Interview Guide

for

Numeracy Competence

Version

18 March 2021

Content

[1.1 Counting objects one by one, by groups]

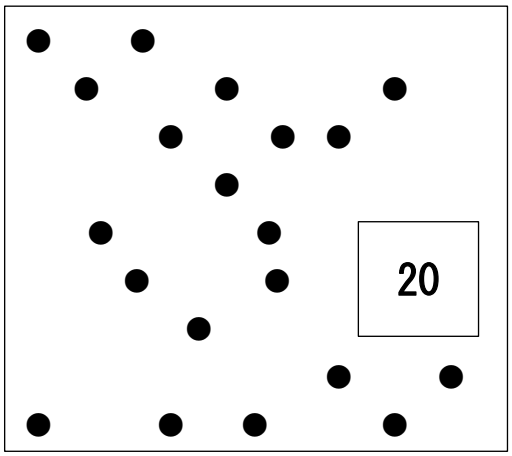
Places 20 bottle tops randomly

Q. 'Count and tell me the number'
When s/he counts one by one correctly
Q. 'Count in 2s and 5s'

Local language

Penda, uniuze tuli tungati

Penda tubili tubili; penda five-five



Intention of the question	To correspond one to one up to 20 correctly.
Materials	20 bottle tops

[Response levels]

1Not at all	S/he makes a mistake in counting, 1, 2, 3, 4, or 5.	
2 Partially Implicit	S/he can count correctly up to 5.	Incorrect
3 Implicit	S/he can count one by one up to 20 s	Correct It does not matter the counting speed. (S/he can count correctly corresponding one by one up to 20)
4 Structural	S/he can count up to 20 in 2s or 5s	**It's level 4 if s/he cannot count either 2s or 5s.**
5 Advanced structural	S/he can count up to 20 both in 2s **and** 5s	

[1.2 Counting forward]

Q. 'Count up to 20.'
For those who reached the fourth response category,
Q. 'Count 2s and 5s up to 20'.

Local language
Penda kufika pa 20
Penda muma 2 kufika pa 20
Penda muma 5 kufika pa 20

Counting upward

Intention of the question	To count numbers from 1 up to 20 upward correctly
Materials	None

[Response levels]

1Not at all	S/he cannot count numbers up to 10.	
2 Partially Implicit	S/he tries to count numbers but failed to count up to 20	
3 Implicit	S/he can count numbers upward one by one.	Counting all
4 Structural	S/he can count numbers upward up to 20 in 2s **or** 5s.	**It's level 4 if s/he cannot count either 2s or 5s.**
5 Advanced structural	S/he can count numbers upward up to 20 both in 2s **and** 5s.	

[1.3 Counting backward]

Q. 'Count down from 20 to 1.
For those who reached the fourth response category,
Q. 'Count 2s and 5s from 20 downward. '

Local language
Penda kuchoka pa 20 kubwela pansi
Manje penda muma 2 kuchoka pa 20 kubwela pansi
Manje penda muma 5 kuchoka pa 20 kubwela pansi

Counting downward

Intention of the question	To say numbers from 20 down to 1 downward correctly
Materials	More than 20 bottle tops

[Response levels]

1Not at all	S/he cannot count numbers downward to 10.	
2 Partially Implicit	S/he tries to count numbers downward but failed to count to 1.	
3 Implicit	S/he can count numbers downward one by one.	Counting all.
4 Structural	S/he can count numbers one by one downward to 1 says in 2s or 5s.	**It's level 4 if s/he cannot count either 2s or 5s.**
5 Advanced structural	S/he can count numbers one by one downward to 1 both 2s and 5s.	

[2.1Recognizing patterns]

Places 10 each of white and red bottle tops (altogether 20)

Q. “Show a patterns of bottle tops on a line.”

Local language

Nipangileko ka mu line ka nkhale na ka pattern ku sebenzesa utu tonse tupendelo

Ni uze mwamene wa pangila pattern yako

(If the learner gets response 3 category: Nipangileko ka mu line kali na pattern inangu.

