Schedule for Early Number Assessment (SENA 2)

Student's name: _____

Class: _____ [   ] **Date of initial assessment**

D.O.B: _____ [   ] **Date of second assessment**

Addition and subtraction

(1) *I had 8 cards and was given another 7. How many do I have now?*

(2) *I have 17 grapes. I ate some and now have 11 left. How many did I eat?*

Numeral identification

(3) **90**   (4) **59**   (5) **101**   (6) **400**   (7) **263**

(8) **607**   (9) **310**   (10) **1000**   (11) **4237**   (12) **3060**

Counting by 10s and 100s

(13) *Can you start from 110 and count backwards by 10s.* (110, 100, 90 … 50)

(14) *Can you start from 7 and count on by 10s.* (7, 17, 27 ... 97)

(15) *Can you start from 924 and count down by 100 each time.* (924, 824, 724 ... 524)

(16) *Can you start from 367 and count on by 10s.* (367, 377, 387 ... 417)

Combining and partitioning

(17) *Can you tell me two numbers that add up to 10?*
   Tell me two other numbers that add up to 10.
   Can you tell me another two that add up to 10?

(18) *Can you tell me two different numbers that add up to 19?*
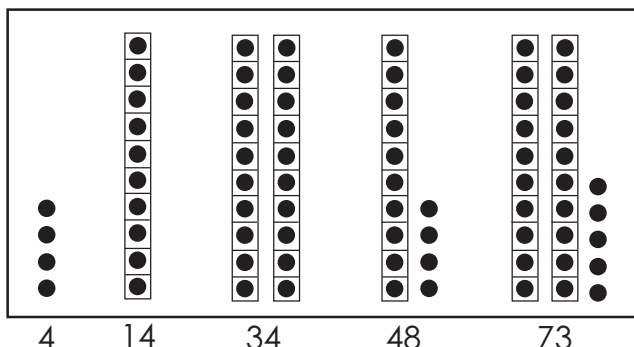   *Can you tell me another two?*

Schedule for Early Number Assessment (SENA 2)

Place value

(19) Uncovering task

Cover the card with two cardboard sheets. Uncover each section as described in the interview guidelines

4   14   34   48   73

- Uncover the first 4 dots.

  How many dots are there?

- Slide the covers to the right so that the first 4 dots and the next 10 dots are visible.

  Each time you see one of these long strips, you know it has 10 dots.

  How many dots are there altogether?

- Slide the cover across so that the next 20 dots are also visible.

  How many dots are there altogether?

- Slide one cover to the left to cover these 34 dots. Slide the second cover to the right to reveal the next 14 dots.

  How many dots are there altogether now?

- Slide the second cover to the left to reveal the last 25 dots.

  How many dots are there altogether now?

- Cover all dots.

  How many more dots would I need to make 100?

(20) Display this card: **43 + 21**   *What is the answer to this?*

(21) Display this card: **37 + 19**   *What is the answer to this?*

(22) Display this card: **50 - 27**   *What is 50 minus 27?*

Can you tell me how you worked it out?

# Schedule for Early Number Assessment (SENA 2)

Multiplication and division

(23) Present a pile of counters, more than 12, to the student. Randomly spaced, not in a line. Do not count them out.

*Using these counters, make three groups with four in each group.*

How many counters are there altogether?

(24) Without the student seeing, put out six cardboard circles, each with 3 dots face down and cover them.

*I have 6 circles each with 3 dots under this cover. How many dots altogether?*
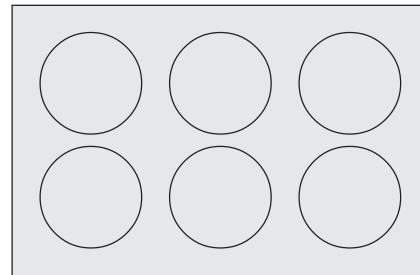
Remove the cover if the student is unsuccessful. If necessary, turn the circles over to reveal the dots.
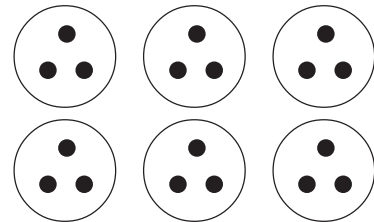
(25) *There are twelve biscuits and the children are given two biscuits each. How many children are there?*

(26) *The dots on this card are in rows and columns.* Briefly show the complete array, then cover.

