Boskenwyn and Germoe

Calculation Policy

The National Curriculum

The national curriculum for mathematics aims to ensure that all pupils:

♣ become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

♣ reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

♣ can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

EYFS – Addition

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

Birth –to 11 months – notice changes in number of objects / images , sounds in groups of and upto 3
8 – 20 months - has some understanding that things exist even when out of sight
16-26 months – Begins to organise and categorise objects -sorting
22 – 36 months – knows that a group of things changes in quantity when something is added or taken away
30 – 50 – separates a group of 3 or 4 objects in different ways beginning to recognise that the total is still the same
40-60 – finds the total number of items in two groups by counting all of them In practical activities and discussions begins to use the vocabulary involved in addition and subtraction

Manipulatives:

Visuals

Making the most of numbers around them in every day life:

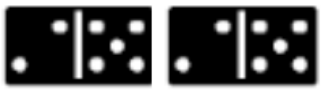
Foundation- Addition

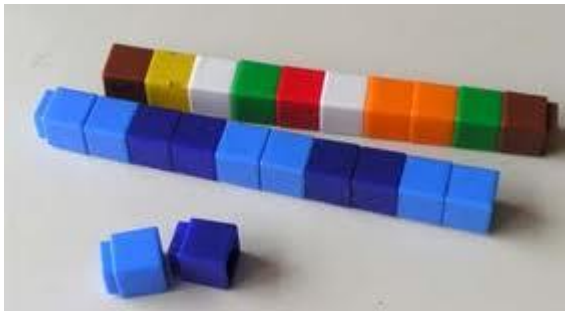
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

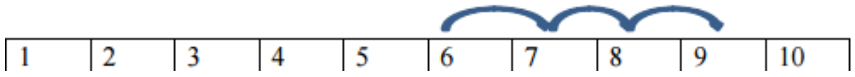
Early Learning Goal: Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. Count on from first group to add two groups of objects.

Manipulatives:





Visuals:



Recording:

6 + 2 = 8

Year 1- Addition

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- read, write and interpret mathematical statements involving addition (+) and equals (=) signs – relate this to balance sums and scales.
- represent and use number bonds and related subtraction facts within 20
- add one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as 9 = ? + 7

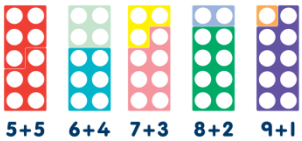
Our Objectives: **Green numbers show the sequences for each objective**

- count to and across 100, forwards *and backwards*, beginning with 0 or 1, or from any given number **1.1, 1.4, 1.5, 1.6, 1.8, 1.9, 1.11, 1.12**
- given a number, identify one more *and one less* **1.1, 1.2, 1.4, 1.5, 1.6, 1.8, 1.9, 1.11, 1.12**
- read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs **1.9, 1.12**
- represent and use number bonds and related subtraction facts within 20 **1.2, 1.5, 1.9, 1.12**
- add *and subtract* one-digit and two-digit numbers to 20, including zero **1.9, 1.12**
- solve one-step problems that involve addition *and subtraction*, using concrete objects and pictorial representations, and missing number problems such as 7 = ? - 9 **1.2, 1.5, 1.9, 1.12**
- recognise and use language relating to dates, including days of the week, weeks, months and years **1.1, 1.2, 1.4, 1.9**
- sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] **1.2, 1.9, 1.11**

Manipulatives:

Add parts to make a whole:

Number Bonds:



Adding 3 single digits:

4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7.

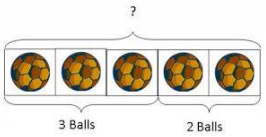
Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.

Starting from the bigger number:

Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.

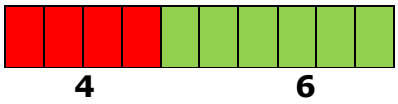
Images:

Add parts to make a whole:

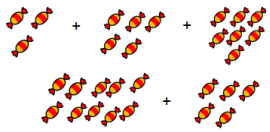


Use pictures to add two numbers together as a group or in a bar.

Number Bonds:



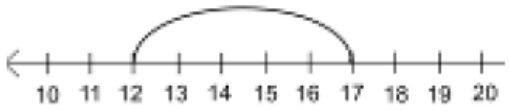
Adding 3 single digits:



Regroup to make 10 first

Starting from the bigger number:

5+12=



Abstract:

Add parts to make a whole:

4+7=11

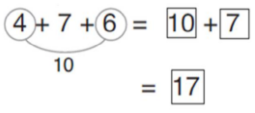
12=4+8

Number Bonds:

6+4=10

Adding 3 single digits:

2+5+1=8



Starting from the bigger number:

5+12=17

Place the larger number in your head and count on the smaller number to find your answer.

Year 2- Addition

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- 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.

Our Objectives: **Green numbers show the sequences for each objective**

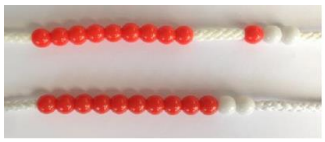
- count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward **2.1, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.11, 2.12, 2.13**
- recognise the place value of each digit in a two-digit number (tens, ones) **2.1, 2.2, 2.4, 2.5, 2.8, 2.9, 2.11, 2.12**
- use place value and number facts to solve problems **2.1, 2.2, 2.4, 2.5, 2.8,**
- **2.9, 2.11, 2.12**
- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures **2.2, 2.5, 2.9, 2.12**
  - applying their increasing knowledge of mental methods and written methods **2.2, 2.5, 2.9, 2.12**
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 **2.2, 2.5, 2.9, 2.12**
- 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 **2.2, 2.5, 2.9, 2.12**
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot **2.5, 2.9, 2.12**
- recognise and use the inverse relationship between addition and
- subtraction and use this to check calculations and solve missing number problems **2.5, 2.9, 2.12**
- recognise and use symbols for pounds (£) and pence (p); combine amounts to

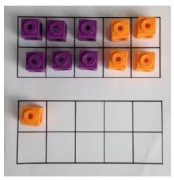
make a particular value **2.5, 2.7, 2.9**

- find different combinations of coins to equal the same amounts of money **2.5, 2.7, 2.9**
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change **2.2, 2.5, 2.9**
- ask and answer questions about totaling and comparing categorical data **2.2, 2.5, .9, .12**

Manipulatives:

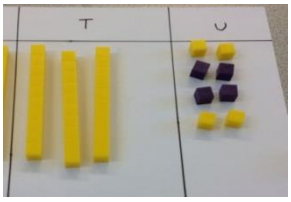
Regrouping to make 10





Start with the bigger number and use the smaller number to make 10.

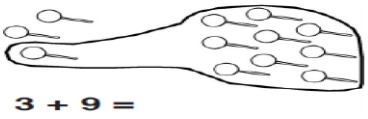
Adding tens or units

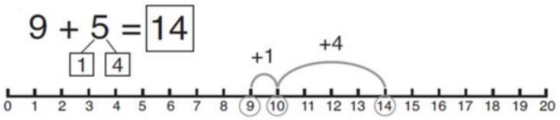


Look back to year 1 manipulatives for further support

Images:

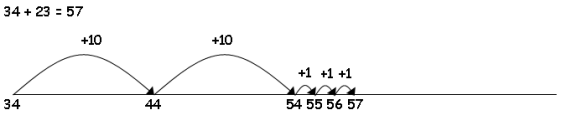
Regrouping



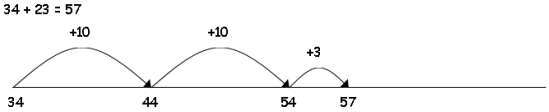


Adding tens or units, or a 2 digit number:

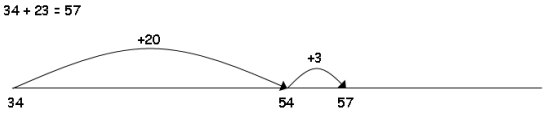
-First counting on in tens and ones.



