are all asked orally. For task 4, you will need the cut-out numbers from the copymaster for task 4A.
Say	1) ***Start counting for me from 1, like this: 1, 2, 3, ... I will tell you when to stop.*** (Stop the student at **32** or when they are unable to successfully continue the sequence.) If the student is unsuccessful in counting forwards, **proceed to task 4A: 3**. If the student is successful, **proceed to task 4A: 2**. Note successful sequences. 2) ***Start counting for me from 86, like this: 86, 87, 88, ... I will tell you when to stop.*** (Stop the student at **106** or when they are unable to successfully continue the sequence.) **Proceed to task 4A: 3**. Note successful sequences. 3) Within the successful counting range of the student, use the task 4A copymaster numbers. Show the numbers one at a time. Say: ***I will show you some numbers. For each number I show you, you say the number after it; that is, the number that is one more.*** (The numbers are 1, 9, 3, 7, 13, 11, 19, 76, 29, 99, 378, 149, 794, 409, 999.) Note the student's responses and **proceed to task 4A: 4**. 4) ***Skip-count for me in 2s, like this: 2, 4, 6, ... I will tell you when to stop.*** (Stop the student at 34 or when they are unable to successfully continue the sequence.) Take note of the highest number counted in 2s.
Decision	If the student is unable to count forwards from 0 to 10, rate them as **stage 0**. If the student is able to count forwards from 0 to 10, rate them as **stage 1**. If the student is able to provide the number after in the range 0 to 10 but drops back in the range 10 to 20, rate them as **stage 2**. If the student is able to provide the number after in the range 0 to 20 without dropping back, rate them as **stage 3**. If the student is able to provide the number after in the range 0 to 100 without dropping back, and is able to skip count forwards in 2s to 34 rate them as **stage 4**. If the student is able to provide the number after in the range 0 to 1000 without dropping back, and is able to skip forwards in 2s to 34, rate them as **early stage 5**. If the student has achieved early stage 5 easily, then proceed to the appropriate section in **IKAN.**

BEHAVIOURAL INDICATORS: NUMBER KNOWLEDGE

NEW ZEALAND CURRICULUM			NUMBER FRAMEWORK	
Students will:			***The student:***	
NZC		**Beginning**	**Stage 0**	• is learning to count forwards **in the range 0–10**
Level One	• know the **forward** and backward counting sequences of whole numbers to 100	**Beginning**	**Stage 1**	• says forward sequences **in the range 0–10**
		Early	**Stage 2**	• says forward sequences and the number after **in the range 0–10**
			Stage 3	• says forward sequences and the number after **in the range 0–20**
		At	**Stage 4**	• says forward sequences and the number after **in the range 0–100 and skip counts forwards in 2s**
Level Two	• know the **forward** and backward counting sequences with whole numbers to at least 1000	**Early**	**Early Stage 5**	• says forward sequences and the number after **in the range 0–1000 and skip counts forwards in 2s**

MODULE FIVE: NUMBER (BACKWARDS SEQUENCES KNOWLEDGE)

TASK 5A	BACKWARD SEQUENCES (CONTINUED)
Actions	These questions are all asked orally. For task 5, you will need the cut-out numbers from the copymaster for task 5A.
Say	1) *Start counting backwards for me from 10, like this: 10, 9, 8, … I will tell you when to stop.* (Stop the student at **0** or when they are unable to successfully say the sequence.) If the student is unable to successfully count backwards, **proceed to task 5A: 4**. If the student is successful, **proceed to task 5A: 2**. Note any successful sequences. 2) *Start counting backwards for me from 23, like this: 23, 22, … I will tell you when to stop.* Stop the student at **9** or when they are unable to successfully continue the sequence and **proceed to task 5A: 3**. Note any confusion with -teen and -ty numbers. Note successful sequences. 3) *Start counting backwards for me from 103, like this: 103, 102, … I will tell you when to stop.* Stop the student at **89** or when they are unable to successfully continue the sequence and **proceed to task 5A: 4**. 4) Within the successful counting range of the student, use the task 5A copymaster numbers. Show the numbers one at a time. Say: *I will show you some numbers. For each number I show you, you say the number before it; that is, the number that is one less.* (The numbers are 4, 9, 6, 8, 13, 11, 20, 80, 30, 100, 261, 576, 400, 230, 1000.) Note student responses and **proceed to task 5A: 5.** 5) *Start skip-counting backwards in 2s from 28, like this: 28, 26, 24, ... I will tell you when to stop.* Stop the student at 6 or when they are unable to successfully continue the sequence. Take note of the last number correctly counted to in 2s.
Decision	If the student is unable to count backwards from 10 to 0, rate them as **stage 0**. If the student is able to count backwards from 10 to 0, rate them as **stage 1**. If the student is able to count backwards from 10 and provide the number before in the range 0 to 10 but counts forward to find number before in the range 10-20, rate them as **stage 2**. If the student is able to count backwards from 20 and provide the number before in the range 0 to 20, rate them as **stage 3.** If the student is able to count backwards from 100, provide the number before in the range 0 to 100 and skip count backwards in 2s from 26, rate them as **stage 4**. If the student is able to provide the number before in the range 0 to 1000 and skip count backwards in 2s from 28 rate them as **early stage 5**. If the student has achieved early stage 5 easily, proceed to the appropriate section in **IKAN.**