Intention of the question	To make original patterns on a line.
Materials	・10 red and white bottle tops respectively

[Response levels]

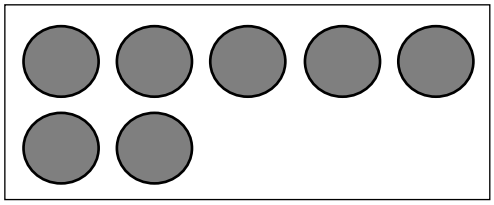
1Not at all	S/he cannot make any patterns.	
2 Partially Implicit	S/he makes a line without any patterns.	Two lines of white and red bottle tops. ○○○○○○○○○○ ●●●●●●●●●●
3 Implicit	S/he can make a line with one by one patterns or 1 red and white line or 5 reds consecutively and whites.	Example: ●○●○●○●○●○●○ Red and white alternately ○○○○○○●●●●●● All white and all red
4 Structural	S/he can make a line with original patterns.	Making a pattern other than arranging one by one alternately. Example: ○○●●●○○●●●○○
5 Advanced structural	Besides level 4, S/he can explain by words.	

[2.2 Recognising structure of numbers]

(Introducing the frame of 10)
Places 7 bottle tops on the frame of 10
Q. 'How many bottle tops are there?

Local language
Tuli tungati tu pendelo utu?
Wapenda bwanji?

How many?



Intention of the question	To identify the bottle tops in a structured way.
Materials	A frame of 10 and 7 bottle tops

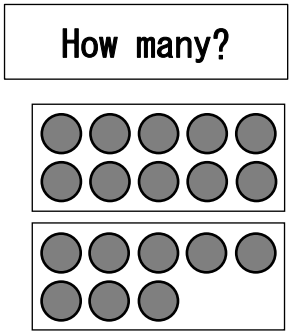
[Response levels]

1Not at all	S/he tries to count, but cannot do it completely in some reasons	
2 Partially Implicit	S/he makes a mistake in counting.	
3 Implicit	S/he can identify the number (7) by counting one by one.	Counting all Judge whether counting one by one or not attentively from student's physical actions.
4 Structural	S/he can identify the number (7) using any groups or counting on from a certain number.	Counting on or using groups Judge from student's actions. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4, s/he can explain by words.	

[2.3 Recognising structure of numbers]

Places 18 bottle tops on the frameworks of 10 vertically
Q. 'How many bottle tops are there?

Local language
Tuli tungati tu pendelo utu?
Wapenda bwanji? (Unless the counting was clear enough)



Intention of the question	To identify the bottle tops in a structured way.
Materials	18 bottle tops

[Response levels]

1Not at all	S/he tries to count, but can not do it completely in some reasons	
2 Partially Implicit	S/he makes a mistake in counting.	Incorrect
3 Implicit	S/he can identify the number (18) by counting one by one from 1	Counting all Judge whether counting one by one or not from student's physical actions.
4 Structural	S/he can identify the number (18) using any groups or counting on from a certain number.	Counting on or using groups Judge from student's physical actions. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4, s/he can explain by words.	

[2.4 Recognising structure of numbers]

※ Do not show and place the 10-frame nearby.

Prepares 20 bottle tops.

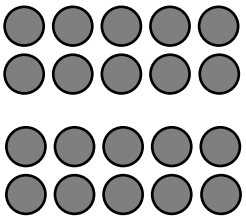
Q. 'Suppose there are two 10 frames and arrange the bottle tops in the imaginary 10 frames.'

Local Language

Khuti pali ma frame of 10 yabili, tutantike tupendelo utu mwamene tunga nkhalile pa ma frame of 10 yabili.

Wachita bwanji?

Imaginary Frames



Intention of the question	To Imagine the frame of 10 in mind and place the bottle tops in such a order.
Materials	・2 frames of 10 ・20 bottle tops

[Response levels]

1Not at all	S/he cannot arrange the bottle tops.	
2 Partially Implicit	S/he can place 20 bottle tops, but they are not placed structurally. (place them randomly)	
3 Implicit	S/he can place 20 bottle tops structurally but not 5 × 2.	[level 3] in case s/he made any structural groups, but did not placed them 5×2.
4 Structural	S/he can place 20 bottle tops correctly considering frame of 10 (5×2).	[level 4] In case s/he placed them 5×2 even when they are spread. In case s/he placed them 5 × 4 (There is no space between two 10s and s/he cannot explain about two 10s)
5 Advanced structural	Besides level 4, s/he can explain by words.	The term 'Ten (10)' should contain in the verbal explanation.

