

YEAR 4: Pre-Assessment: Teacher Talk

Version 2.0 2017

The purpose of this pre-assessment is to find out what students know about the concept of multiplication and any strategies they may have.

In particular:

- concept* of what multiplication is
- understanding of *arrays*: do they think about multiplication in terms of 'arrays' or still as 'groups of'
- when drawing arrays, do they *draw correctly*- 6×4 is '6 rows of 4' or '6 rows with 4 in each' (not 4 rows of 6)
- when answering 9×4 can they *explain their thinking*? We want more than 'I just know it!', e.g. 'I know 10 fours are 40, so I took away 4, and it's 36' or 'I changed it around to say 4×9 , and I doubled 9 twice, that's $18+18=36$ ' etc.
- 254×4 is a 'challenge' question for Year 4- can anyone answer it *without using the formal algorithm*? E.g. we are looking for the use of *distributive property* here- separate the question into 200×4 plus 50×4 plus 4×4 and add back together. This shows *good number sense*.

To gain the best insight from this task, rove around as students complete it. Ask them questions. Students will often not be able to record/explain in writing what they are thinking. By roving around, observing and questioning, you will quickly see the various levels of understanding.

Year 4: Pre/Post-Assessment Task: Marking Guide

*Use as a marking *guide only*- this is a 'rich' task, where teacher discretion and interpretation is required. The main aim is for teachers to gain an insight on their students' thinking.

Question	Marking Guide- (points per question)
1	<p>We <u>do not</u> require the answer or product for Question 1. We are first aiming to assess if the student understands the <u>meaning of the \times sign</u> and the <u>concept of multiplication</u>.</p> <p>0- No evidence of understanding that this is a <i>multiplication equation</i> or the <i>multiplication concept</i> is. E.g. no response, or confuses multiplication with addition etc.</p> <p>1- Shows <u>some understanding</u> that this is a <i>multiplication equation</i> and some understanding of the <i>multiplication concept</i>- e.g. student writes 'this means '6 times 4' or draws a 'groups of' diagram but may draw <u>4 groups of 6</u> instead of <u>6 groups of 4</u>. Draws an array, but draws 4 rows of 6, instead of 6 rows of 4. Or writes some explanation of the equation but does not draw a diagram.</p> <p>2- Understands the equation is multiplication, explains this using terms such as 'times, groups of, multiplied by, rows of' <u>and</u> draws a suitable diagram (either 'groups of' or an array, correctly) e.g. student writes 'this means 6 groups of 4 or 6 times 4' and student draws <u>6 groups of 4</u> or <u>6 rows of 4</u> correctly (must draw 6 rows of 4 NOT 4 rows of 6).</p>

2	<p>0- <u>No evidence</u> of understanding that this diagram relates to the multiplication concept. E.g. the student counts the dots by 1s. Correct answer may still be given, but efficient strategy is not used (counted by 1s).</p> <p>1- Incomplete response, showing some but not complete understanding. Such as, counts the dots by <u>using groups</u>- either counts <u>by groups of 3s or 6s</u> to arrive at 18 but does not record an equation. Or arrives at correct answer, but records equation wrong way around, as $3 \times 6 = 18$ (this means <i>3 rows of 6</i>. <i>It should be $6 \times 3 = 18$</i>)</p> <p>2- Full response. Understands that the array represents a <u>multiplication equation</u> and records the equation correctly, i.e. <u>$6 \times 3 = 18$</u> and explains this array is <i>6 groups of 3 or 6 rows of 3</i>. Must have the equation written the correct way around (not 3×6, which means <i>3 rows of 6</i>) and an explanation.</p>
3	<p>0- <u>No evidence</u> or incorrect answer.</p> <p>1- Student imagines the dots under the cover and counts by 1s to arrive at 24 OR counts by 4s to arrive at 24 (less efficient than counting by 6s).</p> <p>2- Counts by 6s or calculates 4×6 (4 rows of 6) to arrive at 24. Or uses known fact that $4 \times 6 = 24$ or $6 \times 4 = 24$ and records the equation used (note: students may use either equation in this case, depending on their chosen strategy for solving the equation. Some students may like to calculate 4×6, others find it more efficient to calculate 6×4. As we are not asking what the array <i>means</i> but rather we are asking them to <i>calculate the number of dots</i>, students may choose what <i>works best for them</i>).</p>
4	<p>0- Incorrect answer.</p> <p>1- Correct answer (36) with limited or no explanation.</p> <p>2- Correct answer (36) explained in words <u>and/or</u> diagram, showing relevant multiplication concepts- <i>9 groups of 4 or 9 rows of 4 or counting by 4s or 9s to get 36</i>.</p> <p>3- Correct answer (36) explained in words <u>and/or</u> diagram, showing the the use of an <u>efficient strategy</u>, such as: <i>I thought of $10 \times 4 = 40$, then took away one group of 4, ($40 - 4 = 36$) or thought of 4×9, using $2 \times 9 = 18$ and doubling that to get 36..</i></p>
5	<p>0- Incorrect answer.</p> <p>1- Correct answer (96) with limited or no explanation.</p> <p>2- Correct answer (96) explained in words <u>and/or</u> diagram, showing the multiplication concepts- <i>16 groups of 6 or 16 rows of 6 or counting by 6s, 16 times</i>.</p> <p>3- Correct answer (96) explained by use of an <u>efficient strategy</u> - such as <i>first multiply $10 \times 6 = 60$, then multiply $6 \times 6 = 36$ and add together (distributive property) OR written algorithm etc.</i></p>
6	<p>0- <u>No evidence</u> or incorrect answer.</p> <p>1- Correct answer (230) but <i>inefficient strategy</i>, e.g. <i>used the full written algorithm</i></p> <p>2- Correct answer obtained by <i>understanding how to multiply with powers of 10</i> - keep the original number and make it ten times bigger with a zero on the end.</p>
7	<p>0- <u>No evidence</u> or incorrect answer.</p> <p>1- Correct answer (980) with limited or no explanation.</p> <p>2- Correct answer (980) explained by use of an <u>efficient strategy</u> - such as <i>written algorithm or thinking 'double, double- double 245 is 490, then double that again, etc.</i></p>
8 & 9	For student reflection and teacher insight . Get a gauge on how your students feel about learning their multiplication facts.