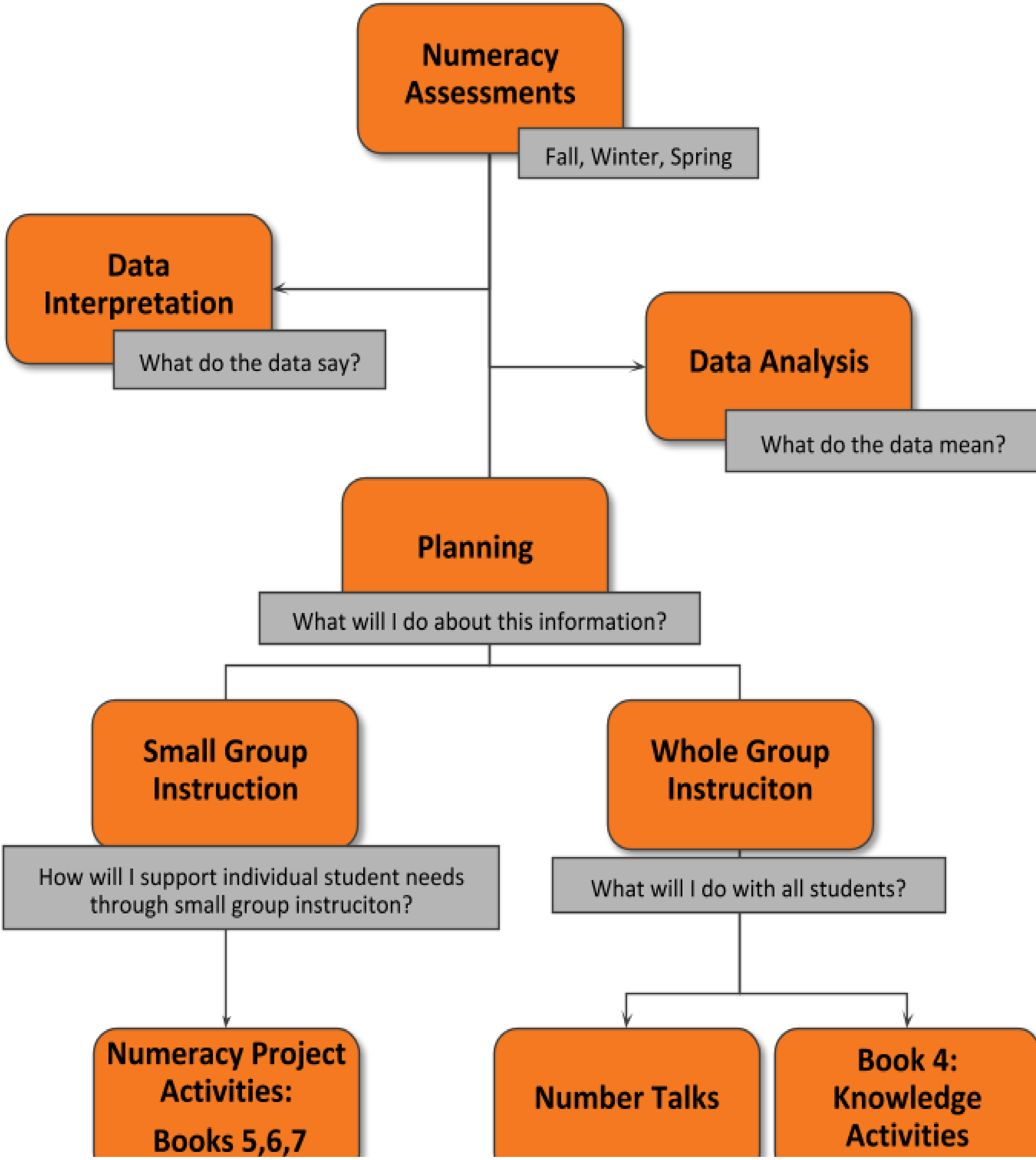
Idaho Numeracy Project

Teacher Manual
GloSS/IKAN Assessment

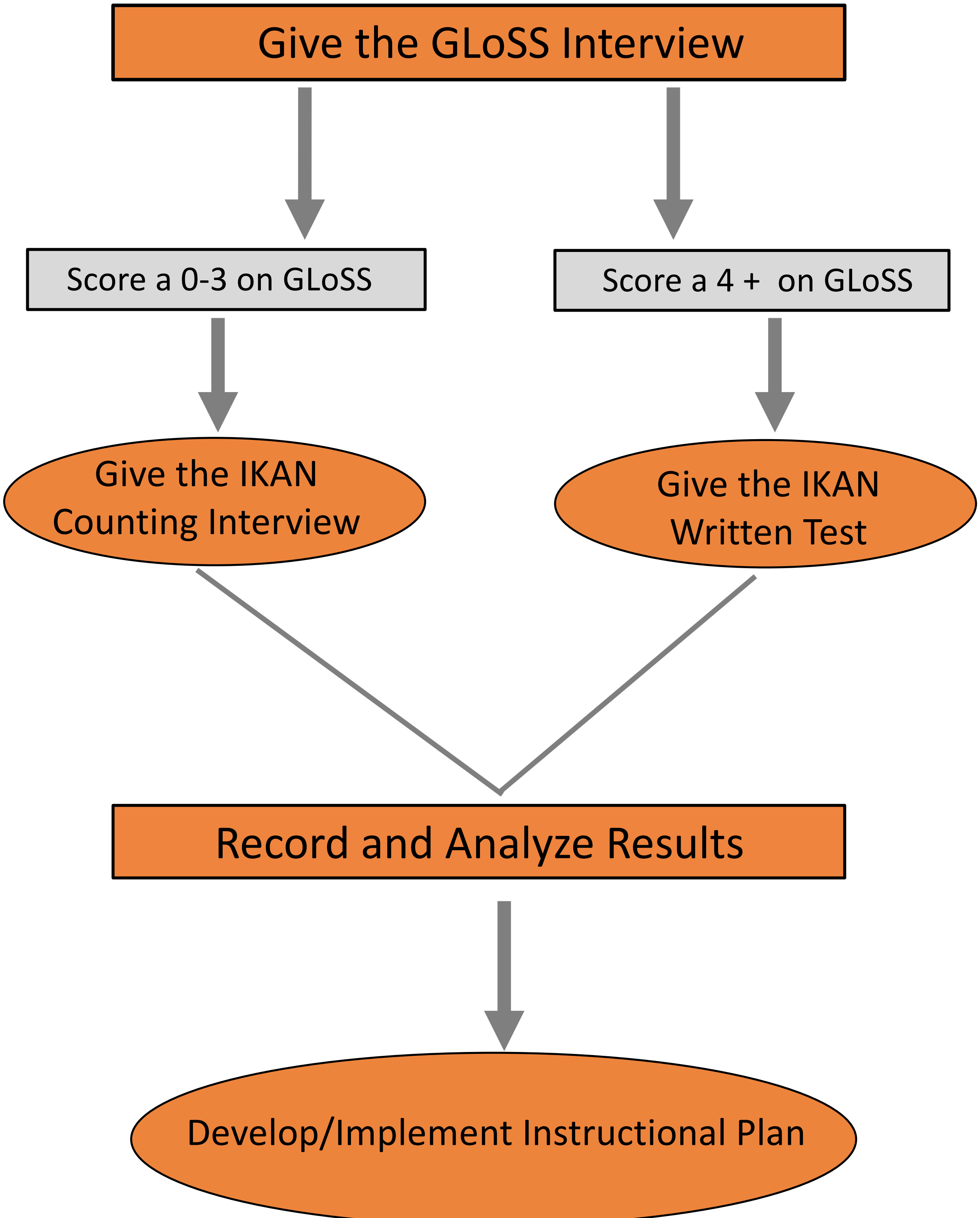
Adapted from New Zealand Numeracy Project

Idaho Numeracy Project



https://isu.edu/education/professional-development/idaho-regional-math-center/

Assessment and Analysis Process



Adapted from the NZ Numeracy Project

GloSS/IKAN Assessment
General Information

GloSS: Global Strategy Stage Assessment &
IKAN: The Individual Knowledge Assessment of Numeracy

The GloSS and IKAN assessment package enables you to identify the strategy stage in which students are operating across all knowledge and strategy domains, known as the global strategy stage. It consists of a series of interview strategy questions which can be administered to individual students in a few minutes or less. The series of questions increase in difficulty and include questions in all knowledge and strategy domains. Students move through these questions until they become too difficult for them to answer correctly. Information regarding a student's specific strategy stage is supported by the information provided through the IKAN regarding the student's comprehension of number and quantity. This information supports the acquisition of efficient strategies for computation, and the efficiency of these strategies can be measured by the GloSS assessment. Hence, these two assessments go hand in hand.

GloSS/IKAN Administration (3 times a year)

<u>Teacher Guidance</u>:

1. Administer GloSS Assessment
2. If a student scores with strategy stages 0-3 on the GloSS assessment, the teacher should then administer IKAN Part 1(Counting Interview). If a student achieves strategy stage 4 or higher on the GloSS assessment, the teacher should then administer IKAN Part 2 (Written Assessment).

Strategy Stage Descriptions

LEVEL 1	**Stage 0** Emergent	Students at the Emergent stage are unable to consistently count a given number of objects because they lack knowledge of counting sequences and/or the ability to match things in one-to-one correspondence.
	Stage 1 One to One Counting	The One to One Counting stage is characterized by students who can count and form a set of objects up to ten but cannot solve simple problems that involve joining and separating sets, like 4 + 3.
	Stage 2 Counting From One on Materials	Students at the Counting From One on Materials stage rely on counting physical materials, like their fingers. They count all the objects in both sets to find an answer to a joining or separating of sets problem.
	Stage 3 Counting From One by Imaging	The Counting from One by Imaging stage is characterized by students counting all of the objects. Students at this stage are able to image visual patterns of the objects in their mind and count them.
	Stage 4 Advanced Counting	Students at the Advanced Counting stage understand that the end number in a counting sequence measures the whole set and can relate the addition or subtraction of objects to the forward and backward number sequences by ones, tens, etc.
LEVEL 2	**Stage 5** Early Additive	At the Early Additive stage, students have begun to recognize that numbers are abstract units that can be treated simultaneously as wholes or can be partitioned and recombined. This is called part-whole thinking.
LEVEL 3	**Stage 6** Advanced Additive	Students at the Advanced Additive stage are learning to choose appropriately from a repertoire of part-whole strategies. They see numbers as whole units in themselves but also understand that “nested” within these units is a range of possibilities for subdivision and recombining.
LEVEL 4-5	**Stage 7** Advanced Multiplicative	Students at the Advanced Multiplicative stage are learning to choose appropriately from a range of part-whole strategies to solve and estimate the answers to problems involving multiplication and division. These strategies require one or more of the numbers involved in a multiplication or division to be partitioned, manipulated, then recombined.
	Stage 8 Advanced Proportional	Students at the Advanced Proportional stage are learning to select from a repertoire of part-whole strategies to solve and estimate the answers to problems involving fractions, proportions, and ratios. These strategies are based on finding common factors and include strategies for the multiplication of decimals and the calculation of percentages.

Adapted from New Zealand Numeracy Project

Global Strategy Stage: GloSS assessments

Interview forms 1–4

Additional Information

Contents

Tables

Part A: Global Strategy Stage assessments

Introduction

The Global Strategy Stage (GloSS) assessments are a set of face-to-face interviews designed primarily to assist classroom teachers in determining students' best-fit strategy stages on the Number Framework (Ministry of Education, 2008, pp. 15–17). GloSS is designed for students in Years 1 to 8, but may well be used with secondary students, especially those in Years 9 and 10.

This edition of GloSS retains much of the same feel and style of the previous forms. Many of the tasks come from the original GloSS Forms E, H, I, J and K. New tasks developed by a panel of teachers and mathematics specialists are also included.

This manual and the four new GloSS interview forms have been prepared by staff at the New Zealand Council for Educational Research under contract to the Ministry of Education.

Features of the new GloSS interviews

(1) Four new interviews have been developed (Interview 1 to Interview 4) with 22 tasks in each.

(2) The interviews are designed to be of equivalent overall difficulty. Tasks in different interview forms with the same task number are also of approximately equal difficulty.

(3) The interviews forms are organised into nine sections. Each section focuses on a specific target stage or stages on the Number Framework. Teachers should ask **all** the questions in a section and then make a decision on whether to continue to the next set of questions based on the student's responses.

(4) To align the interview with the National Standards (Ministry of Education, 2009) Stages 5 to 8 of the Number Framework have each been divided into two sub-stages; for example, Stage 5 is now divided into Early Stage 5 and Stage 5. Table 1 shows how each section is associated with the Number Framework, curriculum and National Standards.

(5) A new recording template is provided. This gives space to record the Number Framework stage that best categorises the student's response on each task and the details of the strategy they employed. At the conclusion of the interview, the recording template allows teachers to record the stage a student is working at for each operational domain.

Table 1 **Target Numeracy Framework stages for sets of tasks**

Section	Task numbers	Target Numeracy stage/s	Curriculum level	National Standard
1	1	1	Early 1	
2	2	2–3	Early1	After one year
3	3–5	4–	At 1	After two years
		Early 5	Early 2	After three years
4	6–8	5	At 2	End of Year 4
5	9–11	Early 6	Early 3	End of Year 5
6	12–14	6	At 3	End of Year 6
7	15–17	Early 7	Early 4	End of Year 7
8	18–20	7	At 4	End of Year 8
9	21–22	Early 8	Early 5	

The GloSS components

The following components are associated with each interview form:

(1) A brief set of **instructions** for the administration of the interview.

(2) A list of **materials** needed for the interview.

(3) An **interview schedule,** which includes:

a) the student tasks, which are organised into nine sections

b) a scoring guide for each task

c) a decision rule on whether to continue the interview at the end of each section.

(4) A set of **student task cards** to be shown to the student. Tasks 1 has no associated task card.

(5) A **GloSS recording sheet** template. A recording sheet is required for each student interview.

Administration and marking

Planning for the administration

(1) Teachers should make themselves familiar with the interview materials and instructions. A brief familiarisation session for staff might be advantageous.

(2) Give students the kind of notice that is normally given for regular assessments. A sense of occasion is to be avoided.

(3) Where possible, the interviews should be administered in a location free from interruption. Try to minimise disruptions during the interview. A notice, "GloSS interview in progress. Please do not disturb" can be hung outside.

(4) Have all of the following: the interview form; the task cards; the materials mentioned on the interview form; and a recording sheet for each student.

(5) For each student, decide the appropriate point to begin the interview. The following principles should help guide this decision:
- Commence the interview with the section targeted just below the Number Framework stage you think the student is at.
- When in doubt opt for a lower starting point. Be willing to move on quickly, or even jump some sections if this level is patently too low.
- If the student finds the first section they are given too hard, go back to a previous section that they can cope with.
- Do not start the interview any later than Section 7.

Administering the tests

(1) Questions are designed so that they can be answered mentally.

(2) Begin the interview at the appropriate starting point (see 5 above). The target Number Framework stage (or stages) is given at the beginning of each set of questions (see Table 1).

(3) Read each task to the student and show them the related task card. For Tasks 1–5, perform the actions indicated.

(4) Give the student time to answer the task (you may sometimes need to wait for a few minutes). If necessary, prompt the student. For example, ask *"How did you work that out?"* or *"Can you talk me through what you were thinking?"*

(5) Allow the student the space to demonstrate higher level strategies. If they use a simpler strategy (e.g., counting) say, *"Can you do it another way?"* If there is some doubt, continue the interview rather than stop it.

(6) Use the scoring guide associated with each task to allocate a Number Framework stage. Generally the decision is whether they are **at or above** the stage targeted by the set of questions in the section, or **below** the target stage. *Example:* If the target level is Stage 6, responses that are at or above this level are coded as "6", and those that are below it are coded as "E6". Circle the Number Framework Stage on the recording sheet that corresponds with the most sophisticated strategy the student used (even if their numerical answer is not correct).

(7) For each task, make notes on the strategies used in the space entitled "Observations".

(8) Ask **all** tasks within a section. Generally these are on the two face-to-face pages, and cover the *Addition and Subtraction*, *Multiplication and Division* and *Proportions and Ratios* domains respectively.

(9) Use the decision rule provided at the end of each section to decide whether to stop or continue the interview.
- If the student is rated at the target stage for **any** of the tasks in that section, then **continue** the interview, otherwise **stop** the interview.
- The exception is for Section 3. Here the interview should continue if the student is rated at the target stage (Early 5) for **any** tasks, or if they are rated at Stage 4 for **both** Task 3 and Task 4.

- If in any doubt, **continue** the interview to see if the student can cope with the next section. Students may have used lower level strategies, and more complicated tasks may evoke higher-level strategies.

Assigning numeracy stages

At the completion of an interview, record the highest numeracy stage demonstrated for each operational domain in the spaces provided at the bottom of the recording sheet.

Example of determining a student's numeracy stages

The following page shows a recording sheet for a hypothetical interview.

- The interview terminated at the end of Section 5, as the student used no Early Stage 6 strategies (the target stage for that section).
- The student was rated at Stage 5 in the *Addition and Subtraction* domain. This was the highest strategy they demonstrated in this domain (observed in Task 6).
- The student was rated as Stage 4 in the *Multiplication and Division* domain as this was the highest strategy they demonstrated in this domain (observed in Task 4).
- The student was rated as Stages 3–4 in the *Proportions and Ratios* domain as they could equally share. Note how this utilises the stage indicator in parentheses, and that the Number Framework does not distinguish between Stages 3 and 4 in the *Proportions and Ratios* domain.

Table 2 **Example of student response to an interview**

GLoSS recording sheet – Form 1 2 3 4 (circle as appropriate)

Name: Ted Stubbs Year Level: 5 Date: 29/2/2012

	Addition and Subtraction	Multiplication and Division	Proportions and Ratios
Section 1	Task 1 Stage: 0 / 1 Observation:		
Section 2	Task 2 Stage: 1 / 2 / 3 Observation: Used materials		
Section 3	Task 3 Stage: 3 / 4 / E5 Observation: 8, 9, 10, … , 13	Task 4 Stage: 3 / 4 / E5 Observation: 6, 12, 18	Task 5 Stage: 4 / E5 Observation: Used equal sharing 1-1 (Stage 3/4)
Section 4	Task 6 Stage: E5 / 5 Observation: 36 + 20 = 56 56 + 2 = 58	Task 7 Stage: E5 / 5 Observation: 5, 10, 15, …	Task 8 Stage: E5 / 5 Observation: Couldn't do it.
Section 5	Task 9 Stage: 5 / E6 Observation: 128 + 10 + 10 + … 198 199, 201, 201, 202	Task 10 Stage: 5 / E6 Observation: 15, 30, 45,	Task 11 Stage: 5 / E6 Observation: Know 3 × 6 = 18
Section 6	Task 12 Stage: E6 / 6 Observation:	Task 13 Stage: E6 / 6 Observation:	Task 14 Stage: E6 / 6 Observation:
Section 7	Task 15 Stage: 6 / E7 Observation:	Task 16 Stage: 6 / E7 Observation:	Task 17 Stage: 6 / E7 Observation:
Section 8	Task 18 Stage: E7 / 7 Observation:	Task 19 Stage: E7 / 7 Observation:	Task 20 Stage: E7 / 7 Observation:
Section 9		Task 21 Stage: 7 / E8 Observation:	Task 22 Stage: 7 / E8 Observation:

Stage summary:
Addition & Subtraction: 5 **Multiplication & Division:** 4 **Proportions & Ratios:** 3/4

For each domain, highlight the largest stage number circled in positions b and c of "Stage a/b" or "Stage a/b/c".

Part B: Technical information

Selection of tasks

The four interview forms include a total of 88 tasks (22 per form). Many of the tasks came from the original GloSS forms E, H, I, J and K. A few of these have been slightly modified. In addition, a number of new tasks have been used in the interviews.

A total of 120 tasks were trialled in the GloSS Psychometric Study (Neill, Lawes, Robertson, & Darr 2011). The study located the tasks on the *patm* scale, a linear measurement scale developed for PAT: Mathematics (Darr, Neill, Stephanou, & Ferral, 2009). The final 88 tasks were selected from this pool using the following criteria:

- The four interview forms should have approximately the same average difficulty level.
- Groups of tasks within each section (aimed at the same target level) have approximately the same average difficulty level.
- Tasks with the same number should be of approximately the same difficulty level across the forms.
- The tasks within each group of three tasks should relate to the Number Framework stage or stages at which they are targeted.
- Within each form, the tasks should be independent. This means that the mathematical content as well as the context of the tasks should be diverse. This reduces the impact of each task upon subsequent ones.

At times, compromises between these criteria were made. Most notably, within a section, the difficulty level for tasks in the *Proportions and Ratios* domain was often of greater difficulty than the corresponding tasks in the other two domains. This was because the fit to the Number Framework stages was prioritised over the task difficulty.

Measurement of task difficulty

Table 3 presents the difficulty measures of the GloSS tasks. These measurements are in *patm* units—the measurement units used in the PAT: Mathematics assessment. The measure for each task is based on data collected during the GloSS Psychometric Study. This study used Rasch modelling techniques to establish a link between the GloSS and PAT: Mathematics assessments.

Some of the task difficulty measures are slightly different from those reported in the GloSS Psychometric Study. This is due to some minor changes made to the marking rubrics used on the GloSS Psychometric Study data so that those rubrics would better reflect the Number Framework. Some further modifications in the rubric for Task 2 may also have a slight overall effect upon the measures.

Table 3 **Difficulty level of tasks**

		Interview 1		Interview 2		Interview 3		Interview 4		Average	
Section	**Task**	**Difficulty**	**s.e**	**Difficulty**	**s.e**	**Difficulty**	**s.e**	**Difficulty**	**s.e**	**Difficulty**	**s.e**
Stages 1–3	1	-	-	-	-	-	-	-	-	-	-
	2	-25.1	1.4	-24.8	1.3	-29.5	1.4	-27.5	1.2	-26.7	0.7
Stage 4–Early stage 5	3	10.5	0.8	8.2	0.8	9.9	0.9	8.0	0.7	9.2	0.4
	4	19.2	0.7	19.2	0.7	18.7	0.7	19.2	0.7	19.1	0.4
	5	26.7	0.9	30.6	0.9	33.4	0.9	33.4	0.9	31.0	0.5
Stage 5	6	29.3	0.9	34.3	0.9	34.0	0.9	30.3	1.1	32.0	0.5
	7	38.2	0.9	38.9	0.9	40.3	0.9	39.4	0.9	39.2	0.5
	8	45.9	0.9	41.1	0.9	39.6	0.9	43.1	0.9	42.4	0.5
Early Stage 6	9	39.4	0.9	39.9	0.9	34.4	1.0	35.0	0.9	37.2	0.5
	10	46.2	0.9	46.2	0.9	49.3	1.0	45.8	0.9	46.9	0.5
	11	46.6	1.1	46.3	0.9	54.5	0.9	54.5	1.1	50.5	0.5
Stage 6	12	49.7	0.9	49.2	1.0	56.2	0.9	53.4	0.9	52.1	0.5
	13	52.8	0.9	53.6	0.9	52.6	1.1	50.1	1.0	52.3	0.5
	14	57.3	1.1	63.4	1.3	56.8	0.9	63.4	1.1	60.2	0.5
Early Stage 7	15	64.8	1.1	63.0	1.1	66.6	1.3	66.0	1.0	65.1	0.6
	16	64.0	1.2	55.7	1.1	62.9	1.0	56.8	1.0	59.9	0.5
	17	62.4	1.1	66.1	1.2	61.9	1.0	63.6	1.1	63.5	0.6
Stage 7	18	78.3	1.5	69.8	1.4	67.5	1.1	67.1	1.2	70.7	0.7
	19	65.4	1.3	72.9	1.3	68.0	1.3	68.9	1.1	68.8	0.6
	20	68.9	1.1	69.4	1.4	71.0	1.1	71.2	1.2	70.1	0.6
Early Stage 8	21	79.5	2.2	83.0	2.0	74.3	1.3	83.6	2.0	80.1	0.9
	22	78.8	1.9	76.5	1.7	77.7	1.6	74.3	1.3	76.8	0.8
	Av.	47.6	0.2	47.7	0.2	47.6	0.2	47.6	0.2		

No data were available for Task 1, as all or virtually all students in the calibration study got these questions correct.

