Mathematics (Addition and Subtraction)

Understanding of number is a pre-requisite to using addition and subtraction

Number (Addition and Subtraction) – KS1 - KS5			
By the end of KS5 our pupils should know:	**Redway Pre-Formal Pathway** Encounter → Foundation	**Redway Semi-formal Pathway** Core → Development	**Redway Formal Pathway** Enrichment → Enhancement
	The pupil can:	**The pupil can:**	**The pupil can:**
Number Bonds			
Represent and use number bonds and related subtraction facts within 20 [NC:YR1]		Pupils need to have a firm understanding of number and number value. *Please see number and number value programme of study* - Uses the term one appropriately - Uses the term lots appropriately - Demonstrate an understanding of composition of numbers to 5 and a developing ability to recall number bonds to and within 5 e.g., 2+2=4 and 3+1=4 [standard 4] - Demonstrate an understanding of composition of numbers to 5 and a developing ability to recall number bonds to and within - Demonstrate an understanding of composition of numbers to 5 and a developing ability to recall number bonds to and within 10	- Can make number bonds to 20 - Can recall pairs of numbers to make 10 (number bonds) - Can recall addition number bonds to 20 e.g. if 9+7=16 then 16-9=7 - Can use related subtraction facts to 20
Recall and use addition and subtraction facts to 20 fluently,			- Demonstrate an understanding of commutative law e.g., 3+2=5, therefore 2+3=5 [standard 4]

and derive and use related facts up to 100 [NC:YR2]			- Demonstrate an understanding of inverse relationships involving addition and subtraction e.g., if 3+2=5, then 5-2=3 [standard 4]
Mental Calculation			
Add and subtract one-digit and two-digit numbers to 20, including zero [NC:YR1]		- Knows that being asked for 'more' means giving some more of an object e.g. 'Give me some more….' and they hand more over - Use real-life materials (e.g. apples or crayons) to add and subtract 1 from a group of objects and indicate how many are now present - Demonstrate an understanding that the total number of objects changes when objects are added or taken away [standard 4] - Solve number problems involving the addition and subtraction of a single-digit number up to 10	- Add two numbers to 10, using objects, writing down calculation (number sentence) or drawing diagrams - Adding two numbers to 20 using objects, writing down calculation (number sentence) or drawing diagrams - Subtract one-digit number from 20 using objects, writing down calculation (number sentence) or drawing diagrams - Subtract a two-digit number from 20 using objects, writing down calculation (number sentence) or drawing diagrams - Know that adding 0 to a number doesn't change - Know that subtracting 0 to a number doesn't change
Read, write, and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs [NC:YR1]		- To begin to use the vocabulary add in practical situations - To begin to use the vocabulary take-away in practical situations - In practical situations, and with support, interpret number sentences	- To understanding the meaning of + - To understanding the meaning of – - To understanding the meaning of = - To be able to write + symbol - To be able to write – symbol - To be able to write = symbol - To be able to read addition mathematical statements/sentences - To be able to read subtraction mathematical statements/sentences

			- Demonstrate an understanding of mathematical symbols of add, subtract and equal too [standard 4]
Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ♣ a two-digit number and ones ♣ a two-digit number and tens ♣ two two-digit numbers ♣ adding three one-digit numbers [NC:YR2]			- Can add using appropriate objects • a two-digit number and 1s (for example, 42 +4) • a two-digit number and 10s (for example, 34 +20) • 2 two-digit numbers (for example, 56 +37) • adding 3 one-digit numbers (for example, 3 + 9 + 5). - Can add using pictures • a two-digit number and 1s (for example, 42 +4) • a two-digit number and 10s (for example, 34 +20) • 2 two-digit numbers (for example, 56 +37) • adding 3 one-digit numbers (for example, 3 + 9 + 5). - Can add using mental arithmetic • a two-digit number and 1s (for example, 42 +4) • a two-digit number and 10s (for example, 34 +20)

