Foundation Stage — Addition and Subtraction

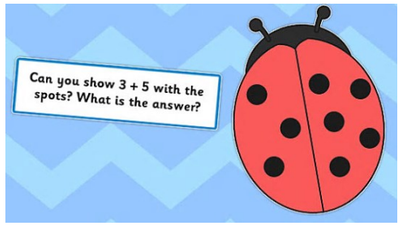
Early Learning Goals	Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number.. Using quantities and objects, they add and subtract 2 single-digit numbers and count on or back to find the answer.

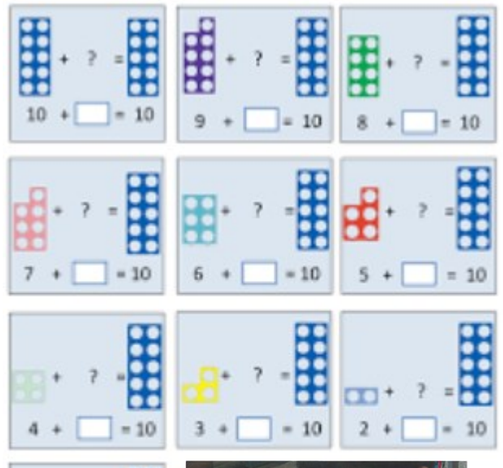
Vocabulary

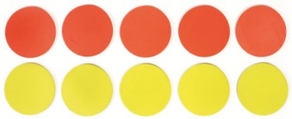
Put together, add, altogether, total, take away, distance between, difference between, more than and less than, bigger, smaller, fewer, more.

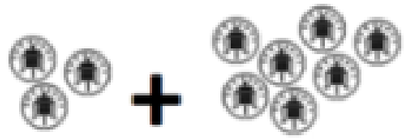
Strategies

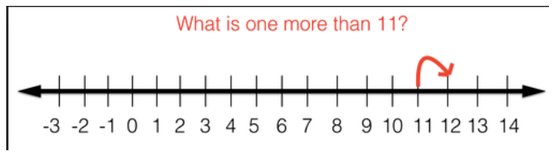
Role-play; Outdoor play; Physical play e.g. clapping, jumping; Fingers and Toes; Context e.g. cooking; Manipulative objects; Numicon; Singing and chanting; Number lines; Hundred square; Interactive Whiteboard Games.

