2.4 Number operations

Outcome	3a G	4c F	4b F	4a F	5c E	5b E	5a E	6c D	6b D
2.4a Arithmetic				understand and use the rules of arithmetic and inverse operations in the context of positive integers and decimals			understand and use the rules of arithmetic and inverse operations in the context of integers and fractions		
2.4b Order of operations					use the order of operations, including brackets			use the order of operations, including brackets, with more complex calculations	

2.4 Number operations

6a D	7c C	7b C	7a B	8c B	8b A	8a A	EP A*
consolidate use of the rules of arithmetic and inverse operations	understand the effects of multiplying and dividing by numbers between 0 and 1	recognise and use reciprocals	understand 'reciprocal' as a multiplicative inverse; know that any number multiplied by its reciprocal is 1, and that zero has no reciprocal because division by zero is not defined			use a multiplier raised to a power to represent and solve problems involving repeated proportional change, eg compound interest	
understand the order of precedence of operations, including powers							

2.5 Mental calculation methods

Outcome	3a G	4c F	4b F	4a F	5c E	5b E	5a E	6c D	6b D
2.5a Recalling number facts				recall number facts, including positive integer complements to 100 and multiplication facts to 10 x 10, and quickly derive associated division facts	use known facts to derive unknown facts, including products involving numbers such as 0.7 and 6, and 0.03 and 8			recall equivalent fractions, decimals and percentages	
2.5b Mental calculations			solve simple problems mentally		strengthen and extend mental methods of calculation to include decimals, fractions and percentages, accompanied where appropriate by suitable jottings			strengthen and extend mental methods of calculation, working with decimals, fractions, percentages, squares and square roots, cubes and cube roots	
2.5c Justifying approximations							make and justify estimates and approximations of simple calculations		

2.5 Mental calculation methods

6a D	7c C	7b C	7a B	8c B	8b A	8a A	EP A*
		extend mental methods of calculation, working with decimals, fractions, percentages, factors, powers and roots	use known facts to derive unknown facts				use surds and pi in exact calculations, without a calculator; rationalise a denominator such as 1/√3 = √ 3 / 3
make and justify estimates and approximations of calculations			make and justify estimates and approximations of calculations by rounding numbers to one significant figure and multiplying or dividing mentally				

2.6 Written calculation methods

Outcome	3a G	4c F	4b F	4a F	5c E	5b E	5a E	6c D	6b D
2.6a Addition and subtraction				use efficient written methods to add and subtract whole numbers and decimals with up to two places				use efficient written methods to add and subtract integers and decimals of any size, including numbers with differing numbers of decimal places	
2.6b Multiplication and division				multiply and divide by single digit integers		multiply and divide three-digit by two-digit whole numbers	extend to multiplying and dividing decimals with one or two places by single-digit whole numbers	understand where to position the decimal point by considering equivalent calculations	use efficient written methods for multiplication and division of integers and decimals, including by decimals such as 0.6 or 0.06

2.6 Written calculation methods

6a D	7c C	7b C	7a B	8c B	8b A	8a A	EP A*
divide by decimals by transforming to division by an integer	use efficient written methods to multiply and divide integers and decimals of any size	multiply by decimals					

2.7 Calculator methods

Outcome	3a G	4c F	4b F	4a F	5c E	5b E	5a E	6c D	6b D
2.7a Using a calculator						use the square root and sign change keys	carry out calculations with more than one step using brackets and the memory	carry out more difficult calculations effectively and efficiently using the function keys for sign change, powers, roots and fractions	
2.7b Interpreting a calculator display							enter numbers and interpret the display in different contexts (decimals, percentages, money, metric measures)		enter numbers and interpret the display in different contexts (extend to negative numbers, fractions, time)

2.7 Calculator methods

6a D	7c C	7b C	7a B	8c B	8b A	8a A	EP A*
use the constant, pi, and sign change keys	use the function keys for powers, roots and fractions	use a calculator efficiently and appropriately to perform complex calculations with numbers of any size, knowing not to round during intermediate steps of a calculation	use an extended range of function keys, including the reciprocal and trigonometric functions		use calculators to explore exponential growth and decay, using a multiplier and the power key		use calculators, or written methods, to calculate the upper and lower bounds of calculations in a range of contexts, particularly when working with measurements
		use standard index form, expressed in conventional notation and on a calculator display	know how to enter numbers in standard index form		calculate with standard index form, using a calculator as appropriate		

2.8 Checking results

Outcome	3a G	4c F	4b F	4a F	5c E	5b E	5a E	6c D	6b D
2.8 Checking results							check results by considering whether they are of the right order of magnitude and by working problems backwards		

2.8 Checking results

6a D	7c C	7b C	7a B	8c B	8b A	8a A	EP A*
select from a range of checking methods, including estimating in context and using inverse operations			check results using appropriate methods				