[3.1 Composing and decomposing numbers]

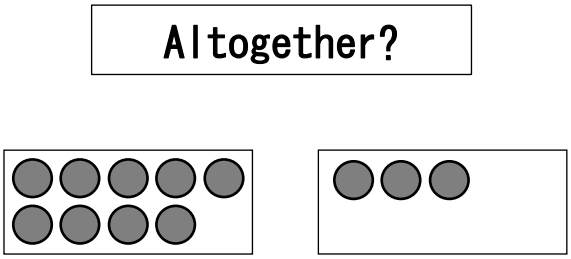
Prepares two frames of 10. On one side, place 9 bottle tops and on the other side, place 3 bottle tops.

Q. 'How many bottle tops are there altogether? You may move the bottle tops'

Local Language

Tuli tungati tupendelo utu pamodzi; ungatu tatike bwino kuti upendze bwino ansa?

Watantika bwanji?



Intention of the question	To add bottle tops in two frames in a structured way.
Materials	・2 frames of 10 and 12 white bottle tops

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he tells the incorrect answers which are closed to the right answer, e.g. 10, 12	
3 Implicit	S/he can find an answer (12) by counting mentally or physically, not moving bottle tops.	Judge whether counting one by one or not from student's physical actions.
4 Structural	S/he can find an answer (12) by moving bottle tops.	Record the method in the individual observation sheet. [Level 4] In the case of counting one by one, after making 10 and 2 as a group by moving bottle tops.
5 Advanced structural	Besides level 4, s/he also can explain by words using group of 10.	(e.g.) Get one top from 3 and place it on the other frame so that we can get a group of 10.

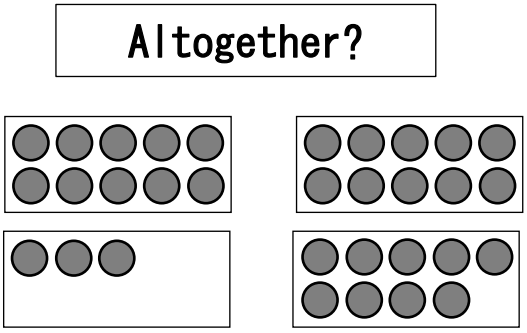
[3.2 Composing and decomposing numbers]

Prepares four frames of 10. On one side, place 13 bottle tops and on the other side, place 19 bottle tops.

Q. 'How many bottle tops are there altogether? You may move the bottle tops.

Local language

Tuli tungati tupendelo utu pamodzi; ungatu tatike bwino kuti upendze bwino ansa? Watantika bwanji?



Intention of the question	To add bottle tops in a structured way
Materials	・2 frames of 10・32 white bottle tops

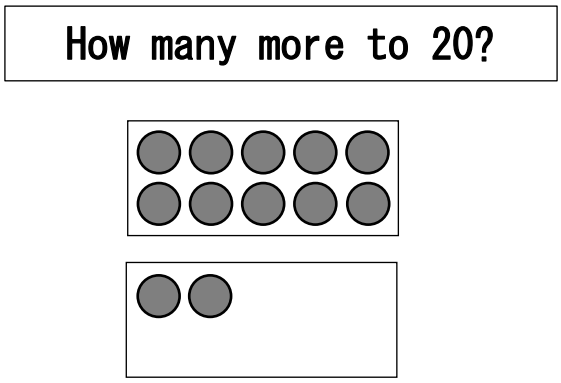
[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he tells the incorrect answers which are closed to the right answer, e.g. 30, 31, 33 or 34.	
3 Implicit	S/he can find an answer (32) by counting mentally or physically **not moving bottle tops.**	Judge whether counting one by one or not from student's physical actions.
4 Structural	S/he can find an answer (32) by moving bottle tops.	Record the method in the individual observation sheet. [Level 4] includes the case of counting one by one after making 30 (three 10s) and 2 by moving bottle tops.
5 Advanced structural	Besides level 4, s/he also can explain by words using groups of 10.	(e.g.) Getting one top from 3 and place it on the other frame so that s/he has a group of 10. Altogether there are three 10s and 2 remaining.

[3.3 Composing and decomposing numbers]

Prepares two frames of 10. Place 12.
Q. 'How many bottle do you need to fill up to 20?

Local language
Pafunika tupendelo tungati kuti tu nkhale 20?
Waziba bwanji?
(If pupil says 'napenda', follow up with, 'wapenda bwanji?')