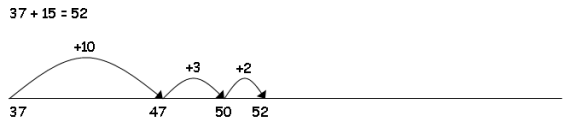
-Then helping children to become more efficient by adding the units in one jump (by using the known fact 4 + 3 = 7).



-Followed by adding the tens in one jump and the units in one jump.



-Bridging through ten can help children become more efficient.



Abstract:

7+4=11

If I have 7, how many more do I need to make 10? How many ore do I add on now.

Year 3- Addition

Curriculum 2014 Statutory Requirements:

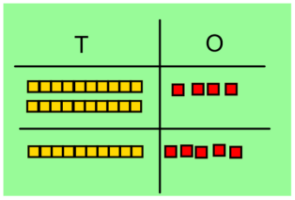
Pupils should be taught to:

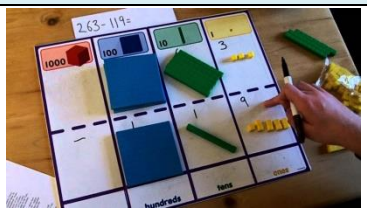
- add and subtract numbers mentally, including:
  - ♣ a three-digit number and ones
  - ♣ a three-digit number and tens
  - ♣ a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to 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.

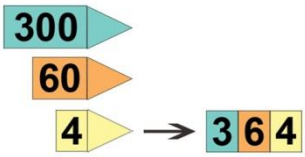
Our Objectives: **Green numbers show the sequences for each objective**

- add and subtract numbers mentally, including:
  - a three-digit number and ones
  - a three-digit number and tens
  - a three-digit number and hundreds **3.2, 3.6**
- add and subtract numbers with up to three digits using formal written methods of columnar addition and subtraction **3.2, 3.6, 3.11**
- estimate the answer to a calculation and use inverse operations to check answers **3.2, 3.6, 3.11**
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction **3.2, 3.6, 3.11**
- measure, compare, add and subtract:
  - lengths (m / cm / mm); mass (kg / g);
  - volume / capacity (l / ml) **3.2, 3.6, 3.11**
- add and subtract amounts of money to give change, using both £ and p in practical contexts **3.2, 3.6, 3.11**
- interpret and present data using bar charts, pictograms and tables **3.2, 3.5, 3.6, 3.11**
- solve one-step and two-step questions [for example, "How many more?" and "How many fewer?"] using information presented in scaled bar charts and pictograms and tables **3.2, 3.6, 3.11**
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m. / p.m., morning, afternoon, noon and midnight **3.10, 3.11**
- know the number of seconds in a minute and the number of days in each month, year and leap year **3.10, 3.11, 3.13**
- compare durations of events, [for example, to calculate the time taken by particular events or tasks] **3.10, 3.11**

Manipulatives:



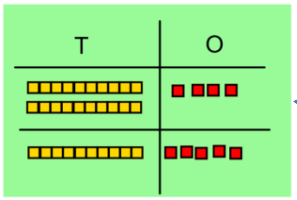




One number made of dienes above each other

See year 2 manipulatives for further support.

Images:



After building this out of dienes children can move on to sketching it themselves.

See year 2 manipulatives for further support- particularly the use of number lines for adding- transferrable to 3 digit numbers.

Abstract:

Expanded Column Addition

324+215=

300	20	4	
200	10	5	+
500	+ 30	+ 9	= 539

394+215=

300	90	4	
200	10	5	+
500	+ 100	+ 9	= 609

Compact Addition

324

215 +

539

Year 4- Addition

Curriculum 2014 Statutory Requirements:

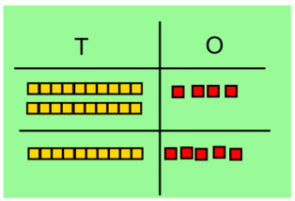
Pupils should be taught to:

- 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.

Our Objectives: **Green numbers show the sequences for each objective**

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate **4.2, 4.6, 4.11**
- estimate and use inverse operations to check answers to a calculation **4.2, 4.6, 4.11**
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why **4.2, 4.6, 4.11**
- estimate, compare and calculate different measures, including money in pounds and pence **4.2, 4.6, 4.11**
- interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs **4.2, 4.6, 4.11**
- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs **4.2, 4.6, 4.11**
- solve simple measure and money problems involving fractions and decimals to two decimal places **4.11**

Manipulatives:



See earlier years for further support

Images:

Place Value Style Chart to Add Money:

£	•	10p	1p
	•		
	•		

See earlier years for further support

Abstract:

Column Addition

$$\begin{array}{r} 536 \\ +\,85 \\ \hline 621 \\ \hline 11 \end{array}$$

Column Addition with money

$$\begin{array}{rrrrrrr} & £ & 2 & 3 & . & 5 & 9 \\ + & £ & & 7 & . & 5 & 5 \\ \hline & £ & 3 & 1 & . & 1 & 4 \\ \hline & & 1 & 1 & & 1 & \end{array}$$

Year 5- Addition

Curriculum 2014 Statutory Requirements:

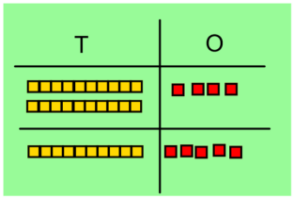
Pupils should be taught to:

- add and subtract whole numbers with more than 4 digits, including using formal written methods
- 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.

Our Objectives: **Green numbers show the sequences for each objective**

- solve problems involving number up to three decimal places **5.1, 5.5, 5.6, 5.10, 5.11**
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) **5.2, 5.6, 5.11**
- add and subtract numbers mentally with increasingly large numbers **5.2, 5.6, 5.11**
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy **5.2, 5.6, 5.11**
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **5.2, 5.6, 5.11**
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation
- including scaling **5.2, 5.3, 5.6, 5.8, 5.11, 5.13**
- solve comparison, sum and difference problems using information presented in a line graph **5.2, 5.6, 5.11**
- complete, read and interpret information in tables, including timetables **5.2, 5.6, 5.11**
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example, $2/5 + 4/5 = 6/5 = 1\,1/5$] **5.7, 5.10, 5.11, 5.12**
- add and subtract fractions with the same
- denominator and denominators that are multiples of the same number **5.11**
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres **5.6, 5.14**

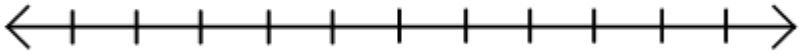
Manipulatives:



Images:

M	HTh	TTh	Th	H	T	U	•	Tth	Hth	Thth

Place numbers on a numberline to assist with rounding:



Abstract:

Column Addition

4 5 6 7

2 5 7 3 +

7 1 4 0

1 1 1

Rounding to the nearest 10:

4 5 6 → 460

Year 6- Addition

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- perform mental calculations, including with mixed operations and large numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Our Objectives: **Green numbers show the sequences for each objective**

- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places **6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.10, 6.11, 6.12, 6.13**
- perform mental calculations, including with mixed operations and large numbers **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- use their knowledge of the order of operations to carry out calculations involving the four operations **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **6.2, 6.6, 6.11**
- solve problems involving addition, subtraction, multiplication and division **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- solve problems which require answers to be rounded to specified degrees of accuracy **6.2, 6.6, 6.11**
- express missing number problems algebraically **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- use simple formulae **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- generate and describe linear number sequences **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- find pairs of numbers that satisfy an equation with two unknowns **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- enumerate possibilities of combinations of two variables **6.2, 6.3, 6.4, 6.6, 6.8, 6.9, 6.11, 6.13, 6.14**
- solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**

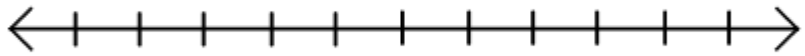
Manipulatives:

Refer to previous year to cement any understanding using manipulatives.