Some of the dots have been covered. How many dots are there altogether?
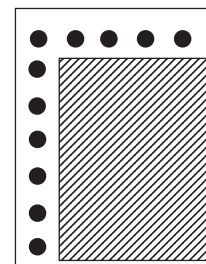
Schedule for Early Number Assessment (SENA 2)

(27) (a) *What is the answer to this?*
     If the student is correct ask part (b):

8 x 4

(b) *If you know the answer to that question is 32, what would 32 divided by 4 equal?*

32 ÷ 4

(c) *If you know the answer to this (point to card displaying 8 x 4) what is the answer to this?*

9 x 4

(28) *I made 27 cakes. 6 cakes fit in a box. How many boxes will I need?*
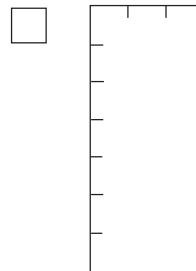
How did you work that out?

Additional prompt questions may be needed.

Area multiplication

(29) Show the cardboard unit square and the "7 x 3" rectangle.

How many squares like this would you need to cover the rectangle completely?

Provide the student with a copy of the grid and ask: *Can you draw what the squares would look like?*

Schedule for Early Number Assessment 2

Interview guidelines

General

- Have an assessment sheet for each student being interviewed.

- Place the assessment sheet to the side of the work space and, if possible, out of the students' view. A small screen is useful for this purpose.

- Note incorrect responses and any useful comments on the assessment sheet.

- Where useful, ask students to explain their strategies.

Addition & subtraction   (Tasks 1 – 2)

- These tasks are designed to elicit facile counting strategies. It is recommended that the student be operating at least at the counting on and back stage before administering SENA 2.

- Administer the tasks verbally. Do not provide material.

- Determine the strategies the student uses to solve each task.

Numeral identification   (Tasks 3 – 12)

- Show the numeral cards in the order indicated.

Counting by 10s and 100s (Tasks 13 – 16)

- Stop if the student encounters difficulty.

Combining and partitioning (Tasks 17 – 18)

Task 17

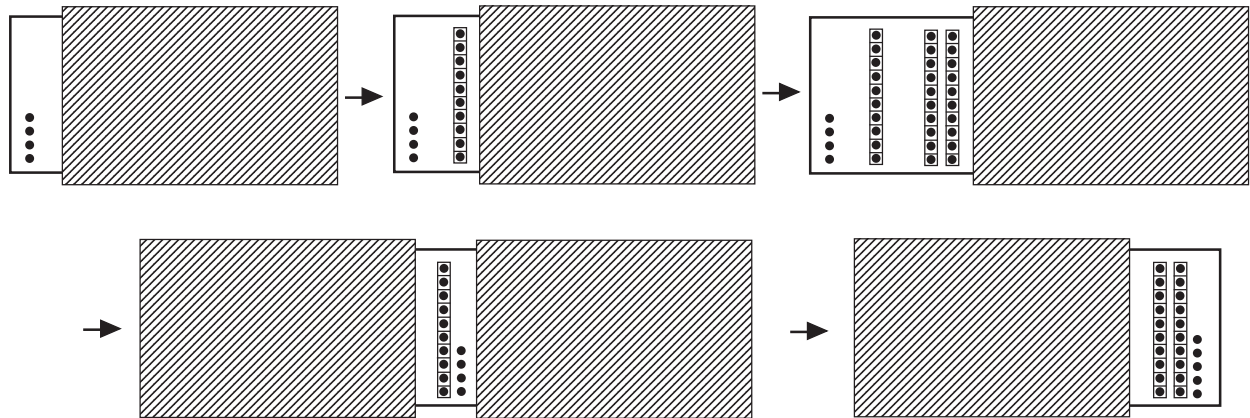- See if the student can produce at least three different number combinations that total 10.

Task 18

- See if the student can produce both standard (10 + 9) and non-standard (e.g. 11 + 8) partitionings of 19.

Place value (Tasks 19 – 22)

Task 19

- Stop if the student counts on by ones. (The student would be determined to be at level 0).

Uncovering task: Cover the dots and then uncover as follows:

Then cover all the dots and ask: *How many more dots would I need to make 100*?

Students are determined to be at Level 1 (Ten as a unit) if they successfully manipulate tens and ones in this task. If students successfully answer the final question, they would be at Level 2 (Tens and ones).