Intention of the question	To identify the number of bottle tops to fill up to 20 in a structured.
Materials	・2 frames of 10 ・12 bottle tops

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he tells incorrect answers which are close to numbers such as 7 or 9.	
3 Implicit	S/he can find the answer (8) by counting blank boxes mentally or physically one by one from 1.	Counting all Count blank boxes one by one. Judge whether counting one by one or not from student's action.
4 Structural	S/he can find an answer (8) by counting on blank boxes by using any groups.	Counting on or using groups S/he answered 8 without counting blank boxes or counting after a certain group. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4, s/he also can explain by words.	(e.g.) 8 blanks are seen, or the blank part has 5 and 3 in a structure.

[3.4 Composing and decomposing number]

Prepares four frames of 10. Interviewer places 27.

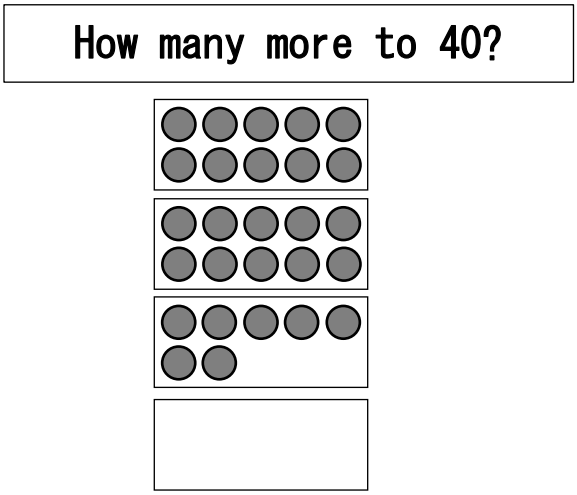
Q. 'How many bottle tops do you need to fill up to 40?

Local Language

Pafunika tupendelo tungati kuti tu nkhale 40?

Waziba bwanji?

(If pupil says 'napenda', follow up with, 'wapenda bwanji?')



Intention of the question	To identify the number of bottle tops to fill up to 40 in a structured.
Materials	・4 frames of 10 and 27 bottle tops

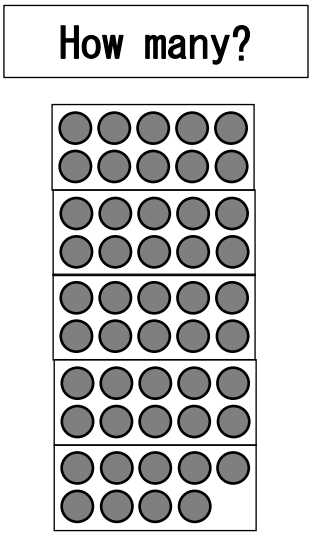
[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he tells incorrect answers which are close to numbers such as 11, 12 or 14.	
3 Implicit	S/he can find an answer (13) by counting mentally or physically one by one from 1.	Counting all:Count blank boxes one by one. Judge whether counting one by one or not from student's physical action.
4 Structural	S/he can find an answer (13) by counting blank boxes on or by using group of 5 or 10.	Counting on or using groups S/he answered 13 without counting blank boxes or counting after 10. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4, s/he also can explain verbally by using group of 5 or 10.	(e.g.) 13 blanks are seen, or the blank part has 10 and 3 in a structured way.

[4.1 Seeing numbers in terms of unit and relative size of numbers]

Prepares five frames of 10 vertically.
Interviewer fills 49 bottle tops.
Q. 'How many bottle tops are there?

Local language
Tuli tungati tu pendelo utu?
Wapeza bwanji ansa?
(If pupil says 'napenda', follow up with, 'wapenda bwanji?')



Intention of the question	To identify the number of bottle tops by seeing the groups of 10.
Materials	・Five frames of 10 ・Forty nine bottle tops

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he tells incorrect answers such as 48 or 50 which is near 49 by counting.	Incorrect but close to the right answer
3 Implicit	S/he can tell 49 by counting one by one.	Judge whether counting one by one or not from student's physical actions.
4 Structural	S/he can tell 49 quickly by using group of 10. or, S/he can tell 49 by using '50'.	Judge from student's physical actions. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4 s/he can explain verbally using group of 5 or 10.	

