

The Number Framework - Knowledge

Stage	Number Identification	Number Sequence and Order	Grouping/Place Value	Basic Facts	Written Recording																																							
Stage 0: Emergent Stages 1, 2, 3: Counting from 1	The student identifies: <input type="checkbox"/> all of the numbers in the range 0–10.	The student says: <input type="checkbox"/> the number word sequences, forwards and backwards, in the range 0–10 at least; <input type="checkbox"/> the number before and after a given number in the range 0–10. The student orders: <input type="checkbox"/> numbers in the range 0–10.	The student instantly recognises: <input type="checkbox"/> patterns to 5, including finger patterns.		The student records: <input type="checkbox"/> numerals to match the sets they form.																																							
	The student identifies: <input type="checkbox"/> all of the numbers in the range 0–20.	The student says: <input type="checkbox"/> the number word sequences, forwards and backwards, in the range 0–20; the number before and after a given number in the range 0–20; the skip-counting sequences, forwards and backwards, in the range 0–20 for twos and fives. The student orders: <input type="checkbox"/> numbers in the range 0–20.	The student knows: <input type="checkbox"/> groupings within 5, e.g., 2 and 3, 4 and 1; <input type="checkbox"/> groupings with 5, e.g., 5 and 1, 5 and 2, ...; <input type="checkbox"/> groupings within 10, e.g., 5 and 5, 4 and 6, ... etc. The student instantly recognises: <input type="checkbox"/> patterns to 10 (doubles and 5-based), including finger patterns.	The student recalls: <input type="checkbox"/> addition and subtraction facts to five, e.g., $2 + 1$, $3 + 2$, $4 - 2$, ... etc; <input type="checkbox"/> doubles to 10, e.g., $3 + 3$, $4 + 4$, ... etc.	The student records: <input type="checkbox"/> the results of counting and operations using symbols, pictures, and diagrams. The teacher and student record: <input type="checkbox"/> The results of operations using symbols, e.g., the reading of five and two as seven is recorded as 5 and 2 is 7, 5 plus 2 equals 7 , $5 + 2 = 7$																																							
Stage 4: Advanced Counting Stage 5: Early Additive	The student identifies: <input type="checkbox"/> all of the numbers in the range 0–100; symbols for halves, quarters, thirds, and fifths.	The student says: <input type="checkbox"/> the number word sequences, forwards and backwards, in the range 0–100; the number before and after a given number in the range 0–100; the skip-counting sequences, forwards and backwards, in the range 0–100 for twos, fives, and tens. The student orders: numbers in the range 0–100.	The student knows: <input type="checkbox"/> groupings with 10, e.g., 10 and 2, 10 and 3, ... and the pattern of “-teens”; <input type="checkbox"/> groupings within 20, e.g., 12 and 8, 6 and 14; <input type="checkbox"/> the number of tens in decades, e.g., tens in 40, in 60.	The student recalls: <input type="checkbox"/> addition and subtraction facts to 10, e.g., $4 + 3$, $6 + 2$, $7 - 3$, ...; <input type="checkbox"/> doubles to 20 and corresponding halves, e.g., $6 + 6$, $7 + 7$, $\frac{1}{2}$ of 14; <input type="checkbox"/> “ten and” facts, e.g., $10 + 4$, $7 + 10$ <input type="checkbox"/> multiples of 10 that add to 100, e.g., $30 + 70$, $40 + 60$.	The student records: <input type="checkbox"/> the results of mental addition and subtraction, using equations, e.g., $4 + 5 = 9$, $8 - 3 = 5$.																																							
