Structuring Number Starters

Grade 2 – Term 1

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Introduction

The 'Structuring Number Starters' activities are lesson starter activities that take about 15 minutes to do with your class. These activities were developed for the 'mental maths' part of the lesson, but they could also be tailored to fit the main part of a Numeracy lesson if needed.

All the 'Structuring Number Starters' have been designed to fit within the number range and focal points described in CAPS for learners at that grade level during that particular term. However, teachers could also use these activities for remediation with learners who may be struggling with structuring number concepts dealt with in the activities.

These activities have been constructed to encourage learners to see and use the relationship between numbers and properties of operations when calculating – rather than calculating by counting in ones which is inefficient and error-prone. Some ways in which learners can structure number are by using:

- *combinations and partitions of numbers* – knowing that 8 can be split into 5 and 3 or 6 and 2, and that 8 is 2 away from 10 or 1 more than 7
- *doubles* – if a child knows that double 6 is 12 then she could solve 7+6 by reasoning that double six is 12 and one more is 13 (which is quicker than counting on)
- *base ten* – if a child sees ten and multiples of ten as valuable benchmarks and can use tens in calculations, then 8+7 can be solved by first making a jump to 10 (i.e. 8+2) and then making another jump of 5 (i.e.10+5) to get to the final answer: 15. The number line below shows that making jumps of 2 and 5 are the same as making one jump of 7.

All the activities can be revisited with different examples or different representations across Term 1. Possible variations and extensions are included with each activity. We hope you enjoy using them!

Overview of Activities

Activity 1 – Positioning numbers 1-20

This activity helps learners to position numbers on a semi-structured number line, using the benchmarks of 5 and 10. The main idea here is for learners to place numbers on the number line (with only 0, 5, 10, 15 and 20 filled in) without counting from 1 and explain their reasoning using benchmark numbers like, "I know 8 is there because it is 2 less than 10" or "I know where 8 is because it is 3 more than 5".

Activity 2 – Adding through 10

Learners often calculate in the 1-20 range by counting in ones (an inefficient strategy) or by counting on in ones. The main idea around 'adding through 10' is for learners to structure their calculation around 10 (or a multiple of 10) because this makes calculations easier and quicker. When learners are comfortable with 'adding through 10' for single digit tasks (6+9) they can then solve 2-digit plus 1-digit tasks (16+7) in the same way.

Activity 3 – Subtracting through 10

In this task, learners are supported to use 10 as a benchmark for subtraction. For 'adding and subtracting through 10' strategies to work well, practising the bonds of numbers up to 10 (and especially the bonds of 10) is useful.

Activity 4 – Connecting and building on what learners know

This activity was designed in response to the preliminary results received from the Grade 2 test that was written at the start of Term 1. We found that many learners answered the question '10 and 7 is []' correctly but then answered the related question '13 is 10 more than []' incorrectly. Learners need to use 10+[unit] known facts in various formats. If they know that 10+5=15 then they should also know that: 15 is 5 more than 10; 15 is 10 more than 5; 5 is 10 less than 15; 10 is 5 less than 15; etc. This activity provides a guide for how the teacher can structure and vary questions for 10 + [unit] tasks.
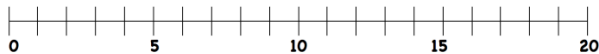
Positioning numbers 1 - 20

CAPS

Key teaching point: Seeing numbers in relation to 5s and 10s.

Typical examples: Numbers close to 5, 10, 15 and 20 (called benchmarks).

Preparation: Place the semi-numbered number line on the board.

Whole class:

- Say, *I want to show 8 on the number line without counting in ones. Can [learner] come and show me how to do it? How do you know that is 8?*
- Emphasize the idea that '8 is 3 more than 5' or '5 and 3 more makes 8' and '8 is 2 less than 10'
- Contrast learners counting in ones with learners counting on from 5 or working backward from 10. Emphasize that working from 5 or 10 is quicker.
- Listen for and record statements like, '8 is 3 more than 5' and '8 is 2 less than 10'.
- Rewrite these statements in different ways: e.g. 8 = 5 + 3, 5 + 3 = 8, 8 − 3 = 5 and 10 − 2 = 8.

Individual work:

- Ask learners to find: 4, 12, 17 and 19 on their semi-numbered number lines.
  Learners have to show and explain how they found each number using the number line.