[5.1 Understanding decimal system]

Q. "How many ● are there in the following dot diagram."

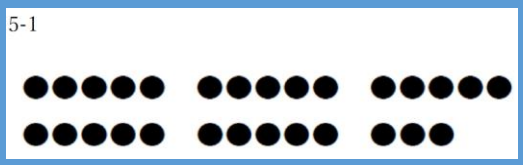
Local language

Tuli tu ngati tu ma dot apa?

Wapeza bwanji ansa?

(If pupil says 'napenda', follow up with, 'wapenda bwanji?')

5-1



Intention of the question	To see the numbers considering group of 10.
Materials	Interview material 5-1

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he count the number one by one, however, miscounted in the middle of counting.	Incorrect but close
3 Implicit	S/he can count the number one by one from 1.	Judge whether counting one by one or not from student's physical actions.
4 Structural	S/he can find an answer by using group of 10.	Judge from student's physical actions. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4 s/he can explain verbally by using group of 10.	

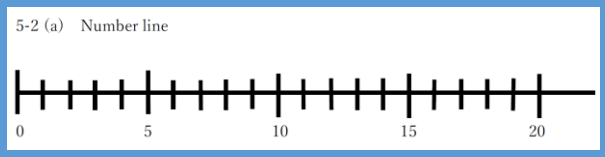
[5.2a Understanding decimal system]

Q. "Point the number (13) indicated on the number line.

Local language

Ni ikile ka dot pa namba line pamene pa funika ku nkhala 13.

Wazibwanji kuti ndiye pamene ifunika ku nkhalila apa



Intention of the question	To understand the position of a number on a number line.
Materials	Interview material 5.2a

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he cannot indicate correctly, however the answer is close to 13.	Incorrect but close
3 Implicit	S/he can indicate the number 13 by counting one by one from 1.	Counting all Count all the numbers from 1. Judge whether counting one by one or not from student's physical actions.
4 Structural	S/he can indicate the number 13 at glance or counting on from a certain number.	At glance or counting on Tell the answer at glance. Count after a certain number such as after 5 or after 10. Record the method in the individual observation sheet. .
5 Advanced structural	Besides level 4 s/he can explain by words.	

[5.2b Understanding decimal system]

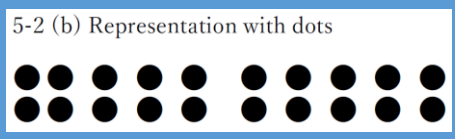
Q. “Circle the amount of 13 marbles on the dotted marble sheet."

Local language

Sekoling’a tuma dot tuli 13

Waziba bwanji tuli 13?

5-2 (b) Representation with dots



Intention of the question	To see the numbers considering group of 10.
Materials	Interview material 5.2b

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he cannot count and circle the amount of 13 marbles, however the answer is close to 13.	Incorrect but close to the correct answer.
3 Implicit	S/he can circle the amount of 13 marbles by counting one by one from 1.	Judge whether counting one by one or not from student’s physical actions.
4 Structural	S/he can circle the amount of 13 dots by counting on from a certain number or using groups.	Circle two groups of numbers such as 10 and 3. Judge from student’ s physical actions.. Record the method in the individual observation sheet. .
5 Advanced structural	Besides level 4 s/he can explain by words.	

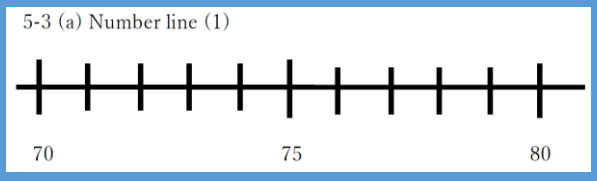
[5.3a Understanding decimal system]

Q. "Indicate the number (76) on the number line."

Local language

Ni ikile ka dot pa namba line pamene pa funika ku nkhala 76.

Wazibwanji kuti ndiye pamene ifunika ku nkhalila apa



Intention of the question	To understand the position of a number on a number line. To show the amount of a given number.
Materials	Interview material 5.3a

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he cannot indicate correctly, however the answer is close to 76.	Incorrect but close to 76. (Between 75 and 77)
3 Implicit	S/he can indicate the number 76 by counting one by one from 70.	Count one by one from 70. Judge whether counting one by one or not from student's physical actions.
4 Structural	S/he can indicate the number 76 at glance or counting from 75.	Judge from student's physical actions. Record the method in the individual observation sheet. .
5 Advanced structural	Besides level4, s/he can explain by words.	

