

# SLIFE Numeracy Skills Grade 4 Assessment Activity

The purpose of this sample assessment of numeracy skills underlying the grade 4 standards in the MA Framework for Mathematics is twofold:

- it serves as an exemplar that shows how these skills **could be** assessed in the **absence of common language**
- It also serves as a prototype to design/generate/adapt similar assessments for other grade levels

**Note:** *The SLIFE Numeracy Skills Pre-Assessment Activity in this packet precedes any grade-specific assessment. Some of grade level numeracy skills may become evident in the Pre-Assessment as called out under “Secondary” Goals (numeracy skills embedded in grade-level standards) in the Pre-Assessment activity. Appendix E: SLIFE Numeracy Assessment Protocol and the MA Frameworks Progression Charts are tools that accompany this document.*

## What are numeracy skills?

Students demonstrate numeracy skills when they “apply grade level basic and computational skills by identifying and understanding numbers, performing simple arithmetic operations, and comparing numerical magnitude.”

Adapted from Reyna, V. F.; Nelson, W. L.; Han, P. K.; Dieckmann, N. F. (2009).



**An example of an assessment for identifying numeracy skills embedded in grade 4 standards would be:** You have 4 boxes of candy. There are 24 packets of candy in each box. How many candies are there altogether?

**Sample responses:**

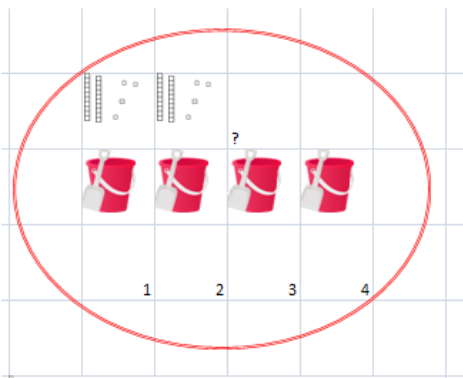
- (1)  $24 \times 4 = 96$  (possible indication of understanding of multiplication as in **4.OA.A**)
- (2)  $20 \times 4 + 4 \times 4$  (possible indication of place value understanding as in **4.NBT.A**)
- (3)  $24 + 24 + 24 + 24 = 96$  (possible indication of understanding of addition as in **4.AO.A**)

**Adaptation of the above assessment for use when there is no common language**

**Assumption: The pre-assessment was administered and the goals of the pre-assessment were met)**

Proctor (what he/she does)	Sample Student Responses	Numeracy skills embedded in and possible indication	Notes
<p>Move 1: Show first 2 in the sequence below:</p>  <p>Point to the third bucket and ask/gesture/act out: how many? Or skip bucket 3, point to bucket 4 ask/gesture/act out: how many?</p>		<p><b>4.OA.C</b> (generate and analyze patterns)</p>	<p><i>Student can generate /analyze patterns</i></p>

Move 2:



Ask/gesture: how many altogether (after circling)?

Response 1:



Response 2:



Response 3:



$24+24+24+24 = 96$   
**4.OA.A** ( addition); **4.OA.C** (generalize and analyze patterns)

$20 \times 4 + 4 \times 4 = 96$   
**4.OA.A** (multiplication); **4.OA.B** (gain familiarity with factors and multiples) **4.OA.C** ((generalize and analyze patterns); **4.NBT** (place value)