Task descriptors

The following table gives a mathematical description of all 22 tasks in each of the four interview forms. These give the formulation of each problem as it is stated. Students may well have interpreted or transformed the problem to an equivalent problem using inverse operations etc.

Table 4 **Mathematical description of tasks**

Task	Interview 1	Interview 2	Interview 3	Interview 4
1	Count 8 items	Count 9 items	Count 7 items	Count 6 items
2	3 + 6 = ?	2 + 5 = ?	2 + 4 = ?	3 + 4 = ?
3	9 + 7 = ?	8 + 6 = ?	8 + 5 = ?	8 + 7 = ?
4	6 × 5 = ?	5 × 5 = ?	3 × 6 = ?	5 × 5 = ?
5	4 × ? = 20 or 1/4 of 20 = ?	3 × ? = 15 or 1/3 of 15 = ?	4 × ? = 12 or 1/4 of 12 = ?	4 × ? = 12 or 1/4 of 12 = ?
6	57 – 25 = ?	84 – 7 = ?	36 + ? = 58	49 + 27 = ?
7	24 = 2 × ?	30 = 5 × ?	45 = 5 × ?	110 = 10 × ? or 110 ÷ 10 = ?
8	12 x 1/4 = ?	3 × 1/4 = ?	8:4 = 1:?	5 = 1/4 of ?
9	? + 26 = 86	476 – 123 = ?	128 + 74 = ?	147 + 36 = ?
10	8 × 6 = ?	88 = 8 × ? or 88 ÷ 8 = ?	6 x 15 = ?	60 = 5 × ? or 60 ÷ 5 = ?
11	6:18 = 3:?	1/2 of 20 c.f. 1/4 of 40	1/2 of 1/4	1/2 of 1/4
12	? + 148 = 176	82 – ? = 44	231 – 78 = ?	143 = 89 + ?
13	(40 – 8) ÷ 4 = ?	72 ÷ 8 = ? or 8 × ? = 72	6 × 15 = ?	5 x 24 = ?
14	32:4 = ?:12	1/3 = 8 so 2/3 = ?	3 share 2	1/3 = 8 so 2/3 = ?
15	4.3 + 5.15 = ?	23.12 – 22.63 = ?	5.33 – 2.9 = ?	0.8 + ? = 1.25
16	33 × 12 = ?	6 x 36 = ?	81 ÷ 3 = 27 or 3 × ? = 81	7 × 27 = ?
17	3/5 of 20 = ?	3/8 of 24 = ?	1/2 of 3/4 = ?	1:1/5 = 23:? rounded up
18	10.6 – ? = 9.69	0.885 + ? = 1.5	1.845 + ? = 2.3	0.67 + ? = 0.9
19	114 ÷ 6 = ? or 114 = 6 × ?	12 × ? = 180 or 180 ÷ 12 = ?	0.075 × ? = 1.5	330 ÷ 15 =? or 330 = 15 × ?
20	3:2 c.f. 8:6	24:16 = a:b and a + b = 10	4/5 of ? = 40	6 × 3/4 = ?
21	0.375 × ? = 4.5	0.38 × 25 = ?	210.9 × 40 = ?	1/5 of 18.5 = ?
22	32/40 = x%	8:6 = 20:?	40:16 = ?:6	6:14 = ?:21

References

Darr, C., Neill, A., Stephanou, A., & Ferral, H. (2009). *Progressive Achievement Test: Mathematics —Teacher manual* (2nd ed.). Wellington: NZCER Press.

Ministry of Education. (2008). *Numeracy Professional Development Projects: Book 1: The Number Framework: Revised edition 2007.* Wellington: Ministry of Education. Available at: http://nzmaths.co.nz/sites/default/files/Numeracy/2008numPDFs/NumBk1.pdf

Ministry of Education. (2009). *Mathematics standards for years 1–8.* Wellington: Author.

Neill, A., Lawes, E., Robertson, S., & Darr, C. (2011). *GloSS psychometric study: Report to the Ministry of Education*. Wellington: Ministry of Education.

GloSS recording sheet—Interview form: **1 2 3 4** *(circle as appropriate)*

Name: ________________________________ **Year level**: ______ **Date**: ____________

Addition and Subtraction	Multiplication and Division	Proportions and Ratios
Task 1 **Stage: 0 / 1** Observation:		
Task 2 **Stage: 1 / 2 / 3 / 4** Observation:		
Task 3 **Stage: 3 / 4 / E5** Observation:	**Task 4** **Stage: 3 / 4 / E5** Observation:	**Task 5** **Stage: 4 / E5** Observation:
Task 6 **Stage: E5 / 5** Observation:	**Task 7** **Stage: E5 / 5** Observation:	**Task 8** **Stage: E5 / 5** Observation:
Task 9 **Stage: 5 / E6** Observation:	**Task 10** **Stage: 5 / E6** Observation:	**Task 11** **Stage: 5 / E6** Observation:
Task 12 **Stage: E6 / 6** Observation:	**Task 13** **Stage: E6 / 6** Observation:	**Task 14** **Stage: E6 / 6** Observation:
Task 15 **Stage: 6 / E7** Observation:	**Task 16** **Stage: 6 / E7** Observation:	**Task 17** **Stage: 6 / E7** Observation:
Task 18 **Stage: E7 / 7** Observation:	**Task 19** **Stage: E7 / 7** Observation:	**Task 20** **Stage: E7 / 7** Observation:
	Task 21 **Stage: 7 / E8** Observation:	**Task 22** **Stage: 7 / E8** Observation:

Stage summary:

Addition & Subtraction:_______ Multiplication & Division:________ Proportions & Ratios:________

For each domain, highlight the largest stage number circled in positions b and c of "Stage a/b" or "Stage a/b/c".

GloSS Continuum of Strategy Stage Expectations

End of Kindergarten Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk
Cause for Concern
Achieving at or above expectations
High Achievers

End of 1st Grade Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk
Cause for Concern
Achieving at or above expectations
High Achievers

End of 2nd Grade Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk
Cause for Concern
Achieving at or above expectations
High Achievers

End of 3rd Grade Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk
Cause for Concern
Achieving at or above expectations
High Achievers

End of 4th Grade Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk
Cause for Concern
Achieving at or above expectations
High Achievers

End of 5th Grade Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk
Cause for Concern
Achieving at or above expectations
High Achievers

End of 6th Grade Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk

Cause for Concern

Achieving at or above expectations

High Achievers

End of 7th Grade Mathematics Strategy Expectations

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
EM	1-1	CA	CAI	AC	EA	AA	AM	AP

At Risk

Cause for Concern

Achieving at or above expectations

Overview of Expectations

The shaded stages in the diagrams shown on the continuum are an indication of the expected levels of achievement. These expectations have been aligned to the expectations in the Common Core State Standards. The goal is for the majority of students to be working within the designated strategy stage, with most of the accompanying knowledge known. Students should also be ready to work at the next stage. A range of achievement is normal and expected at each grade level. These expectations, and the indications of when to consider students to be “At Risk”, “Cause for Concern”, or “High Achievers” are a guide only. They are intended to assist principals and teachers in setting high, yet attainable, expectations, and develop teaching and learning plans for all students at each grade level in their school.

Students rated as **“At Risk”** are those who are sufficiently below expectations that their future learning in mathematics is in jeopardy. Students rated “at risk” require special teaching, modified classroom programs and extra support to continue their development and maintain positive attitudes. These students are in need of more intense interventions on the Response to Intervention Pyramid (i.e. Tier 3 or specialized Tier 4). The support required is likely to be beyond what can be reasonably expected from their regular classroom teacher alone.

Students rated as **“Cause for Concern”** are those who are below expectations, although at a stage where is it reasonable to expect regular classroom teachers to be able to move them to the expected stage. These students may need interventions within Tier 2 of the Response to Intervention Pyramid.

“High achievers” are those students who are sufficiently above expectations that they may require special teaching, modified classroom programs and extra support to continue their development and maintain positive attitudes. The support required could be beyond what can be reasonably expected from the classroom teacher alone. Their needs may be addressed through advanced content and accelerated learning plans for enrichment.

Name of Interviewer_______________________________

GloSS recording sheet – Interview Form: 1 2 3 (circle as appropriate)

Name:___________________________________Grade:________________Date:____________________

Stage summary:

Addition & Subtraction: _____Multiplication & Division: ______Proportions & Ratios:______

For each domain, highlight the largest stage number circled in positions b and c of "Stage a/b" or "Stage a /b/c".

Addition and Subtraction	Multiplication and Division	Proportions and Ratios
Task 1 **Stage: 0 / 1** Observation:		
Task 2 **Stage: 1 / 2 - 3 / 4** Observation:		
Task 3 **Stage: 3 / 4 / E5** Observation:	**Task 4** **Stage: 3 / 4 / E5** Observation:	**Task 5** **Stage: 4 / E5** Observation:
Task 6 **Stage: E5 / 5** Observation:	**Task 7** **Stage: E5 / 5** Observation:	**Task 8** **Stage: E5 / 5** Observation:
Task 9 **Stage: 5 / E6** Observation:	**Task 10** **Stage: 5 / E6** Observation:	**Task 11** **Stage: 5 / E6** Observation:
Task 12 **Stage: E6 / 6** Observation:	**Task 13** **Stage: E6 / 6** Observation:	**Task 14** **Stage: E6 / 6** Observation:
Task 15 **Stage: 6 / E7** Observation:	**Task 16** **Stage: 6 / E7** Observation:	**Task 17** **Stage: 6 / E7** Observation:
Task 18 **Stage: E7 / 7** Observation:	**Task 19** **Stage: E7 / 7** Observation:	**Task 20** **Stage: E7 / 7** Observation:
	Task 21 **Stage: 7 / E8** Observation	**Task 22** **Stage: 7 / E8** Observation:

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

GloSS

INTERVIEW 1

TASK 1

ACTION: *Place 8 counters of the same colour on the table.*

SAY: How many counters are there?

Stage	Strategy observed
0	**Student cannot count 8 objects**
1	**Correctly counts the 8 objects**

DECISION: If "1" is circled in **Task 1**, CONTINUE the interview.
If "0" is circled, rate the student at Stage 0 and STOP the interview.

TASK 2

SAY: Please hold out your hands for me.
SAY: Here are 3 counters.
SAY: Here are another 6 counters.

SAY: How many counters have you got altogether?

ACTION: *Place 3 counters in the student's hand.*
ACTION: *Place 6 counters in their other hand.*
ACTION: *Close the student's hands to encourage imaging.*
ACTION: *Allow the student to open their hands if they find imaging difficult.*

Stage	Strategy observed
1	**Cannot solve the addition problem** (Stage 1)
2–3	**Physically counts all the objects from 1 on materials** (Stage 2) **Correctly counts all the items from 1 by imaging** (Stage 3)
4 or higher	**Counts on** e.g., 4, 5, 6, 7, 8, 9 **or** 7, 8, 9 **Knows** 3 + 6

DECISION: If **either** "2–3" **or** "4" are circled in **Task 2**, CONTINUE the interview.
If "1" is circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 1 TASK 2

$$3 + 6 = \square$$

INTERVIEW 1 TASK 3

$$9 + 7 = \square$$

TASK 3

ACTION: *Place 9 counters under a card then place 7 under another card.*

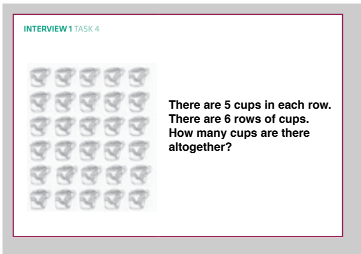
SAY: Here are 9 counters, and here are 7 counters.
How many counters are there altogether?

INTERVIEW 1 TASK 3

$9 + 7 = \square$

Stage	Strategy observed
3	**Cannot solve the problem** (After removing the cards–Stage 1) **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, 3, …, 16 **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, 3, …, 16
4	**Counts on** (Stage 4) **e.g.,** 10, 11, 12, …, 15, 16 **or** 8, 9, 10, …, 15, 16
Early 5 or higher	**Uses a part-whole strategy e.g.,** - Making to ten e.g., 9 + 1 = 10; 10 + 6 = 16 - Doubling with compensation e.g., 7 + 7 = 14; 14 + 2 = 16 **or** 8 + 8 = 16 **or** 9 + 9 = 18; 18 – 2 = 16 - Addition fact e.g., 9 + 7 = 16

TASK 4



SAY: There are 5 cups in each row.
SAY: There are 6 rows of cups.
SAY: How many cups are there altogether?

ACTION: *Sweep one row with your finger.*
ACTION: *Point to each row one by one.*

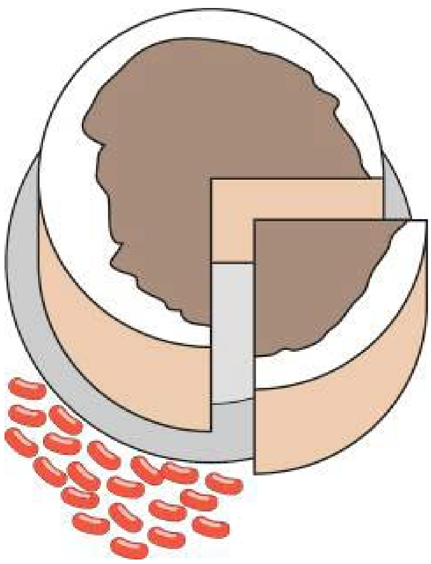
Stage	Strategy observed
3	**Cannot solve the problem** **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, 3, 4, **5**, 6, …, **30** **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, 3, 4, **5**, 6, …, **30**
4	**Skip counting** (Stage 4) **e.g.,** 5, 10, 15, 20, 25, 30 [**or** 6, 12, 18, 24, 30]
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Repeat addition e.g., 5 + 5 + 5 + 5 + 5 + 5 **=** 30 **or** 5 + 5 = 10; 10 + 5 = 15; …; 25 + 5 = 30 - Multiplication strategies e.g., 4 × 5 = 20; 20 + 5 + 5 = 30 - Multiplication fact e.g., 6 × 5 = 30

INTERVIEW 1 TASK 4

There are 5 cups in each row.
There are 6 rows of cups.
How many cups are there altogether?

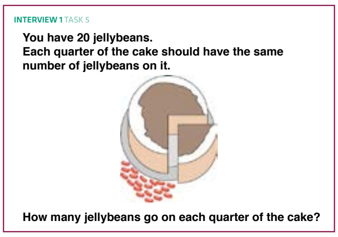
INTERVIEW 1 TASK 5

You have 20 jellybeans.
Each quarter of the cake should have the same number of jellybeans on it.



How many jellybeans go on each quarter of the cake?

TASK 5



ACTION: *Provide 20 counters (jellybeans).*
Allow the student access to these counters if necessary.

SAY: You have 20 jellybeans.

Each quarter of the cake should have the same number of jellybeans on it.

How many jellybeans go on each quarter of the cake?

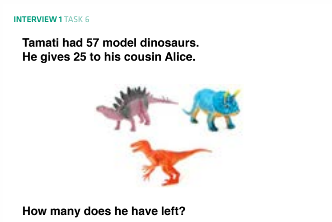
Note: Say "fourth" instead of "quarter" if this is more familiar to your student.

Stage	Strategy observed
2–4	**Cannot solve the problem** **Equally shares the beans, on materials or by imaging** (Stage 2–4)
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Additive partitioning e.g., 10 + 10 = 20; (5 + 5) + (5 + 5) = 20 - Multiplication strategy e.g., 5 × 2 = 10; 10 × 2 = 20 - Multiplication or division fact e.g., 5 × 4 = 20 **or** 20 ÷ 4 = 5

DECISION: If **any** "E5" are circled in **Tasks 3, 4** or **5**, **or** if the "4s" are circled in **both Task 3** and **Task 4**, CONTINUE the interview.

Otherwise STOP the interview. If in any doubt, CONTINUE the interview.

TASK 6



SAY: Tamati had 57 model dinosaurs.
He gives 25 to his cousin Alice.
How many does he have left?

Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Counting on** or **Counting back** (Stage 4) **e.g.,** 26, 27, …, 57 **or** 56, 55, …, 25 **Skip counting in tens and ones** (Stage 4) **e.g.,** [57] 47, 37, 36, 35, 34, 33, 32 **Repeat addition in tens and ones** (Stage E5) **e.g.,** 57 – 10 = 47; 47 – 10 = 37; 37 – 5 = 32 **or** 25 + 10 = 35; 35 + 10 = 45; 45 + 10 = 55; 55 + 2 = 57; 30 + 2 = 32 **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** 25 + 5 = 30; 30 + 10 = 40; 40 + 10 = 50; 51, 52, …, 56, 57
5 or higher	**Uses a part-whole strategy e.g.,** - Doubling e.g., 25 + 25 = 50; 50 + 7 = 57; 25 + 7 = 32 - Place value partitioning e.g., (50 – 20) + (7 – 5) = 32 - Subtracting in parts e.g., 57 – 20 = 37; 37 – 5 = 32 - Making to ten e.g., 57 – 7 = 50; 50 – 20 = 30; 30 + 2 = 32

INTERVIEW 1 TASK 6

Tamati had 57 model dinosaurs.
He gives 25 to his cousin Alice.

How many does he have left?

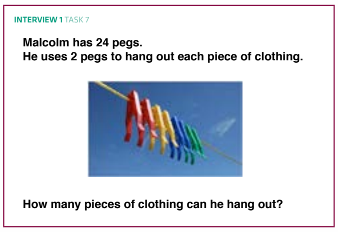
INTERVIEW 1 TASK 7

Malcolm has 24 pegs.
He uses 2 pegs to hang out each piece of clothing.

How many pieces of clothing can he hang out?

TASK 7

SAY: Malcolm has 24 pegs.
He uses 2 pegs to hang out each piece of clothing.
How many pieces of clothing can he hang out?



Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Skip counting** (Stage 4) **e.g.,** 2, 4, 6, …, 24 **Repeated addition** (Stage E5) **e.g.,** 2 + 2 + 2 + … + 2 = 24
5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Doubling additively e.g., 2 + 2 = 4; 4 + 4 = 8; 8 + 8 + 8 = 24; 4 + 4 + 4 = 12 - Derive from multiplication facts e.g., 10 × 2 = 20; 2 × 2 = 4; 10 + 2 = 12 - Multiplication or division facts e.g., 12 × 2 = 24 **or** 24 ÷ 2 = 12

TASK 8

SAY: Alex and his friends ate 12 slices of pizza.
Each slice was one-quarter of a pizza.
How many pizzas did they eat?
Note: Say "fourth" instead of "quarter" if this is more familiar to your student.

Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Counting strategy** (Stage E5) **e.g.,** $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$ (one whole), $\frac{5}{4}$, …, $\frac{11}{4}, \frac{12}{4}$ (three wholes)
5 or higher	**Uses a proportional approach e.g.,** - Addition strategies e.g., 4 pieces is 1 pizza; 4 + 4 + 4 = 12 so the answer is 3 - Rate strategies e.g., 4 quarters is 1 pizza, 8 quarters is 2, 12 quarters is 3 - Multiplication facts e.g., 4 × 3 = 12 **or** 12 ÷ 4 = 3

DECISION: If **any** "5" are circled in **Tasks 6, 7** or **8**, CONTINUE the interview.
If **only** "E5" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 1 TASK 8

Alex and his friends ate 12 slices of pizza.
Each slice was one-quarter ($\frac{1}{4}$) of a pizza.

How many pizzas did they eat?

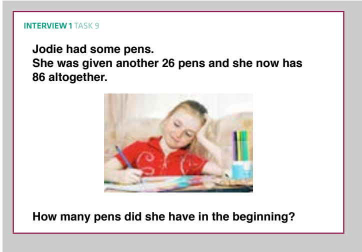
INTERVIEW 1 TASK 9

Jodie had some pens.
She was given another 26 pens and she now has 86 altogether.

How many pens did she have in the beginning?

TASK 9

SAY: Jodie had some pens.
She was given another 26 pens and she now has 86 altogether.
How many pens did she have in the beginning?



Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Skip counting in tens** (Stage 4) **e.g.,** [26] 36, 46, 56, 66, 76, 86 **Repeat addition in tens** (Stage E5) **e.g.,** 26 + 10 + 10 + 10 + 10 + 10 + 10 = 86
Early 6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (80 – 20) + (6 – 6) = 60 + 0 = 60 - Addition in parts (with reversibility) e.g., 26 + 60 = 86 **or** 86 – 26 = 60

TASK 10

SAY: Zac has 8 packs of drink.
Each pack has 6 cans.
How many cans is that altogether?

Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy e.g.,** - Skip counting (Stage 4) e.g., 6, 12, 18, 24, …, 48 [**or** 8, 16, 24, 32, 40, 48] - Repeated addition (Stage E5) e.g., 6 + 6 + 6 + … + 6 [**or** 8 + 8 + 8 + … + 8] - Doubling additively (Stage 5) e.g., 6 + 6 = 12; 12 + 12 = 24; 24 + 24 = 48
Early 6 or higher	**Uses a multiplicative strategy e.g.,** - Derives from multiplication facts e.g., 8 × 5 = 40; 40 + 8 = 48 - Multiplication facts e.g., 8 × 6 = 48

INTERVIEW 1 TASK 10

Zac has 8 packs of drink.
Each pack has 6 cans.

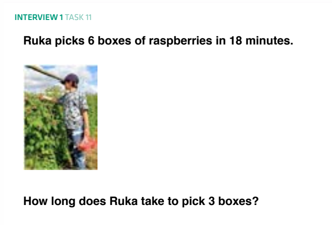
How many cans is that altogether?

INTERVIEW 1 TASK 11

Ruka picks 6 boxes of raspberries in 18 minutes.

How long does Ruka take to pick 3 boxes?

TASK 11

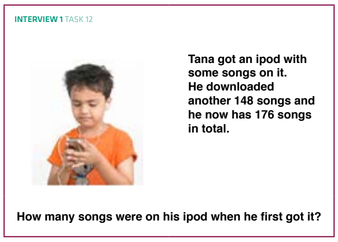


SAY: Ruka picks 6 boxes of raspberries in 18 minutes.
How long does Ruka take to pick 3 boxes?

Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies only** (Stage 5) **e.g.,** 6 + 6 + 6 = 18 so 3 minutes per box; 3 + 3 + 3 = 9
Early 6 or higher	**Uses a mix of additive and multiplicative strategies e.g.,** 3 × 6 = 18 so 3 minutes per box; 3 + 3 + 3 = 9 **Uses multiplicative strategies e.g.,** 3 × 6 = 18 so 3 minutes per box; 3 × 3 = 9 **Proportional approach e.g.,** Equate fraction of boxes to fraction of time e.g., $\frac{3}{6} = \frac{1}{2}$; $\frac{1}{2}$ of 18 = 9

DECISION: If **any** “E6” are circled in **Tasks 9, 10** or **11**, CONTINUE the interview.
If **only** “5” are circled, STOP the interview. If in any doubt, CONTINUE the interview.

TASK 12



SAY: Tana got an ipod with some songs on it.
He downloaded another 148 songs and he now has 176 songs in total.
How many songs were on his ipod when he first got it?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** [148] 158, 168; 168 + 2 = 170; 170 + 6 = 176; 20 + 2 + 6 **Attempts part-whole strategy with error** (Stage 5) **e.g.,** 176 – 150 = 26; 26 – 2 = 24 (compensates in the wrong direction)
6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (100 – 100) + (70 – 40) + (6 – 8) = 30 – 2 = 28 - Adding on in parts e.g., 148 + 20 = 168; 168 + 8 = 176; 20 + 8 = 28 **or** 176 – 20 = 156; 156 – 8 = 148; 20 + 8 = 28 - Rounding and compensation e.g., 148 + 30 – 2 = 176; 30 – 2 = 28 - Making to tens and compensation e.g., 148 + 2 = 150; 150 + 20 = 170; 170 + 6 = 176; 2 + 20 + 6 = 28

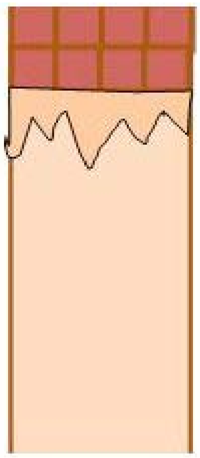
INTERVIEW 1 TASK 12

Tana got an ipod with some songs on it.
He downloaded another 148 songs and he now has 176 songs in total.