			• 2 two-digit numbers (for example, 56 +37) • adding 3 one-digit numbers (for example, 3 + 9 + 5). - Can subtract using appropriate objects • a two-digit number and 1s (for example, 42– 4) • a two-digit number and 10s (for example, 34 – 20) • 2 two-digit numbers (for example, 56 – 37) - Can subtract using pictures • a two-digit number and 1s (for example, 42– 4) • a two-digit number and 10s (for example, 34 – 20) • 2 two-digit numbers (for example, 56 – 37) - Can subtract using mental arithmetic • a two-digit number and 1s (for example, 42– 4) • a two-digit number and 10s (for example, 34 – 20) • 2 two-digit numbers (for example, 56 – 37)

Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot [NC:YR2]			- Know that when they are adding numbers, they get the same total no matter on the order e.g., 7+4=11, 4+7=11 - Know that when they are subtracting numbers, they get a different answer e.g., 7-4=3, 4-7=3
Add and subtract numbers mentally, including: ♣ a three-digit number and ones ♣ a three-digit number and tens ♣ a three-digit number and hundreds [NC:YR3]			Can mentally calculate sums (addition): • a three-digit number and 1s (for example, 234 +7) • a three-digit number and 10s (for example, 534 +20) • a three-digit number and 100s (for example, 635 +300) Can mentally calculate sums (subtraction): • a three-digit number and 1s (for example, 234-7) • a three-digit number and 10s (for example, 534-20) • a three-digit number and 100s (for example, 635-300) (Strategies may include using pairs to 10's, near halves, near doubles, parts and wholes, counting on, and counting back, etc…)
Written Methods			
Read, write, and interpret mathematical statements involving addition (+),		- Overwrite + sign - Overwrite – sign - Overwrite = sign	- To understanding the meaning of + - To understanding the meaning of – - To understanding the meaning of =

subtraction (–), and equals (=) signs [NC: YR1] *(also appears in mental calculation)*		- To recognise the – sign from a choice of 2 but may not understand the meaning - To recognise the + sign from a choice of 2 but may not understand the meaning - To recognise the = sign from a choice of 2 but may not understand the meaning	- To be able to write + symbol - To be able to write – symbol - To be able to write = symbol - To be able to read addition mathematical statements/sentences - To be able to read subtraction mathematical statements/sentences
Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction [NC:YR3]			- Can make number bonds to 20 - Can recall pairs of numbers to make 10 (number bonds) - Can recall addition number bonds to 20 e.g. if 9+7=16 then 16-9=7 - Can use related subtraction facts to 20
Inverse Operations, estimating and checking answers			
Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. [NC:YR2]			- Understand inverse relationships between numbers to check their calculations, for example if 5+6=11 then 11-6=5 or 11-5=6 (*Addition and subtraction undo each other)*
Problem Solving			
Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9. [NC:YR1]			- Can solve number sentences that involve addition using concrete objects, and pictorial representations - Can solve one step word problems that involve addition using concrete objects, and pictorial representations

			- Can solve number sentences that involve subtractions using concrete objects, and pictorial representations - Can solve one step word problems that involve subtractions using concrete objects, and pictorial representations
Solve problems with addition and subtraction: ○ using concrete objects and pictorial representations, including those involving numbers, quantities and measures ○ applying their increasing knowledge of mental and written methods [NC:YR2]			- Can solve addition problems involving number using: • Objects (e.g. counters, straws, fruit) • Pictures (number lines, grids, and arrays • Symbols (+, and =) - Can solve addition problems involving quantities using: • Objects (e.g. counters, straws, fruit) • Pictures (number lines, grids, and arrays • Symbols (+, and =) - Can solve addition problems involving measurements using: • Objects (e.g. counters, straws, fruit) • Pictures (number lines, grids, and arrays • Symbols (+, and =) - Can solve subtraction problems involving number using: • Objects (e.g. counters, straws, fruit) • Pictures (number lines, grids, and arrays • Symbols (-, and =) - Can solve subtraction problems involving quantities using: • Objects (e.g. counters, straws, fruit)

			• Pictures (number lines, grids, and arrays • Symbols (-, and =) - Can solve subtraction problems involving measurements using: • Objects (e.g. counters, straws, fruit) • Pictures (number lines, grids, and arrays • Symbols (-, and =)
Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. [NC:YR3]			- Can select appropriate, previously taught, method to solve a problem e.g. number facts, place value or partitioning. - Can check answer using a different method - Can explain how they have sold the problem - Can explain why they chose the method they did (can you pictures/symbols to explain thought process)