Tasks 20 – 22

- Ask the student to explain the strategy used.
- Success with these tasks may indicate Level 2 (Tens & ones).
- Identify if the student used a split or jump method to solve the tasks.

Multiplication & division (Tasks 23 – 28)

Task 23

Present more than 12 counters, randomly placed to the student. The first instruction is designed to indicate if the student is able to form equal groups. The follow-up question is designed to show the counting strategy which the student uses to find the total.

Task 24

- If the student is able to recreate the groups and keep track of the count, he or she is typically demonstrating Level 4.
- Note the strategy used. Does the student multiply, use repeated addition, use a double count or need to recreate the individual units using finger strategies?

- If the student is unsuccessful with the circles screened, remove the screen to make the markers for the units visible. This reduces the question to Level 3.
- If necessary, reduce to a lower level by turning the circles over for a Level 2 or Level 1 response.

Task 25

- This is an oral question.

- Try to discover the student's strategy.

- This task is designed to indicate:

  - Level 4 strategy (solving a quotitive division where the number of groups are not apparent)

  - a more advanced strategy (6 x 2 or 12 ÷ 2).

Task 26

- Place a cover over the array as indicated and then display.

- Try to discover the student's strategy.

- This task is designed to indicate:

  - Level 3 strategy (counting hidden items by fives)

  - a more advanced strategy (7 x 5).

Task 27

- This task is designed to elicit students' Level 5 strategies (known facts, understanding multiplication and division as inverses, etc.).

- Part (c) can be done by adding 4 to the answer to part (a). Note whether the student is able to treat the question as multiplication or derives the result by addition.

Task 28

- This task deals with "Fair share with remainder".

- Ask the student to explain his or her answer.

- Note how the student deals with the "remainder".

- Additional prompt questions may be needed, for example:

    If the student answers "5" ask, *Are they all full*?

    If the student answers "4" ask, *Were there any left over*?

Area multiplication (Task 29)

- This task is designed to investigate the relationship between spatial structure and multiplication.

- Note whether the student counts by ones, attempting to visualise the implicit structure, counts in multiples or uses multiplication.

- Note the spatial structuring which the student uses to complete the drawing task.

- Does the student:

    - see the outside structure, but "lose" the middle structure?

    - see the rows, but not the column structure?

    - use a row by column structure?

Individual analysis sheet (SENA 2)

Student's name: _____

D.O.B: _____   **Initial interview date:** _____

Early arithmetical strategies (Tasks 1 – 2)

Stage 0 Emergent	Stage 1 Perceptual	Stage 2 Figurative	Stage 3 Counting-on-and-back	Stage 4 Facile

Numeral identification (Tasks 3 – 12)

Level 1 1– 10	Level 2 1 – 20	Level 3 1 –100	Level 4 1–1000	Level 5 > 1000

Counting by 10s and 100s (Tasks 13 – 16)

Level 1 Initial counting by 10s and 100s	Level 2 Off decade by 10s	Level 3 Off hundred and off decade by 100s

Combining and partitioning (Tasks 17 – 18)

Level 1 To 10	Level 2 To 20

Place value (Tasks 19 – 22)

Level 0 Counts by ones	Level 1 Ten as a unit	Level 2 Tens & ones

Multiplication and division (Tasks 23 – 28)

Level 1 Forming equal groups (Perceptual counting by ones)	Level 2 Perceptual counting in multiples	Level 3 Figurative units (Repeated numerical composites)	Level 4 Repeated abstract composites	Level 5 Multiplication & division as operations

Area multiplication (Task 29)

Level 1 Counts by ones Inconsistent structure	Level 2 Forms a composite unit	Level 3 Coordinates units

Comments:

Class summary sheet (SENA 2)

Class: _____

Date: initial interview _____   **Date: final interview:** _____

Student	Age at initial interview		Numeral identififation (Levels 0-5)		Counting by 10s and 100s (Levels 1-3)		Early arithmetical strategies (Stages 0-4)		Combining & partitioning (Levels 1-2)		Place value (Levels 0-2)		Multiplication & division (Levels 1-5)		Area Multiplication (Levels 1–3)	
	Years	Mths	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final

Summary of materials needed for implementing *SENA 2*

☑ **One set of numeral cards: 59 90 101 263 310 400 607 1000 3060 4237**

☑ **One card displaying the ten strip and arrangement of units, as shown in Task 19**