How many songs were on his ipod when he first got it?

INTERVIEW 1 TASK 13

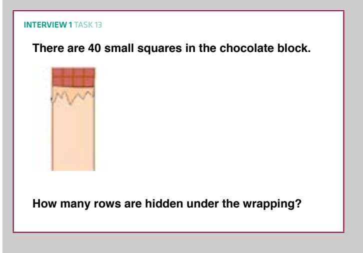
There are 40 small squares in the chocolate block.



How many rows are hidden under the wrapping?

TASK 13

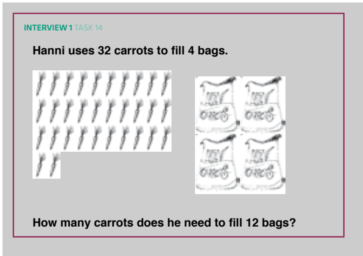
SAY: There are 40 small squares in the chocolate block.
How many rows are hidden under the wrapping?
If the student does not understand that the question is asking for the number of rows, explain this to them.



Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy** (Stage 5) **e.g.,** - Doubling additively e.g., 4 + 4 = 8; 8 + 8 = 16; 16 + 16 = 32; 4 + 4 = 8
6 or higher	**Uses a multiplicative strategy e.g.,** - Derived from basic fact e.g., 10 × 4 = 40 so 8 × 4 = 32 so the answer is 8 **or** 10 × 4 = 40 so there are 10 – 2 = 8 - Multiplication facts e.g., 40 – 8 = 32 and 32 ÷ 4 = 8 (**or** 8 × 4 = 32)

TASK 14

SAY: Hanni uses 32 carrots to fill 4 bags.
How many carrots does he need to fill 12 bags?

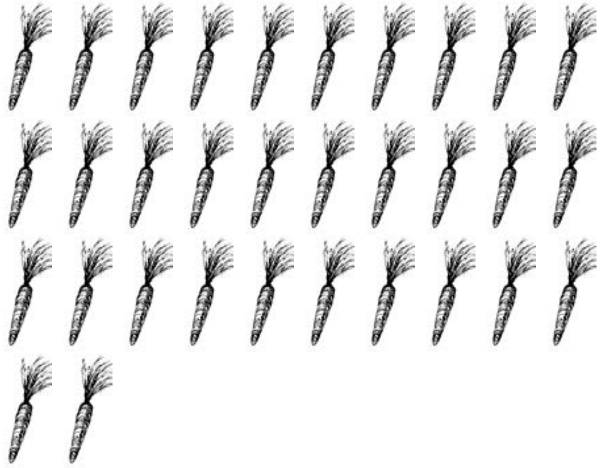


Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy** (Stage 5) **e.g.,** - Doubling additively e.g., 32 + 32 = 64; 64 + 32 = 96
6 or higher	**Uses a multiplicative strategy** - Unitising e.g., 8 carrots per bag because 4 × 8 = 32; 12 × 8 = 96 - Using ratios e.g., Three times as many bags because 3 × 4 = 12; 3 × 32 = 96

DECISION: If **any** “6” are circled in **Tasks 12, 13** or **14**, CONTINUE the interview.
If **only** “E6” are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 1 TASK 14

Hanni uses 32 carrots to fill 4 bags.



How many carrots does he need to fill 12 bags?

INTERVIEW 1 TASK 15

Kathie ran 4.3 kilometres on the first day.
She ran 5.15 kilometres on the second day.

How far did Kathie run altogether?

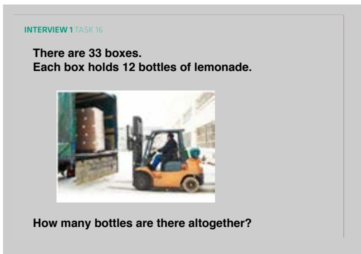
TASK 15

SAY: Kathie ran 4.3 kilometres on the first day.
She ran 5.15 kilometres on the second day.
How far did Kathie run altogether?

Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Misunderstands decimal place value** (Stage 6) **e.g.,** - Ignores the decimal points e.g., 4.3 + 5.15 = 558 - Treats numbers after the decimal as whole numbers e.g., 4.3 + 5.15 "=" 9.18 [often said "nine point eighteen"]
Early 7 or higher	**Uses part-whole strategies with decimal place value understanding e.g.,** - Place value partitioning e.g., (4 + 5) + (0.3 + 0.1) + 0.05 = 9.45 - Adding on in parts e.g., 4.3 + 5 = 9.3; 9.3 + 0.15 = 9.45 **or** 9.3 + 0.1 = 9.4; 9.4 + 0.05 = 9.45

TASK 16

SAY: There are 33 boxes.
Each box holds 12 bottles of lemonade.
How many bottles are there altogether?



Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses a mix of multiplicative and additive strategies** (Stage 6) **e.g.,** 12 + 12 + 12 = 36; 36 × 10 = 360; 360 + 36 = 396 **or** 30 × 12 = 360; 360 + 12 + 12 + 12 = 396
Early 7 or higher	**Uses a multiplicative strategy e.g.,** - Partitioning e.g., 33 × 10 = 330; 33 × 2 = 66; 330 + 66 = 396 **or** 30 × 10 = 300; 3 × 10 = 30; 30 × 2 = 60; 3 × 2 = 6; 300 + 30 + 60 + 6 = 396 - Derived from basic facts e.g., 3 × 12 = 36 and 30 × 12 = 360; 36 + 360 = 396 - Triples and thirds e.g., 12 × 33 = 4 × 99; 4 × 100 = 400; 400 – 4 = 396

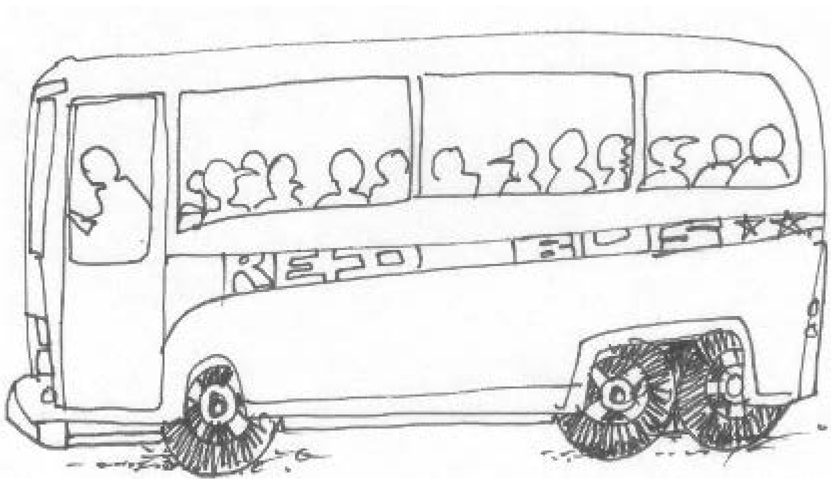
INTERVIEW 1 TASK 16

There are 33 boxes.
Each box holds 12 bottles of lemonade.

How many bottles are there altogether?

INTERVIEW 1 TASK 17

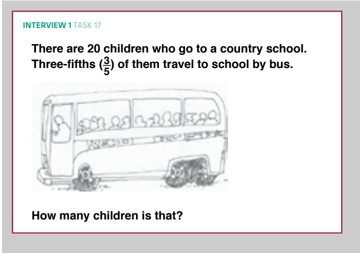
There are 20 children who go to a country school.
Three-fifths ($\frac{3}{5}$) of them travel to school by bus.



How many children is that?

TASK 17

SAY: There are 20 children who go to a country school.
Three-fifths of them travel to school by bus.
How many children is that?



Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies** (Stage 5) **e.g.,** $\frac{1}{5}$ of 20 is 4 because 4 + 4 + 4 + 4 + 4 = 20; $\frac{3}{5}$ of 20 = 4 + 4 + 4 = 12
Early 7 or higher	**Uses multiplicative strategies e.g.,** $\frac{1}{5}$ of 20 is 4 because 5 × 4 = 20 **or** 20 ÷ 5 = 4 **then** multiplies (or adds) to get $\frac{3}{5}$, i.e., 3 × 4 = 12 [**or** 4 + 4 + 4 = 12]

DECISION: If **any** “E7” are circled in **Tasks 15, 16** or **17**, CONTINUE the interview.
If **only** “6” are circled, STOP the interview. If in any doubt, CONTINUE the interview.

TASK 18

SAY: In 1912 the world record time for the 100 metre sprint was 10.6 seconds.
It is now 9.69 seconds.
By how much has the record changed?

Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Misinterprets decimal place value** (Stage 6) **e.g.,** - Treats numbers after the decimal as whole numbers e.g., (10 – 9) + (0.6 – 0.69) “=” 1 – 0.63 = 0.37 **Attempts part-whole strategy with error** (Stage 6) **e.g.,** (0.6 – 0.69) = 0.09; 1 + 0.09 = 1.09 (compensates in the wrong direction)
7 or higher	**Uses part-whole strategies e.g.,** - Place value partitioning e.g., (10 – 9) + (0.6 – 0.69) = 1 – 0.09 = 0.91 - Making to ones e.g., 9.69 + 0.31 = 10; 10 + 0.6 = 10.6; 0.6 + 0.31 = 0.91 - Takes off a tidy number and compensates e.g., 10.6 – 1.0 = 9.6; 9.6 + 0.09 = 9.69; 1 – 0.09 = 0.91 - Takes off to get a tidy number and compensates e.g., 10.6 – 9.6 = 1.0; 1.0 – 0.09 = 0.91

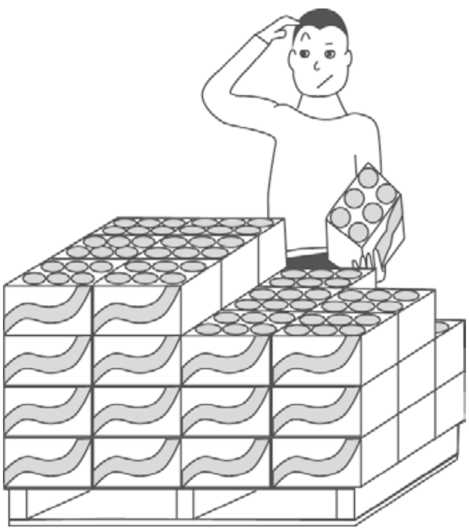
INTERVIEW 1 TASK 18

In 1912 the world record time for the 100 metre sprint was 10.6 seconds.
It is now 9.69 seconds.

By how much has the record changed?

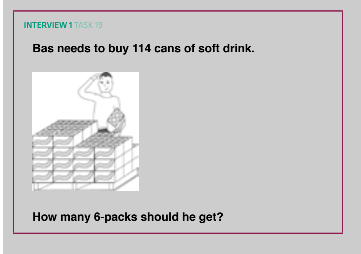
INTERVIEW 1 TASK 19

Bas needs to buy 114 cans of soft drink.



How many 6-packs should he get?

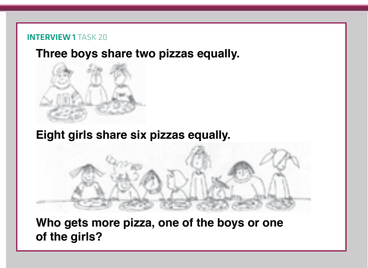
TASK 19



SAY: Bas needs to buy 114 cans of soft drink.
How many 6-packs should he get?

Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses a mix of multiplicative and additive strategies** (Stage 6) **e.g.,** 6 × 10 = 60; 60 + 60 = 120; 120 – 6 = 114; 10 + 10 – 1 = 19
7 or higher	**Uses a multiplicative strategy e.g.,** - Basic facts with adjustment e.g., 10 × 6 = 60; 20 × 6 = 120; 120 – 6 = 114; 10 + 10 – 1 = 19 - Halving then basic facts with adjustment e.g., 114 ÷ 6 = 57 ÷ 3; 60 ÷ 3 = 20; 20 – 1 = 19 - Nice (compatible) numbers e.g., 120 ÷ 6 = 20; 120 – 6 = 114; 20 – 1 = 19

TASK 20



SAY: Three boys share two pizzas equally.
Eight girls share six pizzas equally.
Who gets more pizza, one of the boys or one of the girls?

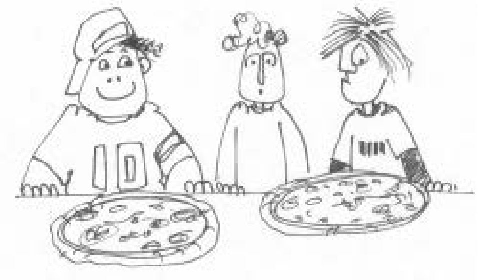
Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage**
7 or higher	**Uses proportional approach e.g.,** - Uses equivalent fractions to get unit rate e.g., $2 \div 3 = \frac{2}{3} = \frac{8}{12}$ of a pizza **and** $6 \div 8 = \frac{6}{8} = \frac{3}{4} = \frac{9}{12}$ of a pizza, $\frac{9}{12} > \frac{8}{12}$ so girls get more each. - Uses equivalent ratios e.g., 2:3 = 6:9 so 9 boys would share 6 pizza and they get a lesser share than 8 girls sharing 6 pizza. - Rate argument e.g., 3 times as much pizza for the girls but fewer than 3 times as many girls. **Partial solution e.g.,** $2 \div 3 = \frac{2}{3}$ of a pizza, $6 \div 8 = \frac{6}{8} = \frac{3}{4}$ of a pizza, and $\frac{3}{4} > \frac{2}{3}$ [**Ask:** How do you know $\frac{3}{4} > \frac{2}{3}$? **Rate as "7"** if they can explain why.]

DECISION: If **any** "7" are circled in **Tasks 18, 19** or **20**, CONTINUE the interview.

If **only** "E7" are circled, STOP the interview If in any doubt, CONTINUE the interview.

INTERVIEW 1 TASK 20

Three boys share two pizzas equally.



Eight girls share six pizzas equally.

Who gets more pizza, one of the boys or one of the girls?

INTERVIEW 1 TASK 21

The hairdresser has 4.5 litres of dye left.
Each tint uses 0.375 litres of dye.

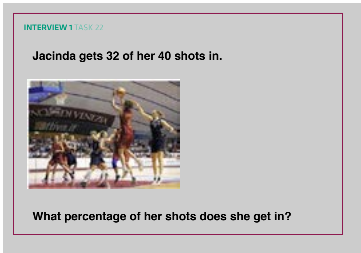
How many tints can the hairdresser do?

TASK 21

SAY: The hairdresser has 4.5 litres of dye left.
Each tint uses 0.375 litres of dye.
How many tints can the hairdresser do?

Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage**
Early 8 or higher	**Uses multiplicative strategies e.g.,** - Successive doubling e.g., $2 \times 0.375 = 0.75$; $2 \times 0.75 = 1.5$; $3 \times 1.5 = 4.5$; $2 \times 2 \times 3 = 12$ - Multiplication facts and compensation e.g., $3.750 \div 0.375 = 10$; $4.5 - 3.750 = 0.750$; $0.750 \div 0.375 = 2$; $10 + 2 = 12$ **or** $10 \times 0.375 = 3.75$; $2 \times 0.375 = 0.75$; $10 + 2 = 12$ **Turns decimals into fractions e.g.,** $0.375 = \frac{3}{8}$; $4.5 = 4\frac{1}{2}$; $4\frac{1}{2} = \frac{36}{8}$; $\frac{36}{8} \div \frac{3}{8} = 12$

TASK 22



SAY: Jacinda gets 32 of her 40 shots in.
What percentage of her shots does she get in?

Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Estimation strategies** (Stage 7) **e.g.,** Half of 40 is 20 (that's 50%) **and** 30 shots is three-quarters (that's 75%) **so** it is more than three-quarters.
Early 8 or higher	**Uses multiplicative strategies e.g.,** $2\frac{1}{2} \times 40$ is 100; $2\frac{1}{2} \times 32$ is 80; 80 out of 100 = 80% **Uses equivalent fractions e.g.,** $\frac{32}{40} = \frac{8}{10} = \frac{80}{100} = 80\%$

Stop the interview

Jacinda gets 32 of her 40 shots in.

What percentage of her shots does she get in?

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

GloSS

INTERVIEW 2

TASK 1

ACTION: *Place 9 counters of the same colour on the table.*
SAY: How many counters are there?

Stage	Strategy observed
0	**Student cannot count 9 objects**
1	**Correctly counts the 9 objects**

DECISION: If “1” is circled in **Task 1**, CONTINUE the interview.
If “0” is circled, rate the student at Stage 0 and STOP the interview.

TASK 2

INTERVIEW 2 TASK 2

$$2 + 5 = \square$$

SAY: Please hold out your hands for me.
ACTION: *Place 2 counters in the student’s hand.*
SAY: Here are 2 counters.
ACTION: *Place 5 counters in their other hand.*
SAY: Here are another 5 counters.
ACTION: *Close the student’s hands to encourage imaging.*
SAY: How many counters have you got altogether?
ACTION: *Allow the student to open their hands if they find imaging difficult.*

Stage	Strategy observed
1	**Cannot solve the addition problem** (Stage 1)
2–3	**Physically counts all the objects from 1 on materials** (Stage 2) **Correctly counts all the items from 1 by imaging** (Stage 23)
4 or higher	**Counts on** e.g., 3, 4, 5, 6, 7 **or** 6, 7 **Knows** 2 + 5

DECISION: If **either** “2–3” **or** “4” are circled in **Task 2**, CONTINUE the interview.
If “ 1” is circled, STOP the interview. If in any doubt, CONTINUE the interview.

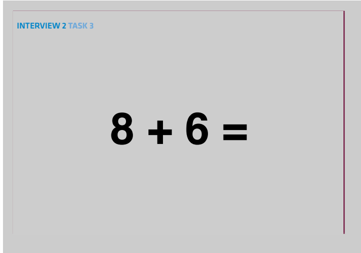
INTERVIEW 2 TASK 2

$$2 + 5 = \square$$

INTERVIEW 2 TASK 3

$$8 + 6 = \square$$

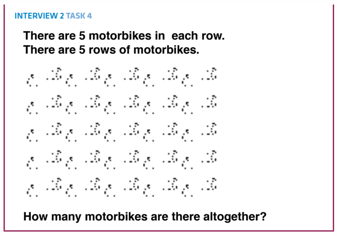
TASK 3



ACTION: *Place 8 counters under a card then place 6 under another card.*
SAY: Here are 8 counters, and here are 6 counters.
How many counters are there altogether?

Stage	Strategy observed
3	**Cannot solve the problem** (After removing the cards – Stage 1) **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, 3, …, 14 **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, 3, …, 14
4	**Counts on** (Stage 4) **e.g.,** 9, 10, 11, 12, 13, 14 **or** 7, 8, …, 13, 14
Early 5 or higher	**Uses a part-whole strategy e.g.,** - Making to ten e.g., 8 + 2 = 10; 10 + 4 = 14 - Doubling with compensation e.g., 6 + 6 = 12; 12 + 2 = 14 **or** 7 + 7 = 14 **or** 8 + 8 = 16; 16 – 2 = 14 - Addition fact e.g., 8 + 6 = 14

TASK 4

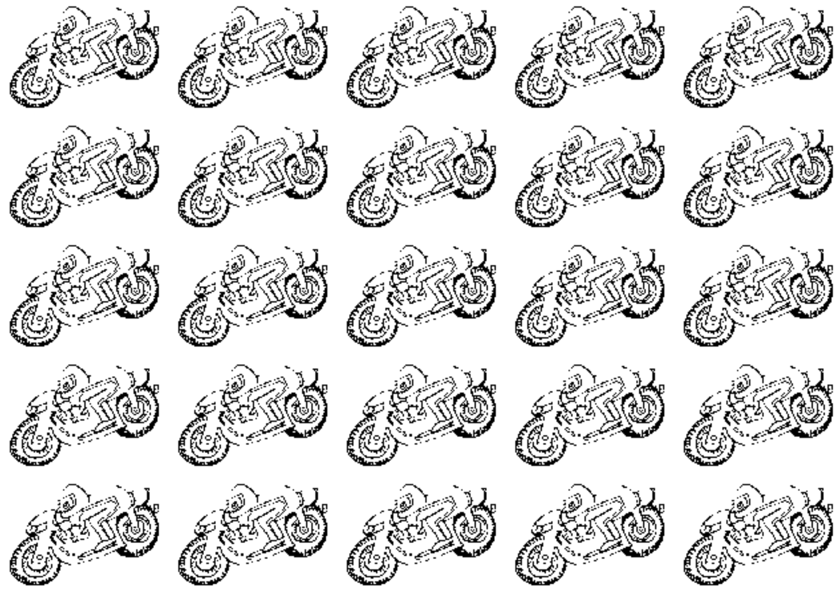


SAY: There are 5 motorbikes in each row. **ACTION:** *Sweep one row with your finger*
SAY: There are 5 rows of motorbikes. **ACTION:** *Point to each row one by one*
SAY: How many motorbikes are there altogether?

Stage	Strategy observed
3	**Cannot solve the problem** **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, 3, 4, **5**, 6, …, **25** **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, 3, 4, **5**, 6, …, **25**
4	**Skip counting** (Stage 4) **e.g.,** 5, 10, 15, 20, 25
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Repeat addition e.g., 5 + 5 + 5 + 5 + 5 = 25 - Additive strategies e.g., 5 + 5 = 10; 10 + 10 = 20; 20 + 5 = 25 - Multiplication strategies e.g., 4 × 5 = 20; 20 + 5 = 25 - Multiplication fact e.g., 5 × 5 = 25

INTERVIEW 2 TASK 4

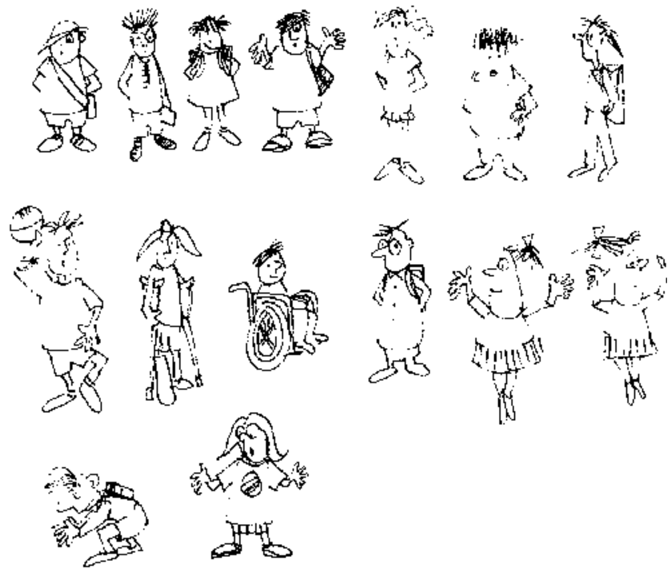
There are 5 motorbikes in each row. There are 5 rows of motorbikes.

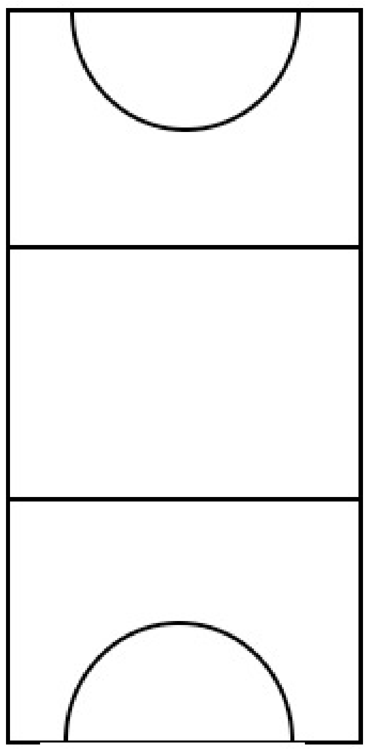


How many motorbikes are there altogether?