Extension:

- Use a number line with unit markings marked at 0, 10, 20
- Ask learners to show number five on the number line.
- Listen particularly for learners who say 5 is halfway between 0 and 10. Contrast this with counting in 1's from 0 emphasizing the idea of 'halfway' along. Repeat with the number 15.

What to look for:

- Children can say sentences that describe the position of their number in relation to the 5's/10's around it.

- Children can show where numbers are positioned on the number line marked in 5's.

- Children can record the position of numbers and write a number sentence describing its position.

Term 1

Describe, compare, and order numbers to 25.

Resources

Teacher: semi-numbered nr line

Learners: semi-numbered nr lines

| Term 1 Grade 2 Activity 2: Addition and Subtraction 1-20		
Adding through 10		CAPS

Key teaching point: Adding is easier if we can hit 10

Typical examples: 8 + 7; 7 + 6; 8 + 5 (adding two numbers, each in the range 6 to 9)

Preparation: Write 8 + 7 on the board. Attach the semi-numbered number line to the board.

Whole class:

- Read 8 + 7 aloud with class
  We are going to look at an easy way to find the answer to 8 plus 7.
  Where 8 is on the number line.   Mark 8 on the number line.
- Point to the 7 in 8 + 7.
  *We are going to jump **forward** 7 from 8. Will we land before or after 10?*
          Point before and after 10.
- Make some jumping forward gestures to help learners understand that a jump on 7 from 8 will land **after** the 10. The point is not to get the answer, but to show that the jump will cross over 10.
  Let's do an easy jump forward. Let's jump forward from 8 to 10. How big is that jump?
- Encourage learners to be confident that jumping from 8 to 10 can be done in **one** jump of two. Lots of gestures on the number line will help here. Record the jump on the number line.
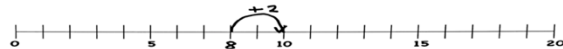
  We've jumped on 2. But we need to jump on 7 altogether. What other jump must we make?
- Work on a jump of 7 being split up into a jump of 2 and a jump of 5. Use actions on the number line to reinforce that a jump of 7 is the same as a jump of 2 and a jump of 5. Record the second jump.

  We added 2 to 8 to get to 10. Then we added another 5, so we added 7 altogether.
  8 add 7 is 15.
- Repeat for 7 + 6 by adding 3 to land on ten and then adding another 3.

Individual work:
- Put examples on the board for learners to do.
  Learners have to show and explain how they solved the problems using the number line by first jumping forward to 10.

Look for:

- Children can <mark>say</mark> that a jump of 2 is needed to jump forward from 8 to 10.

- Children can <mark>say</mark> that a jump forward of 7 can be done in two jumps – a jump of 2 and a jump of 5.

- Children can <mark>say</mark> that a jump of 5 forward from ten will land on 15.

- Children can <mark>say</mark> that jumping forward 7 from 8 lands on 15.

- Children record two jumps, one landing on 10

Term 1

Resources

Teacher: semi-numbered nr line;

Learners: number tracks and semi-numbered nr lines

Term 1 Grade 2 Activity 3: Addition and Subtraction 1-20		
Subtracting through 10		CAPS

|	Look for:	Term 1

Key teaching point: Subtracting is easier if we can hit 10
 	
Typical examples: 15 – 7; 16 – 8; 13 – 5 (a teen number minus a single digit)
 	
Preparation: Write 15 – 7 on the board. Attach the semi-numbered number line to the board.
 	
Whole class:
 	
• Read 15 – 7 aloud with class
  We are going to look at an easy way to find the answer to 15 minus 7.
  Where 15 is on the number line?　　　　　Mark 15 on the number line.
• Point to the 7 in 15 – 7.
  *We are going to jump **back** 7 from 15. Will we land before or after 10?* Point before and after 10.
• Make some jumping back gestures to help learners understand that a jump back 7 from 15 will land **before** the 10. The point is not to get the answer, but to show that the jump will cross over 10.
  Let's do an easy jump back. Let's jump back from 15 to 10. How big is that jump?
• Encourage learners to be confident that jumping from 15 to 10 can be done in **one** jump of five. Lots of gestures on the number line will help here. Record the jump on the number line.
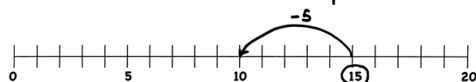 	
  We've jumped back 5. But we need to jump back 7 altogether. What other jump must we make?
• Work on a jump of 7 being split up into a jump of 5 and a jump of 2. Use actions on the number line to reinforce that a jump of 7 is the same as a jump of 5 and a jump of 2. Record the second jump.
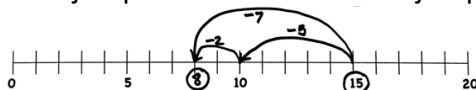 	
  We took away 5 from 15 to get to 10. We took another 2 away, so we took away 7 altogether.
  15 take away 7 is 8.
• Repeat for 13 – 6 by taking away 3 to land on ten and then taking away another 3.
 	