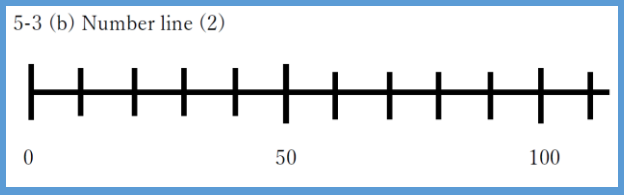
[5.3b Understanding decimal system]

Q. "Indicate the number (76) on the number line"

Local language

Ni ikile ka dot pa namba line pamene pa funika ku nkhala 76.

Wazibwanji kuti ndiye pamene ifunika ku nkhalila apa



Intention of the question	To understand the position of a number on a number line. To show the amount of a given number.
Materials	Interview material 5.3b

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	Except for 70 or 80.
2 Partially Implicit	S/he cannot indicate correctly, however the answer is close to 76.	Incorrect but close (70 or 80)
3 Implicit	S/he can indicate the number between 70 and 80, but not close to 76.	
4 Structural	S/he can indicate the number in the middle between 70 and 80 (Close to 76)	
5 Advanced structural	Besides level4, s/he can explain by words.	(e.g.) 76 is between 70 and 80, and it's around the middle between 70 and 80.

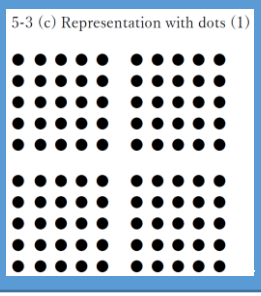
[5.3c Understanding decimal system]

Q. "Circle the amount of 76 marbles on the dotted marble sheet"

Local language

Sekoling'a tuma dot tuli 76

Waziba bwanji tuli 76?



Intention of the question	To see the numbers considering group of 10.
Materials	Interview material 5.3c

[Response levels]

1Not at all	S/he tells a wrong answer that is beyond our expectations	
2 Partially Implicit	S/he cannot count and circle the amount of 76 marbles, however the answer is close to 76.	Incorrect but close to 76. (Between 70 to 80)
3 Implicit	S/he can circle the amount of 76 marbles by counting one by one from 1.	Count from 1 without considering group of 5 or 10. Judge from student's physical actions.
4 Structural	S/he can circle the amount of 76 marbles by counting on from a certain number or using group of 5 or 10.	Consider a group of 5 or 10. Judge from student's physical actions. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4 s/he can explain by words.	

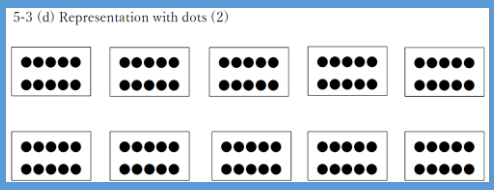
[5.3d Understanding decimal system]

Q. “Circle the amount of 76 marbles on the dotted marble sheet"

Local language

Sekoling’a tuma dot tuli 76.

Waziba bwanji tuli 76?



Intention of the question	To see the numbers considering group of 10.
Materials	Interview material 5.3d

[Response levels]

1Not at all	S/he can count from 1 by corresponding to the bottle tops, however s/he cannot answer correctly.	
2 Partially Implicit	S/he cannot count and circle the amount of 76 marbles, however the answer is close to 76.	Incorrect but close to the 76 (Between 70 and 80)
3 Implicit	S/he can circle the amount of 76 marbles by counting one by one from 1.	Counting all Count from 1 by not considering any groups. Judge whether counting one by one or not from student’s physical actions.
4 Structural	S/he can circle the amount of 76 marbles by counting on from a certain number or using groups.	Consider groups of 10. Judge from student’s physical actions. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4 s/he can explain by words.	

[6.a1 Significance, procedure and proficiency of calculation (Addition)]

Shows "7+8"
Q. "Represent it by bottle tops, tell the sum. If you want to use the frame of 10, you can use it."
Local language
Sebenzesa tupendelo kuonesa vamene ba lemba apa. Unga sebenzese tuma frame of 10 ngati unfuna.
Nichani ansa?
Wapeza bwanji?