Images:

TM	M	HTh	TTh	Th	H	T	U	•	Tth	Hth	Thth

Place numbers on a numberline to assist with rounding:



Abstract:

Column Addition

4 5 6 7

2 5 7 3 +

7 1 4 0

1 1 1

Column Addition with decimals

4 5. 6 7

0 0 .7 3 +

4 6 .4 0

1 1

Rounding to the nearest 10:

4 5 6 → 460

BODMAS: Brackets**, O**ther**, D**ivision**, M**ultiplication**, A**ddition**, S**ubtraction

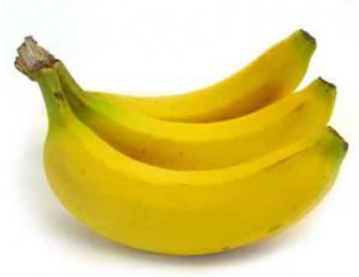
Nursery- Subtraction

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

Birth –to 11 months – notice changes in number of objects / images , sounds in groups of and upto 3
8 – 20 months - has some understanding that things exist even when out of sight
16-26 months – Begins to organise and categorise objects -sorting
22 – 36 months – knows that a group of things changes in quantity when something is added or taken away
30 – 50 – separates a group of 3 or 4 objects in different ways beginning to recognise that the total is still the same
40-60 – finds the total number of items in two groups by counting all of them In practical activities and discussions begins to use the vocabulary involved in addition and subtraction

Manipulatives:



Visuals

Making the most of numbers around them in every day life:

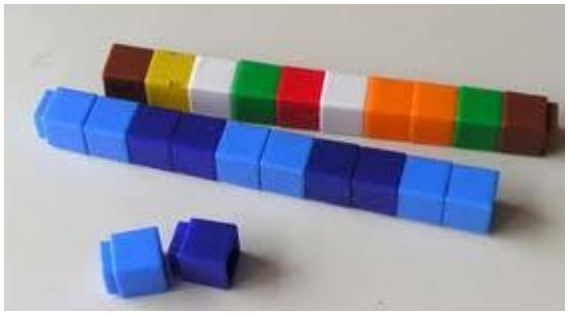
Foundation- Subtraction

Curriculum 2014 Statutory Requirements

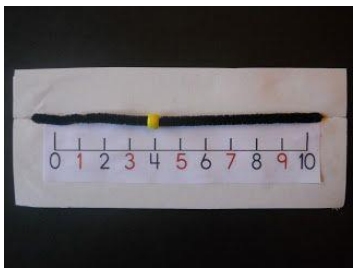
Pupils should be taught to:

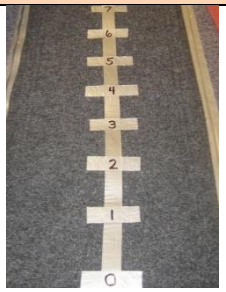
Early Learning Goal: Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. Count on from first group to add two groups of objects.

Manipulatives:



Visuals:





Recording:

****** -**= ******

6 - 2 = 4

Year 1- Subtraction

Curriculum 2014 Statutory Requirements:

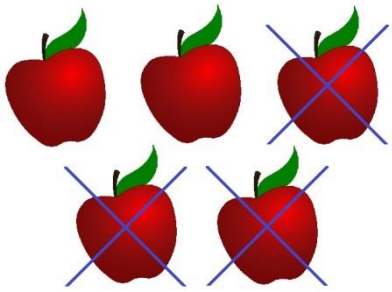
Pupils should be taught to:

- read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 9 = □ - 7.

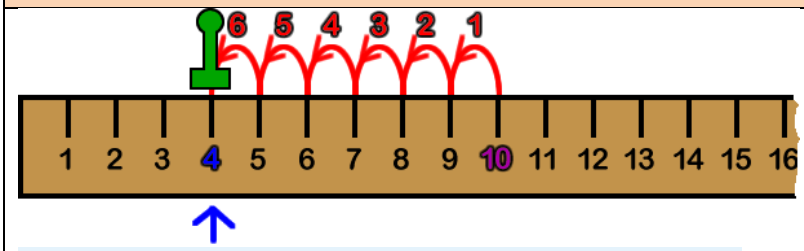
Our Objectives: **Green numbers show the sequences for each objective**

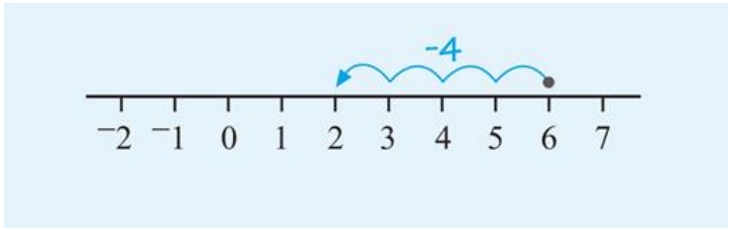
- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number **1.1, 1.4, 1.5, 1.6, 1.8, 1.9, 1.11, 1.12**
- given a number, identify one more and one less **1.1, 1.2, 1.4, 1.5, 1.6, 1.8, 1.9, 1.11, 1.12**
- read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs **1.9, 1.12**
- represent and use number bonds and related subtraction facts within 20 **1.2, 1.5, 1.9, 1.12**
- add and subtract one-digit and two-digit numbers to 20, including zero **1.9, 1.12**
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ____ - 9 **1.2, 1.5, 1.9, 1.12**

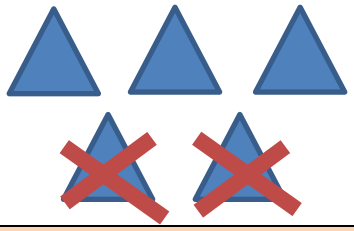
Manipulatives:



Images:

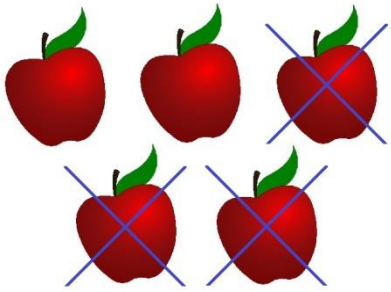


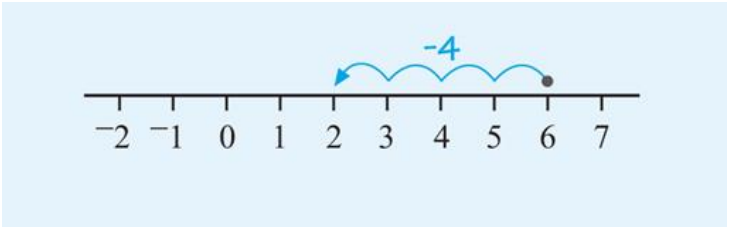




Abstract:

6 - 2 = 4





5-3=2

6-4=2

Year 2- Subtraction

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- solve problems with 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 subtraction facts to 20 fluently, and derive and use related facts up to 100
- 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
  - ♣ subtracting 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

Our Objectives: **Green numbers show the sequences for each objective**

- count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward **2.1, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.11, 2.12, 2.13**
- recognise the place value of each digit in a two-digit number (tens, ones) **2.1, 2.2, 2.4, 2.5, 2.8, 2.9, 2.11, 2.12**
- use place value and number facts to solve problems **2.1, 2.2, 2.4, 2.5, 2.8, 2.9, 2.11, 2.12**
- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures **2.2, 2.5, 2.9, 2.12**
  - applying their increasing knowledge of mental methods and written methods **2.2, 2.5, 2.9, 2.12**
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 **2.2, 2.5, 2.9, 2.12**
- 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 **2.2, 2.5, 2.9, 2.12**
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot **2.5, 2.9, 2.12**
- recognise and use the inverse relationship between addition and
- subtraction and use this to check calculations and solve missing number problems **2.5, 2.9, 2.12**
- recognise and use symbols for pounds (£) and pence (p); combine amounts to

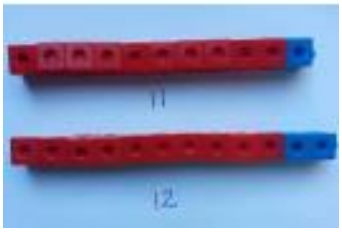
make a particular value **2.5, 2.7, 2.9**

- find different combinations of coins to equal the same amounts of money **2.5, 2.7, 2.9**
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change **2.2, 2.5, 2.9**
- ask and answer questions about totaling and comparing categorical data **2.2, 2.5, .9, .12**

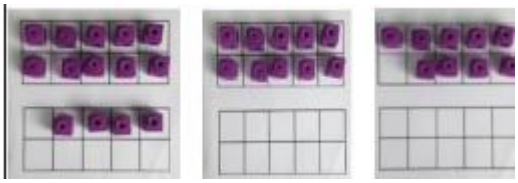
Manipulatives:

Make the larger number on your bead string and move the beads along as you count back in ones.

Finding the difference

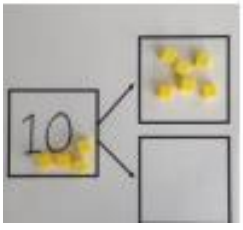


Make number on 10 squares:
14-5=



<- Use this for subtracting 2 digit numbers too by removing whole tens

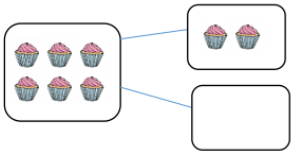
To show inverse:



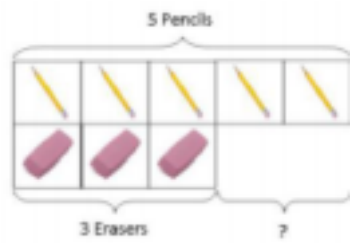
Look back to year 1 manipulatives for further support

Images:

Part Part Whole model



Bar model for finding the difference



Stages of subtracting 2 digit numbers on a numberline:

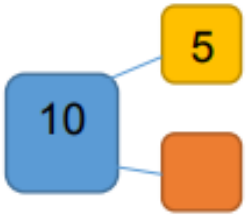
1)Counting back in 10s and 1s

2) Counting back in 10s and whole units

3)2 jumps: 1 for all the tens and then 1 for all the units

Abstract:

70 + 30 = 100 100 - Δ = 30 30 + Δ = 100 <- sets of number sentences



62-5=57

34-28=6

Year 3- Subtraction

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

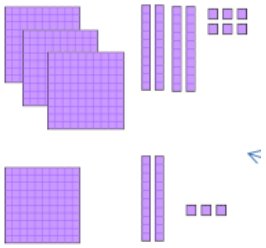
- subtract numbers mentally, including:
  - ◇ a three-digit number and ones
  - ◇ a three-digit number and tens
  - ◇ a three-digit number and hundreds
  - ◇ a three-digit number and thousands
- subtract numbers with up to three digits, using formal written methods of columnar subtraction
- estimate 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 subtraction.

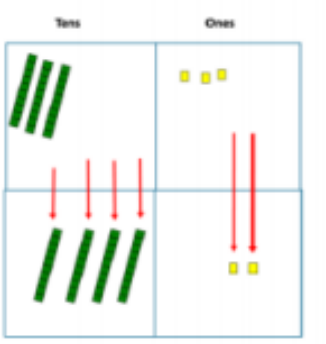
Our Objectives: **Green numbers show the sequences for each objective**

- add and subtract numbers mentally, including:
  - a three-digit number and ones
  - a three-digit number and tens
  - a three-digit number and hundreds **3.2, 3.6**
- add and subtract numbers with up to three digits using formal written methods of columnar addition and subtraction **3.2, 3.6, 3.11**
- estimate the answer to a calculation and use inverse operations to check answers **3.2, 3.6, 3.11**
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction **3.2, 3.6, 3.11**
- measure, compare, add and subtract:
  - lengths (m / cm / mm); mass (kg / g);
  - volume / capacity (l / ml) **3.2, 3.6, 3.11**
- add and subtract amounts of money to give change, using both £ and p in practical contexts **3.2, 3.6, 3.11**
- interpret and present data using bar charts, pictograms and tables **3.2, 3.5, 3.6, 3.11**
- solve one-step and two-step questions [for example, "How many more?" and "How many fewer?"] using information presented in scaled bar charts and pictograms and tables **3.2, 3.6, 3.11**
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m. / p.m., morning, afternoon, noon and midnight **3.10, 3.11**
- know the number of seconds in a minute and the number of days in each month, year and leap year **3.10, 3.11, 3.13**
- compare durations of events, [for example, to calculate the time taken by particular events or tasks] **3.10, 3.11**

Manipulatives:

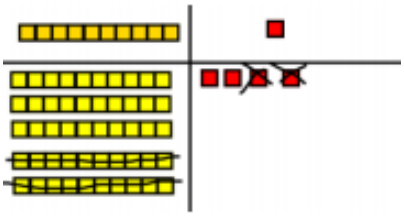
346-223=



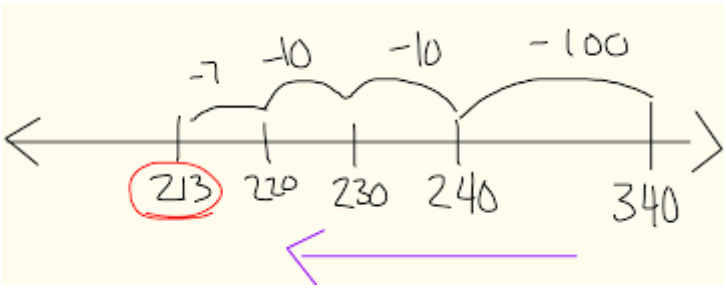


Use these models for regrouping- when you run out of units to subtract replace one of the 10 sticks with 10 unit cubes.