INTERVIEW 2 TASK 5

These 15 players have to spread out evenly on the court.





How many players should be in each third of the court?

TASK 5

ACTION: *Provide 15 counters (players).*
Allow the student access to these counters if necessary.

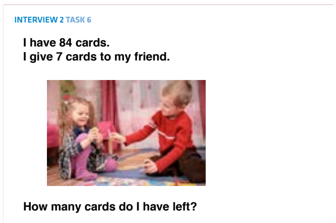
SAY: These 15 players have to spread out evenly on the court.
How many players should be in each third of the court?

Stage	Strategy observed
2–4	**Cannot solve the problem** **Equally shares the players, on materials or by imaging** (Stage 2–4)
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Additive partitioning e.g., 5 + 5 = 10; 5 + 5 + 5 = 15 - Multiplication or division strategies e.g., 3 × 4 = 12; 12 + 3 = 15 - Multiplication or division fact e.g., 3 × 5 = 15 **or** 15 ÷ 3 = 5

DECISION: If **any** "E5" are circled in **Tasks 3, 4** or **5**, **or** if the "4s" are circled in **both Task 3** and **Task 4**, CONTINUE the interview.
Otherwise STOP the interview. If in any doubt, CONTINUE the interview.

TASK 6

SAY: I have 84 cards.
I give 7 cards to my friend.
How many cards do I have left?



Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Counting back** (Stage 4) **e.g.,** 83, 82, 81, 80, 79, 78, 77 **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** 84 – 4 = 80; 79, 78, 77
5 or higher	**Uses a part-whole strategy e.g.,** - Making to tens e.g., 84 – 4 = 80; 80 – 3 = 77 - Take off tidy number and compensates e.g., 84 – 10 = 74; 74 + 3 = 77 - Uses doubles e.g., 7 + 7 = 14 or 14 – 7 = 7 so 84 – 7 = 77

INTERVIEW 2 TASK 6

I have 84 cards.
I give 7 cards to my friend.

How many cards do I have left?

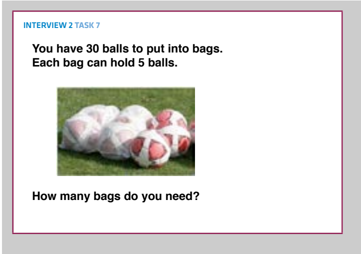
INTERVIEW 2 TASK 7

You have 30 balls to put into bags.
Each bag can hold 5 balls.

How many bags do you need?

TASK 7

SAY: You have 30 balls to put into bags.
Each bag can hold 5 balls.
How many bags do you need?

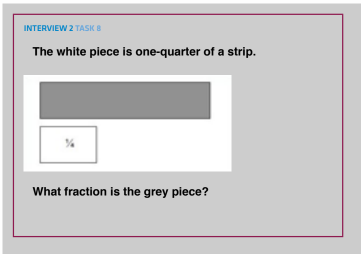


Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Skip counting** (Stage 4) **e.g.,** 5, 10, 15, …, 30 **Repeated addition** (Stage E5) **e.g.,** 5 + 5 + 5 + … + 5 = 30
5 or higher	**Uses an additive or multiplicative strategy e.g.,** -Additive strategies e.g., 5 + 5 = 10; 10 + 10 + 10 = 30; 2 + 2 + 2 = 6 - Derive from multiplication facts e.g., 4 × 5 = 20; 2 × 5 = 10; 4 + 2 = 6 **or** 5 × 5 = 25; 25 + 5 = 30; 5 + 1 = 6 - Multiplication or division facts e.g., 6 × 5 = 30 **or** 30 ÷ 5 = 6

TASK 8

SAY: The white piece is one-quarter of a strip.
What fraction is the grey piece?

Note: Say "fourth" instead of "quarter" if this is more familiar to your student.

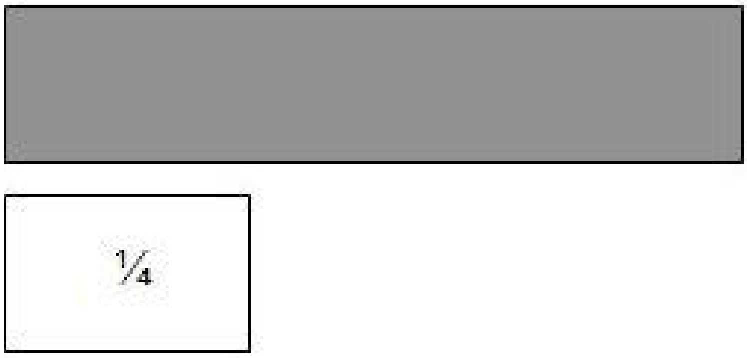


Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Answer other than three quarters** (Stage 3–4) **Answer of three quarters without reasonable justification** (Stage E5)
5 or higher	**Maps one quarter three times and says three quarters e.g.,** $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}$

DECISION: If **any** "5" are circled in **Tasks 6, 7** or **8**, CONTINUE the interview.
If **only** "E5" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 2 TASK 8

The white piece is one-quarter of a strip.



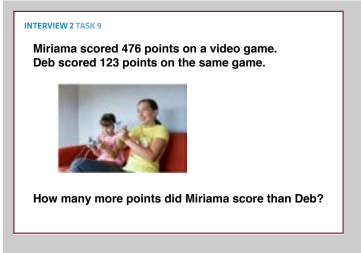
What fraction is the grey piece?

INTERVIEW 2 TASK 9

Miriama scored 476 points on a video game.
Deb scored 123 points on the same game.

How many more points did Miriama score than Deb?

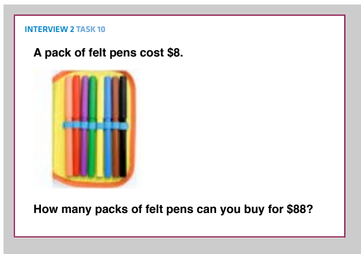
TASK 9



SAY: Miriama scored 476 points on a video game.
Deb scored 123 points on the same game.
How many more points did Miriama score than Deb?

Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Repeat addition or skip counting in hundreds, tens and ones** (Stage E5) **e.g.,** [123] 223, 323, 423, 433, 443, ..., 473, 474, 475, 476; 300 + 50 + 3 **Mix of counting and part-whole strategies** (Stage E5/5) **e.g.,** [123] 223, 323, 423; 423 + 50 + 3 = 300 + 50 + 3 = 353
Early 6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (400 – 100) + (70 – 20) + (6 – 3) = 300 + 50 + 3 = 353 - Adding on or subtracting in parts e.g., 123 + 300 = 423; 423 + 50 = 473; 473 + 3 = 476; 300 + 50 + 3 = 353

TASK 10



SAY: A pack of felt pens cost $8.
How many packs of felt pens can you buy for $88?

Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy e.g.,** - Skip counting (Stage 4) e.g., 8, 16, 24, …, 88 - Repeated addition e.g., (Stage E5) e.g., 8 + 8 + … + 8 = 88 - Doubling additively (Stage 5) e.g., 8 + 8 = 16; 16 + 16 = 32; 32 + 32 = 64; 64 + 16 + 8 = 88
Early 6 or higher	**Uses a multiplicative strategy e.g.,** - Derives from multiplication facts e.g., 10 × 8 = 80**;** 11 × 8 = 80 + 8 = 88 - Multiplication facts e.g., 11 × 8 = 88 **or** 88 ÷ 8 = 11

INTERVIEW 2 TASK 10

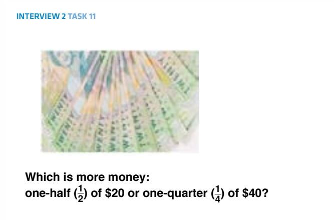
A pack of felt pens cost $8.

How many packs of felt pens can you buy for $88?

INTERVIEW 2 TASK 11

Which is more money:
one-half ($\frac{1}{2}$) of $20 or one-quarter ($\frac{1}{4}$) of $40?

TASK 11

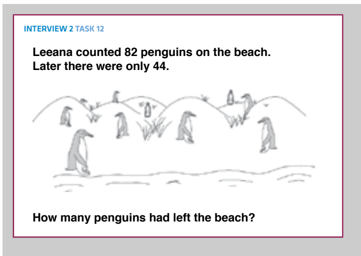


SAY: Which is more money:
one-half of $20 **or** one-quarter of $40?
Note: Say "fourth" instead of "quarter" if this is more familiar to your student.

Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Gets both unit fractions from addition facts** (Stage E5) **e.g.,** 10 + 10 + 10 + 10 = 40 so $\frac{1}{4}$ of 40 is 10 **and** 10 + 10 = 20 so $\frac{1}{2}$ of 20 is 10
Early 6 or higher	**Uses multiplication or division facts e.g.,** $\frac{1}{4}$ of 40 is 10 because 10 × 4 = 40 or 40 ÷ 4 = 10 **and** $\frac{1}{2}$ of 20 is 10 because 10 × 2 = 20 or 20 ÷ 2 = 10

DECISION: If **any** "E6" are circled in **Tasks 9, 10** or **11**, CONTINUE the interview.
If **only** "5" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

TASK 12

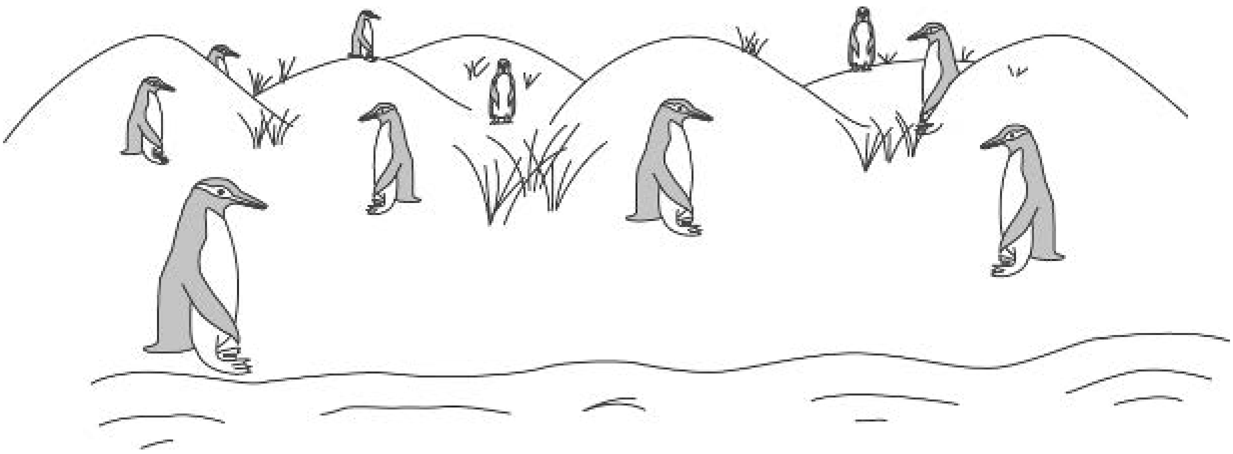


SAY: Leeana counted 82 penguins on the beach.
Later there were only 44.
How many penguins had left the beach?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** [82] 72, 62, 52; 52 – 2 = 50; 50 – 6 = 44; 30 + 2 + 6 **Attempts part-whole strategy with error** (Stage 5) **e.g.,** 82 – 50 = 32; 32 – 6 = 26 (compensates in the wrong direction)
6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (80 – 40) + (2 – 4) = 40 – 2 = 38 - Making to tens e.g., 82 – 2 = 80; 80 – 30 = 50; 50 – 6 = 44; 2 + 30 + 6 = 38 **or** 44 + 6 = 50; 50 + 30 = 80; 80 + 2 = 82; 6 + 30 + 2 = 38 - Rounding and compensation e.g., 82 – 40 = 42; 42 – 4 = 38 - Equal additions e.g., 82 – 44 = 88 – 50 = 38

INTERVIEW 2 TASK 12

Leeana counted 82 penguins on the beach.
Later there were only 44.



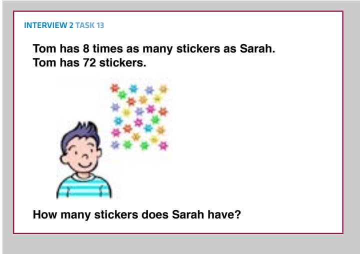
How many penguins had left the beach?

INTERVIEW 2 TASK 13

Tom has 8 times as many stickers as Sarah.
Tom has 72 stickers.

How many stickers does Sarah have?

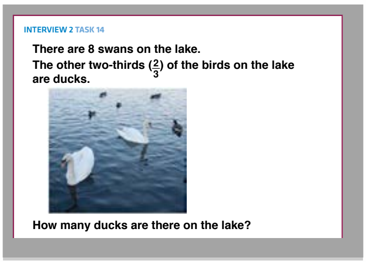
TASK 13



SAY: Tom has 8 times as many stickers as Sarah.
Tom has 72 stickers.
How many stickers does Sarah have?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Adding strategies e.g.,** - Doubling additively (Stage 5) e.g., $8 + 8 = 16$; $16 + 16 = 32$; $32 + 32 = 64$; $64 + 8 = 72$; $8 + 1 = 9$
6 or higher	**Uses a multiplicative strategy e.g.,** - Derived from a known fact e.g., $8 \times 10 = 80$; $80 - 8 = 72$; $10 - 1 = 9$ - Multiplication fact e.g., $8 \times 9 = 72$ **or** $72 \div 8 = 9$

TASK 14



SAY: There are 8 swans on the lake.
The other two-thirds of the birds on the lake are ducks.
How many ducks are there on the lake?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies only** (Stage 5) **e.g.,** $8 + 8 + 8 = 24$ so 24 birds in total; $8 + 8 = 16$
6 or higher	**Uses multiplicative strategies e.g.,** $3 \times 8 = 24$ so 24 birds in total **then** multiplies (or adds) to get i.e., $2 \times 8 = 16$ [**or** $8 + 8 = 16$] **or** $1 - \frac{2}{3} = \frac{1}{3}$; $\frac{1}{3} = 8$; $\frac{2}{3} = 2 \times 8 = 16$

DECISION: If **any** "6" are circled in **Tasks 12, 13** or **14**, CONTINUE the interview.
If **only** "E6" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 2 TASK 14

There are 8 swans on the lake.
The other two-thirds ($\frac{2}{3}$) of the birds on the lake are ducks.

How many ducks are there on the lake?

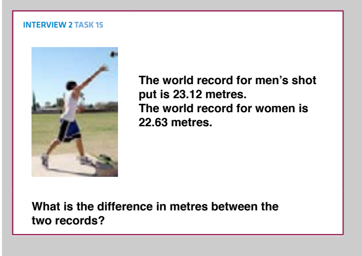
INTERVIEW 2 TASK 15

The world record for men's shot put is 23.12 metres.
The world record for women is 22.63 metres.

What is the difference in metres between the two records?

TASK 15

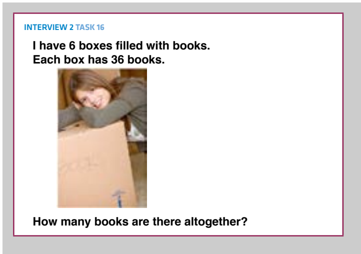
SAY: The world record for men's shot put is 23.12 metres.
The world record for women is 22.63 metres.
What is the difference in metres between the two records?



Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Subtraction misconception** (Stage 5) **e.g.,** - Subtracts the whole number then subtracts the smaller decimal from the larger e.g., 23 – 22 = 1; 0.63 – 0.12 = 0.51 so the answer is 1.51
Early 7 or higher	**Uses part-whole strategies with decimal place value understanding e.g.,** - Place value partitioning e.g., (23 – 22) + (0.1 – 0.6) + (0.02 – 0.03) = 1 – 0.5 – 0.01 = 0.49 - Making to ones e.g., 22.63 + 0.37 = 23; 23 + 0.12 = 23.12; 0.37 + 0.12 = 0.49 - Rounding and compensation e.g., 22.63 + 0.5 = 23.13; 23.13 – 0.01 = 23.12; 0.5 – 0.01 = 0.49 - Equal addition e.g., (23.12 + 0.37) – (22.63 + 0.37) = 23.49 – 23.00 = 0.49

TASK 16

SAY: I have 6 boxes filled with books.
Each box has 36 books.
How many books are there altogether?



Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies** (Stage 5) **e.g.,** - Doubling additively e.g., 36 + 36 = 72; 72 + 72 = 144; 144 + 72 = 216 **Uses a mix of multiplicative and additive strategies** (Stage 6) **e.g.,** 6 × 10 = 60; 60 + 60 + 60 = 180; 6 × 6 = 36; 180 + 36 = 216
Early 7 or higher	**Uses a multiplicative strategy e.g.,** - Place value partitioning with basic facts e.g., (6 × 30) + (6 × 6) = 180 + 36 = 216 - Rounding and compensation e.g., (6 × 40) – (6 × 4) = 240 – 24 = 216 - Doubling and halving e.g., 6 × 36 = 3 × 72 = 216

INTERVIEW 2 TASK 16

I have 6 boxes filled with books.
Each box has 36 books.

How many books are there altogether?

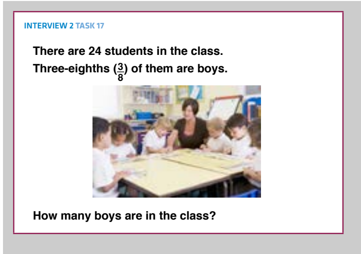
INTERVIEW 2 TASK 17

There are 24 students in the class.
Three-eighths ($\frac{3}{8}$) of them are boys.

How many boys are in the class?

TASK 17

SAY: There are 24 students in the class.
Three-eighths of them are boys.
How many boys are in the class?

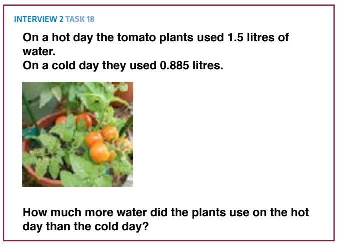


Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies** (Stage 5) **e.g.,** $\frac{1}{8}$ of 24 is 3 because 3 + 3 + 3 + … + 3 = 24; $\frac{3}{8}$ of 24 = 3 + 3 + 3 = 9
Early 7 or higher	**Uses a multiplicative strategy e.g.,** $\frac{1}{8}$ of 24 is 3 because 8 × 3 = 24 **or** 24 ÷ 3 = 24 **then** multiplies (or adds) to get $\frac{3}{8}$ i.e., 3 × 3 = 9 [**or** 3 + 3 + 3 = 9] **Obtains from a known fraction e.g.,** $\frac{4}{8}$ of 24 = 12; $\frac{3}{8}$ of 24 = 12 – 3 = 9

DECISION: If **any** "E7" are circled in **Tasks 15, 16** or **17**, CONTINUE the interview.
If **only** "6" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

TASK 18

SAY: On a hot day the tomato plants used 1.5 litres of water.
On a cold day they used 0.885 litres.
How much more water did the plants use on the hot day than the cold day?



Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Misinterprets or ignores decimal place value** (Stage 6) **e.g.,** 1.5 – 0.885 = 1 + (0.5 – 0.885) "=" 1 – 0.88 = 0.12
7 or higher	**Uses part-whole strategies e.g.,** - Place value partitioning e.g., (1 – 0) + (0.5 – 0.885) = 1 – 0.385 = 0.615 - Other partitioning e.g., 1.5 – 0.885 = 0.5 + (1 – 0.885) = 0.5 + 0.115 = 0.615 - Making to tenths and ones e.g., 0.885 + 0.015 = 0.9; 0.9 + 0.1= 1; 0.015 + 0.1 + 0.5 = 0.615 - Rounding and compensation e.g., 1.5 – 0.9 = 0.6; 0.6 + 0.015 = 0.615

INTERVIEW 2 TASK 18

On a hot day the tomato plants used 1.5 litres of water.
On a cold day they used 0.885 litres.

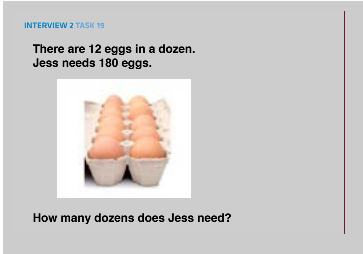
How much more water did the plants use on the hot day than the cold day?

INTERVIEW 2 TASK 19

There are 12 eggs in a dozen.
Jess needs 180 eggs.

How many dozens does Jess need?

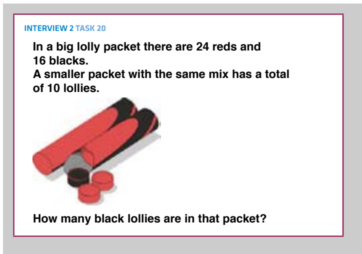
TASK 19



SAY: There are 12 eggs in a dozen.
Jess needs 180 eggs.
How many dozens does Jess need?

Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses a mix of additive and multiplicative strategies** (Stage 6) **e.g.,** 10 × 12 = 120; 120 + 12 + 12 + 12 + 12 + 12 = 180 **or** 12 + 12 + 12 + 12 + 12 = 60; 60 × 3 = 180; 5 × 3 = 15
7 or higher	**Uses multiplicative strategies e.g.,** - Derive from basic facts with adjustment e.g., 12 × 10 = 120; 12 × 5 = 60 - Successive halving e.g., 180 ÷ 12 = 90 ÷ 6 = 45 ÷ 3 = 15 **or** 180 ÷ 6 = 30 so 180 ÷ 12 = 15 **Uses proportional strategies e.g.,** - Proportionality e.g., 10 × 12 = 120; $\frac{1}{2}$ × 120 = 60; 120 + 60 = 180; $\frac{1}{2}$ × 10 = 5; 10 + 5 = 15 **or** 180 is half way between 120 (= 10 × 12) and 240 (= 20 × 12); **and** 15 is half way between 10 and 20 so the answer is 15

TASK 20



SAY: In a big lolly packet there are 24 reds and 16 blacks.
A smaller packet with the same mix has a total of 10 lollies.
How many black lollies are in that packet?

Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses proportions inappropriately** (Stage 6) **e.g.,** 24 = 1.5 × 16, so the answer is 10 × 1.5 = 15 **or** 16 + $\frac{1}{2}$ of 16 = 24; 10 + $\frac{1}{2}$ of 10 = 15
7 or higher	**Evaluates the whole and then partitions it proportionally e.g.,** 16 ÷ (24 + 16) = $\frac{16}{40}$ = $\frac{2}{5}$; $\frac{2}{5}$ of 10 = 4 **or** 16:(24 + 16) = 16:40 = 4:10 so the answer is 4 **or** 24:16 is 40 in total; 40 in total is four times 10; 24:16 = (24 ÷ 4):(16 ÷ 4) = 6:4 so the answer is 4

DECISION: If **any** “7” are circled in **Tasks 18, 19** or **20**, CONTINUE the interview.
If **only** “E7” are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 2 TASK 20

In a big lolly packet there are 24 reds and 16 blacks.
A smaller packet with the same mix has a total of 10 lollies.

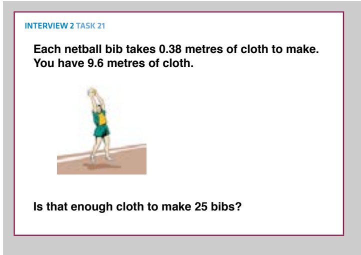
How many black lollies are in that packet?

INTERVIEW 2 TASK 21

Each netball bib takes 0.38 metres of cloth to make.
You have 9.6 metres of cloth.

Is that enough cloth to make 25 bibs?

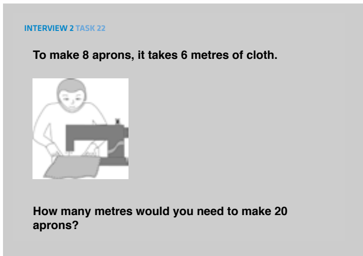
TASK 21



SAY: Each netball bib takes 0.38 metres of cloth to make.
You have 9.6 metres of cloth.
Is that enough cloth to make 25 bibs?

Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Attempts multiplication strategy e.g.,** 25 × 0.4 = 10
Early 8 or higher	**Uses multiplication strategies e.g.,** - Doubling e.g., 0.38 × 20 = 7.6; $\frac{1}{2}$ of 3.8 = 1.9; 7.6 + 1.9 = 9.5; so 9.5m can make 25 **or** 0.38 × 20 = 7.6; 9.6 – 7.6 = 2; 2 ÷ 0.4 = 5 (and 0.4 is more than 0.38) - Facts of 25 e.g., 25 × 3 = 75 so 25 × 0.3 = 7.5; 25 × 0.08 = 2; so 25 × 0.38 = 7.5 + 2 = 9.5 **or** 38 × 100 = 38 metres; 25 = $\frac{1}{4}$ ×100; $\frac{1}{4}$ × 38 = $\frac{1}{4}$ × 36 + $\frac{1}{4}$ × 2 = 9 + 0.5 = 9.5 so 9.5m enough to make 25 bibs.

TASK 22



SAY: To make 8 aprons, it takes 6 metres of cloth.
How many metres would you need to make 20 aprons?

Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses inappropriate additive strategy** (Stage 5) **e.g.,** 8 + 12 = 20; 6 + 12 = 18 **or** 8 – 6 = 2; 20 – 2 = 18 **Uses estimation** (Stage 6/7) **e.g.,** Less than 1 metre to make 1 apron so about 15 **or** 16 metres
Early 8 or higher	**Uses a proportional approach e.g.,** - Multiplicative strategies e.g., 8 × 2.5 = 20; 6 × 2.5 = 15 - Unitising e.g., 8 aprons take 6 metres so 1 apron takes $\frac{6}{8}$ metre = $\frac{3}{4}$ metre; $\frac{3}{4}$ of 20 = 15 - Equivalent fractions or ratios e.g., 20:8 = 10:4 = 5:2 = 15:6 so the answer is 15

Stop the interview

To make 8 aprons, it takes 6 metres of cloth.

How many metres would you need to make 20 aprons?

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

GloSS

INTERVIEW 3

TASK 1

ACTION: *Place 7 counters of the same colour on the table.*
SAY: How many counters are there?

Stage	Strategy observed
0	**Student cannot count 7 objects**
1	**Correctly counts the 7 objects**

DECISION: If "1" is circled in **Task 1**, CONTINUE the interview.
If "0" is circled, rate the student at Stage 0 and STOP the interview.

TASK 2

INTERVIEW 3 TASK 2

2 + 4 = □

SAY: Please hold out your hands for me.
SAY: Here are 2 counters.
SAY: Here are another 4 counters.

SAY: How many counters have you got altogether?

ACTION: *Place 2 counters in the student's hand.*
ACTION: *Place 4 counters in their other hand.*
ACTION: *Close the student's hands to encourage imaging.*
ACTION: *Allow the student to open their hands if they find imaging difficult.*

Stage	Strategy observed
1	**Cannot solve the addition problem** (Stage 1)
2–3	**Physically counts all the objects from 1 on materials** (Stage 2) **Correctly counts all the items from 1 by imaging** (Stage 3)
4 or higher	**Counts on** e.g., 3, 4, 5, 6 **or** 5, 6 **Knows** 2 + 4

DECISION: If **either** "2–3" **or** "4" are circled in **Task 2**, CONTINUE the interview.
If "1" is circled, STOP the interview. If in any doubt, CONTINUE the interview.

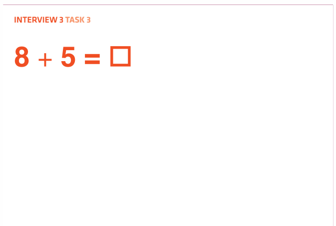
INTERVIEW 3 TASK 2

$$2 + 4 = \square$$

INTERVIEW 3 TASK 3

$$8 + 5 = \square$$

TASK 3

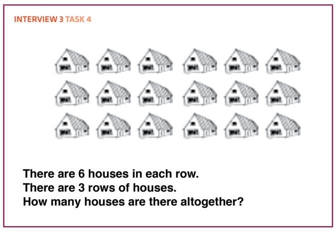


ACTION: *Place 8 counters under a card then place 5 under another card.*

SAY: Here are 8 counters, and here are 5 counters.
How many counters are there altogether?

Stage	Strategy observed
3	**Cannot solve the problem** (After removing the cards – Stage 1) **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, 3, …, 13 **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, 3, …, 13
4	**Counts on** (Stage 4) **e.g.,** 9, 10, 11, 12, 13 **or** 6, 7, …, 12, 13
Early 5 or higher	**Uses a part-whole strategy e.g.,** - Making to ten e.g., 8 + 2 = 10; 10 + 3 = 13 - Doubling with compensation e.g., 5 + 5 = 10; 10 + 3 = 13 **or** 8 + 8 = 16; 16 – 3 = 13 - Addition fact e.g., 8 + 5 = 13

TASK 4

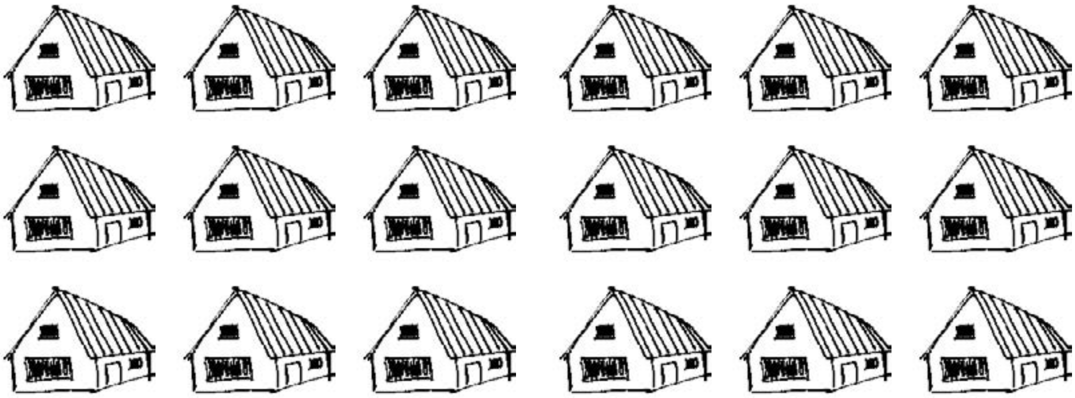


SAY: There are 6 houses in each row.
SAY: There are 3 rows of houses.
SAY: How many houses are there altogether?

ACTION: *Sweep one row with your finger*
ACTION: *Point to each row one by one*

Stage	Strategy observed
3	**Cannot solve the problem** **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, …, **6**, 7, …, **18** **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, …, **6**, 7, …, **18**
4	**Skip counting** (Stage 4) **e.g.,** 6, 12, 18 [**or** 3, 6, 9, 12, 15, 18]
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Repeat addition e.g., 6 + 6 + 6 = 18 or 6 + 6 = 12; 12 + 6 = 18 - Multiplication strategies e.g., 2 × 6 = 12; 12 + 6 = 18 - Multiplication fact e.g., 3 × 6 = 18

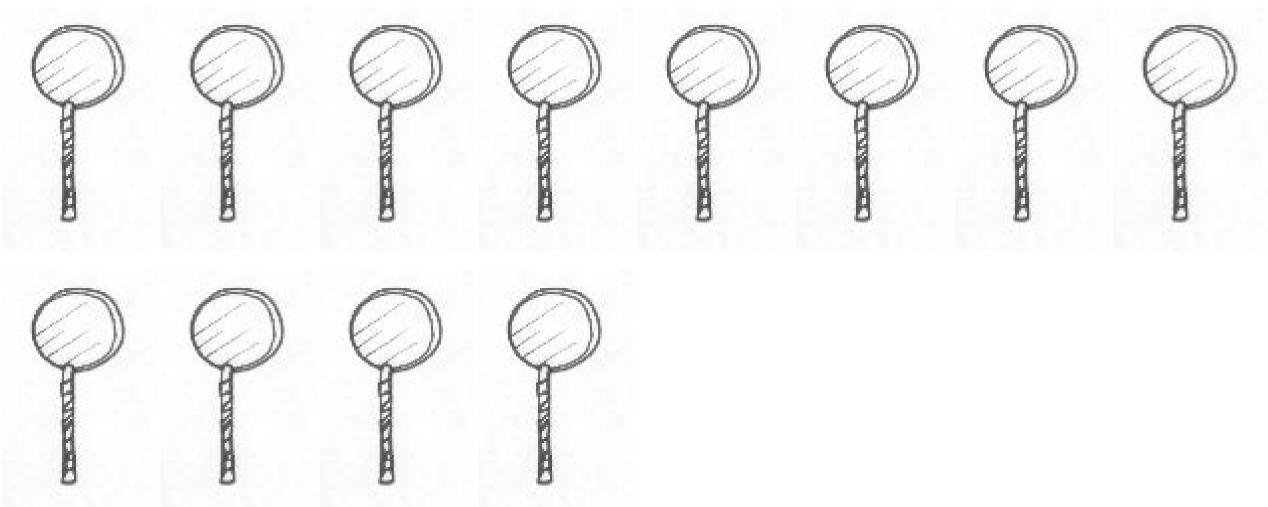
INTERVIEW 3 TASK 4



There are 6 houses in each row.
There are 3 rows of houses.
How many houses are there altogether?

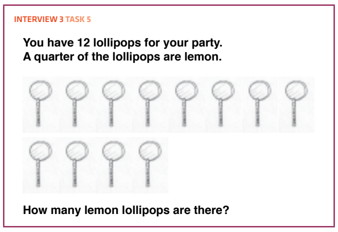
INTERVIEW 3 TASK 5

You have 12 lollipops for your party.
A quarter of the lollipops are lemon.



How many lemon lollipops are there?

TASK 5



ACTION: *Provide 12 counters (lollipops).*
Allow the student access to these counters if necessary.

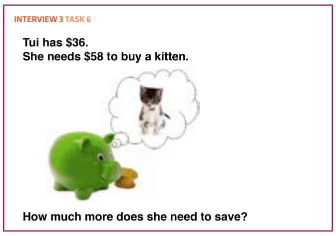
SAY: You have 12 lollipops for your party.
A quarter of the lollipops are lemon.
How many lemon lollipops are there?

Note: Say "fourth" instead of "quarter" if this is more familiar to your student.

Stage	Strategy observed
2–4	**Cannot solve the problem** **Equally shares the lollipops, on materials or by imaging** (Stage 2–4)
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Additive partitioning e.g., 6 + 6 = 12 and 3 + 3 + 3 + 3 = 12 - Multiplication or division strategy e.g., 3 × 3 = 9; 9 + 3 = 12 - Multiplication or division fact e.g., 4 × 3 = 12 or 12 ÷ 4 = 3

DECISION: If **any** "E5" are circled in **Tasks 3, 4** or **5**, **<u>or</u>** if the "4s" are circled in **both Task 3** and **Task 4**, CONTINUE the interview.
Otherwise STOP the interview. If in any doubt, CONTINUE the interview.

TASK 6



SAY: Tui has $36.
She needs $58 to buy a kitten.
How much more does she need to save?

Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Counting on** or **Counting back** (Stage 4) **e.g.,** 37, 38, …, 58 **Skip counting in tens and ones** (Stage 4) **e.g.,** [36] 46, 56, 57, 58 **Repeat addition in tens and ones** (Stage E5) **e.g.,** 58 – 10 = 48; 48 – 10 = 38; 38 – 2 = 36; 20 + 2 = 22 **or** 36 + 10 = 46; 46 + 10 = 56; 56 + 2 = 58; 20 + 2 = 22 **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** 36 + 4 = 40; 40 + 10 = 50; 51, 52, … , 57, 58
5 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (50 – 30) + (8 – 6) = 20 + 2 = 22 - Adding on in parts e.g., 36 + 20 = 56; 56 + 2 = 58; 20 + 2 = 22 - Making to ten e.g., 36 + 4 = 40; 40 + 10 = 50; 50 + 8 = 58; 4 + 10 + 8 = 22

INTERVIEW 3 TASK 6

Tui has $36.
She needs $58 to buy a kitten.

How much more does she need to save?

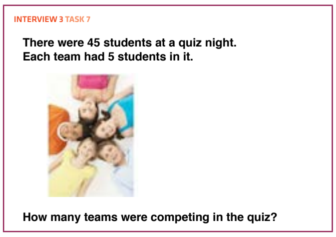
INTERVIEW 3 TASK 7

There were 45 students at a quiz night.
Each team had 5 students in it.

How many teams were competing in the quiz?

TASK 7

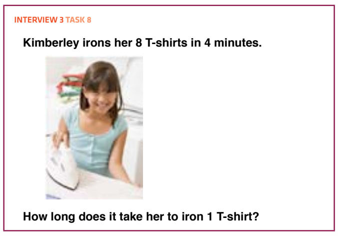
SAY: There were 45 students at a quiz night.
Each team had 5 students in it.
How many teams were competing in the quiz?



Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Skip counting** (Stage 4) **e.g.,** 5, 10, 15, …, 45 **Repeated addition** (Stage E5) **e.g.,** 5 + 5 + 5 + … + 5 = 45
5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Additive strategies e.g., 5 + 5 =10; 10 + 10 = 20; 20 + 20 = 40; 40 + 5 = 45; 8 + 1 = 9 - Derive from multiplication facts e.g., 4 × 5 = 20; 20 + 20 = 40; 40 + 5 = 45; 8 + 1 = - Multiplication or division facts e.g., 5 × 9 = 45 **or** 45 ÷ 5 = 9

TASK 8

SAY: Kimberley irons her 8 T-shirts in 4 minutes.
How long does it take her to iron 1 T-shirt?



Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Incorrect additive strategy** (Stage 4) **e.g.,** 4 + 4 = 8; 1 + 4 = 5 minutes **or** 4 + 4 = 8 so 1 + 1 = 2 minutes
5 or higher	**Uses a proportional approach e.g.,** - Additive strategies e.g., $\frac{1}{2} + \frac{1}{2} + \ldots + \frac{1}{2} = 4$ **or** 4 + 4 = 8 and $\frac{1}{2} + \frac{1}{2} = 1$ so the answer is $\frac{1}{2}$ - Multiplicative strategies e.g., 4 is half of 8 so it's half of 1 minute **or** $4 \div 8 = \frac{1}{2}$ minute - Rate strategies e.g., 8:4 = 4:2 = 2:1 so the answer is $\frac{1}{2}$ a minute (= 30 seconds)

DECISION: If **any** "5" are circled in **Tasks 6, 7** or **8**, CONTINUE the interview.
If **only** "E5" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 3 TASK 8

Kimberley irons her 8 T-shirts in 4 minutes.

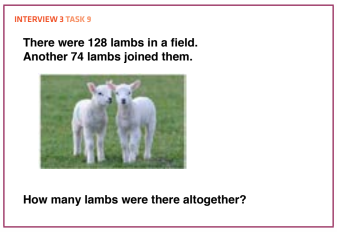
How long does it take her to iron 1 T-shirt?

INTERVIEW 3 TASK 9

There were 128 lambs in a field.
Another 74 lambs joined them.

How many lambs were there altogether?

TASK 9



SAY: There were 128 lambs in a field.
Another 74 lambs joined them.
How many lambs were there altogether?

Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Skip counting in tens and ones** (Stage 4) **e.g.,** [128] 138, ..., 198; 199, 200, 201, 202 **Repeat addition in tens and ones** (Stage E5) **e.g.,** 128 + 10 + 10 + … + 10 = 198; 199, 200, 201, 202 **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** 128 + 10 + 10 + … + 10 = 198; 198 + 2 + 2 = 202 **Attempts part-whole strategy with error** (Stage E5) **e.g.,** 192 (no carrying)
Early 6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (120 + 70) + (8 + 4) = 190 + 12 = 202 - Adding on in parts e.g., 128 + 70 = 198; 198 + 4 = 202 **or** 120 + 74 = 194; 194 + 8 = 202 - Making to ten e.g., 128 + 2 = 130; 130 + 70 = 200; 200 + 2 = 202

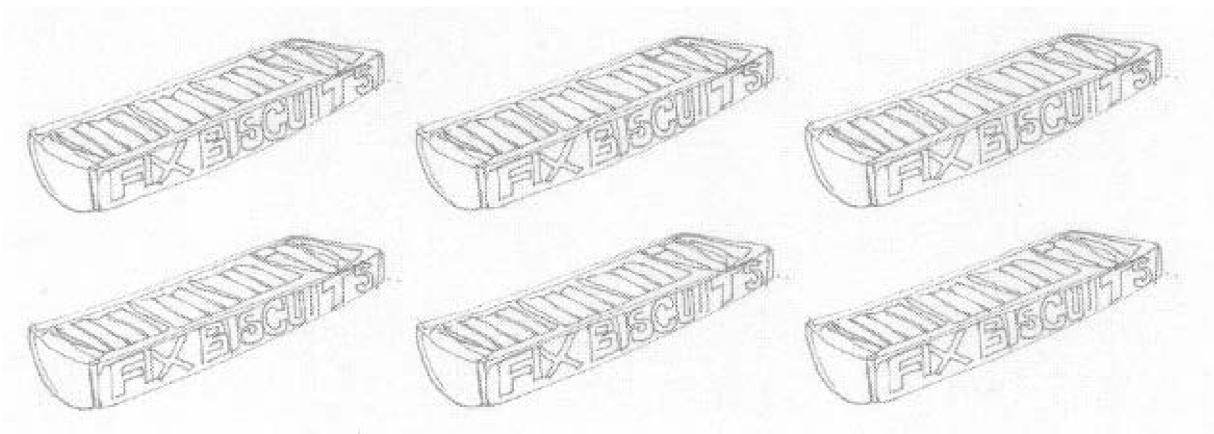
TASK 10

SAY: Ra has 6 packets of biscuits.
There are 15 biscuits in each packet.
How many biscuits does Ra have?

Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy e.g.,** - Skip counting (Stage 4) e.g., 15, 30, 45, 60, 75, 90 [or 6, 12, 18, …, 90] - Repeated addition e.g., (Stage E5) e.g., 15 + 15 + ... + 15 = 90 [**or** 6 + 6 + ... + 6 = 90] - Doubling additively (Stage 5) e.g., 15 + 15 = 30; 30 + 30 = 60; 60 + 30 = 90
Early 6 or higher	**Uses a multiplicative strategy e.g.,** - Place value partitioning e.g., 6 × 10 = 60; 6 × 5 = 30; 60 + 30 = 90 - Derived from basic fact e.g., 6 × 10 = 60; 60 + 6 + 6 + 6 + 6 + 6 = 90 - Halving and doubling e.g., 6 × 15 = 3 × 30 = 90

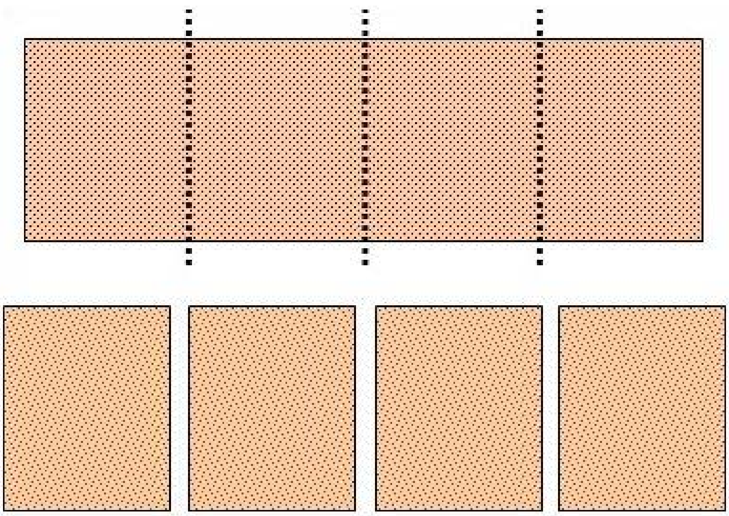
INTERVIEW 3 TASK 10

Ra has 6 packets of biscuits.
There are 15 biscuits in each packet.



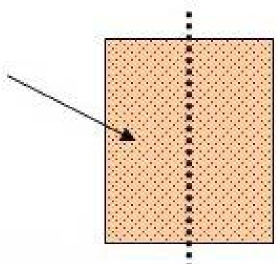
How many biscuits does Ra have?

INTERVIEW 3 TASK 11



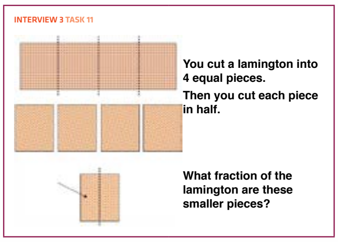
You cut a lamington into 4 equal pieces.

Then you cut each piece in half.



What fraction of the lamington are these smaller pieces?

TASK 11

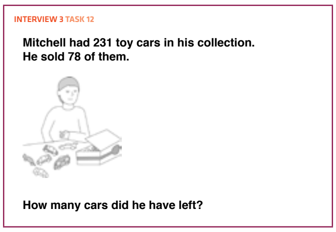


SAY: You cut a lamington into 4 equal pieces.
Then you cut each piece in half.
What fraction of the lamington are these smaller pieces?

Stage	Strategy observed
5	**Cannot solve the problem OR Uses an earlier numeracy stage** **Counting strategy** (Stage 4) **e.g.,** 1, 2, 3, ..., 8 so the pieces are eighths
Early 6 or higher	**Uses an additive or multiplicative strategy e.g.,** - Additive strategy e.g., 2 + 2 + 2 + 2 = 8, so these pieces are quarters, and the smaller ones are eighths - Multiplicative strategy e.g., 4 × 2 = 8 so the pieces are eighths

DECISION: If **any** “E6” are circled in **Tasks 9, 10** or **11**, CONTINUE the interview.
If **only** “5” are circled, STOP the interview. If in any doubt, CONTINUE the interview.

TASK 12



SAY: Mitchell had 231 toy cars in his collection.
He sold 78 of them.
How many cars did he have left?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** [231] 22 1, 201, ..., 161; 161 – 1 = 160; 160 – 7 = 153 **Attempts part-whole strategy with error** (Stage 5) **e.g.,** 231 – 80 = 151; 151 – 2 = 149 (compensates in the wrong direction)
6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (230 – 70) + (1 – 8) = 160 – 7 = 153 - Making to hundreds e.g., 231 – 31 = 200; 78 – 31 = 47; 200 – 47 = 153 - Subtracting tidy number and compensation e.g., 231 – 80 = 151; 151 + 2 = 153 - Equal additions e.g., 231 – 78 = 253 – 100 = 153

INTERVIEW 3 TASK 12

Mitchell had 231 toy cars in his collection.
He sold 78 of them.

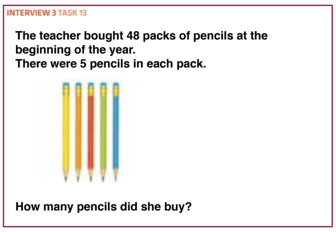
How many cars did he have left?

INTERVIEW 3 TASK 13

The teacher bought 48 packs of pencils at the beginning of the year.
There were 5 pencils in each pack.

How many pencils did she buy?

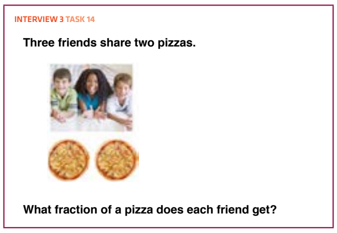
TASK 13



SAY: The teacher bought 48 packs of pencils at the beginning of the year.
There were 5 pencils in each pack.
How many pencils did she buy?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies e.g.,** - Doubling additively (Stage 5) e.g., 48 + 48 = 96; 96 + 96 = 192; 192 + 48 = 240
6 or higher	**Uses a multiplicative strategy e.g.,** - Place value partitioning with basic facts e.g., (5 × 40) + (5 × 8) = 200 + 40 = 240 - Doubling and halving e.g., 48 × 5 = 24 × 10 = 240 - Rounding and compensation e.g., (5 × 50) – (5 × 2) = 250 – 10 = 240

TASK 14



SAY: Three friends share two pizzas.
What fraction of a pizza does each friend get?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy** (Stage 5) **e.g.,** $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$ each, the remaining half is cut into three pieces, but cannot name the combined fraction.
6 or higher	**Uses a multiplicative strategy e.g.,** Two lots of $\frac{1}{3}$ of 1 = 2 × $\frac{1}{3}$ = $\frac{2}{3}$ **or** 2 out of 6 pieces is $\frac{2}{3}$ of one pizza **or** $3 \times \frac{1}{2} = 1\frac{1}{2}$; $\frac{1}{3}$ of $\frac{1}{2} = \frac{1}{6}$; $\frac{1}{2} + \frac{1}{6} = \frac{2}{3}$

DECISION: If **any** “6” are circled in **Tasks 12, 13** or **14**, CONTINUE the interview.
If **only** “E6” are circled, STOP the interview. If in any doubt, CONTINUE the interview.