☑ **Two pieces of cardboard for covering task**

☑ **One card displaying 43 + 21, one card displaying 37 + 19, one card displaying 50 - 27, one card displaying 8 x 4, one card displaying 32 ÷ 4, one card displaying 9 x 4**

☑ **20 counters**

☑ **One card displaying 5 x 7 array**

☑ **One sheet of paper per student showing 7 x 3 rectangle grid and one cardboard unit square**

☑ **Six circles displaying three dots on each**

☑ **One cloth or piece of cardboard large enough to cover six circles**

☑ Photocopiable material follows

SENA 2: Tasks 3 – 12

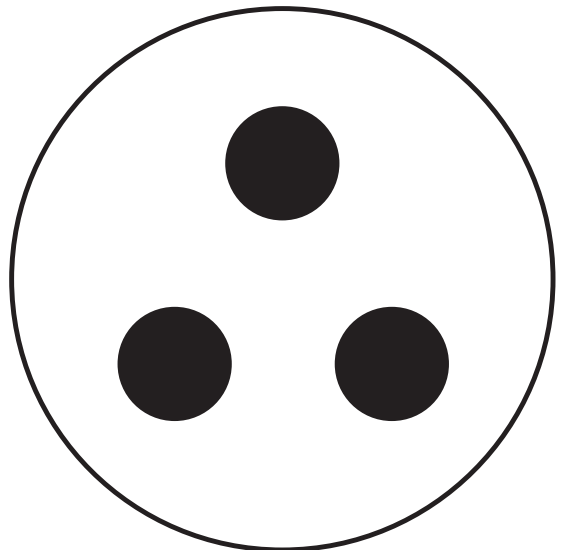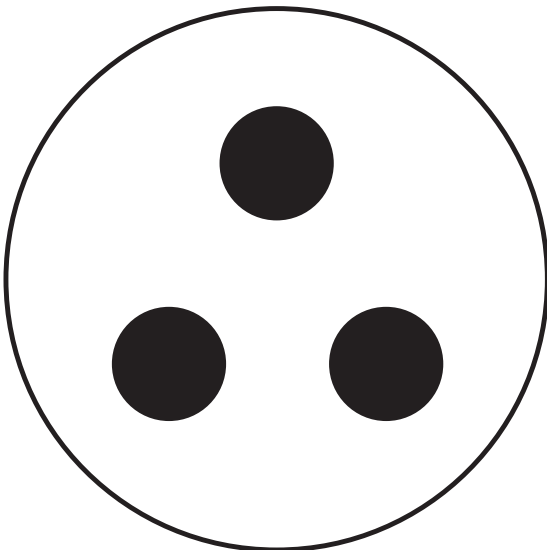|		
59	90	101
263	310	400
607	1000	3060
4237		