Intention of the question	1-digit+ 1-digit without carrying
Materials	15 Bottle tops, 2 frames of 10.

[Response levels]

1Not at all	S/he cannot place bottle tops correctly.	
2 Partially Implicit	S/he can place 7 and 8 bottle tops correctly but cannot answer correctly.	
3 Implicit	S/he can place 7 and 8 bottle tops and tell the sum by counting all or by memorisation.	
4 Structural	S/he can place 7 and 8 bottle tops and tell the sum by manipulating bottle tops to make 10.	Students should fulfill following all two points. (1) To place the bottle tops structurally (2) To solve the question by moving bottle tops
5 Advanced structural	Besides level 4, s/he can explain using base 10 by words.	

[6.a2 Significance, procedure and proficiency of calculation (Addition)]

Shows "11+13"

Q. "Represent it by bottle tops, tell the sum. If you want to use the frame of 10, you can use it."

Local language

Sebenzesa tupendelo kuonesa vamene ba lemba apa. Unga sebenzese tuma frame of 10 ngati unfuna.

Nichani ansa?

Wapeza bwanji?

Intention of the question	Addition of 2-digit number
Materials	24 Bottle tops, 4 frames of 10.

[Response levels]

1Not at all	S/he used bottle tops, however could not answer correctly.	
2 Partially Implicit	S/he can place 11 and 13 bottle tops correctly but S/he cannot answer correctly.	
3 Implicit	S/he can place 11 and 13 bottle tops and tell the sum by counting all bottle tops or counting on.	Counting after one side of number (Counting on)
4 Structural	S/he can place 11 and 13 bottle tops and tell the sum by manipulating bottle tops considering tens and ones.	Adding numbers according to place value (ones and tens respectively). Record the method in the individual observation sheet. .
5 Advanced structural	Besides level 4, s/he can explain using base 10 by words.	

[6.s1 Significance, procedure and proficiency of calculation (Subtraction)]

Shows “15-8”

Q. “Represent it by bottle tops, tell the answer. If you want to use the frame of 10, you can use it.”

Local language

Sebenzesa tupendelo kuonesa vamene ba lemba apa. Unga sebenzese tuma frame of 10 ngati unfuna.

Nichani ansa?

Wapeza bwanji?

Intention of the question	Subtraction with borrowing
Materials	15 Bottle tops, 2 frames of 10.

[Response levels]

1Not at all	S/he used bottle tops, however could not answer correctly.	
2 Partially Implicit	S/he can place the necessary number of bottle tops but S/he cannot answer correctly. Wrong answer/counting all.	Incorrect
3 Implicit	S/he can place 15 bottle tops and remove 8 from them and counting all bottle tops, (Counting all)	Judge whether counting one by one or not from student’s physical actions.
4 Structural	S/he can place 15 bottle tops and remove 8 from them using base 10.	Counting on or using groups Use the method of 15-5= 10 and 10-3=7, 10-8=2 and 2+5=7. Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4, s/he can explain using base 10 by words.	

[6.s2 Significance, procedure and proficiency of calculation (Subtraction)]

Shows “25-12”

Q. “Represent it by bottle tops , tell the answer. If you want to use the frame of 10, you can use it.”

Local language

Sebenzesa tupendelo kuonesa vamene ba lemba apa. Unga sebenzese tuma frame of 10 ngati unfuna.

Nichani ansa?

Intention of the question	Subtraction with 2-digit number
Materials	25 Bottle tops, 3 frames of 10

[Response levels]

1Not at all	S/he used bottle tops, however could not answer correctly.	
2 Partially Implicit	S/he can place the necessary number of bottle tops but S/he cannot answer correctly.	Incorrect
3 Implicit	S/he can place 25 bottle tops and remove 12 from them by counting all bottle tops, (Counting all)	
4 Structural	S/he can place 25 bottle tops and remove 12 from them by manipulating bottle tops considering tens and ones.	Subtract according to place value, tens and ones respectively.
5 Advanced structural	Besides level 4, s/he can explain using base 10 by words.	

[6.m1 Significance, procedure and proficiency of calculation (Multiplication)]

Shows “2x3”
Q. “Represent it by bottle tops, tell the answer.”
Local language
Sebenzesa tu pendelo kuonesa vamene ba lemba apa
Nichani answer?
Wapeza bwanji?

