



Addition Year 1

Skills and Mental Strategies

Skills

Count forwards (one more) fluently in 1s from any number up to 100.

Mental Strategies

Identify 1 more

Begin to quickly recall simple single addition facts such as

$$2+3 = 5, 7+2 = 9$$

Know by heart number bonds to 10 and 20.

Methods

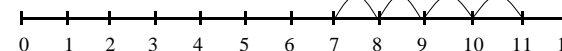
Must read, write and interpret statements involving addition.

For example

$$3 + 17 = 20$$

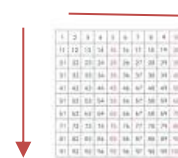
Calculate using a prepared number line to add one-digit and two-digit numbers to 20, including zero.

$$7+4$$



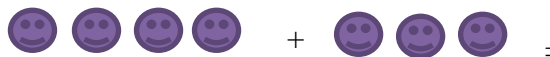
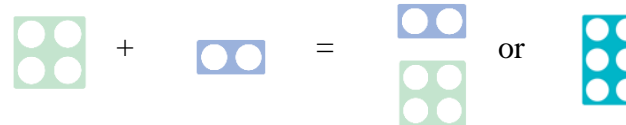
Start to become familiar with calculating using a Hundred Square.

Down to
add tens



Right to add
ones

Objects / pictorial representations



Problem solving

Solve problems involving missing numbers by using known addition facts (number bonds to 10 & 20)

$$3 + 4 = \square$$

$$\square = 3 + 4$$

$$3 + \square = 7$$

$$7 = \square + 4$$

Real life problems:

Ben has 5 straws for the milk but he has 20 cartons. How many straws does he need altogether? *Use concrete equipment to solve simple problems.*



Addition Year 2

Skills and Mental Strategies

Skills

Count forwards (one more) fluently in 1s from any number up to 100 and beyond.

Addition can be done in any order (commutative)

For example $5+2+1 = 1+5+2 = 1+2+5$

Mental Strategies

+ 11 add ten; then add one

+9 add ten; subtract one

Have quick recall of simple single addition facts such as

$2+3 = 5$, $7+2 = 9$

Know by heart number bonds to 10, 20 and 100 (using multiples of 10).

Using knowledge of place value (partitioning numbers mentally)

add two digit + ones $23+ 6 = 29$

add two digit + tens $23 + 30 = 63$

add two digit + 2 digit $23 + 34 = 57$

add 3 one digits $4 + 5 + 2 = 11$

Methods

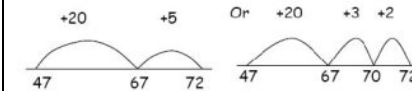
Calculate using a Hundred Square to support place value.

E.g. $23 + 31$



Find 23 on the number square. Add 30. Then add 1.

Calculate using a number line to add using 2 digit numbers.



Preparing for Column Addition

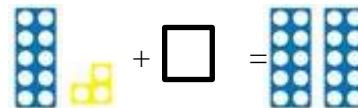
$$33 + 42 = 75$$

$$\begin{array}{r}
 \text{T} \quad \text{U} \\
 30 + 3 \\
 + 40 + 2 \\
 \hline
 70 + 5 = 75
 \end{array}$$

Problem solving

Solve problems involving using the inverse operation to check answers

$$13 + \square = 20 \text{ so } 20 - 13 = 7 \text{ also } 20 - 7 = 13$$



Overlap the shapes to work out what is remaining.

Real life problems (including quantities and measures) :

Amina bought 25 metres of fabric for her curtain but needed 13 metres. What lengths of fabric did she buy altogether? *Use concrete equipment to solve simple problems.*

Real life problems (money)

Find different combinations of coins that equal the same amounts of money.

Simple problems involving adding the same unit (p or £).

Use of coins to support.



Addition Year 3

Skills and Mental Strategies

Skills

Count on 1s, 10s or 100s from any number under 1000.

Using numbers up to at least 100 solve complex addition problems

E.g. $146 = 100 + 40 + 6$ so $146 = 130 + 16$.

Mental Strategies

Find 10 or 100 more than given number

Split numbers to the nearest multiple of ten and then count on

E.g. $27 + 36 =$

$20 + 30 = 50$

$50 + 7 = 57$

Split 6 into $3 + 3$ so $57 + 3 = 60$ then add 3 equals 63.

Know by heart number bonds to 10, 20 and 100 (using multiples of 10). Use pairs of numbers that total 100 (and subtraction facts)

E.g. $87 + 13 = 100$ also $100 - 13 = 87$

Use knowledge of place value (partitioning numbers mentally)

add a three-digit number and ones $123 + 6 = 129$

add a three-digit number and tens $123 + 30 = 163$

add a three-digit number and hundreds $123 + 200 = 323$

Methods

Calculate using a Hundred Square.