	The student identifies: <input type="checkbox"/> all of the numbers in the range 0–1000; symbols for the most common fractions, including at least halves, quarters, thirds, fifths, and tenths; symbols for improper fractions, e.g., $\frac{5}{4}$.	The student says: <input type="checkbox"/> the number word sequences, forwards and backwards, by ones, tens, and hundreds in the range 0–1000; the number 1, 10, 100 before and after a given number in the range 0–1000; <input type="checkbox"/> the skip-counting sequences, forwards and backwards, in the range 0–100 for twos, threes, fives, and tens. The student orders: numbers in the range 0–1000; fractions with like denominators, e.g., $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, ... etc.	The student knows: <input type="checkbox"/> groupings within 100, e.g., 49 and 51 (particularly multiples of 5, e.g., 25 and 75); <input type="checkbox"/> groupings of two that are in numbers to 20, e.g., 8 groups of 2 in 17; <input type="checkbox"/> groupings of five in numbers to 50, e.g., 9 groups of 5 in 47; <input type="checkbox"/> groupings of ten that can be made from a three-digit number, e.g., tens in 763 is 76; <input type="checkbox"/> the number of hundreds in centuries and thousands, e.g., hundreds in 800 is 8 and in 4000 is 40. The student orders: <input type="checkbox"/> three-digit whole numbers to the nearest 10 or 100 e.g., 561 rounded to the nearest 10 is 560 and to the nearest 100 is 600.	The student recalls: <input type="checkbox"/> addition facts to 20 and subtraction facts to 10, e.g., $7 + 5$, $8 + 7$, $9 - 6$, ...; <input type="checkbox"/> multiplication facts for the 2, 5, and 10 times tables and the corresponding division facts; <input type="checkbox"/> multiples of 100 that add to 1000, e.g., 400 and 600, 300 and 700.	The student records: <input type="checkbox"/> the results of addition, subtraction, and multiplication calculations using equations, e.g., $35 + 24 = 59$, $4 \times 5 = 20$, and diagrams, e.g., an empty number line.																																							
Stage 6: Advanced Additive	The student identifies: <input type="checkbox"/> all of the numbers in the range 0–1 000 000; decimals to three places; <input type="checkbox"/> symbols for any fraction including tenths, hundredths, thousandths, and improper fractions.	The student says: <input type="checkbox"/> the whole number word sequences, forwards and backwards, by ones, tens, hundreds, and thousands in the range 0–1 000 000; <input type="checkbox"/> the number 1, 10, 100, 1000 before and after a given whole number in the range 0–1 000 000; <input type="checkbox"/> forwards and backwards word sequences for halves, quarters, thirds, fifths, and tenths, e.g., $\frac{1}{3}$, $\frac{2}{3}$, 1 , $\frac{4}{3}$, $\frac{5}{3}$, etc. <input type="checkbox"/> the decimal number word sequences, forwards and backwards, in tenths and hundredths. The student orders: <input type="checkbox"/> whole numbers in the range 0–1 000 000; <input type="checkbox"/> unit fractions for halves, thirds, quarters, fifths, and tenths.	The student knows: <input type="checkbox"/> groupings within 1000, e.g., 240 and 760, 498, and 502, ...; <input type="checkbox"/> groupings of two, three, five, and ten that are in numbers to 100 and finds the resulting remainders, e.g., three in 17 is 5 with 2 remainder, fives in 48 is 9 with 3 remainder. <input type="checkbox"/> groupings of 10 and 100 that can be made from a four-digit number, e.g., tens in 4562 is 456 with 2 remainder, hundreds in 7894 is 78 with 94 remainder. <input type="checkbox"/> tenths and hundredths in decimals to two places, e.g., tenths in 7.2 is 72, hundredths in 2.84 is 284. The student orders: <input type="checkbox"/> whole numbers to the nearest 10, 100, or 1000. <input type="checkbox"/> decimals with up to two decimal places to the nearest whole number, e.g., rounds 6.49 to 6, rounds 19.91 to 20.	