Individual work:
• Put examples on the board for learners to do. Learners have to show and explain how they solved the problems using the number line by first jumping backward to 10.
	• Children can <mark>say</mark> that a jump of 5 is needed to jump back from 15 to 10.
	
	• Children can <mark>say</mark> that a jump back of 7 can be done in two jumps – a jump of five and a jump of 2.
	
	• Children can <mark>say</mark> that a jump of 2 back from ten will land on 8.
	
	• Children can <mark>say</mark> that jumping back 7 from 15 lands on 8.
	
	• Children record two jumps, one landing on 10
		Resources
		
		Teacher:
		semi-numbered nr line;
		
		Learners:
		number tracks and semi-numbered nr lines

Activity 4 - Connecting and building from what children know

10 and 7 = 17
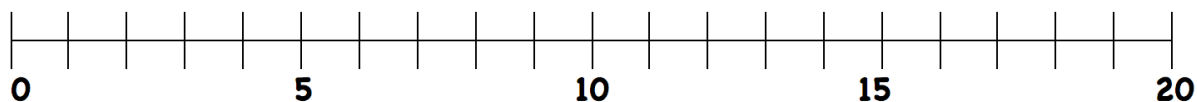
1. What can we say about 7 and 10?

2. What is 10 more than 7?

3. What is 7 less than 17?

4. What is 10 less than 17?

5. $7 + \square = 17$ $\square + 10 = 17$

    $10 = \square - 7$ $7 = 17 - \square$

6. 17 is 10 more than $\square$

7. 10 is $\square$ less than 17

8. If 10 + 7 is 17, what can we say about 9 + 7?

9. Write as many statements as you can linked to:
    10 and 7 = 17 and the diagram above

Teacher guidelines per test item

	Write the practice example on board: 2 and 3 is ☐ Explain that the box needs to be filled in with the answer for all the questions on this test. Use home languages for questions where needed.
1	What is 9 more than 4? Write your answer in the box.
2	What is 3 less than 13? Write your answer in the box.
3	What is 10 and 7? Write your answer in the box.
4	Circle the smallest number of 16, 23, 19 and 14.
5	Look at the picture. How many groups of 4 can you make with the dots? Write your answer in the box.
6	What is 18 take away 16? Write your answer in the box.
7	What is 2 less than 18? Write your answer in the box.
8	13 is 10 more than what number? Write your answer in the box.
9	You can see 12, 20 and 7. Circle the number closest to 15.
10	14 is how many less than 17? Write your answer in the box.
11	One of these sums gives a different total to the other sums. Circle the odd one out.
12	Corin has 12 pencils. Mike has 5 pencils. How many less pencils does Mike have than Corin? Write your answer in the box.
13-25	Have a look at the questions on this page. I'm going to give you a short time to work out and fill in the missing numbers in each number sentence as quickly as you can. When I ask you to stop, you have to put your hands on your head. Is everyone ready to start? (3 minutes to complete the page)

9

	Name: _____ Class: _____
1	9 more than 4 is ☐
2	3 less than 13 is ☐
3	10 and 7 is ☐
4	Circle the smallest number 16 23 19 14
5	☐ groups of 4
6	18 take away 16 is ☐
7	2 less than 18 is ☐
8	13 is 10 more than ☐
9	Circle the number closest to 15 12 20 7
10	14 is ☐ less than 17
11	Circle the odd one out: 10 + 10 9 + 11 13 + 4 8 + 12
12	Corin has 12 pencils. Mike has 5 pencils. Mike has ☐ less pencils than Corin.