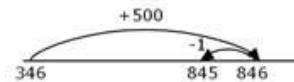
Down to
add tens



Right to add
units

Calculate using a number line to add using 3 digit numbers.

$$346 + 499$$



Column Addition

Use formal columnar addition to add up to 3 digits, including 1 dp.

$$\begin{array}{r} 366 \\ +458 \\ \hline 824 \\ 11 \end{array}$$

As addition is commutative, it doesn't matter which way round the numbers are. Add the bottom ones (units) to the top ones. If the number exceeds ten, carry this under the equals sign into the tens column. Then repeat as you work into the hundred column. Children may want to label H, T and O to support methodology. Children will be expected to estimate the answer to a calculation and use inverse operations to check answers.

Adding Fractions

Add fractions with the same denominator within one whole.

$$\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$$

Measurement

Add lengths (m/cm/mm), mass (kg/g) volume/capacity (l/ml).

Money

Add amounts of money to give change, using both £ and p in practical context. (2 step including giving change).



Addition Year 5

Skills and Mental Strategies

Skills

Count forwards in steps of powers of 10 for any given number up to 1,000,000.

E.g. 21, 210, 2100, 21,000, 210,000, 2,100,000

Mental Strategies

Add numbers mentally with increasingly large numbers

Count forwards with positive and negative whole numbers, including through 0.

Methods

Column Addition

Add numbers with more than 4 digits using formal written methods. Estimate and use inverse operations to check answers to a calculation

$$\begin{array}{r}
 12376 \\
 + 15237 \\
 \hline
 27613
 \end{array}
 \quad \text{so} \quad
 \begin{array}{r}
 \overset{5101}{27613} \\
 - 15237 \\
 \hline
 12376
 \end{array}$$

Use rounding up to 1,000,000 to nearest 10, 100, 1000, 10,000, 100,000, 1,000,000 to check answers. Extend to numbers with any number of digits and decimals (up to 3 decimal places).

$$124.912 + 117.250 = 242.15$$

$$\begin{array}{r}
 124.912 \\
 + 117.250 \\
 \hline
 242.162 \\
 11
 \end{array}$$

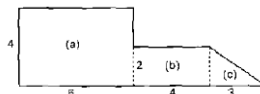
Adding Fractions

Add fractions with a different denominator beyond one whole.

$$\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1 \frac{3}{8}$$

Calculating perimeter

Calculate the perimeter of composite rectilinear shapes in cm/m



Area of a rectangle = length \times width
 Area of a triangle = $\frac{1}{2}$ base \times height where base = 3, height = 2
 Area of Fig.(a) = $6 \times 4 = 24$
 Area of Fig.(b) = $4 \times 2 = 8$
 Area of Fig.(c) = $\frac{1}{2} \times 3 \times 2 = 3$
 Total area = $24 + 8 + 3 = 35$ square units

Missing measure questions such as those that can be express algebraically, For Example: $4 + 2b = 20$ for a rectangle of side 2cm and b cm and perimeter of 20cm

Measurement & Money

Solve multi-step problems in contexts, deciding which operations and methods to use and why. Adding lengths (m/cm/mm), mass (kg/g) volume/capacity (l/ml) and pound and pence using decimal notation.

Carmen bought 7 books about animals costing £1.10 each, 2 books about outer space costing £1.25 each, and 3 books about trains costing £2.50 each. How much did Carmen spend on the books?



Addition Year 6

Skills and Mental Strategies

Skills

Perform mental calculations, including with mixed operations and large numbers.

Count in intervals of negative numbers across zero

-7, -4, -1, 2, 5, 8, 11...

Mental Strategies

Use their knowledge of the order of operations to carry out calculations involving the four operations

Methods

Column Addition

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Working up to 10,000,000.

Use pencil and paper methods to add decimals to 3 decimal places.

$$124.912 + 117.250 = 242.15$$

$$\begin{array}{r} 124.912 \\ + 117.250 \\ \hline 242.162 \\ 11 \end{array}$$

Adding Fractions

Add fractions with different denominators and mixed numbers using the concept of equivalent fractions.

$$1\frac{3}{4} + 4\frac{7}{8} = 5\frac{13}{8} = 6\frac{5}{8}$$

Explore the order of operations using brackets

$$2+1 \times 3 = 5 \text{ and } (2+1) \times 3 = 9$$

Express missing number problems algebraically.

$$A = 180 - (a + c)$$

Find pairs of numbers that satisfy an equation that has two unknowns.

Is (3 -4) a solution to the equation $5X + 2Y = 7$

$$5 \times 3 = 15 \quad 2 \times -4 = -8$$

$$15 + -8 = 7$$

Problem solving

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Use a number line to add positive and negative integers for measure such as temperature.

E.g. Find the difference between 11°C and -3°C