Notes:

• Students may find it more difficult to name the number before a number ending in a 0 because it takes them to a different decade.

BEHAVIOURAL INDICATORS: NUMBER KNOWLEDGE

NEW ZEALAND CURRICULUM			NUMBER FRAMEWORK	
Students will:			*The student:*	
NZC		Beginning	Stage 0	• is learning to count backwards **in the range 0–10**
Level One	• know the forward and **backward** counting sequences of whole numbers to 100	Beginning	Stage 1	• says backward sequences **in the range 0–10**
		Early	Stage 2	• says backward sequences and the number before **in the range 0–10**
			Stage 3	• says backward sequences and the number before **in the range 0–20**
		At	Stage 4	• says backward sequences and the number before **in the range 0–100 and skip counts backwards in 2s**
Level Two	• know the forward and **backward** counting sequences with whole numbers to at least 1000	Early	Early Stage 5	• says backward sequences and the number before **in the range 0–1000 and skip counts backwards in 2s.**

MODULE SIX: NUMBER (FRACTION KNOWLEDGE)

TASK 6A	NAMING PARTS
Actions	Show each picture on page 6 of the Assessment Booklet. (Make sure that the student can only see one picture at a time.)
Say	(For each picture) *What fraction of the shape is coloured in?*
Decision	If the student is unable to name any fraction, rate them as **stages 0–1** and **proceed to module seven**.
	If the student names one-half and one-quarter (one-fourth) successfully, rate them as **stages 2–3** and **proceed to task 6B** to extend their thinking.
	If the student names all the fractions **except** $\frac{1}{10}$ successfully, rate them as **stage 4** and **proceed to task 6B** to extend their thinking.
	If the student names all the fractions successfully, rate them as **early stage 5** and **proceed to task 6B** to extend their thinking.

TASK 6B	FRACTION SYMBOLS
Actions	For this task, you will need the cut-out fractions from the copymaster for task 6B.
	Place the fraction symbol cards one at a time in front of the student. Show page 6 of the Assessment Booklet.
Say	*Say these fractions for me (* $\frac{1}{4}, \frac{1}{2}, \frac{1}{3}, \frac{1}{5}, \frac{1}{10}$ *).* If the student names the symbols: *Place the cards on the correct shape.*
Decision	If the student names the symbols for one-half and one-quarter (one-fourth) only and correctly matches the cards to the correct shape picture, rate them as **stage 2–3**.
	If the student names all the symbols and correctly matches the cards to the correct picture **except** $\frac{1}{10}$, rate them as **stage 4**.
	If the student names all the symbols and correctly matches the cards to the correct picture, rate them as **early stage 5**.

BEHAVIOURAL INDICATORS: NUMBER KNOWLEDGE

NEW ZEALAND CURRICULUM			NUMBER FRAMEWORK	
Students will:			*The student:*	
Level One		Beginning	**Stages 0–1**	• learning to identify $\frac{1}{2}$
		Early	**Stages 2–3**	• recognises and names halves and quarters of shapes
		At	**Stage 4**	• identifies symbols for halves, quarters, thirds, and fifths
Level Two	• know simple fractions in everyday use	Early	**Early stage 5**	• identifies the symbols for the most common unit fractions, including halves, quarters, thirds, fifths, and tenths

Note:
• The stages are indicative of what students should be exploring with fractions in the early years at school. The students need to be involved in activities that focus on halves and quarters of shapes and quantities, even though there are no fraction knowledge descriptors at stages 0–3 in the Number Framework or at level one of the NZC. Fractions are explored at the early stages through the strategy domain (see task 2C).