The student recalls: <input type="checkbox"/> addition and subtraction facts up to 20, e.g., $9 + 5$, $13 - 7$; <input type="checkbox"/> multiplication basic facts up to 10 times tables (10 x 10) and the corresponding division facts; <input type="checkbox"/> multiplication basic facts with tens, hundreds, and thousands, e.g., $10 \times 100 = 1000$, $100 \times 100 = 10\,000$	The student: <input type="checkbox"/> records the results of calculations using addition, subtraction, multiplication, and division equations, e.g., $349 + 452 = 350 + 451 = 801$, <input type="checkbox"/> demonstrates the calculation on a number line or with a diagram. The student performs: <input type="checkbox"/> column addition and subtraction with whole numbers of up to four digits. e.g., <table style="display: inline-table; vertical-align: middle;"> <tr><td></td><td>11</td><td>691</td></tr> <tr><td></td><td>476</td><td>—7600</td></tr> <tr><td></td><td>+ 285</td><td>+ 586</td></tr> <tr><td></td><td>761</td><td>6414</td></tr> </table>		11	691		476	—7600		+ 285	+ 586		761	6414																											
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Stage Seven: Advanced Multiplicative	The student says: <input type="checkbox"/> the decimal word sequences, forwards and backwards, by thousandths, hundredths, tenths, ones, tens, etc., starting at any decimal number; <input type="checkbox"/> the number one-thousandth, one-hundredth, one-tenth, one, ten, etc. before and after any given decimal number The student orders: <input type="checkbox"/> fractions, decimals, and percentages.	The student knows: <input type="checkbox"/> the number of tenths, hundredths, and one-thousandths that are in numbers of up to three decimal places, e.g., tenths in 45.6 is 456, hundredths in 9.03 is 903, thousandths in 8.502 is 8502; <input type="checkbox"/> what happens when a whole number or decimal is multiplied or divided by a power of 10, e.g., 4.5×100 , $67.3 \div 10$. The student rounds: <input type="checkbox"/> decimals to the nearest 100, 10, 1, $\frac{1}{10}$, or $\frac{1}{100}$, e.g., rounding 5234 to the nearest 100 gives 5200.	The student recalls: <input type="checkbox"/> fraction \leftrightarrow decimal \leftrightarrow percentage conversions for given fractions and decimals, e.g., $\frac{9}{8} = 1.125 = 112.5\%$. The student knows: <input type="checkbox"/> divisibility rules for 2, 3, 4, 5, 6, 8, and 10, e.g. 5 632 is divisible by 8 since 632 is divisible by 8, e.g. 756 is divisible by 3 and 9 as its digital root is 9; <input type="checkbox"/> simple powers of numbers to 10, e.g. $2^4 = 16$, $5^3 = 125$ The student identifies: <input type="checkbox"/> common factors of numbers to 100, including the highest common factor, e.g. common factors of 48 and 64 = {1, 2, 4, 8, 16}; <input type="checkbox"/> least common multiples of numbers to 10 e.g. 24 is the least common multiple of 6 and 8.	The student records: <input type="checkbox"/> the results of calculations using equations, e.g., $\frac{3}{4} \times 28 = 21$, and diagrams, e.g., double number line. The student performs: <input type="checkbox"/> column addition and subtraction for whole numbers, and decimals to three places; <input type="checkbox"/> short multiplication and division of whole numbers and decimals by single-digit numbers e.g., <table style="display: inline-table; vertical-align: middle;"> <tr><td></td><td>14.65</td></tr> <tr><td>4</td><td>$\overline{) 58.60}$</td></tr> <tr><td></td><td>14</td></tr> <tr><td></td><td>22</td></tr> <tr><td></td><td>—22</td></tr> <tr><td></td><td>146</td></tr> <tr><td></td><td>—146</td></tr> <tr><td></td><td>0</td></tr> <tr><td></td><td>21</td></tr> <tr><td></td><td>—21</td></tr> <tr><td></td><td>63</td></tr> <tr><td></td><td>—63</td></tr> <tr><td></td><td>0</td></tr> <tr><td></td><td>49</td></tr> <tr><td></td><td>—49</td></tr> <tr><td></td><td>0</td></tr> <tr><td></td><td>30</td></tr> <tr><td></td><td>—30</td></tr> <tr><td></td><td>0</td></tr> <tr><td></td><td>37387</td></tr> </table>		14.65	4	$\overline{) 58.60}$		14		22		—22		146		—146		0		21		—21		63		—63		0		49		—49		0		30		—30		0		37387
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