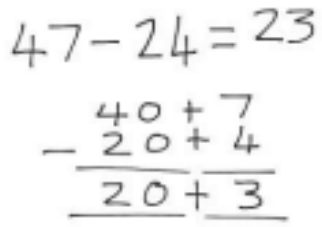
Images:

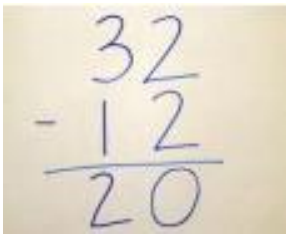


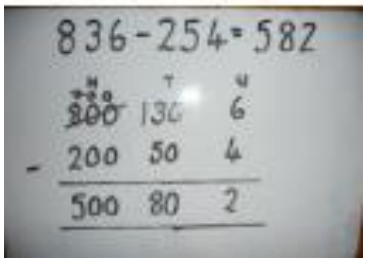
(also with a 100s image)

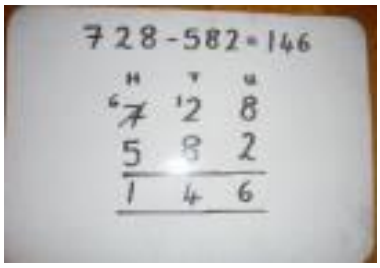


Abstract:


47-24=23
40+7
-20+4
20+3


32
-12
20


836-254=582
H T U
800 130 6
- 200 50 4
500 80 2


728-582=146
H T U
6 12 8
5 8 2
1 4 6

Year 4- Subtraction

Curriculum 2014 Statutory Requirements:

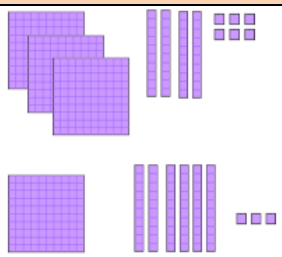
Pupils should be taught to:

- 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.

Our Objectives: **Green numbers show the sequences for each objective**

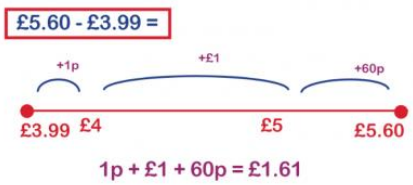
- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate **4.2, 4.6, 4.11**
- estimate and use inverse operations to check answers to a calculation **4.2, 4.6, 4.11**
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why **4.2, 4.6, 4.11**
- estimate, compare and calculate different measures, including money in pounds and pence **4.2, 4.6, 4.11**
- interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs **4.2, 4.6, 4.11**
- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs **4.2, 4.6, 4.11**
- solve simple measure and money problems involving fractions and decimals to two decimal places **4.11**

Manipulatives:



Expand to 4 digit numbers and refer to year 3 manipulatives

Images:



Thousands	Hundreds	Tens	Units
●●	●	●●●●● ●●●●	●●●
2193-1021=			

Abstract:

H	T	U
~~2~~ 3	1 4	6
- 1	6	3
1	8	3

£213.83 - £183.51

H	T	U • t	h
~~1~~ 2	1 1	3 • 8	3
1	8	3 • 5	1
0	3	0 • 3	2

Year 5- Subtraction

Curriculum 2014 Statutory Requirements:

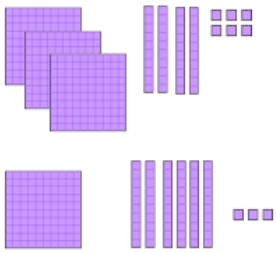
Pupils should be taught to:

- subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)
- 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 subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Our Objectives: **Green numbers show the sequences for each objective**

- solve problems involving number up to three decimal places **5.1, 5.5, 5.6, 5.10, 5.11**
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) **5.2, 5.6, 5.11**
- add and subtract numbers mentally with increasingly large numbers **5.2, 5.6, 5.11**
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy **5.2, 5.6, 5.11**
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **5.2, 5.6, 5.11**
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation
- including scaling **5.2, 5.3, 5.6, 5.8, 5.11, 5.13**
- solve comparison, sum and difference problems using information presented in a line graph **5.2, 5.6, 5.11**
- complete, read and interpret information in tables, including timetables **5.2, 5.6, 5.11**
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example, $^{2}/_{5} + {}^{4}/_{5} = {}^{6}/_{5} = 1{}^{1}/_{5}$] **5.7, 5.10, 5.11, 5.12**
- add and subtract fractions with the same
- denominator and denominators that are multiples of the same number **5.11**
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres **5.6, 5.14**

Manipulatives:

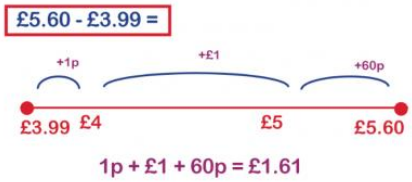


Expand to 4 digit numbers and refer to previous year's manipulatives

Images:

Rounding to the nearest 10 in order to estimate:

4 5 6 → 460



Thousands	Hundreds	Tens	Units
●●	●	●●●●● ●●●●	●●●
2193-1021=			

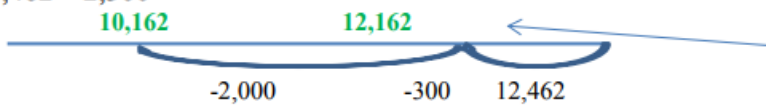
Abstract:

Th	H	T	U
7	~~8~~ 9	~~9~~ 10	~~1~~ 6
- 2	5	9	8
5	3	0	8

Estimating answers:

E: 7900 – 2600 = 5300

When modelling and teaching mental strategies, refer to picturing the use of a number line and either counting back or on: Δ = 12,462 – 2,300



Year 6- Subtraction

Curriculum 2014 Statutory Requirements:

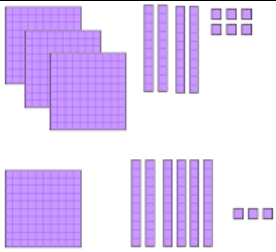
Pupils should be taught to:

- perform mental calculations, including with mixed operations and large numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Our Objectives: **Green numbers show the sequences for each objective**

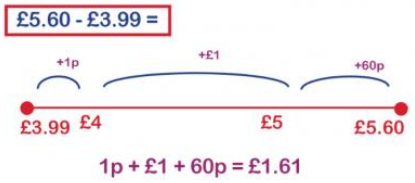
- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places **6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.10, 6.11, 6.12, 6.13**
- perform mental calculations, including with mixed operations and large numbers **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- use their knowledge of the order of operations to carry out calculations involving the four operations **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **6.2, 6.6, 6.11**
- solve problems involving addition, subtraction, multiplication and division **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- solve problems which require answers to be rounded to specified degrees of accuracy **6.2, 6.6, 6.11**
- express missing number problems algebraically **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- use simple formulae **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- generate and describe linear number sequences **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- find pairs of numbers that satisfy an equation with two unknowns **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- enumerate possibilities of combinations of two variables **6.2, 6.3, 6.4, 6.6, 6.8, 6.9, 6.11, 6.13, 6.14**
- solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**

Manipulatives:



Expand to 4 digit numbers and refer to previous year's manipulatives

Images:



Thousands	Hundreds	Tens	Units
●●	●	●●●●● ●●●●	●●●
2193-1021=			

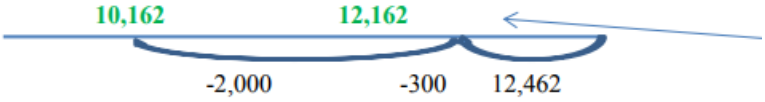
Abstract:

	Th	H	T	U
	7	~~8~~ 9	~~9~~ 10	~~1~~ 6
-	2	5	9	8
	5	3	0	8

Estimating answers:

E: 7900 – 2600 = 5300

When modelling and teaching mental strategies, refer to picturing the use of a number line and either counting back or on: Δ = 12,462 – 2,300



Foundation- Multiplication

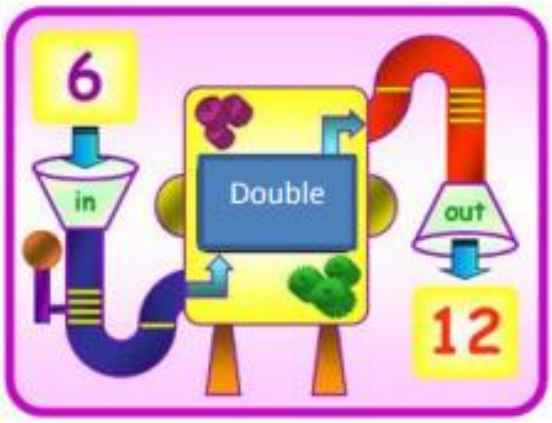
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

Early Learning Goal Children count reliably with numbers from one 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 two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

Manipulatives and Visuals

Stress that doubling is the same number twice, symmetry, dice, doubling machine, ladybird with spots



6 + 6 = 12 - Making it clear you are adding the same number.