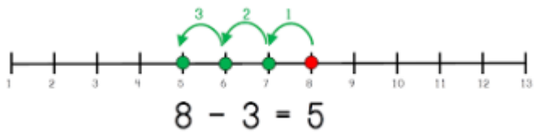


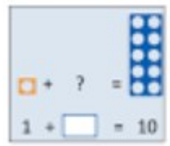


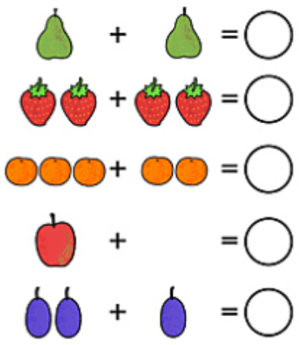


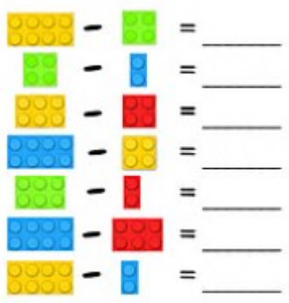


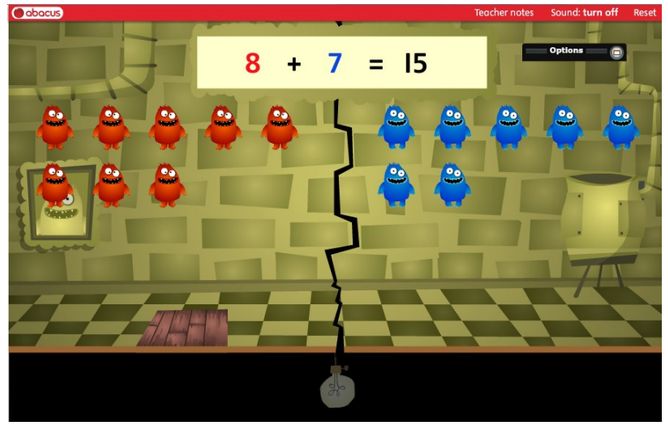












Key Stage 1 — Addition and Subtraction

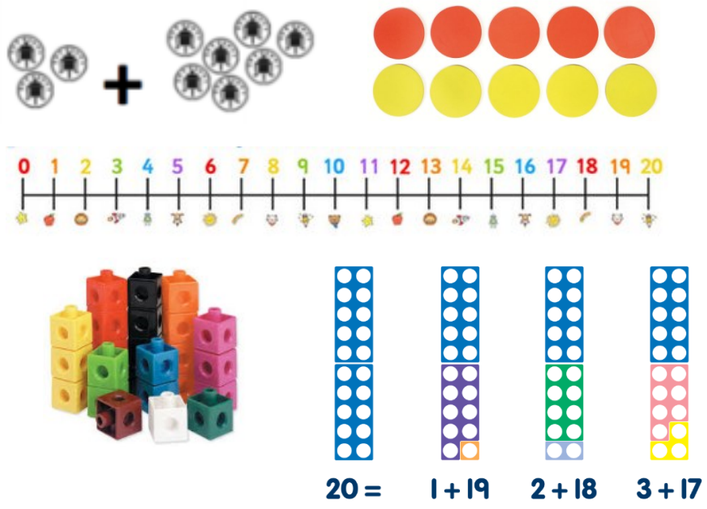
Year 1	Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs. Represent and use number bonds and related subtraction facts within 20. Add and subtract one-digit and two-digit numbers to 20, including zero. Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.
Year 2	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. Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. 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. Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Vocabulary

Put together, add, plus, altogether, total, take away, subtract, distance between, difference between, more than and less than, sum, difference, in-

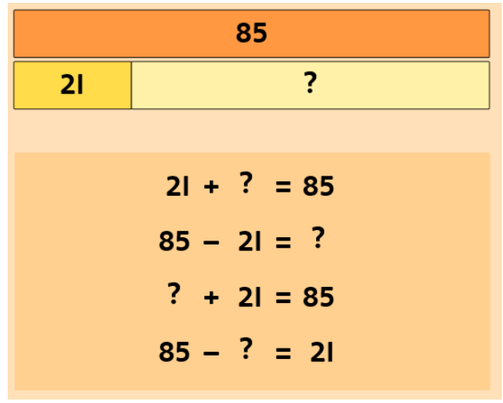
Strategies

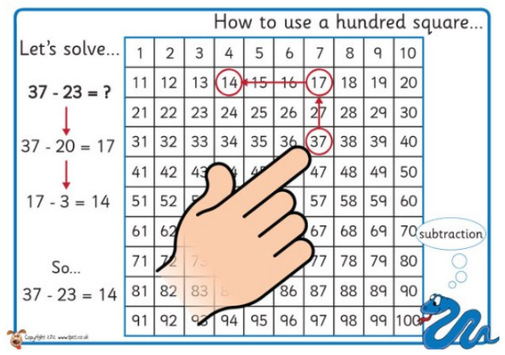
Singing and chanting; Numicon; Bead strings; Sets of objects; Fingers and toes; Counters; Money; Multilink; Interactive white board games; Number line; Hundred square; Dienes; Bar Model; Jottings; Partitioning; Expanded