MODULE SEVEN: NUMBER (GROUPING AND PLACE VALUE KNOWLEDGE)

TASK 7A	SUBITISING AND GROUPING TO TEN
Actions 7A(i)	Randomly show all of the cut-out dot pictures from the copymaster for task 7A, one at a time for one second.
Say	(For each picture) *How many dots do you see?*
Decision 7A(i)	Note which sets they are able to subitise and **proceed to task 7A**(ii).
Actions 7A(ii)	Show the four tens frame from the copymaster for task 7A for one second.
Say	*How many more dots to make five?*
Actions 7A(iii)	Show the eight tens frame from the copymaster for task 7A for one second.
Say	*How many dots did you see? How do you know?* (You are listening for five and three)
Decision 7A(iii)	If the student is unable to recognise 4 + 1 (grouping within 5) rate them as **stage 0-1** and **proceed to module eight**. If the student is able to recoginse 4 + 1 rate them as **stage 2** and **proceed to module eight**. If the student is able to recognise 4 + 1 and 5 + 3 (grouping with 5) **proceed to task 7A**(iv)**.**
Actions 7A(iv)	Show the card with six dots from the copymaster for task 7A.
Say	*This is double three. What number do you need to double to make ten?*
Decision 7A(iv)	If the student is unable to say 5, rate as **stage 2** and **proceed to module eight**. If the student is able to say 5 and has all of 7A(iii) correct, rate as **stage 3** and **proceed to task 7B**

TASK 7B	INCREMENTING TEN
Actions	For this task, you will need the cut-out five-strip and ten-strips from the copymaster for task 7B. Place a five-strip horizontally in front of the student. Then place a ten-strip below the five-strip. Continue adding ten-strips underneath each other one at a time.
Say	*Here are five dots. Here are ten more dots. How many dots are there now?* Place the ten-strips one at a time. Each time that you add a strip, ask *How many dots are there now?*
Decision	If the student counts the first 15 dots one by one, **proceed to module eight**. If the student knows 10 + 5 = 15 and counts in increments, 15, 25, 35, … 65, rate them as **stage 4** for this task and **proceed to task 7C** to extend their thinking.

TASK 7C	TENS AND ONES PLACE VALUE
Actions	Show the student page 7 of the Assessment Booklet.
Say	*How many groups of ten can you make with 70 sticks?*
Decision	If the student uses a double count (count in tens until they reach 7 fingers) rate them as **stage 4 and proceed to module eight.** If the student instantly says 7 **proceed to task 7D.**

TASK 7D	PLACE VALUE USING TENS
Actions	Show the student page 8 of the Assessment Booklet.
Say	*A DVD player costs $240. How many $10 notes do you need to pay for it?* If their strategy for their answer is not obvious, ask: *How did you work that out?*
Decision	If the student counts in increments, 10, 20, 30, …, rate them as **stage 4**. If the student uses place value, i.e., "20 tens in 200 and 4 tens in 40, so it is 24", rate them as **early stage 5**.

BEHAVIOURAL INDICATORS: NUMBER KNOWLEDGE

NEW ZEALAND CURRICULUM			NUMBER FRAMEWORK	
Students will:			*The student:*	
Level One	• know groupings with five, within ten, and with ten	Beginning	Stage 0	• is learning to recognise patterns **to 5**
			Stage 1	• instantly recognises groupings up to **5**
		Early	Stage 2	• knows groupings within **5**, and with **5**
			Stage 3	• knows doubles **to 10** and within **10**
		At	Stage 4	• knows groupings with 10 and the pattern of teens • knows the number of tens in decades
Level Two	• know how many ones, tens, and hundreds are in whole numbers to at least 1000	Early	Early stage 5	• knows groupings of 10 in a three-digit number

MODULE EIGHT: NUMBER (BASIC FACTS KNOWLEDGE)

TASK 8A	BASIC FACTS
Actions	For this task, you will need pages 9 and 10 of the Assessment Booklet. Show the number sentences to the student one at a time. Allow the student two seconds (count 1001, 1002) to give each answer. (Note: As soon as the student uses a strategy, stop this section.)
Say	**What is (number sentence)? (**For example, **What is 2 + 3?)** 2 + 3 1 + 4 5 + 4 5 − 2 3 + 3 7 + □ =10 2 + 8 4 + 4 10 + 8 7 + 7 9 + 9 5 + 6 7 − 3 9 − 6 8 + 6 7 + 5
Decision	If the student is unable to recall facts to 5, rate them as **stages 0–1** and **proceed to module nine**. If the student instantly recalls facts to 5 and facts with 5, rate them as **stage 2**. If the student instantly recalls doubles to 10 and groupings within 10, rate them as **stage 3**. If the student instantly recalls addition and subtraction facts to 10, teen facts, and doubles to 20, rate them as **stage 4**. If the student knows addition facts to 20 and subtraction facts to 10, rate them as **early stage 5**.