Double 4 is 8

Year 1- Multiplication

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- solve one-step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

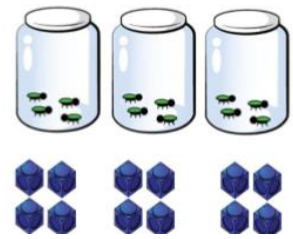
Our Objectives: **Green numbers show the sequences for each objective**

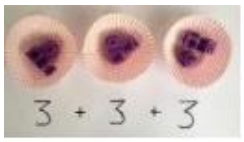
- count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens **1.1, 1.4, 1.6, 1.7, 1.8, 1.11, 1.13**
- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher **1.7, 1.13**
- recognise, find and name a half as one of two equal parts of an object, shape or quantity **1.13, 1.14**
- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity **1.13, 1.14**
- tell the time to the hour and half past the hour and draw the hands on a clock face to show these times **1.13**

Manipulatives:

Pupils build on learning in the Foundation Stage and ensure a clear understanding of the concept of doubling.

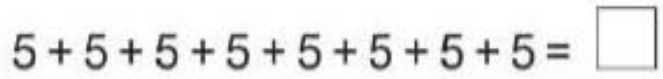
Counting in multiples:





Use different objects to add equal groups.

Visuals:



Abstract:

Counting in multiples out loud

Writing sequences of multiples

2,4,6,8,10,12,14,16

Write addition sentences to describe objects and pictures used for repeated addition.

Year 2- Multiplication

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

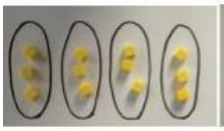
Our Objectives: Green numbers show the sequences for each objective

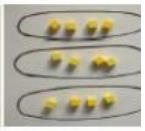
- count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward **2.1, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.11, 2.12, 2.13**
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers **2.6, 2.7, 2.13**
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (3), division (4) and equals (5) signs **2.7, 2.13**
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot **2.7, 2.13**
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts **2.7, 2.13**
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value **2.5, 2.7, 2.9**
- find different combinations of coins to equal the same amounts of money **2.5, 2.7, 2.9**
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times **2.7, 2.13**
- know the number of minutes in an hour and the number of hours in a day **2.7, 2.13**
- recognise, find, name and write fractions ⅓, ¼, ⅔ and ¾ of a length, shape, set of objects or quantity **2.13, 2.14**
- write simple fractions for example, ½ of 6 5 3 and recognise the equivalence of
- ⅔ and ½ **2.13, 2.14**

Pupils recall and use 2x 5x 10x, 3x and 4x table

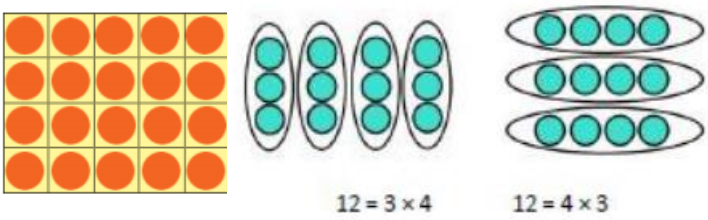
Manipulatives:

Creating Arrays- show that multiplication is commutative using rotation





Visuals:



Link arrays to the area of rectangles

4x3=12

Abstract:

5 + 5 + 5 = 15

3 + 3 + 3 + 3 + 3 = 15

5 x 3 = 15

3 x 5 = 15

X	3	
10	30	
4	12	
	42	

Introduce the simple grid method- only one 2 digit number (teens only) multiplied by a single digit number- reinforce place value

Year 3- Multiplication

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

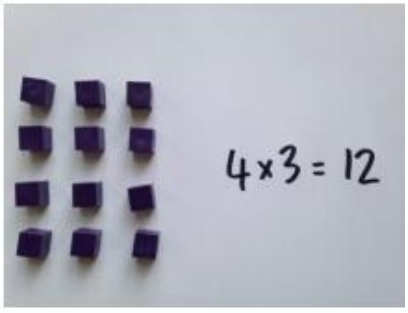
- recall and use multiplication facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to written methods
- solve problems involving missing number problems involving multiplication including positive number scaling problems and correspondence problems where n objects are connected to m objects

Our Objectives: **Green numbers show the sequences for each objective**

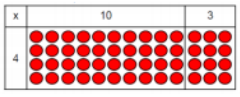
- count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number **3.1, 3.3, 3.5, 3.8, 3.10, 3.13**
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators **3.8, 3.13**
- solve problems that involve all of the above (fractions) **3.7, 3.8, 3.12, 3.13**
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables **3.3, 3.8, 3.13**
- write and calculate mathematical statements for multiplication and division using the multiplication tables that students know, including for two-digit numbers times one-digit numbers using mental and progressing to formal written methods **3.3, 3.8, 3.13**
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which *n* objects are connected to *m* objects **3.3, 3.8, 3.13**
- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 **3.5, 3.7, 3.8, 3.12 3.13**
- know the number of seconds in a minute and the number of days in each month, year and leap year **3.10, 3.11, 3.13**

Pupils recall and use 2x 5x 10x 3x 4x 8x

Manipulatives:

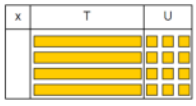


Show the link with arrays to first introduce the grid method.



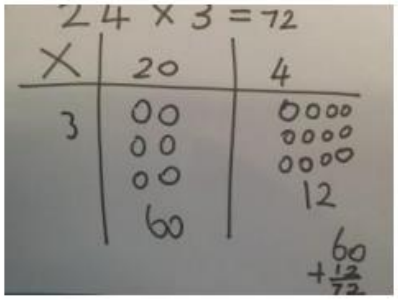
4 rows of 10
4 rows of 3

Move on to using Base 10 to move towards a more compact method.



4 rows of 13

Images:



Abstract:

×	30	5
7	210	35

210 + 35 = 245

$$\begin{array}{r} 2 \\ 64 \\ \times\ 7 \\ \hline 448 \end{array}$$

Year 4- Multiplication

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

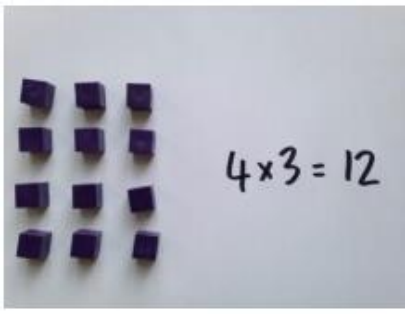
- recall and use multiplication facts for multiplication tables up to 12 x 12
- use place value, known and derived facts to multiply mentally, including: x0 x1 and multiplying together three numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying, including the distributive law to multiply two-digit numbers by one digit including positive number scaling problems and correspondence problems where n objects are connected to m objects.