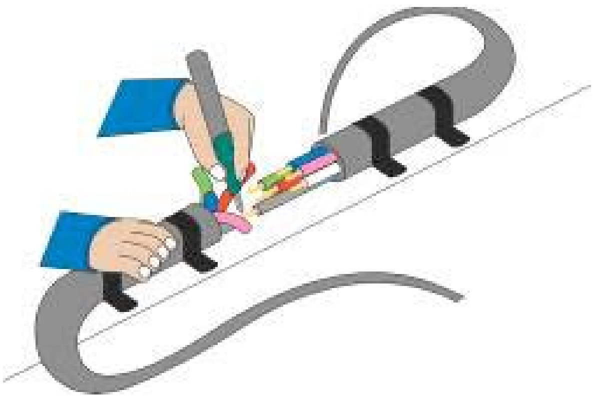
INTERVIEW 3 TASK 14

Three friends share two pizzas.

What fraction of a pizza does each friend get?

INTERVIEW 3 TASK 15

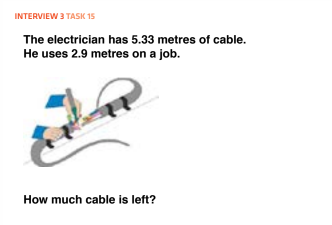
The electrician has 5.33 metres of cable.
He uses 2.9 metres on a job.



How much cable is left?

TASK 15

SAY: The electrician has 5.33 metres of cable.
He uses 2.9 metres on a job.
How much cable is left?



Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Misinterprets decimal place value** (Stage 6) **e.g.,** - Ignores the decimal points e.g., 533 – 29 = 504 - Treats numbers after the decimal as whole numbers e.g., 5.33 – 2.9 = (5 – 2) + (0.33 – 0.9 "=" 0.24) = 3.24
Early 7 or higher	**Uses part-whole strategies e.g.,** - Taking off in parts e.g., 5.33 – 2.0 = 3.33; 3.33 – 0.9 = 2.43 - Place value partitioning e.g., (5 – 2) + (0.3 – 0.9) + 0.03 = 3 – 0.6 + 0.03 = 2.43 - Making to ones e.g., 2.9 + 0.1 = 3.0; 3.0 + 2.33 = 5.33; 0.1 + 2.33 = 2.43 - Rounding and compensation e.g., 5.33 – 3.0 = 2.33; 2.33 + 0.1 = 2.43

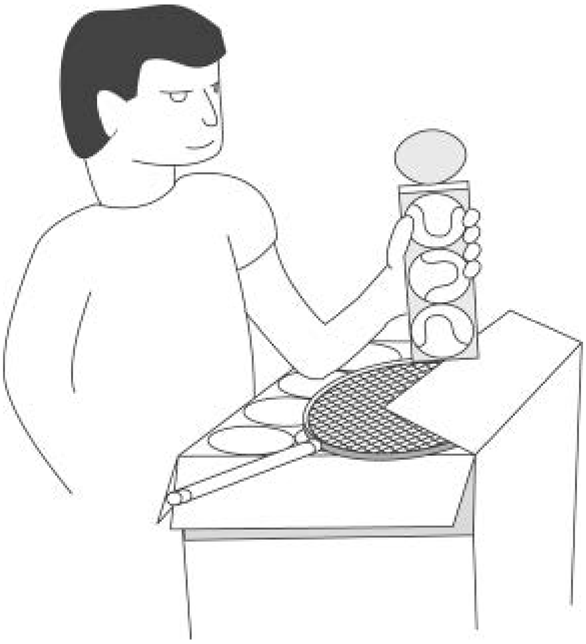
TASK 16

SAY: Solomona has ordered 81 tennis balls.
They are in cans of 3 balls.
How many cans should there be?

Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies (Stage 5) e.g.,** - Additive doubling or tripling e.g., 3 + 3 + 3 = 9; 9 + 9 + 9 = 27; 27 + 27 + 27 = 81 **Uses a mix of additive and multiplicative strategies (Stage 6) e.g.,** 20 × 3 = 60; 60 + 3 + 3 + 3 + … + 3 = 81 so the answer is 20 + 7 = 27
Early 7 or higher	**Uses multiplicative strategies e.g.,** - Derive from basic facts e.g., (3 × 20) + (3 × 7) = 60 + 21 = 81; 20 + 7 = 27 **or** 30 × 3 = 90; 90 – (3 × 3) = 90 – 9 = 81; 30 – 3 = 27 - Proportional adjustment e.g., 81 ÷ 9 = 9 so 81 ÷ 3 = 3 × 9 = 27

INTERVIEW 3 TASK 16

Solomona has ordered 81 tennis balls.
They are in cans of 3 balls.



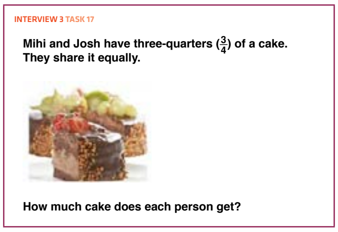
How many cans should there be?

INTERVIEW 3 TASK 17

Mihi and Josh have three-quarters ($\frac{3}{4}$) of a cake.
They share it equally.

How much cake does each person get?

TASK 17



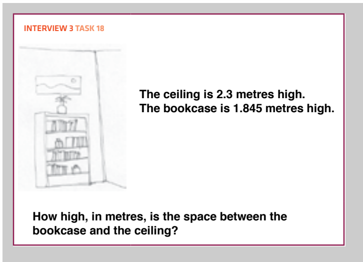
SAY: Mihi and Josh have three-quarters of a cake.
They share it equally.
How much cake does each person get?

Note: Say "three-fourths" instead of "three-quarters" if this is more familiar to your student.

Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage**
Early 7 or higher	**Images three quarters, and equally shares e.g.,** $\frac{1}{4}$ plus ($\frac{1}{2}$ of $\frac{1}{4}$) = $\frac{1}{4} + \frac{1}{8} = \frac{2}{8} + \frac{1}{8} = \frac{3}{8}$ **Uses a multiplicative strategy e.g.,** $\frac{1}{2}$ of $\frac{1}{4}$ is $\frac{1}{8}$ so $\frac{1}{2}$ of $\frac{3}{4} = 3 \times \frac{1}{8} = \frac{3}{8}$

DECISION: If **any** "E7" are circled in **Tasks 15, 16** or **17**, CONTINUE the interview.
If **only** "6" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

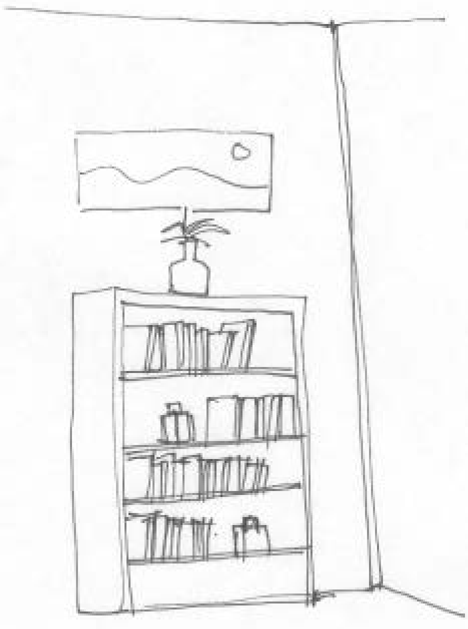
TASK 18



SAY: The ceiling is 2.3 metres high.
The bookcase is 1.845 metres high.
How high, in metres, is the space between the bookcase and the ceiling?

Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Misinterprets or ignores decimal place value** (Stage 6) **e.g.,** 2.3 – 1.845 = (2 – 1) + (0.3 – 0.845) "=" 1 – 0.842 = 0.158 **or** 0.152
7 or higher	**Uses part-whole strategies e.g.,** - Place value partitioning e.g., (2 – 1) + (0.3 – 0.845) = 1 – 0.545 = 0.455 **or** (2.3 – 1.8) + (0 – 0.045) = 0.5 – 0.045 = 0.455 - Making to ones e.g., 1.845 + 0.155 = 2.0; 0.155 + 0.3 = 0.455 - Rounding and compensation e.g., 2.3 – 1.9 = 0.4; 0.4 + 0.55 = 0.455

INTERVIEW 3 TASK 18



**The ceiling is 2.3 metres high.
The bookcase is 1.845 metres high.**

How high, in metres, is the space between the bookcase and the ceiling?

INTERVIEW 3 TASK 19

**Joni has 1.5 kilograms of butter in the fridge.
A batch of scones requires 0.075 kilograms of butter.**

How many batches of scones will Joni be able to bake?

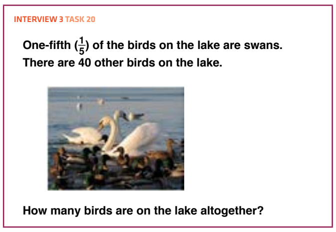
TASK 19

SAY: Joni has 1.5 kilograms of butter in the fridge.
A batch of scones requires 0.075 kilograms of butter.
How many batches of scones will Joni be able to bake?

Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Attempts multiplication strategy** (Stage 6)
7 or higher	**Uses multiplication strategies e.g.,** 0.075 × 20 = 1.5 [because 75 × 2 = 150] so the answer is 20 **or** 1500 ÷ 75 (simplify by 5) = 300 ÷ 15 = 60 ÷ 3 = 20 **or** 2 batches need 2 × 0.075 = 0.15; 10 × 0.15 = 1.5; 2 × 10 = 20

TASK 20

SAY: One-fifth of the birds on the lake are swans.
There are 40 other birds on the lake.
How many birds are on the lake altogether?



Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies** (Stage 6) **e.g.,** $\frac{4}{5}$ is 40 because 10 + 10 + 10 + 10 = 40 so $\frac{1}{5}$ is 10; $\frac{5}{5}$ is 40 + 10 = 50
7 or higher	**Uses a multiplicative strategy e.g.,** $\frac{4}{5}$ is 40 because 4 × 10 = 40, so $\frac{5}{5}$ is 5 × 10 = 50 $\frac{4}{5}$ is 40 so $\frac{1}{5}$ is 40 ÷ 4 = 10; $\frac{5}{5}$ is 5 × 10 = 50

DECISION: If **any** "7" are circled in **Tasks 18, 19** or **20**, CONTINUE the interview.
If **only** "E7" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

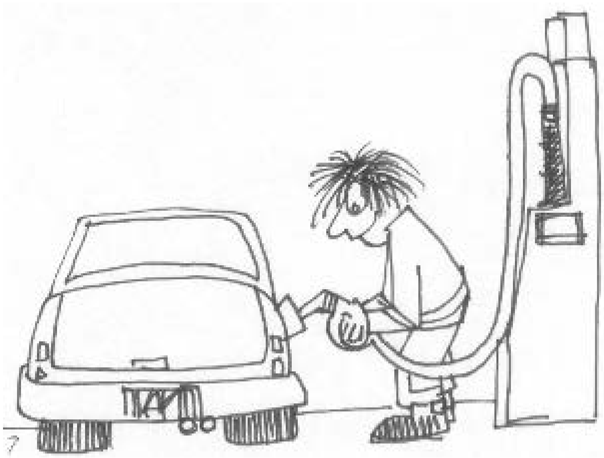
INTERVIEW 3 TASK 20

One-fifth ($\frac{1}{5}$) of the birds on the lake are swans.
There are 40 other birds on the lake.

How many birds are on the lake altogether?

INTERVIEW 3 TASK 21

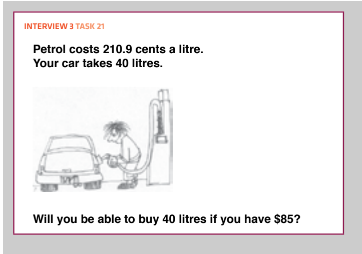
Petrol costs 210.9 cents a litre.
Your car takes 40 litres.



Will you be able to buy 40 litres if you have $85?

TASK 21

SAY: Petrol costs 210.9 cents a litre.
Your car takes 40 litres.
Will you be able to buy 40 litres if you have $85?



Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Attempts multiplication strategy e.g.,** 40 × 200 = 8000
Early 8 or higher	**Uses multiplication strategies e.g.,** - Place value partitioning e.g., 40 × 200 = 8000; 40 × 10 = 400; 40 × 0.9 = 36; 8000 + 400 + 36 = 8436c = $84.36 - Rounding dollars and cents e.g., Round 210.9 to 211 **then** 40 × $2 = $80; 40 × 10c = $4; 40 × 1c = 40c; $80 + $4 + 40c = $84.40 - Unitising (i.e. cost of fuel per litre if 40 litres costs $85) e.g., 80 ÷ 40 = $2; 5 ÷ 40 = $\frac{1}{8}$; $\frac{1}{8}$ of $1 = 12.5 cents; so could pay if petrol cost 212.5 cents per litre

TASK 22

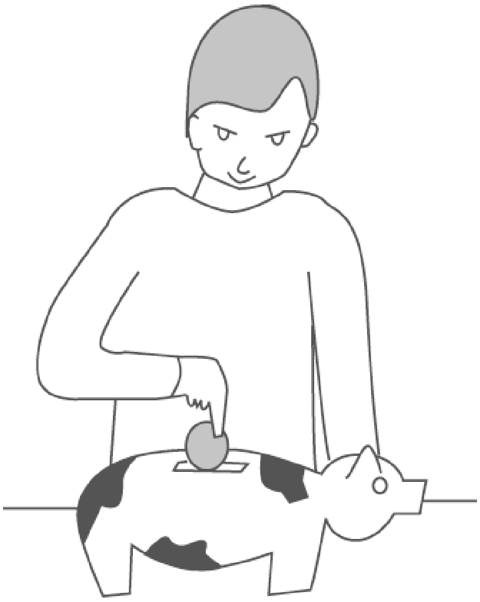
SAY: Mei-ling saved $40 in 16 weeks.
She saved the same amount each week.
How much had she saved after 6 weeks?

Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses inappropriate additive strategy** (Stage 5) **e.g.,** 16 – 6 = 10; 40 – 10 = 30 **or** 6 + 10 = 16; 30 + 10 = 40 **Uses estimation** (Stage 6–7) **e.g.,** 6 ≤ $\frac{1}{2}$ of 16; 15 ≤ $\frac{1}{2}$ of 40; so an estimate is 15
Early 8 or higher	**Use a proportional approach e.g.,** - Equivalent fractions or ratios e.g., $\frac{6}{16} = \frac{3}{8}$; $\frac{3}{8}$ × 40 = 15 **or** 40:16 = 20:8 = 10:4 = 5:2; (10 + 5):(4 + 2) = 15:6 so the answer is 15 **or** 40:16 = 20:8 = 15:6 (using $\frac{3}{4}$ of 20 and $\frac{3}{4}$ of 8) so the answer is 15 **or** 40:16 (8 as a factor) = 5:2 = 15:6 so the answer is 15

Stop the interview

INTERVIEW 3 TASK 22

Mei-ling saved $40 in 16 weeks.
She saved the same amount each week.



How much had she saved after 6 weeks?

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

GLoSS

INTERVIEW 4

FORM 1

TASK 1

ACTION: *Place 6 counters of the same colour on the table.*
SAY: How many counters are there?

Stage	Strategy observed
0	**Student cannot count 6 objects**
1	**Correctly counts the 6 objects**

DECISION: If “1” is circled in **Task 1**, CONTINUE the interview.
If “0” is circled, rate the student at Stage 0 and STOP the interview

TASK 2

INTERVIEW 4 TASK 2

3 + 4 = □

SAY: Please hold out your hands for me.
SAY: Here are 3 counters.
SAY: Here are another 4 counters.
SAY: How many counters have you got altogether?

ACTION: *Place 3 counters in the student’s hand.*
ACTION: *Place 4 counters in their other hand.*
ACTION: *Close the student’s hands to encourage imaging.*
ACTION: *Allow the student to open their hands if they find imaging difficult.*

Stage	Strategy observed
1	**Cannot solve the addition problem** (Stage 1)
2–3	**Physically counts all the objects from 1 on materials** (Stage 2) **Correctly counts all the items from 1 by imaging** (Stage 3)
4 or higher	**Counts on** e.g., 4, 5, 6, 7 **or** 5, 6, 7 **Knows** 3 + 4

DECISION: If **either** “2–3” **or** “4” are circled in **Task 2**, CONTINUE the interview.
If “1” is circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 4 TASK 2

$$3 + 4 = \square$$

INTERVIEW 4 TASK 3

$$8 + 7 = \square$$

TASK 3

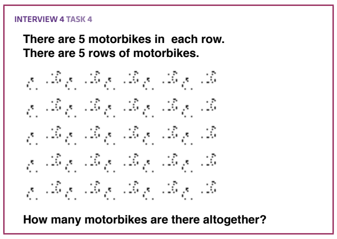
INTERVIEW 4 TASK 3

8 + 7 = □

ACTION: *Place 8 counters under a card then place 7 under another card.*
SAY: Here are 8 counters, and here are 7 counters.
How many counters are there altogether?

Stage	Strategy observed
3	**Cannot solve the problem** (After removing the cards – Stage 1) **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, 3, …, 15 **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, 3, …, 15
4	**Counts on** (Stage 4) **e.g.,** 9, 10, 11, … , 14, 15 **or** 8, 9, 10, …, 14, 15
Early 5 or higher	**Uses a part-whole strategy e.g.,** - Making to ten e.g., 8 + 2 = 10; 10 + 5 = 15 - Doubling with compensation e.g., 7 + 7 = 14; 14 + 1 = 15 **or** 8 + 8 = 16; 16 – 1 = 15 - Addition fact e.g., 8 + 7 = 15

TASK 4



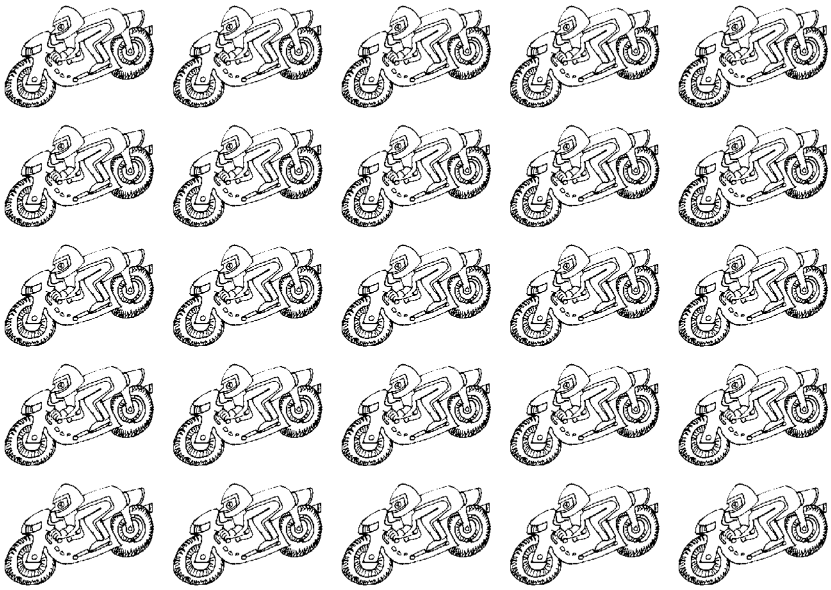
SAY: There are 5 motorbikes in each row.
SAY: There are 5 rows of motorbikes.
SAY: How many motorbikes are there altogether?

ACTION: *Sweep one row with your finger*
ACTION: *Point to each row one by one*

Stage	Strategy observed
3	**Cannot solve the problem** **Counts all objects from 1 on materials** (Stage 2) **e.g.,** 1, 2, 3, 4, **5**, 6, …, **25** **Counts all objects from 1 by imaging** (Stage 3) **e.g.,** 1, 2, 3, 4, **5**, 6, …, **25**
4	**Skip counting** (Stage 4) **e.g.,** 5, 10, 15, 20, 25
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Repeat addition e.g., 5 + 5 + 5 + 5 + 5 = 25 - Additive strategies e.g., 5 + 5 = 10; 10 + 10 = 20; 20 + 5 = 25 - Multiplication strategies e.g., 4 × 5 = 20; 20 + 5 = 25 - Multiplication fact e.g., 5 × 5 = 25

INTERVIEW 4 TASK 4

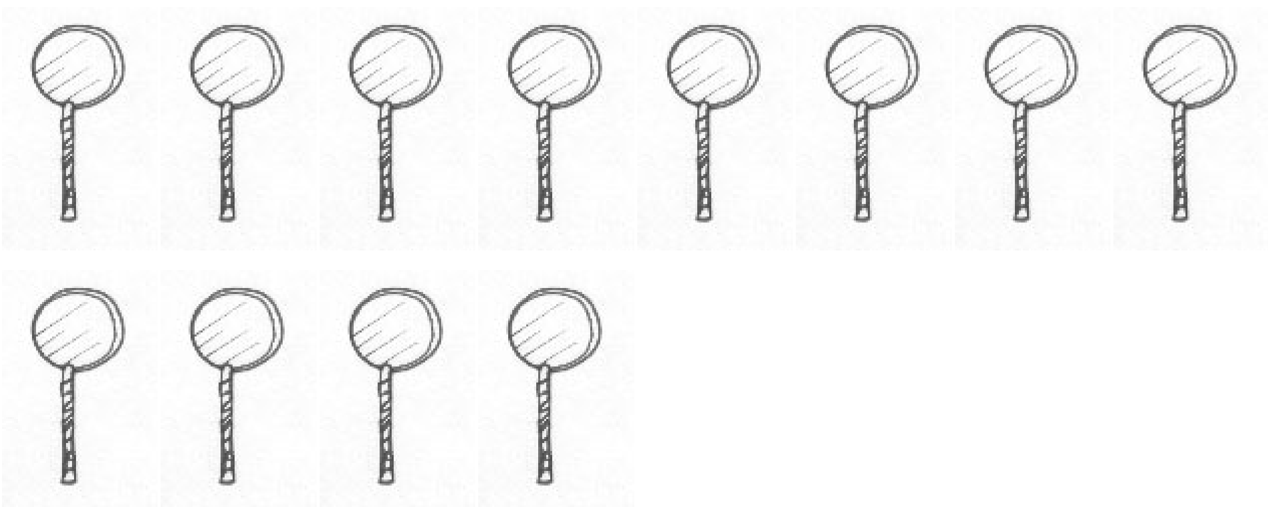
There are 5 motorbikes in each row.
There are 5 rows of motorbikes.



How many motorbikes are there altogether?

INTERVIEW 4 TASK 5

You have 12 lollipops for your party.
A quarter of the lollipops are lemon.



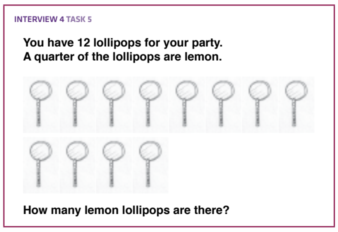
How many lemon lollipops are there?

TASK 5

ACTION: *Provide 12 counters (lollipops).*
Allow the student access to these counters if necessary.

SAY: You have 12 lollipops for your party.
A quarter of the lollipops are lemon.
How many lemon lollipops are there?

Note: Say "fourth" instead of "quarter" if this is more familiar to your student.