BEHAVIOURAL INDICATORS: NUMBER KNOWLEDGE

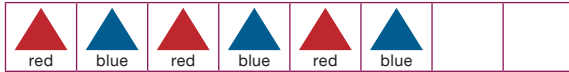| NEW ZEALAND CURRICULUM			NUMBER FRAMEWORK		
Students will:			*The student:*		
Level One	• know groupings with five, within ten, and with ten	**Beginning**	**Stages 0–1**		• is learning to recognise patterns to 5
		Early	**Stage 2**		• Recalls facts to 5 and with 5
			Stage 3		• Recalls doubles to 10 and groupings within 10
		At	**Stage 4**		• recalls facts to 10, doubles to 20, and corresponding halves and teen facts
Level Two	• know the basic addition and subtraction facts	**Early**	**Early stage 5**		• recalls addition facts to 20 and subtraction facts to 10

MODULE NINE: ALGEBRA (PATTERNS)

Before you start this module, it may be useful to let the student know that this module is about patterns. Ask them some questions about patterns to put them at ease and to determine what they already know.

TASK 9A	CONTINUE A PATTERN
Actions	Copy the pattern below onto the table in front of the student. Provide the set of attribute blocks (see page 2 for materials needed). red blue red blue red blue
Say	*Put the next block on the end of this pattern.* *How did you know which block to use?* *Continue this pattern until you run out of blocks.*
Decision	If the student is unable to put a red triangle in the next space, rate them as **beginning level one** and **proceed to module ten**. If the student correctly chooses a red triangle and continues the pattern, **proceed to task 9B**.

TASK 9B	CREATE A PATTERN
Actions	Provide the set of attribute blocks.
Say	*Make me a pattern using these blocks.* *Describe your pattern.*
Decision	If the student is unable to create a pattern, rate them as **early level one** and **proceed to module ten**. If the student can create and describe their pattern, rate them as at least **at level one** and **proceed to task 9C**.

TASK 9C	CONTINUE A TWO-ATTRIBUTE PATTERN
Actions	In front of the student, copy the pattern below onto the table. Provide the set of attribute blocks. yellow blue yellow green yellow blue yellow green yellow Note: There are two variables (shape and colour) in this sequence. The student may notice one or two of the patterns. The shape pattern is triangle, triangle, square, square, which is also represented as AABB. The colour pattern is yellow, blue, yellow, green, which is also represented as ABAC.
Say	*Put the next block on the end of this pattern.* *How did you know which block to use?* *What would the twelfth block be? How do you know?*
Decision	If the student is unable to name the correct blocks, rate them as **at level one**. If the student is able to say that a blue triangle is next and that a green square goes in position 12, rate them as **early level two**.

BEHAVIOURAL INDICATORS: ALGEBRA

NEW ZEALAND CURRICULUM			MATHEMATICS STANDARDS	
In solving problems and modelling situations, students will:			*In solving problems and modelling situations, students will:*	
Level One	• **create** and continue sequential patterns	Beginning	Beginning	• learn to recognise sequential patterns
		Early	Year 1	• **continue** sequential patterns …
		At	Year 2	• **create and continue** sequential patterns by **identifying the unit of repeat**
Level Two	• find rules for the next number in a sequential pattern	Early	Year 3	• **create and continue** sequential patterns with **one or two variables** by identifying the unit of repeat

MODULE TEN: GEOMETRY (SHAPE)

Before you start this module, it may be useful to let the student know that this module is about shapes and sorting objects.
Ask some questions about shapes and sorting to put them at ease and to determine what they already know.

TASK 10A	SORT BY A SELF-CHOSEN CATEGORY
Actions	Give the student a set of attribute blocks (at least 25 blocks; see page 2 for materials needed).

Say	
	1) *All of these blocks are jumbled up. Can you sort them into groups?* (Ensure that the student understands the task.)
	2) *Tell me about your groups and the way you have sorted your blocks.* Listen for language about the features of the groups: what they are grouped by; what group has the most, the least; everyday language, e.g., colour, shape, or size; mathematical language, e.g., straight sides or 4 corners, and so on. Question 3 may elicit a more mathematical description of the blocks.)
	3) *Tell me about this group here.* (Point to a group that has different categories within it, e.g., small, large, thick, thin, or colour. Listen for language about different features **within** a group. Or if a student has sorted by colour, the student may talk about the different shapes within a group of a particular colour.)
	4) *Show me another way you could sort your blocks.* Repeat questions 2 and 3 only if further information is required. For example, if the blocks were sorted by colour originally, this may have limited the student's response.
	Please note: You may need to ask a specific question about at least two different shapes to draw out the mathematical language. For example, *What is the difference between this shape* (point to a square) *and this one* (point to a triangle)*?*