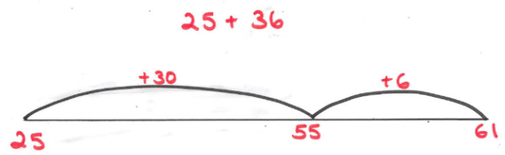


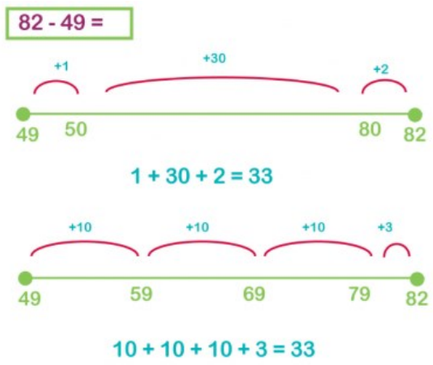
20 = 1 + 19 2 + 18 3 + 17

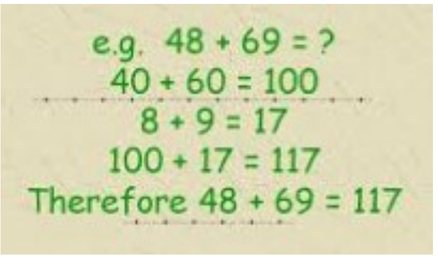
13 + 7 = 20	7 + 13 = 20
20 – 13 = 7	20 – 7 = 13

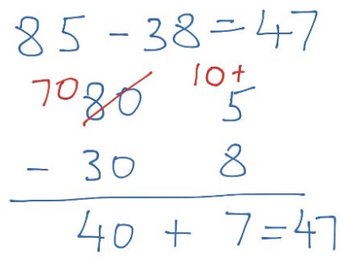


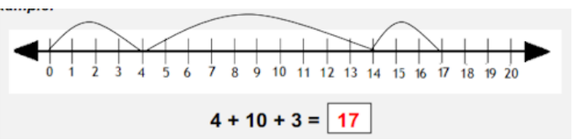












Mastery	Mastery with Greater Depth
Use the first number sentence to complete the second number sentence. 4 + 3 = □ 7 + □ = 9 7 – □ = 4 9 – □ = 7 5 + 2 = □ □ + 3 = 9 □ – □ = 2 □ – □ = □	Write a pair of numbers in the boxes to add to 12. □ + □ = 12 And another pair, and another, and another. Can you find all possibilities? Convince me!

Mastery	Mastery with Greater Depth
If each peg on the coat hanger has a value of 10, find three ways to partition the pegs to make the number sentences complete. ? □ + □ = □ □ + □ = □ □ + □ = □ What is the total of each addition sentence? Will the total always be the same? Explain your reasoning.	If each peg on the coat hanger has a value of 10, find three ways to partition the pegs to make the number sentences complete. ? □ + □ + □ = □ □ + □ + □ = □ □ + □ + □ = □ What is the total of each addition sentence? Will the total always be the same? Explain your reasoning.

Key Stage 2 — Addition and Subtraction

Year 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. Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. Estimate the answer to a calculation and use inverse operations to check answers. Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
Year 4	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate Estimate and use inverse operations to check answers to a calculation Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.
Year 5	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Add and subtract numbers mentally with increasingly large numbers. Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Year 6	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Vocabulary

Put together, add, plus, altogether, total, take away, subtract, distance between, difference between, more than and less than, sum, difference,

Strategies

Expanded Column Method; Compact Column Method.

Strategies from KS1 may be used where appropriate to support transition to KS2 strategies and to support mental

353 + 268 = 621

300 + 50 + 3
200 + 60 + 8
600 + 20 + 1 = 621
100 10

457 − 226 = 231

400 + 50 + 7 −
200 + 20 + 6
200 + 30 + 1
= 231

534 − 265 = 269

400 120 14
500 + 30 + 4 −
200 + 60 + 5
200 + 60 + 9 = 269

789 + 642 becomes

$$\begin{array}{r} 7\,8\,9 \\ +\;6\,4\,2 \\ \hline 1\,4\,3\,1 \\ \hline 1\;1 \end{array}$$

Answer: 1431

874 − 523 becomes

$$\begin{array}{r} 8\,7\,4 \\ -\;5\,2\,3 \\ \hline 3\,5\,1 \end{array}$$

Answer: 351

932 − 457 becomes

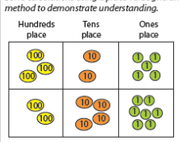
$$\begin{array}{r} 8\;\;12\;\;1 \\ \not{9}\;\not{3}\;2 \\ -\;4\,5\,7 \\ \hline 4\,7\,5 \end{array}$$

Answer: 475

Mastery

Solve calculations using a place value grid and equipment alongside a column method to demonstrate understanding.