SENA 2: Task 19
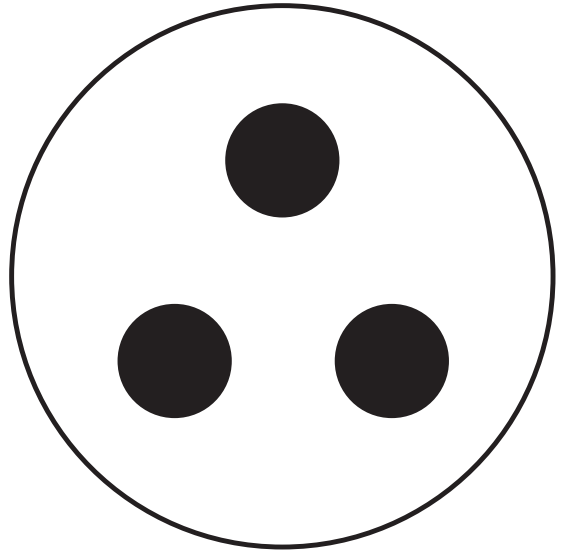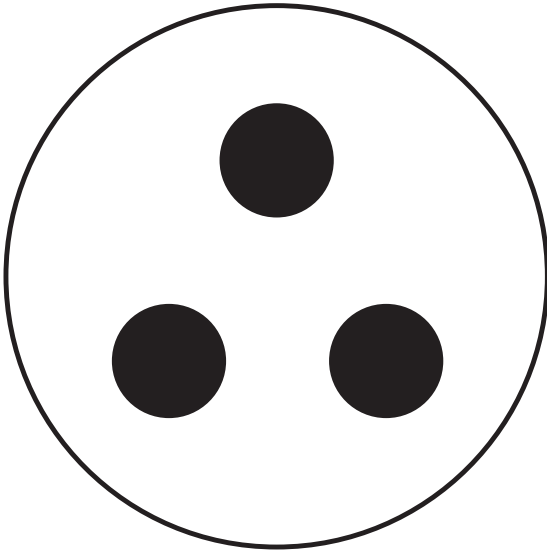
SENA 2: Task 20
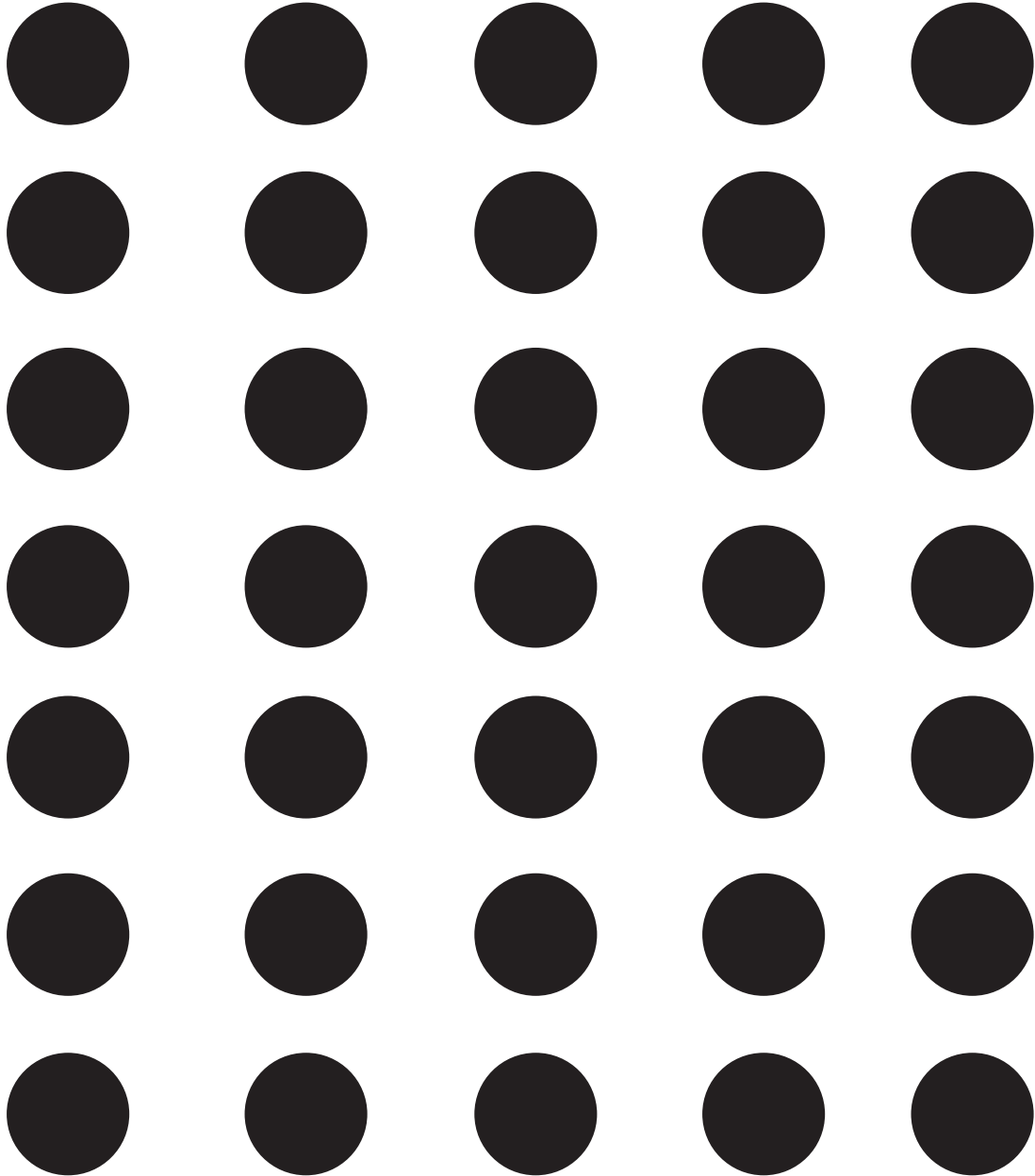
43 + 21