Decision	
	If the student is unable to sort the materials, rate them as **beginning level one** for Geometry and **proceed to module eleven**.
	If the student is able to sort the materials and describes the groups using everyday language (e.g., colour, basic shapes, big, small), then rate the student as **early level one** (questions 1 and 2).
	If the student sorts the materials and describes the groups using mathematical language (e.g., shape, size of groups) then rate the student as **at level one** (question 2).
	If the student sorts the materials and describes the sub-groups within a group (e.g., the dimensional features, such as thick and thin) and can re-sort the blocks and describe the features of the re-sorted blocks, rate the student as **early level two** (questions 3–4).

BEHAVIOURAL INDICATORS: GEOMETRY (SHAPE)

NEW ZEALAND CURRICULUM			MATHEMATICS STANDARDS	
In solving problems and modelling situations, students will:			*In solving problems and modelling situations, students will:*	
Level One	• sort objects by their appearance	**Beginning**	**Beginning**	• be able to name features of a given object, **using everyday language**
		Early	**Year 1**	• **sort** objects and shapes by a single feature and describe the feature, **using everyday language**
		At	**Year 2**	• sort objects and shapes by different features and describe the features, **using mathematical language**
Level Two	• sort objects by their spatial features, with justification	**Early**	**Year 3**	• sort objects and two- and three-dimensional shapes by their features, identifying categories **within categories**

MODULE ELEVEN: MEASUREMENT (LENGTH)

Before you start this module, it may be useful to let the student know that this module is about measuring (length). Ask some questions about measuring to put them at ease and to determine what they already know.

TASK 11A	DIRECT COMPARISON
Actions	Place the cut-out red and yellow strips from the copymaster for task 11A randomly in front of the student.
Say	*Which of these strips is longer?*
Decision	If the student is unable to align the strips, rate them as **beginning level one.**
	If the student directly compares the strips, rate them as **early level one** and **proceed to task 11B** to extend their thinking.

TASK 11B	CHOOSING AN APPROPRIATE UNIT OF MEASURE
Actions	Use the materials listed on page 2 (for example, Cuisenaire blocks, coloured strips) or handspans or armspans for this task. Encourage the student to choose their own non-standard unit. Ask the student the following questions.
Say	*Show me how you would measure the length of this desk?* (Or find something else approximately 50cm in length. Indicate with a sweep of the hand where you want them to measure.) *Show me how you would measure the length of this pencil?*
Decision	If the student is unable to choose the appropriate measuring tool, rate them as **early level one**.
	If the student is able to choose an appropriate measuring tool, rate them as **at level one** and **proceed to task 11C** to extend their thinking.
	Ask the student to explain why they chose that particular tool. Note their response.

TASK 11C	USING A UNIT OF MEASURE
Actions	For this task, you will need the cut-out coloured strips from the copymaster for task 11C.
	Put down standard (a ruler) and non-standard materials (blocks, string, Cuisenaire blocks etc). Give the student the cut-out blue strip.
Say	*Measure the blue strip for me.*
Actions	Remove the strip after they have measured it. Give the student the green and yellow strips; place them randomly on the table so that the student is unable to compare them.
Say	*Here are two strips. You have to work out which strip is longer, but you cannot put them side by side. You can use some of these materials to help you measure.* (It may be necessary to check whether the student can use the ruler). *Which strip is longer? How do you know? How much longer than the other strip is it?*
Decision	If the student is able to use non-standard materials as a measuring unit to compare the strips, rate them as **at level one**.
	If the student uses the ruler to measure the strips and gives the difference in measures, e.g., "9 – 7 = 2; it's two bits longer", then rate them as **early level two**.

BEHAVIOURAL INDICATORS: MEASUREMENT

NEW ZEALAND CURRICULUM			MATHEMATICS STANDARDS	
In solving problems and modelling situations, students will:			*In solving problems and modelling situations, students will:*	
Level One	• order and compare objects … by length, … by direct comparison and/or counting whole numbers of units	**Beginning**	**Beginning**	• learn to compare objects
		Early	**Year 1**	• **compare** the lengths … of objects **directly**
		At	**Year 2**	• **compare** the lengths … of objects …, **using self-chosen units of measurement**
Level Two	• create and use appropriate units and devices to measure length … • partition and/or combine like measures and communicate them, using numbers and units	**Early**	**Year 3**	• **measure** the lengths … of objects …, using linear, whole-number scales and applying basic addition facts to standard units