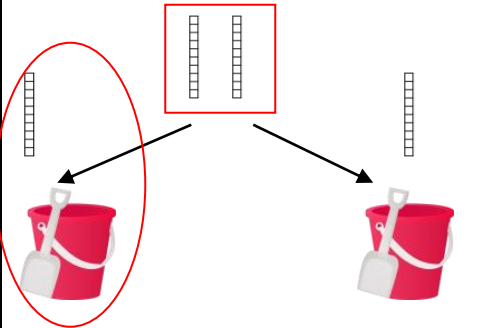
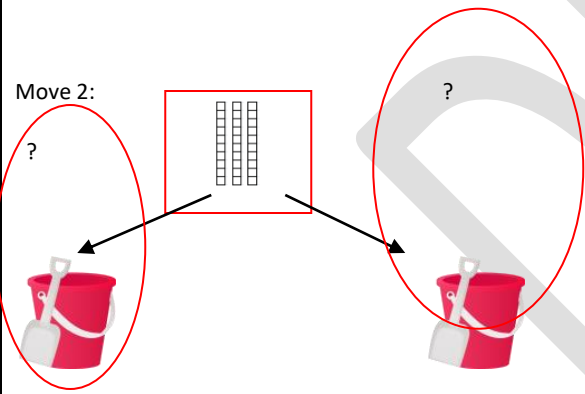
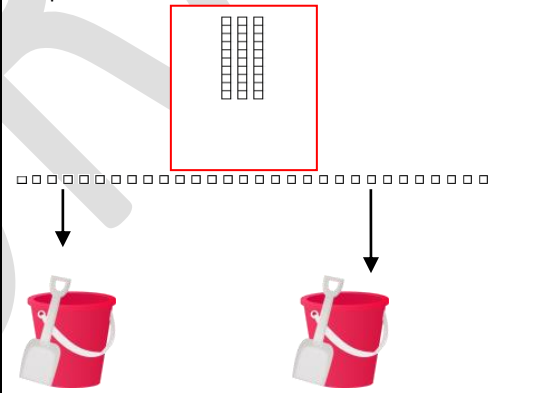
$24 \times 4 = 96$   
**4.OA.A** (multiplication); **4.OA.B** (gain familiarity with factors and multiples) **4.OA.C** ((generalize and analyze patterns); **4.NBT** (place value) **4.NBT**(place value); **4.MD** (conversion of units- trades 10 ones for 1 ten)

May have to assess further for understanding of multiplication ...

**Representative grade 4 assessment for identifying numeracy skills embedded in grade level standards:** There are 30 books altogether. All the books are shipped in 2 boxes with each box having the same number of books. How many books are there in each box? Solution:  $30/2=15$

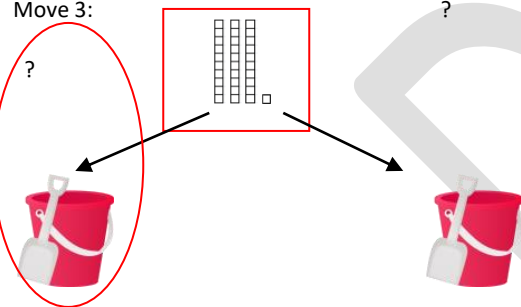
(4.OA.A division; 4.NBT.A – place value);  $2 \times ? = 30$  (4.OA.B) (4.NBT.A – place value)

**Adaptation for case of no common language (assumption pre-assessment goals were met)**

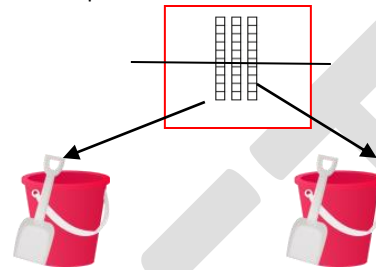
Proctor	Sample Student Responses	Numeracy skills embedded in and possible indication	Notes
<p>Move 1: Demonstrate using 2 tens</p>  <p>(Therefore 10 in each box)</p> <p>Move 2:</p>  <p>Gesture or ask: how many in each?</p>	<p>Response 1:</p>  <p>(trades 3 tens for 30 ones and then begins to place one ones in each basket till runs out ...)</p>	<p><b>4.MD. A (conversion from larger to smaller units); (4.NBT.A – place value)</b></p>	<p><i>Assess further for understanding of multiplication</i></p>

Note: the above problem can be presented with 31 instead of 30 books to be divided by 2 to check for understanding of remainder.

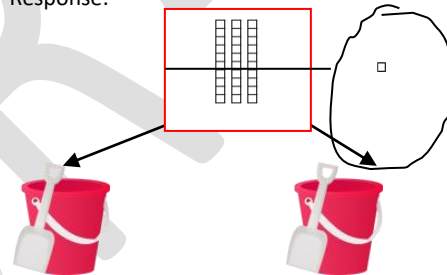
Move 3:



Response 2:



Response:



$30/2 = 15$  **4.OA.A**  
(division); **4.OA.B** (gain familiarity with factors and multiples) **4.OA.C** ((generalize and analyze patterns); **4.NBT** (place value)  
**4.NBT**(place value)

or  $30 = 10 + 10 + 10$ ;  $10/2 + 10/2 + 10/2 = 5 + 5 + 5 = 15$  (**4.OA.A** (addition, division); ); **4.OA.B** (gain familiarity with factors and multiples) **4.OA.C** ((generalize and analyze patterns); **4.NBT** (place value)  
**4.NBT**(place value)

$30/2 = 15$  **4.OA.A**  
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