	3 minutes for this page		
13	$5 + 8 = \Box$	14	$15 - 5 = \Box$
15	$14 = 3 + \Box$	16	$1 + \Box = 16$
17	$\Box + 7 = 14$		
18	$20 - 7 = \Box$		
19	$\Box$ fingers		
20	$\Box = 14 + 3$	21	$8 + \Box = 12$
22	$\Box + 7 = 16$	23	$12 = 14 - \Box$
24	$\Box = 6 + 6 + 6$	25	$18 - 9 = \Box$

Total _____ /25   Date _____

School _____   Teacher _____

How to use the recording sheet diagnostically

On the next page is a partial copy of a recording sheet drawn up for Term 1's test with the question numbers and actual test items typed in at the top of each row. Learner names were typed in alphabetically for ease of access (only initials were left here for anonymity). The recording sheet has been completed using the following codes: '1' for a correct answer and '0' for an incorrect answer. The formatting of the sheet adds up each learner's score at the end of every row and it also gives the average number of correct answers for each item at the bottom of each column/test item. The scores at the bottom is what will indicate which test item/s the class answered well and which item/s were more difficult for them.

In our example more than 86% of the class gave the correct answer for Q4 and more than 75% got Q5 correct, so these items were answered well. Less than 17% of the class gave the correct answer for Q1 and less than 28% got Q6 correct – so this class needs more practice with these types of tasks. From the total in the last column one can see that three learners got more than 10 items correct and only two learners got a score of 18. The scores marked in red show that 9 learners achieved around or below 1% of the total marks for this test (which is a score of 2,5) which points out those learners who struggled with most of the items on the test.

The same test can be given to learners at the end of Term 1 as a post-test. The scores from the post-test can then be entered into another spreadsheet and compared to learners' previous scores in order to ascertain what type of progress has been made.
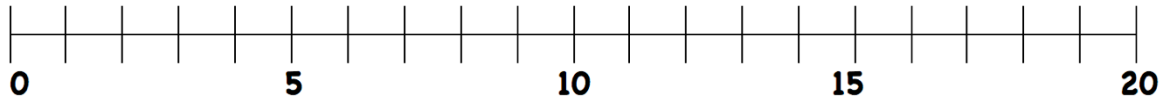
Term 1

Name	Surname		1	2	3	4	5	6	7-----25	START T1
						14				
			4 and 9	13-3	10 + 7	smallest	3 gps of 4	18 - 16	---------	TOTAL/25
M	B		0	1	0	1	0	0	-------	4
K	B		0	0	0	1	1	0	-------	3
A	B		0	1	1	1	0	0	-------	8
K	B		0	0	0	0	1	0	-------	2
T	B		0	0	1	1	1	0	-------	5
Q	D		0	0	1	1	0	1	-------	7
S	F		0	1	1	1	1	0	-------	6
S	F		1	1	1	1	1	1	-------	18
I	I		1	1	0	1	1	1	-------	13
I	I		0	0	1	0	1	0	-------	3
L	I		0	1	0	1	1	0	-------	5
N	J		0	0	1	1	1	0	-------	3
L	K		0	0	1	1	1	0	-------	3
M	L		0	1	1	1	1	1	-------	18
J	L		0	0	1	1	1	0	-------	4
K	L		1	0	1	1	1	0	-------	10
Z	L		1	1	0	1	1	1	-------	11
P	M		0	1	1	1	0	0	-------	8
M	M		1	1	1	1	0	0	-------	10
Y	M		0	0	1	1	1	0	-------	10
P	M		0	0	0	1	1	0	-------	2
N	M		1	0	1	1	1	1	-------	10
K	M		0	0	0	1	0	0	-------	1
L	M		0	1	0	1	0	0	-------	4
N	M		0	1	1	1	1	1	-------	14
L	N		0	1	1	1	0	0	-------	7
K	P		0	0	1	0	1	0	-------	4
Y	P		0	1	1	1	1	0	--------	7
H	P		0	1	0	0	1	0	-------	5
K	P		0	1	1	1	1	1	-------	7
D	P		0	1	1	1	1	1	-------	6
T	P		0	0	0	1	1	0	-------	5
F	S		0	0	1	1	1	1	-------	8
V	T		0	1	0	0	1	0	-------	5
J	W		0	1	1	1	1	0	--------	6
C	Y		0	0	0	1	1	0	-------	2
D	Z		0	1	0	1	0	0	-------	3
Number getting item correct			6	20	23	32	28	10		
Number in the class			37	37	37	37	37	37		
% getting answer correct			16,2162	54,0540	62,1621	86,4864	75,6756	27,0270		

Resources for activities

0-20 semi-numbered number line

20 number track shaded in 5s