Hundreds place | Tens place | Ones place



325 + 247

Sam has completed these calculations, but he is incorrect.
Explain the errors he has made.

325 + 247 = 581

355 − 247 = 112

Complete these calculations. What do you notice?

3 + 7 =	8 + 2 =	6 + 4 =
30 + 70 =	80 + 20 =	60 + 40 =
33 + 7 =	88 + 2 =	66 + 4 =
333 + 7 =	888 + 2 =	666 + 4 =
300 + 700 =	800 + 200 =	600 + 400 =

Mastery with Greater Depth

There are six 3-digit addition calculations shown below.

a) 124 + 233 b) 644 + 172 c) 366 + 277

d) 579 + 221 e) 791 + 163 f) 567 + 233

Which calculations have no carry digits?
Which calculations have a carrying digit only once?
Which calculations have a carrying digit twice?
Which calculation has the largest answer?
Which calculation has the smallest answer?

Check that children are looking at the numbers involved, rather than doing the calculations.

□ □ □ + □ □ □ =

Throw a 1 to 6 dice and each time record the digit in one of the place holders. The aim is to get the sum as low as possible. Repeat to find different answers.
Could you have done it in a different way?
Compete against a friend and compare your answers.

Mastery

Fill in the missing numbers.

352 + □ = 480
70 + 99 + □ = 270
□ − 55 = 84
□ − 3000 = 600

What do you notice about the calculations below?
Can you find easy ways to calculate?

5000 + 4000 =	5230 + 400 =	5023 + 28 =
4000 + 5000 =	4230 + 500 =	4023 + 28 =
3000 + 6000 =	3230 + 600 =	3023 + 28 =
2000 + 7000 =	2230 + 700 =	2023 + 28 =
1000 + 8000 =	1230 + 800 =	1023 + 48 =

Mastery with Greater Depth

Fill in the missing digits.

1□3 + 6□ = 200
1□5□ + 300 = 1557
5□28 − 44□ = 4788
□□□0 − 2468 = 5092

Find the missing numbers.
What do you notice?

Make 9999	Make 9998	Make 9990
5000 + □ = 9999	5230 + □ = 9998	5023 + □ = 9990
4000 + □ = 9999	4230 + □ = 9998	4023 + □ = 9990
3000 + □ = 9999	3230 + □ = 9998	3023 + □ = 9990
2000 + □ = 9999	2230 + □ = 9998	2023 + □ = 9990
1000 + □ = 9999	1230 + □ = 9998	1023 + □ = 9990

Mastery

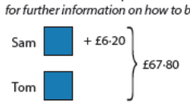
The table shows the cost of train tickets from different cities.

What is the total cost for a return journey to York for one adult and two children?
How much more does it cost for two adults to make a single journey to Hull than to Leeds?

		York	Hull	Leeds
Adult	Single	£13·50	£16·60	£11·00
	Return	£24·50	£30·00	£20·00
Child	Single	£9·75	£11·00	£8·00
	Return	£15·00	£18·50	£13·50

Mastery with Greater Depth

Sam and Tom have £67·80 between them.
If Sam has £6·20 more than Tom, how much does Tom have?
The bar model can help children solve these type of problems, please visit ncetm.org for further information on how to build understanding.



£67·80 − £6·20 = £61·60
£61·60 ÷ 2 = £30·80
Tom has £30·80