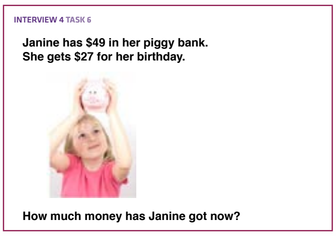


Stage	Strategy observed
2–4	**Cannot solve the problem** **Equally shares the lollipops, on materials or by imaging** (Stage 2–4)
Early 5 or higher	**Uses an additive or multiplicative strategy e.g.,** - Additive partitioning e.g., 6 + 6 = 12 and 3 + 3 + 3 + 3 = 12 - Multiplication or division strategy e.g., 3 × 3 = 9; 9 + 3 = 12 - Multiplication or division fact e.g., 4 × 3 = 12 or 12 ÷ 4 = 3

DECISION: If **any** "E5" are circled in **Tasks 3, 4** or **5**, **or** if the "4s" are circled in **both Task 3** and **Task 4**,CONTINUE the interview.
Otherwise STOP the interview. If in any doubt, CONTINUE the interview.

TASK 6

SAY: Janine has $49 in her piggy bank.
She gets $27 for her birthday.
How much money has Janine got now?



Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Counting on** (Stage 4) **e.g.,** 49, 50, 51, … , 76 **Skip counting in tens and ones** (Stage 4) **e.g.,** [49] 59, 69, 70, 71, ..., 76 **Repeat addition in tens and ones** (Stage E5) **e.g.,** 49 + 10 = 59; 59 + 10 = 69; 70, 71, ..., 76 **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** [49] 59, 69; 69 + 1 = 70; 70 + 6
5 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (40 + 20) + (9 + 7) = 76 - Adding on in parts e.g., 49 + 20 = 69; 69 + 1 + 6 = 76 **or** 40 + 27 = 67; 67 + 9 = 76 - Making to ten e.g., 49 + 27 = (49 + 1) + (27 – 1) = 50 + 26 = 76

INTERVIEW 4 TASK 6

Janine has $49 in her piggy bank.
She gets $27 for her birthday.

How much money has Janine got now?

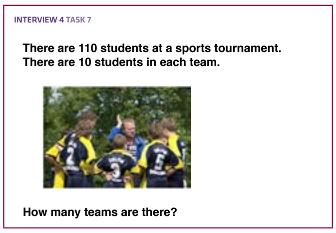
INTERVIEW 4 TASK 7

There are 110 students at a sports tournament.
There are 10 students in each team.

How many teams are there?

TASK 7

SAY: There are 110 students at a sports tournament.
There are 10 students in each team.
How many teams are there?

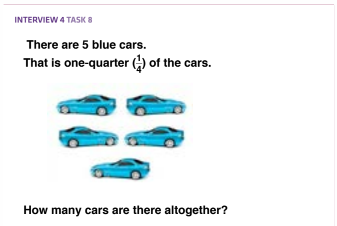


Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Skip counting** (Stage 4) **e.g.,** 10, 20, 30, 40, ..., 110 **Repeated addition** (Stage E5) **e.g.,** 10 + 10 + 10 + 10 + … + 10 = 110
5 or higher	**Uses an additive or multiplicative strategy e.g.** - Additive strategies e.g., 10 + 10 = 20; 20 + 20 = 40; 40 + 40 = 80; 8 + 2 + 1 = 11 - Derive from multiplication facts e.g., 10 × 10 = 100; 100 + 10 = 110; 10 + 1 = 11 - Multiplication facts e.g., 11 × 10 = 110 so the answer is 11

TASK 8

SAY: There are 5 blue cars.
That is one-quarter of the cars.
How many cars are there altogether?

Note: Say "fourth" instead of "quarter" if this is more familiar to your student.

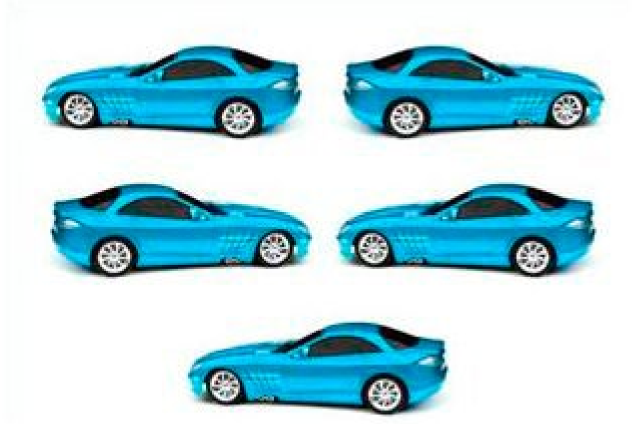


Stage	Strategy observed
Early 5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Counting strategy** (Stage 2–4) **e.g.,** 1, 2, 3, 4, **5**, 6, …, **10**, 11, …, **15**, 16, …, **20**
5 or higher	**Uses an addition or multiplication strategy e.g.,** - Additive strategies e.g., 5 + 5 = 10; 10 + 5 = 15; 15 + 5 = 20 - Multiplication facts e.g., 5 × 4 = 20 or 20 ÷ 4 = 5

DECISION: If **any** "5" are circled in **Tasks 6, 7** or **8**, CONTINUE the interview.
If **only** "E5" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 4 TASK 8

There are 5 blue cars.
That is one-quarter ($\frac{1}{4}$) of the cars.



How many cars are there altogether?

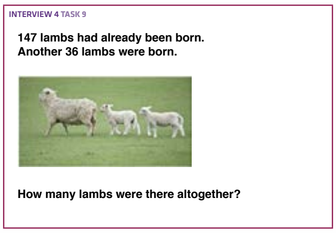
INTERVIEW 4 TASK 9

147 lambs had already been born.
Another 36 lambs were born.

How many lambs were there altogether?

TASK 9

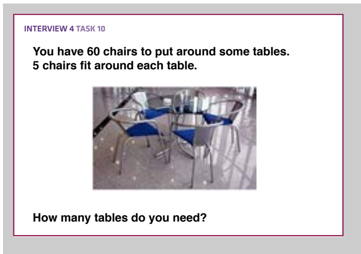
SAY: 147 lambs had already been born.
Another 36 lambs were born.
How many lambs were there altogether?



Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Skip counting in tens and ones** (Stage 4) **e.g.,** [147] 157, 167, 177, 178, 179, …, 183 **Repeat addition in tens and ones** (Stage E5) **e.g.,** 147 + 10 + 10 + 10 + 1 + 1 + … + 1 = 183 **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** 147 + 10 + 10 + 10 = 177; 177 + 3 + 3 = 183 **Attempts part-whole strategy with error** (Stage E5) **e.g.,** 173 (no carrying)
Early 6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (140 + 30) + (7 + 6) = 170 + 13 = 183 - Adding on in parts e.g., 147 + 30 = 177; 177 + 3 + 3 = 183 **or** 140 + 36 = 176; 176 + 4 + 3 = 183

TASK 10

SAY: You have 60 chairs to put around some tables.
Five chairs fit around each table.
How many tables do you need?



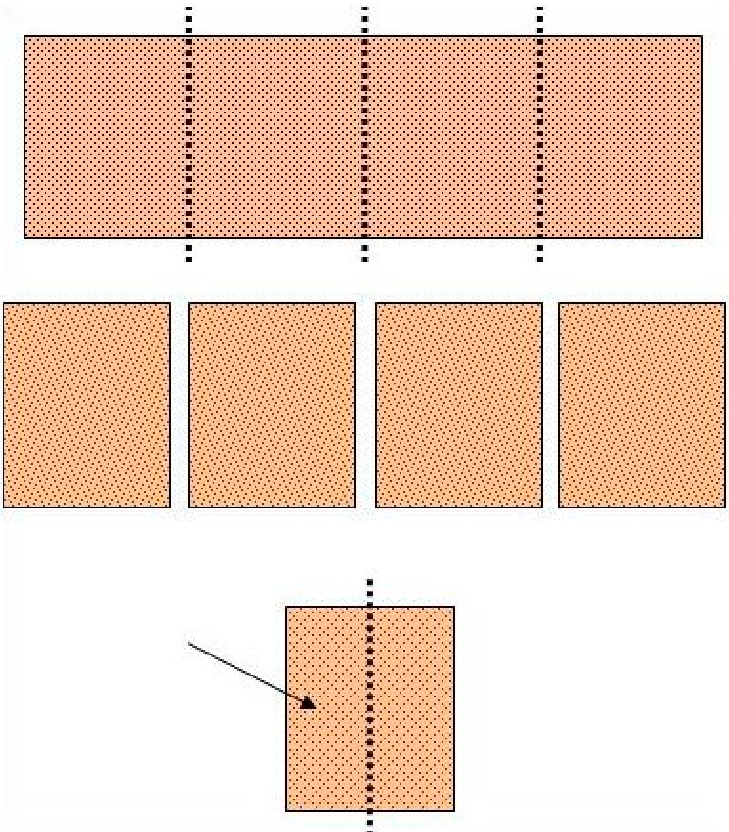
Stage	Strategy observed
5	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy e.g.,** - Skip counting (Stage 4) e.g., 5, 10, 15, 20, 25, ..., 60 or 60, 55, 50, …, 5 - Repeated addition (Stage E5) e.g., 5 + 5 + 5 + ... + 5 = 60 - Doubling additively (Stage 5) e.g., 5 + 5 = 10; 10 + 10 = 20; 20 + 20 + 20 = 60
Early 6 or higher	**Uses a multiplicative strategy e.g.,** - Doubling and halving e.g., 6 × 10 = 60; 12 × 5 = 60 so the answer is 12 - Derives from multiplication facts e.g., 10 × 5 = 50; 2 × 5 = 10; 10 + 2 = 12 - Multiplication facts e.g., 5 × 12 = 60 or 60 ÷ 5 = 12

INTERVIEW 4 TASK 10

You have 60 chairs to put around some tables.
5 chairs fit around each table.

How many tables do you need?

INTERVIEW 4 TASK 11



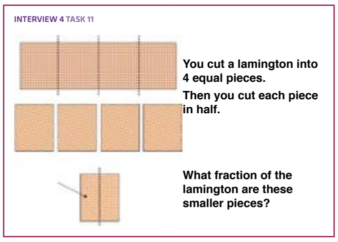
You cut a lamington into 4 equal pieces.

Then you cut each piece in half.

What fraction of the lamington are these smaller pieces?

TASK 11

SAY: You cut a lamington into 4 equal pieces.
Then you cut each piece in half.
What fraction of the lamington are these smaller pieces?

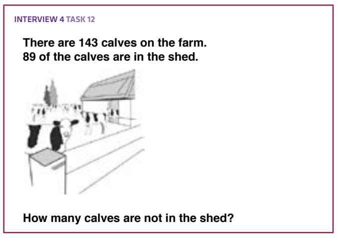


Stage	Strategy observed
5	**Cannot solve the problem OR Uses an earlier numeracy stage** **Counting strategy** (Stage 4) **e.g.,** 1, 2, 3, ..., 8 so the pieces are eighths
Early 6 or higher	**Uses an additive or multiplicative strategy e.g.,** - Additive strategy e.g., 2 + 2 + 2 + 2 = 8, so these pieces are quarters, and the smaller ones are eighths - Multiplicative strategy e.g., 4 × 2 = 8 so the pieces are eighths

DECISION: If **any** "E6" are circled in **Tasks 9, 10** or **11**, CONTINUE the interview.
If **only** "5" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

TASK 12

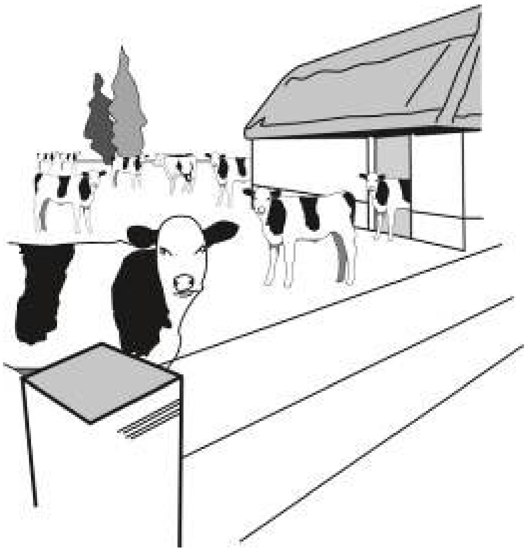
SAY: There are 143 calves on the farm.
89 of the calves are in the shed.
How many calves are not in the shed?



Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Mix of counting and part-whole strategies** (Stage E5) **e.g.,** [89] 99, 109, ..., 139; 139 + 1 = 140; 140 + 3 = 143; 50 + 1 + 3 **Attempts part-whole strategy with error** (Stage 5) **e.g.,** 143 – 90 = 53; 53 – 1 = 52 (compensates in the wrong direction)
6 or higher	**Uses a part-whole strategy e.g.,** - Place value partitioning e.g., (140 – 80) + (3 – 9) = 60 – 6 = 54 - Reversibility e.g., 89 + 1 = 90; 90 + 10 = 100; 100 + 43 = 143; 1 + 10 + 43 = 54 - Rounding and compensation e.g., 143 – 90 = 53; 53 + 1 = 54 - Subtracting in parts e.g., 143 – 80 = 63; 63 – 9 = 54 - Equal additions e.g., 144 – 90 = 54

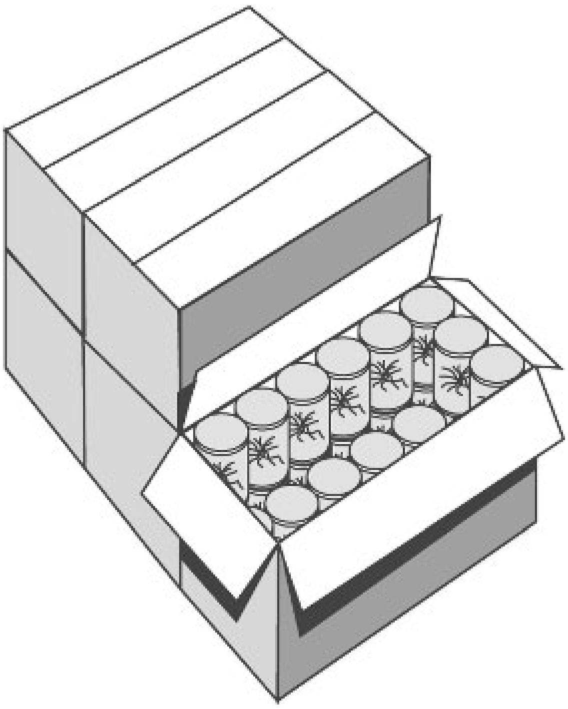
INTERVIEW 4 TASK 12

There are 143 calves on the farm.
89 of the calves are in the shed.



How many calves are not in the shed?

INTERVIEW 4 TASK 13

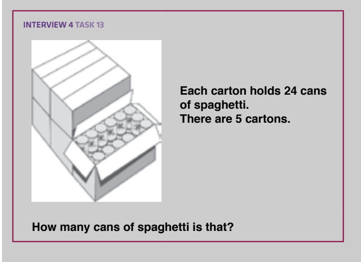


Each carton holds 24 cans of spaghetti.
There are 5 cartons.

How many cans of spaghetti is that?

TASK 13

SAY: Each carton holds 24 cans of spaghetti.
There are 5 cartons.
How many cans of spaghetti is that?



Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses an additive strategy e.g.,** - Doubling additively (Stage 5) e.g., 24 + 24 = 48; 48 + 48 = 96; 96 + 24 = 120
6 or higher	**Uses a multiplicative strategy e.g.,** - Place value partitioning e.g., 5 × 24 = (5 × 20) + (5 × 4) = 100 + 20 = 120 - Doubling and halving e.g., 5 × 24 = 10 × 12 = 120 - Derived from a known fact e.g., 25 × 5 = 125; 125 – 5 = 120

TASK 14

SAY: There are 8 swans on the lake.
The other two-thirds of the birds on the lake are ducks.
How many ducks are there on the lake?

Stage	Strategy observed
Early 6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies only** (Stage 5) **e.g.,** 8 + 8 + 8 = 24 so 24 birds in total; 8 + 8 = 16
6 or higher	**Uses multiplicative strategies e.g.,** 3 × 8 = 24 so 24 birds in total **then** multiplies (or adds) to get i.e., 2 × 8 = 16 [**or** 8 + 8 = 16] **or** $1 - \frac{2}{3} = \frac{1}{3}$; $\frac{1}{3} = 8$; $\frac{2}{3} = 2 \times 8 = 16$

DECISION: If **any** "6" are circled in **Tasks 12, 13** or **14**, CONTINUE the interview.
If **only** "E6" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 4 TASK 14

There are 8 swans on the lake.
The other two-thirds ($\frac{2}{3}$) of the birds on the lake are ducks.

How many ducks are there on the lake?

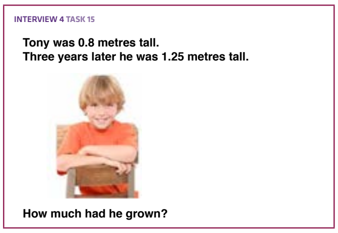
INTERVIEW 4 TASK 15

Tony was 0.8 metres tall.
Three years later he was 1.25 metres tall.

How much had he grown?

TASK 15

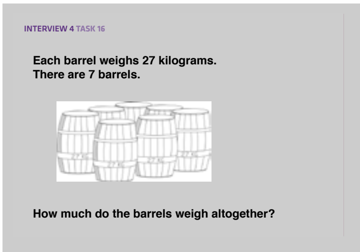
SAY: Tony was 0.8 metres tall.
Three years later he was 1.25 metres tall.
How much had he grown?



Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Misunderstands decimal place value** (Stage 6) **e.g.,** - Ignores the decimal points e.g., 125 – 8 = 117 **or** 125 – 80 = 45 [Check to see if they self-correct to 0.45 or 45cm then code as "E7"] - Treats numbers after the decimal as whole numbers e.g., 1.25 – 0.8 "=" 1.17
Early 7 or higher	**Uses part-whole strategies with decimal place value understanding e.g.,** - Place value partitioning e.g., (1.2 – 0.8) + (0.05 – 0) = 0.4 + 0.05 = 0.45 - Making to ones e.g., 0.8 + 0.2 = 1.0; 1.0 + 0.25 = 1.25; 0.2 + 0.25 = 0.45 - Equal addition e.g., 1.45 – 1.0 = 0.45

TASK 16

SAY: Each barrel weighs 27 kilograms.
There are 7 barrels.
How much do the barrels weigh altogether?



Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies** (Stage 5) **e.g.,** 27 + 27 = 54; 54 + 54 = 108; 108 + 108 = 216; 216 – 27 = 189 **Uses a mix of multiplicative and additive strategies** (Stage 6) **e.g.,** 20 × 7 = 140; 140 + 7 + 7 + 7 + 7 + 7 + 7 + 7 = 189
Early 7 or higher	**Uses a multiplicative strategy e.g.,** - Place value partitioning with basic facts e.g., (20 × 7) + (7 × 7) = 140 + 49 = 189 **or** (7 × 30) - (7 × 3) = 210 - 21 = 189 - Derive from basic facts e.g., (25 × 4) + (25 × 3) = 175; 175 + 2 × 7 = 189 **or** 10 × 7 = 70 so 20 × 7 = 140; 7 × 5 = 35; 7 × 2 = 14; 140 + 35 + 14 = 189

INTERVIEW 4 TASK 16

Each barrel weighs 27 kilograms.
There are 7 barrels.

How much do the barrels weigh altogether?

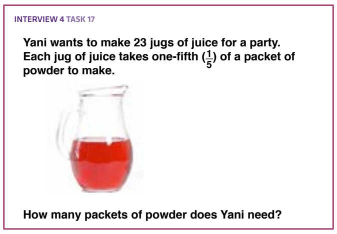
INTERVIEW 4 TASK 17

Yani wants to make 23 jugs of juice for a party.
Each jug of juice takes one-fifth ($\frac{1}{5}$) of a packet of powder to make.

How many packets of powder does Yani need?

TASK 17

SAY: Yani wants to make 23 jugs of juice for a party.
Each jug of juice takes one-fifth of a packet of powder to make.
How many packets of powder does Yani need?

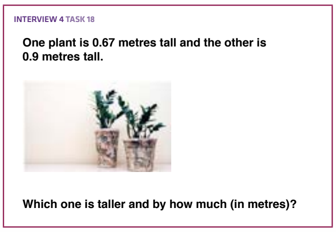


Stage	Strategy observed
6	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses additive strategies** (Stage 5) **e.g.,** 5 + 5 + 5 + 5 = 20 so 4 packets make 20 jugs, 1 more sachet makes 25 jugs
Early 7 or higher	**Uses a multiplicative strategy e.g.,** - Division with remainder e.g., 23 ÷ 5 = 4 r 3, so 5 packets will make more than 23 jugs 4 × 5 = 20, for 20 jugs, so 5 packets would be needed - Division with fraction e.g., 23 ÷ 5 = 4 r 3 = $4\frac{3}{5}$; so need 5 packets

DECISION: If **any** "E7" are circled in **Tasks 15, 16** or **17**, CONTINUE the interview.
If **only** "6" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

TASK 18

SAY: One plant is 0.67 metres tall and the other is 0.9 metres tall.
Which one is taller and by how much (in metres)?



Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Misunderstands decimal place value** (Stage 6) **e.g.,** - Ignores the decimal points e.g., 67 – 9 = 58 - Treats numbers after the decimal as whole numbers e.g., 0.9 – 0.67 "=" 0.67 – 0.9 "=" 0.58
7 or higher	**Uses part-whole strategies with decimal place value understanding e.g.,** - Place value partitioning e.g., (0.9 – 0.6) + (0.00 – 0.07) = 0.3 – 0.07 = 0.23 - Making to tenths e.g., 0.67 + 0.03 = 0.7; 0.7 + 0.2 = 0.9; 0.03 + 0.2 = 0.23 - Subtracting in parts e.g., 0.9 – 0.6 = 0.3; 0.3 – 0.07 = 0.23 - Equal addition e.g., 0.9 – 0.67 = 0.93 – 0.7 = 0.23

INTERVIEW 4 TASK 18

One plant is 0.67 metres tall and the other is 0.9 metres tall.

Which one is taller and by how much (in metres)?

INTERVIEW 4 TASK 19

There are 330 children wanting to play rugby. Each team has 15 players.

How many teams will there be?

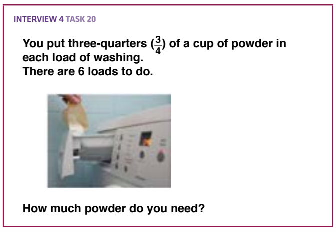
TASK 19

SAY: There are 330 children wanting to play rugby.
Each team has 15 players.
How many teams will there be?

Stage	Strategy observed
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses a mix of multiplicative and additive strategies** (Stage 6) **e.g.,** 15 + 15 = 30; 30 × 10 = 300; 300 + 30 = 330; 20 + 2 = 22
7 or higher	**Uses multiplicative strategies e.g.,** - Partitioning e.g., 330 ÷ 15 = 330 ÷ (3 × 5); 330 ÷ 3 = 110; 110 ÷ 5 = 22 - Doubling e.g., 330 ÷ 15 = 660 ÷ 30 = 22 - Basic facts with adjustment e.g., 33 ÷ 3 = 11 so 330 ÷ 30 = 11; 11 × 2 = 22 **or** 2 × 15 = 30; 20 × 15 = 300; 20 + 2 = 22

TASK 20

SAY: You put three-quarters of a cup of powder in each load of washing.
There are 6 loads to do.
How much powder do you need?



Note: Say "three-fourths" instead of "three-quarters" if this is more familiar to your student.

Stage	Strategy
Early 7	**Cannot solve the problem** or **Uses an earlier numeracy stage**
7 or higher	**Uses an additive strategy e.g.,** $\frac{3}{4} + \frac{3}{4} = 1\frac{1}{2}$, $1\frac{1}{2} + 1\frac{1}{2} = 3$, $3 + 1\frac{1}{2} = 4\frac{1}{2}$ **Uses a multiplicative strategy e.g.,** $6 \times \frac{3}{4} = (6 \times 3) \div 4 = \frac{18}{4} = 4\frac{1}{2}$ **or** $\frac{1}{4}$ of $6 = \frac{6}{4} = 1\frac{1}{2}$; $1\frac{1}{2} \times 3 = 4\frac{1}{2}$

DECISION: If **any** "7" are circled in **Tasks 18, 19** or **20**, CONTINUE the interview.
If **only** "E7" are circled, STOP the interview. If in any doubt, CONTINUE the interview.