SENA 2: Task 21

37 + 19

SENA 2: Task 22

50 − 27

SENA 2: Task 24
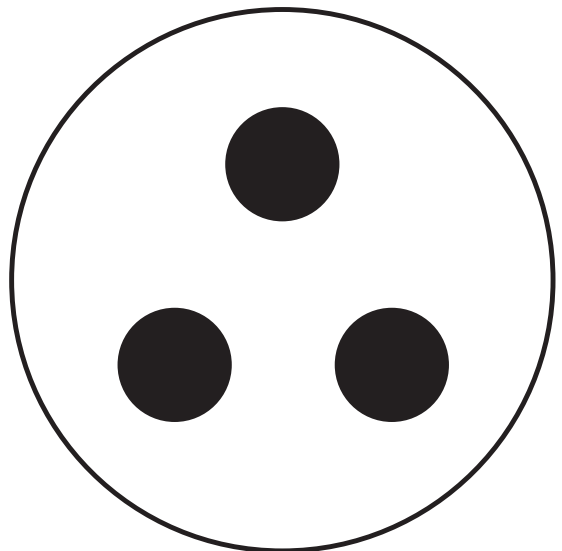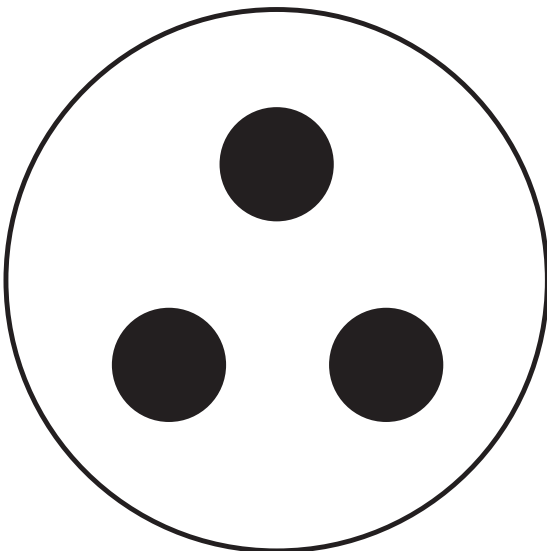
SENA 2: Task 26

SENA 2: Task 27
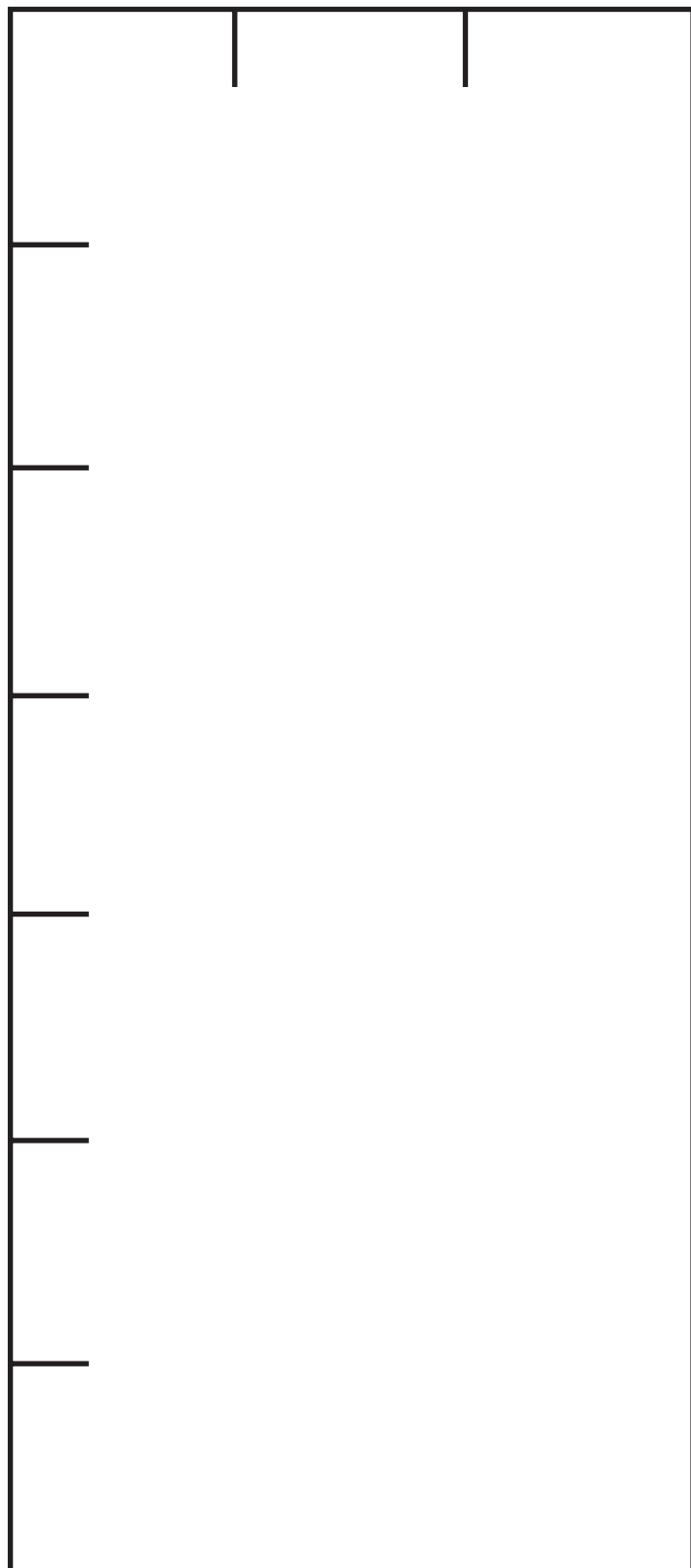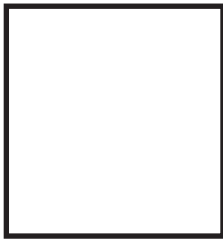
(a)