Intention of the question	Multiplication、 To see the numbers by group、Represent by numbers、Be able to calculate
Materials	Bottle tops,

[Response levels]

1Not at all	S/he used bottle tops, however could not answer correctly.	
2 Partially Implicit	S/he can place 6 bottle tops in groups but S/he cannot answer correctly.	Incorrect
3 Implicit	S/he can place 6 bottle tops in groups and tell the answer verbally by counting, or by memorisation.	Counting all Judge whether counting one by one or not from student’s physical actions. ○○ ○○ ○○ or ○○○ ○○○
4 Structural	S/he can place 6 bottle tops in groups, and tell the answer verbally using groups.	Record the method in the individual observation sheet.
5 Advanced structural	Besides level 4, s/he can explain using concept of multiplication by words.	The term ‘2’ and ‘3’ must be contained in the explanation.

[6.m2 Significance, procedure and proficiency of calculation (Multiplication)]

Shows “12x3”

Q. “Represent it by bottle tops, tell the answer.” If you want to use the frame of 10, you can use it.”

Local language

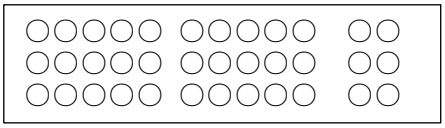
Sebenzesa tu pendelo kuonesa vamene ba lemba apa

Nichani answer?

Wapeza bwanji?

Intention of the question	2-digt x 1-digit, Emphasis on place value
Materials	Bottle tops

[Response levels]

1Not at all	S/he used bottle tops, however could not answer correctly.	
2 Partially Implicit	S/he can place 12 bottle tops in 3 rows, but S/he cannot answer correctly.	Incorrect
3 Implicit	S/he can place 36 bottle tops and tell the answer by counting.	Different representations (three 12s and twelve 3s) are both acceptable.
4 Structural	S/he can place 36 bottle tops structurally considering tens and ones, and tell the answer according to place value, tens and ones respectively.	Place the bottle tops structurally by three 12s 
5 Advanced structural	Besides level 4, s/he can explain using the meaning of multiplication by words.	Explain by using three 10s and three 2s or explain by using the term ‘12’ and ‘3’.

[6.d1 Significance, procedure and proficiency of calculation (Division)]

Shows “8÷2”

Q. “Represent it by bottle tops, tell the answer.”

Local language

Sebenzesa tu pendelo kuonesa vamene ba lemba apa

Nichani answer?

Wapeza bwanji?

Intention of the question	・Division, To see the numbers by group, To represent by numbers and To be able to calculate
Materials	Bottle tops

[Response levels]

1Not at all	S/he used bottle tops, however could not answer correctly.	
2 Partially Implicit	S/he can place 8 bottle tops, however could not answer correctly.	Incorrect
3 Implicit	S/he can place 8 bottle tops in a scattered way and find the answer by dividing one by one, or by memorisation.	Different arrangements (2,2,2,2, or 4,4) can be fine).
4 Structural	S/he can place 8 bottle tops 2 by 4 in order, and tell the answer verbally.	○○ ○○ ○○ ○○ or ○○○○ ○○○○
5 Advanced structural	Besides level 4, s/he can explain using the meaning of division by words.	

[6.d2 Significance, procedure and proficiency of calculation (Division)]

Shows “30÷3”
Q. “Represent it by bottle tops, tell the answer.” If you want to use the frame of 10, you can use it.”

Local language
Sebenzesa tu pendelo kuonesa vamene ba lemba apa
Nichani answer?
Wapeza bwanji?

Intention of the question	2-digt ÷ 1-digit, Emphasis on place value
Materials	Bottle tops, 3 frames of 10

[Response levels]

1Not at all	S/he used bottle tops, however could not answer correctly.	
2 Partially Implicit	S/he can place 30 bottle tops, however could not answer	Incorrect
3 Implicit	S/he can place 30 bottle tops in a scattered way and find the answer by dividing one by one, or by memorisation.	Different arrangements (three 10s, or ten 3s) can be fine.
4 Structural	S/he can place 30 bottle tops structurally and tell the answer using group of 10.	Place the bottle tops structurally by three 10s. ○○○○○○○○○○ ○○○○○○○○○○ ○○○○○○○○○○
5 Advanced structural	Besides level 4, s/he can explain using the meaning of division by words.	