INTERVIEW 4 TASK 20

You put three-quarters ($\frac{3}{4}$) of a cup of powder in each load of washing.
There are 6 loads to do.

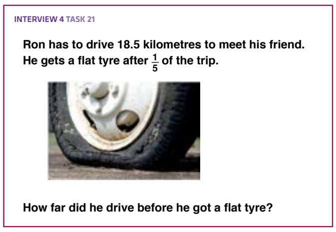
How much powder do you need?

INTERVIEW 4 TASK 21

Ron has to drive 18.5 kilometres to meet his friend.
He gets a flat tyre after $\frac{1}{5}$ of the trip.

How far did he drive before he got a flat tyre?

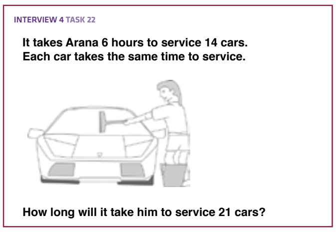
TASK 21



SAY: Ron has to drive 18.5 kilometres to meet his friend.
He gets a flat tyre after one-fifth of the trip.
How far did he drive before he got a flat tyre?

Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Attempts multiplication strategy** (Stage 6) **e.g.,** 5 × 3 = 15 and 5 × 4 = 20 so the answer is between 3 and 4 (and over 3.5)
Early 8 or higher	**Uses multiplication strategies e.g.,** - Uses decimal equivalent e.g., $\frac{1}{5}$ = 0.2; 2 × 18.5 = 37 so 0.2 × 18.5 = 3.7 - Rounds and compensates e.g., 20 ÷ 5 = 4; 1.5 ÷ 5 = 0.3 so 18.5 ÷ 5 = 4 – 0.3 = 3.7 **or** 18 ÷ 5 = 3 r 3 = $3\frac{3}{5}$ = 3.6; $\frac{1}{5}$ × 0.5 = 0.1; 3.6 + 0.1 = 3.7 - Interpolates between known facts e.g., 5 × 3 = 15 and 5 × 4 = 20; 18.5 is 3.5 ÷ 5 = $\frac{7}{10}$ = 0.7 of the way between 15 and 20, so the answer is 3.7 - Fractional multiplication, e.g., 18.5 = $18\frac{1}{2}$ = $\frac{37}{2}$; $\frac{37}{2}$ × $\frac{1}{5}$ = $\frac{37}{10}$ = $3\frac{7}{10}$ (= 3.7) - Doubling and halving, e.g., 18.5 × 2 = 37; $\frac{1}{5}$ ÷ 2 = $\frac{1}{10}$; 37 × $\frac{1}{10}$ = 3.7

TASK 22



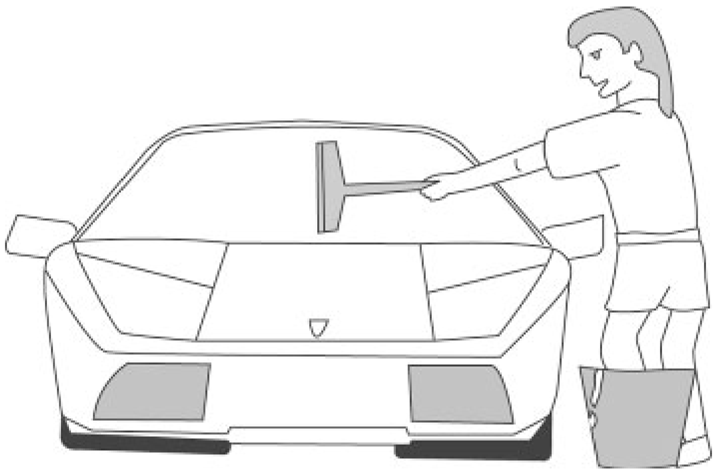
SAY: It takes Arana 6 hours to service 14 cars.
Each car takes the same time to service.
How long will it take him to service 21 cars?

Stage	Strategy observed
7	**Cannot solve the problem** or **Uses an earlier numeracy stage** **Uses inappropriate additive strategy** (Stage 5) **e.g.,** 14 + 7 = 21; 6 + 7 = 13 **or** 14 – 8 = 6; 21 – 8 = 13 **Uses estimation** (Stage 6/7) **e.g.,** Half of 14 is 7; 6 is less than half of 14; 9 **or** 10 is less than half of 21
Early 8 or higher	**Uses a proportional approach e.g.,** - Multiplicative strategies e.g., 14 × 1.5 = 21; 6 × 1.5 = 9 - Unitising e.g., 6 cars take 14 hours so 1 car takes $\frac{6}{14}$ hour = $\frac{3}{7}$ hour; $\frac{3}{7}$ of 21 = 9 - Equivalent fractions or ratios e.g., 14:21 = 2:3 = 6:9 so the answer is 9 **or** 6:14 = 3:7 = 6:9 so the answer is 9

Stop the interview

INTERVIEW 4 TASK 22

It takes Arana 6 hours to service 14 cars.
Each car takes the same time to service.



How long will it take him to service 21 cars?

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

Individual Knowledge Assessment of Number (IKAN)

IKAN is an assessment tool to be used to assess a student's knowledge stage on the Number Framework. It has been developed as an alternative to using the knowledge section of the diagnostic interview (NumPA). The knowledge stages describe key items of knowledge which students need to know and be able to quickly recall without needing to strategize. This assessment is suitable for students in years 3 to 8 who are at the Advanced Counting stage, numeracy stage 4, or higher. Teachers may use this assessment with all of their students or they may choose to use this assessment for those students whom they require more knowledge information about.

The assessment has been divided into five parts. Each part assesses the four knowledge domains. - Number Sequence and Order, Fractions, Place Value, and Basic Facts.

Part One:	Advanced Counting	AC (Stage 4)
Part Two:	Early Additive	EA (Stage 5)
Part Three:	Advanced Additive	AA (Stage 6)
Part Four:	Advanced Multiplicative	AM (Stage 7)
Part Five:	Advanced Proportional	AP (Stage 8)

It is recommended that different versions of IKAN are used within a school year to ensure that students do not become familiar with the questions. Each student will need a copy of the answer sheet attached to this document. The answer sheet has been broken into the four knowledge domains.

The on-line IKAN automatically times the exposure students have to each item. The time allocated for tasks has been altered depending upon the demands of each domain. Once the power point show is started the **teacher needs to read each item** as it appears including reading the numbers.
Note: Students at stages 7 and 8 may start the IKAN at part three.

Students can opt out of the assessment when they reach a point where they feel that they are unable to answer any more questions. It would be beneficial that students continue through the parts as they may have strength in a knowledge domain which will be evident when marking the assessment horizontally (see marking assessment section below). It is recommended that students have an independent activity available to continue with if they stop the assessment.

Marking the IKAN
The teacher marks all the questions at the end of the power point. The IKAN can be marked horizontally by individual domains and vertically for a knowledge stage.

Horizontally: Record the last stage where the student got all the questions correct. Each of the knowledge domains requires an identified stage. Strengths and weaknesses within these domains can easily be identified for teaching and learning purposes (refer to the student answer sheet example below).

Vertically: Record the total number of questions that the student answered correctly at the bottom of the column. Highlight the last stage where the student got all the questions correct (refer to the student answer sheet example below). This information may be used for collation of school wide knowledge data. It is not recommended that vertical analysis is used for classroom practice.

NB: The IKAN does not assess all the knowledge for each stage; it is a representative example only.
All aspects of knowledge need to be covered (refer to the Number Framework).
The knowledge domains align with the information obtained from using NumPA (Numeracy Project Assessment).See www.nzmaths.co.nz for more information about the NumPA assessment interview.

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

Student Answer Sheet – IKAN

IKAN 1 IKAN 2 IKAN 3 IKAN 4 (Circle the form used)

Student Name: ______________ Year Level: 4 Date: ______________

	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional	
Domain	**Part One**	**Part Two**	**Part Three**	**Part Four**	**Part Five**	**Stage**
Number Sequence and Order	1. 50 ✓ 2. 29 ✓	1. 600 ✓ 2. 999 ✓	1. 440 000 ✓ 2. 801 099	1. 2.		5 EA
Fractions	3. 1/2 ✓ 4. 1/5 ✓	3. 5 1/4 4. 1/4 2/4 3/4 ✓	3. 1/3 1/6 1/7 4. 4 1/5	3. 4.	1. 2.	4 AC
Place Value	5. 8 ✓ 6. 90 ✓	5. 3 6. 490 ✓	5. 6 6. 8	5. 6.	3. 4.	4 AC
Basic Facts	7. 14 ✓ 8. 9 ✓	7. 16 ✓ 8. 35 ✓	7. 7 ✓ 8. 42 ✓	7. 8.	5. 6 7. 8.	6 AA.
Total	8	6	3			

Mathematics Number Knowledge Grade Level Expectations (IKAN)

End of Kindergarten Number Knowledge Expectations

Counting interview					Written Assessment				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk	Cause for Concern	Achieving at or above expectations		High Achievers					

End of 1st Grade Number Knowledge Expectations

Counting interview					Written Assessment				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk		Cause for Concern	Achieving at or above expectations		High Achievers				

End of 2nd Grade Number Knowledge Expectations

Counting interview					Written Assessment				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk			Cause for Concern	Achieving at or above expectations		High Achievers			

End of 3rd Grade Number Knowledge Expectations

Counting interview					Written Assessment				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk				Cause for Concern	Achieving at or above expectations		High Achievers		

End of 4th Grade Number Knowledge Expectations

Counting interview					Written Assessment				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk					Cause for Concern	Achieving at or above expectations		High Achievers	

End of 5th Grade Number Knowledge Expectations

Counting interview					**Written Assessment**				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk					Cause for Concern		Achieving at or above expectations		High Achievers

End of 6th Grade Number Knowledge Expectations

Counting interview					**Written Assessment**				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk						Cause for Concern		Achieving at or above expectations	

End of 7th Grade Number Knowledge Expectations

Counting interview					**Written Assessment**				
NO PARTS MASTERED	FNWS/BNWS COUNTING MASTERED, BUT R&S NOT MASTERED	FNWS/BNWS R&S 20	FNWS/BNWS R&S 120	FNWS/BNWS R&S 1000	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
At Risk							Cause for Concern		Achieving at or above expectations

*<u>***By the end of 7th grade students should have successfully completed through stage 8 of the IKAN***</u>*

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

Student Answer Sheet – IKAN **IKAN 1** **IKAN 2** **IKAN 3** **IKAN 4** (Circle the form used)

Student Name: ___________________________________ Year Level: _________ Date: _______________

Domain	Part One Stage 4 Advanced Counting	Part Two Stage 5 Early Additive	Part Three Stage 6 Advanced Additive	Part Four Stage 7 Advanced Multiplicative	Part Five Stage 8 Advanced Proportional	Stage
Number Sequence and Order	1. 2.	1. 2.	1. 2.	1. 2.		
Fractions	3. 4.	3. 4.	3. 4.	3. 4.	1. 2.	
Place Value	5. 6.	5. 6.	5. 6.	5. 6.	3. 4.	
Basic Facts	7. 8.	7. 8.	7. 8.	7. 8.	5. 6 7. 8.	
Total						

Answers for IKAN 1

	IKAN 1 Part 1	Part 2	Part 3	Part 4	Part 5
1	50	600	440 000	0.9	3/4
2	29	999	800 999	2.084	0.6
3	1/2	5/4	1/7, 1/6, 1/5	12/20	607 or 607.3
4	1/5	1/4, 2/4, 3/4	21/5	1/3	4.75
5	8	83 or 83.2	536 or 536.05	6.5	4/5
6	90	490	58	6457 or 6457.894	130%
7	14	16	7	7	18
8	9	35	42	42	12

Answers for IKAN 2

	IKAN 2 Part 1	Part 2	Part 3	Part 4	Part 5
1	90	900	650 000	0.48	7/10
2	59	699	302 999	6.175	3/4
3	1/4	6/5	1/9, 1/8, 1/2	6/9	208 or 208.1
4	1/3	2/5, 3/5, 4/5	17/3	1/4	7.35
5	7	93 or 93.5	148 or 148.7	3.4	3/5
6	60	560	62	725 or 725.106	8.5%
7	16	14	7	9	12
8	7	40	72	72	8

Answers for IKAN 3

	IKAN 3 Part 1	Part 2	Part 3	Part 4	Part 5
1	80	500	110 000	0.83	2/5
2	39	899	701 999	0.52	59%
3	1/5	4/3	1/11, 1/5, 1/4	16/20	205 or 205.3
4	1/4	1/3, 2/3, 3/3	67/10	2/3	2.55
5	10	48 or 48.1	509 or 509.05	2.9	7/10
6	80	790	83	9050 or 9050.391	3.4%
7	18	15	6	7	21
8	6	30	56	32	3

Answers for IKAN 4

	IKAN 4 Part 1	**Part 2**	**Part 3**	**Part 4**	**Part 5**
1	70	800	730 000	0.55	4/5
2	89	599	603 999	4.24	3/5
3	1/3	3/2	1/7, 1/6, 1/3	3/5	300 or 300.4
4	1/2	1/5, 3/5, 4/5	14/4	5/8	3.65
5	9	65.4 or 65	667 or 667.38	5.5	2/5
6	50	620	74	850 or 850.034	102%
7	12	15	6	8	28
8	9	45	48	54	4

Questions and Answers for IKAN 1

	Part 1	Part 2	Part 3	Part 4	Part 5
1	What number is one more than 49? **50**	What number is one more 599? **600**	What number is one more 439 999? **440 000**	Which decimal is the biggest, 0.639, 0.9, 0.84? **0.9**	Which fraction is the biggest, ¾, 73/100, 7/10? **3/4**
2	What number is one less than 30? **29**	What number is one less than 1000? **999**	What number is one less than 801 000? **800 999**	Which decimal is the smallest, 2.4, 2.71, 2.084? **2.084**	Which is the smallest? 2/3 , 0.6 or 70 % **0.6**
3	Write the fraction for one half. **1/2**	Write the fraction for five quarters. **5/4**	Write these fractions in order of size, smallest to biggest. 1/5, 1/7, 1/6 **1/7, 1/6, 1/5**	Which number is the same as 3/5? 5/3, 12/20, 1 2/3 4/6 **12/20**	How many hundredths are in all of 6.073? **607 or 607.3**
4	Write the fraction for one fifth. **1/5**	Write these fractions in order of size, smallest to biggest. ¾, ¼, 2/4 **1/4, 2/4, 3/4**	Write 4 and 1/5 as a fraction. **21/5**	Which fraction is the smallest, 3/8 4/10 1/3 ? **1/3**	What number is half way between 4.8 and 4.7? **4.75**
5	How many tens are in 80? **8**	How many tens are in all of the number 832? **83 or 83.2**	How many hundreds are in all of this number, 53 605? **536 or 536.05**	Round the following decimal to the nearest tenth. 6.49 **6.5**	What is the simplest fraction for 80%? **4/5**
6	What is the number for nine groups of ten? **90**	What is the number for 49 groups of ten? **490**	How many tenths are in all of the number, 5.8? **58**	How many thousands are in all of 6 457 894? **6457 or 6457.894**	What is 1.3 written as a percentage? **130%**
7	7 + 7 = ? **14**	7 + 9 = ? **16**	15 – 8 = ? **7**	63 ÷ 9 = ? **7**	What is the least common multiple of 6 and 9? **18**
8	Half of 18 is ? **9**	5 x 7 = ? **35**	6 x 7 = ? **42**	What number divided by 7 gives 6? **42**	What is the highest common factor of 36 and 48? **12**

Answers for IKAN 2

	IKAN 2 **Part 1**	**Part 2**	**Part 3**	**Part 4**	**Part 5**
1	What number is one more than 89? **90**	What number is one more 899? **900**	What number is one more 649 999? **650 000**	Which decimal is the biggest, 0.307, 0.48, 0.2? **0.48**	Which fraction is the biggest, 2/3, 7/10, 3/5? **7/10**
2	What number is one less than 60? **59**	What number is one less than 700? **699**	What number is one less than 303 000? **302 999**	Which decimal is the smallest, 6.39, 6.2, 6.175? **6.175**	Which is the smallest, ¾, 0.76, 80%? **3/4**
3	Write the fraction for one quarter. **1/4**	Write the fraction for six fifths. **6/5**	Write these fractions in order of size, smallest to biggest, 1/2 1/9. 1/8. **1/9, 1/8, 1/2**	Which number is the same as 2/3? 3/2, 6/9, 1 ½ 66/100 **6/9**	How many hundredths are in all of 2.081? **208 or 208.1**
4	Write the fraction for one third. **1/3**	Write these fractions in order of size, smallest to biggest. 3/5, 2/5, 4/5 **2/5, 3/5, 4/5**	Write 5 2/3 as a fraction. **17/3**	Which fraction is the smallest, 2/5, ¼, 3/8? **1/4**	What number is half way between 7.3 and 7.4? **7.35**
5	How many tens are in 70? **7**	How many tens are in all of the number 935? **93 or 93.5**	How many hundreds are in all of this number, 14 870? **148 or 148.7**	Round the following decimal to the nearest tenth. 3.37 **3.4**	What is the simplest fraction for 60%? **3/5**
6	What is the number for six groups of ten? **60**	What is the number for 56 groups of ten? **560**	How many tenths are in all of the number, 6.2? **62**	How many thousands are in all of 725 106? **725 or 725.106**	What is 0.085 written as a percentage? **8.5%**
7	8 + 8 = ? **16**	6 + 8 = ? **14**	16 – 9 = ? **7**	54 ÷ 6 = ? **9**	What is the least common multiple of 4 and 6? **12**
8	Half of 14 is ? **7**	8 x 5 = ? **40**	9 x 8 = ? **72**	What number divided by 8 gives 9? **72**	What is the highest common factor of 24 and 32? **8**

Answers for IKAN 3

	IKAN 3 **Part 1**	**Part 2**	**Part 3**	**Part 4**	**Part 5**
1	What number is one more than 79? **80**	What number is one more 499? **500**	What number is one more 109 999? **110 000**	Which decimal is the biggest, 0.83, 0.6, 0.754? **0.83**	Which fraction is the biggest, 2/5, 3/8, 1/3? **2/5**
2	What number is one less than 40? **39**	What number is one less than 900? **899**	What number is one less than 702 000? **701 999**	Which decimal is the smallest, .643, 0.52, 0.9? **0.52**	Which is the smallest? 59%, 5/8, 0.6% **59%**
3	Write the fraction for one fifth. **1/5**	Write the fraction for four thirds. **4/3**	Write these fractions in order of size, smallest to biggest. ¼, 1/5, 1/11, **1/11, 1/5, 1/4**	Which number is the same as 4/5? 5/4, 2/3, 1 1/4 16/20 **16/20**	How many hundredths are in all of 2.053? **205 or 205.3**
4	Write the fraction for one quarter. **1/4**	Write these fractions in order of size, smallest to biggest. 2/3, 3/3, 1/3. **1/3, 2/3, 3/3**	Write 6 7/10 as a fraction. **67/10**	Which fraction is the smallest, 7/8, 2/3, 5/6? **2/3**	What number is half way between 2.3 and 2.8? **2.55**
5	How many tens are in 100? **10**	How many tens are in all of the number 481? **48 or 48.1**	How many hundreds are in all of this number, 50 905 ? **509 or 509.05**	Round the following decimal to the nearest tenth. 2.89 **2.9**	What is the simplest fraction for 70%? **7/10**
6	What is the number for eight groups of ten? **80**	What is the number for 79 groups of ten? **790**	How many tenths are in all of the number, 8.3? **83**	How many thousands are in all of 9050391? **9050 or 9050.391**	What is 0.034 written as a percentage? **3.4%**
7	9 + 9 = ? **18**	7 + 8 = ? **15**	14 – 8= ? **6**	63 ÷ 9 = ? **7**	What is the least common multiple of 3 and 7? **21**
8	Half of 12 is ? **6**	6 x 5 = ? **30**	8 x 7 = ? **56**	What number divided by 4 gives 8? **32**	What is the highest common factor of 12 and 21? **3**

Answers for IKAN 4

	IKAN 4 Part 1	Part 2	Part 3	Part 4	Part 5
1	What number is one more than 69? **70**	What number is one more 799? **800**	What number is one more 729 999? **730 000**	Which decimal is the biggest, 0.371, 0.4, 0.55? **0.55**	Which fraction is the biggest, 4/5, 77/100, 3/4? **4/5**
2	What number is one less than 90? **89**	What number is one less than 600? **599**	What number is one less than 604 000? **603 999**	Which decimal is the smallest, 4.24, 4.389, 4.4? **4.24**	Which is the smallest, 3/5, 65%, 0.687? **3/5**
3	Write the fraction for one third. **1/3**	Write the fraction for three halves. **3/2**	Write these fractions in order of size, smallest to biggest. 1/6, 1/3, 1/7 **1/7, 1/6, 1/3**	Which number is the same as 6/10? 4/8, 10/6, 1 1/6, 3/5 **3/5**	How many hundredths are in all of 3.004? **300 or 300.4**
4	Write the fraction for one half. **1/2**	Write these fractions in order of size, smallest to biggest. 3/5, 1/5, 4/5 **1/5, 3/5, 4/5**	Write 3 2/4 as a fraction. **14/4**	Which fraction is the smallest, 4/6, 5/8, 3/4? **5/8**	What number is half way between 3.4 and 3.9? **3.65**
5	How many tens are in 90? **9**	How many tens are in all of the number 654? **65.4 or 65**	How many hundreds are in all of this number, 66 738 ? **667 or 667.38**	Round the following decimal to the nearest tenth. 5.51 **5.5**	What is the simplest fraction for 40%? **2/5**
6	What is the number for five groups of ten? **50**	What is the number for 62 groups of ten? **620**	How many tenths are in all of the number, 7.4? **74**	How many thousands are in all of 850 034? **850 or 850.034**	What is 1.02 written as a percentage? **102%**
7	6 + 6 = ? **12**	9 + 6 = ? **15**	13 – 7 = ? **6**	56 ÷ 7 = ? **8**	What is the least common multiple of 4 and 7? **28**
8	Half of 18 is ? **9**	9 x 5 = ? **45**	6 x 8 = ? **48**	What number divided by 6 gives 9? **54**	What is the highest common factor of 12 and 28? **4**

Individual Knowledge Assessment for Numeracy (IKAN) Part I **Name:_______________**

Counting Students (Interview)

***for students scoring within Strategy Stage 0 - 3**

Look for confusions between "teen" and "ty" numbers in questions (1), (3), and (7) to (9) and for "dropping back" to find the numbers after and before.

(1) Start counting from 1. Stop at 32.

1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32

student must stop counting at (32) and not go beyond

(2) Count backwards from 10. Stop at 0.

10,9,8,7,6,5,4,3,2,1,0 student must say "zero"

(3) Count backwards from 23. Stop at 11.

23,22,21,20,19,18,17,16,15,14,13,12,11 student must stop counting at (11) and not go beyond

Show each number (on card). For each number ask:

Questions:	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Show Card #	1	5	11	14	31	50	80	100	111	409	870	999
What is this Number?												
What Number comes after?												
What number comes before?												

record dates achieved FNWS/BNWS/R&S in table below

	(K) R&S to 20	(1st Grade) R&S to 120	(2nd Grade) R&S to 1000
	FNWS- BNWS- Number recognition to- Number after and before to-	Number recognition to- Number after and before to-	Number recognition to- Number after and before to-

FNWS/BNWS- Forward and Backward Number with Sequence **R&S-**recognition and Sequence *Adapted from nzmaths*

******Every student should have the counting interview administered until mastery******

Number Recognition and Sequence Cards

1	5	11	14
31	50	80	100
111	409	870	999