$$8 \times 4$$

(b)

$$32 \div 4$$

(c)

$$9 \times 4$$

SENA 2: Task 29

Reference guide (SENA 2)

Early arithmetic strategies EAS (Tasks 1–2)

Stage 0 Emergent	Stage 1 Perceptual	Stage 2 Figurative	Stage 3 Counting on	Stage 4 Facile
Unable to coordinate number words with items when counting	Needs to see, touch or hear to work out answer. Counts from one objects remain constantly in view	Can complete tasks involving concealed items but counts from one	Uses larger number and counts on to find the answer	Uses known facts and other non-count-by-one strategies, e.g. doubles, partitioning, to solve problems

Numeral identification (Tasks 3–12)

Level 1 (1-10)	Level 2 (1-20)	Level 3 (1-100)	Level 4 (1-1000)	Level 5 (1-10 000)
Indentifies numerals 1-10	Indentifies numerals 1-20	Indentifies numerals to 100	Indentifies numerals to 1000	Indentifies numerals to 10 000

Counting by 10s and 100s (Tasks 13–16)

Level 1 Initial counting by 10sand 100s	Level 2 Off decade counting by 10s	Level 3 Off hundred and off decade counting by 100s
Counts forwards and backwards by 10s and 100s	Counts forwards and backwards by 10s, off the decade	Counts forwards and backwards by 100s off the hundred and by 10s off the decade

Combining and partitioning (Tasks 17–18)

Level 1 To 10	Level 2 To 20
Knows number combinations to 10 and how many more needed to make 10	Can provide standard and non-standard partitioning of a number to 20

Place value (Tasks 19–22)

Level 0 Counts by ones	Level 1 Tens as a unit	Level 2 Tens & ones
Counts the dots on the ten strips individually. Does not see ten as an iterable (countable) unit	Ten is treated as a single unit while recognising that it contains ten ones.	Student can mentally solve 2digit written number sentences by adding or subtracting units of ten and ones. Does not need materials or representations

Multiplication and division (Tasks 23–28)

Level 1 Perceptual counting by ones (Forming equal groups)	Level 2 Perceptual counting in multiples	Level 3 Repeated numerical composites (Figurative units)	Level 4 Repeated abstract composites	Level 5 Multiplication & division as operations
Student does not see equal groups as composite units and thus counts each item by ones	Uses groups or multiples in perceptual counting and sharing, e.g. rhythmic or skip counting	Equal grouping and counting without individual items visible. Uses group markers or organisers	Constructs composites and coordinates the count. Uses repeated addition or subtraction	Uses known facts and inverse operations to derive answers.

Area multiplication (Task 29)

Level 1 Counts by ones, inconsistent structure	Level 2 Forms a composite unit	Level 3 Coordinates units
Tries to visualise structure, counts by ones	Counts in multiples	Uses multiplication (7x3, 3x7)