Our Objectives: **Green numbers show the sequences for each objective**

- count in multiples of 6, 7, 9, 25 and 1000 **4.1, 4.3, 4.5, 4.8, 4.10, 4.13**
- recall multiplication and division facts for multiplication tables up to 12 X 12 **4.3, 4.8, 4.13**
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers **4.3, 4.8, 4.13**
- recognise and use factor pairs and commutativity in mental calculations **4.3, 4.8, 4.13**
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout **4.13**
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling and harder correspondence problems such as *n* objects are connected to *m* objects **4.3, 4.8, 4.13**
- solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number **4.8, 4.13**
- solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days **4.8, 4.10, 4.13**

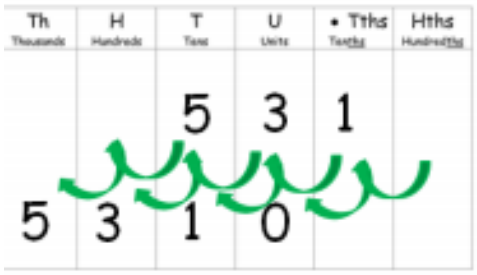
Pupils recall and use tables facts up to 12 x 12

Manipulatives:



Also repeat with replacing units with 100 etc.

Images:

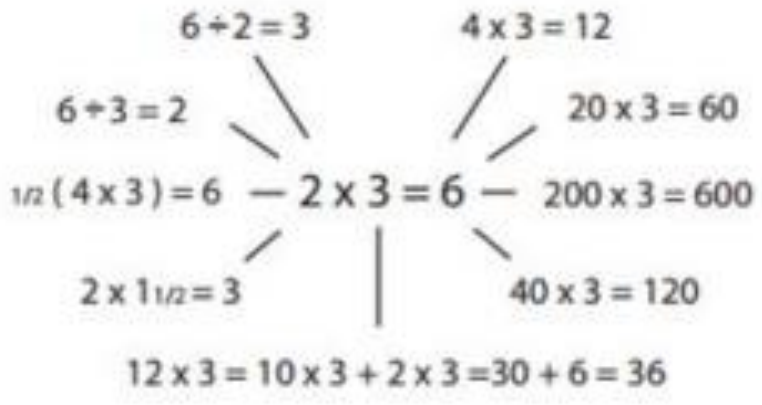


Abstract:

$$\begin{array}{rrr} 1 & 4 & 3 \\ \times & & 6 \\ \hline 8 & 5 & 8 \\ 2 & 1 & \end{array}$$

Use expanded short multiplication if struggling with carrying

$$\begin{array}{rrr} 1 & 4 & 3 \\ & \times & 6 \\ \hline & 1 & 8 \\ 2 & 4 & 0 \\ 6 & 0 & 0 \\ \hline 8 & 5 & 8 \end{array}$$



Year 5- Multiplication

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- identify multiples and factors: all factor pairs of a number, common factors of two numbers, establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to four digits by a one- or two-digit number using a formal written method
- multiply whole numbers and those involving decimals by 10, 100 and 1000.

Our Objectives: **Green numbers show the sequences for each objective**

- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation including scaling **5.2, 5.3, 5.6, 5.8, 5.11, 5.13**
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers **5.3, 5.8, 5.13**
- multiply numbers up to 4 digits by a one– or two-digit number using a formal written method including long multiplication for two-digit numbers **5.3, 5.8, 5.13**
- multiply and divide numbers mentally drawing upon known facts **5.3, 5.8, 5.13**
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context **5.3, 5.8, 5.13**
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 **5.1, 5.3, 5.5, 5.7, 5.8, 5.10, 5.12, 5.13**
- recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) **5.8, 5.13**
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes **5.3, 5.8, 5.13**
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign **5.3, 5.8, 5.13**
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers **5.8, 5.13**
- establish whether a number up to 100 is prime and recall prime numbers up to 19 **5.8, 5.13**
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates **5.8, 5.13**
- solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those with a denominator of a multiple of 10 or 25 **5.8, 5.13**
- identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths **5.7, 5.13**
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams **5.13**
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints **5.13**

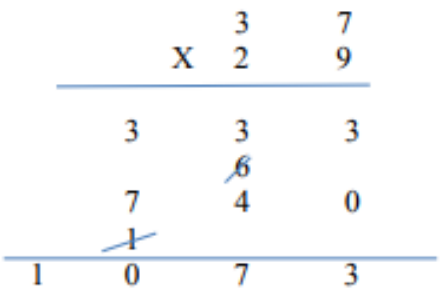
Manipulatives:

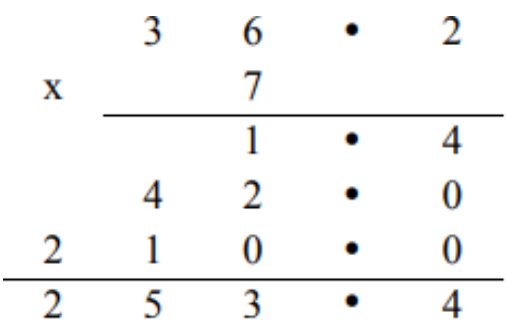
See previous years

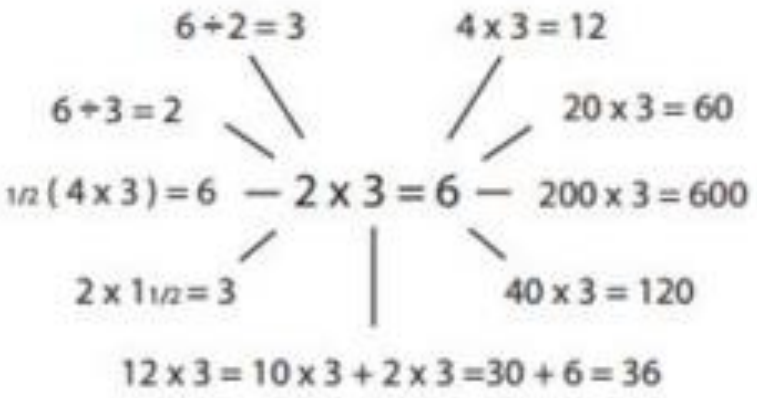
Images:

See previous years

Abstract:






6÷2=3
4x3=12
6÷3=2
20x3=60
1/2(4x3)=6
2x3=6
200x3=600
2x1 1/2=3
40x3=120
12x3=10x3+2x3=30+6=36

Year 6- Multiplication

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- identify multi-digit numbers up to 4 digits by a two-digit number using formal, long multiplication
- identify common factors, common multiples and common prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations

Our Objectives: **Green numbers show the sequences for each objective**

- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places **6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.10, 6.11, 6.12, 6.13**
- solve problems involving addition, subtraction, multiplication and division **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- express missing number problems algebraically **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- use simple formulae **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- generate and describe linear number sequences **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- find pairs of numbers that satisfy an equation with two unknowns **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- enumerate possibilities of combinations of two variables **6.2, 6.3, 6.4, 6.6, 6.8, 6.9, 6.11, 6.13, 6.14**
- solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- interpret and construct pie charts and line graphs and use these to solve problems **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication **6.3, 6.8, 6.13**
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context **6.3, 6.8, 6.13**
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context **6.3, 6.8, 6.13**
- perform mental calculations, including with mixed operations and large numbers **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**

identify common factors, common multiples and prime numbers **6.3, 6.8, 6.13**

Manipulatives:

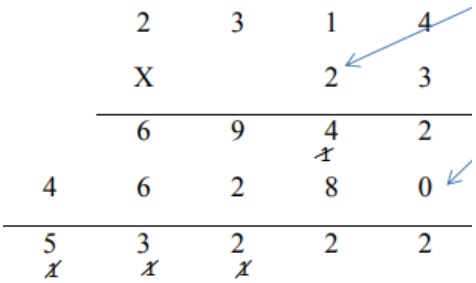
See previous years

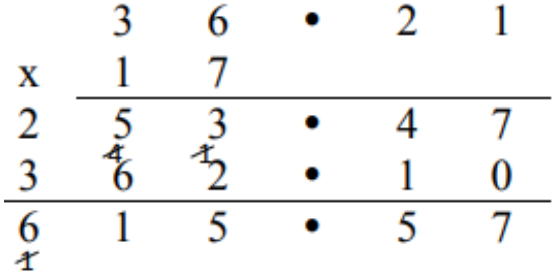
Images:

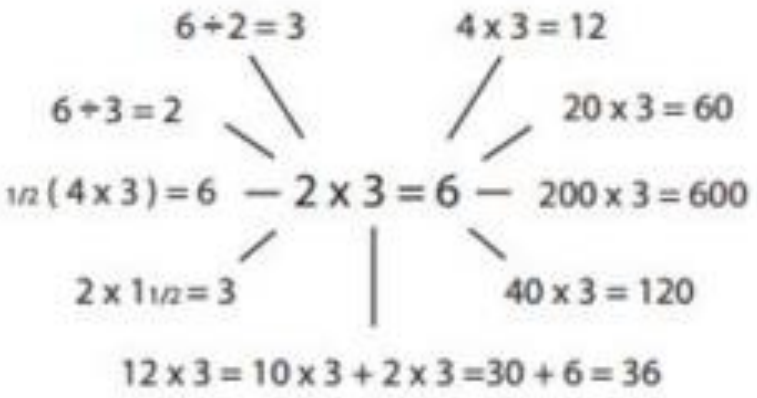
See previous years

Abstract:

2 3 1 4 x 2 3 =






6÷2=3
4x3=12
6÷3=2
20x3=60
1/2(4x3)=6
2x3=6
200x3=600
2x1 1/2=3
40x3=120
12x3=10x3+2x3=30+6=36

Foundation- Division

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

Early Learning Goal: Children count reliably with numbers from one 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 two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

Manipulatives:

Year 1- Division

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

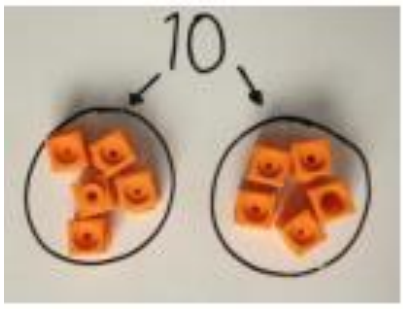
- solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Our Objectives: **Green numbers show the sequences for each objective**

- count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens **1.1, 1.4, 1.6, 1.7, 1.8, 1.11, 1.13**
- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher **1.7, 1.13**
- recognise, find and name a half as one of two equal parts of an object, shape or quantity **1.13, 1.14**
- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity **1.13, 1.14**

Manipulatives:

Sorting of objects into the correct number of groups



Visuals:

Abstract:

10 ÷ 2 = 5

Year 2- Division

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for division within the multiplication tables and write them using the signs ÷ and =
- show that multiplication of two numbers is commutative but division is not
- solve problems involving division using materials, arrays, repeated addition, mental methods and division facts, including problems in contexts.

Our Objectives: **Green numbers show the sequences for each objective**

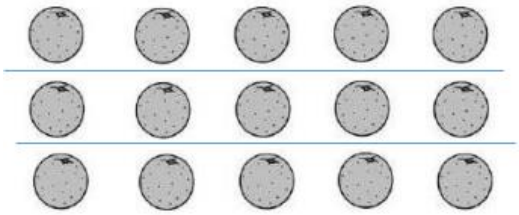
- count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward **2.1, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.11, 2.12, 2.13**
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers **2.6, 2.7, 2.13**
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (3), division (4) and equals (5) signs **2.7, 2.13**
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot **2.7, 2.13**
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts **2.7, 2.13**
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value **2.5, 2.7, 2.9**
- find different combinations of coins to equal the same amounts of money **2.5, 2.7, 2.9**
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times **2.7, 2.13**
- know the number of minutes in an hour and the number of hours in a day **2.7, 2.13**
- recognise, find, name and write fractions ⅓, ¼, ⅔ and ¾ of a length, shape, set of objects or quantity **2.13, 2.14**
- write simple fractions for example, ½ of 6 5 3 and recognise the equivalence of
- ⅔ and ½ **2.13, 2.14**

Manipulatives:

Link division to multiplication by creating an array and thinking about the number sentences that can be created.

Eg 15 ÷ 3 = 5 5 x 3 = 15
15 ÷ 5 = 3 3 x 5 = 15

Visuals:



Draw an array and use lines to split the array into groups to make multiplication and division sentences.

Abstract:

15 ÷ 5 = 3

Year 3- Division

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- recall and use multiplication and division facts for the 3, 4 and 8 x tables
- write and calculate mathematical statements for division using the multiplication tables they know, including 2-digit divided by 1-digit using mental and progressing to formal written methods
- solve problems, involving missing number problems, involving division, including positive number scaling problems and correspondence problems where n objects are connected to m objects.

Our Objectives: **Green numbers show the sequences for each objective**

- count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number **3.1, 3.3, 3.5, 3.8, 3.10, 3.13**
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators **3.8, 3.13**
- solve problems that involve all of the above (fractions) **3.7, 3.8, 3.12, 3.13**
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables **3.3, 3.8, 3.13**
- write and calculate mathematical statements for multiplication and division using the multiplication tables that students know, including for two-digit numbers times one-digit numbers using mental and progressing to formal written methods **3.3, 3.8, 3.13**
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which *n* objects are connected to *m* objects **3.3, 3.8, 3.13**
- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 **3.5, 3.7, 3.8, 3.12 3.13**
- know the number of seconds in a minute and the number of days in each month, year and leap year **3.10, 3.11, 3.13**

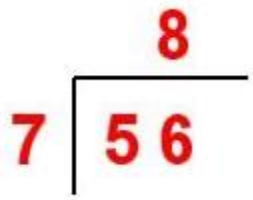
Manipulatives:

See previous years

Images:

See previous years

Abstract:



Encourage children to use their knowledge of multiplication facts.

Year 4- Division

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- recall multiplication and division facts up to 12 x 12
- use place value, known and derived facts to divide mentally, including dividing by 1
- solve problems involving dividing a three-digit number by one-digit and number using a formal layout

Our Objectives: **Green numbers show the sequences for each objective**

- count in multiples of 6, 7, 9, 25 and 1000 **4.1, 4.3, 4.5, 4.8, 4.10, 4.13**
- recall multiplication and division facts for multiplication tables up to 12 X 12 **4.3, 4.8, 4.13**
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers **4.3, 4.8, 4.13**
- recognise and use factor pairs and commutativity in mental calculations **4.3, 4.8, 4.13**
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout **4.13**
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling and harder correspondence problems such as *n* objects are connected to *m* objects **4.3, 4.8, 4.13**
- solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number **4.8, 4.13**
- solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days **4.8, 4.10, 4.13**

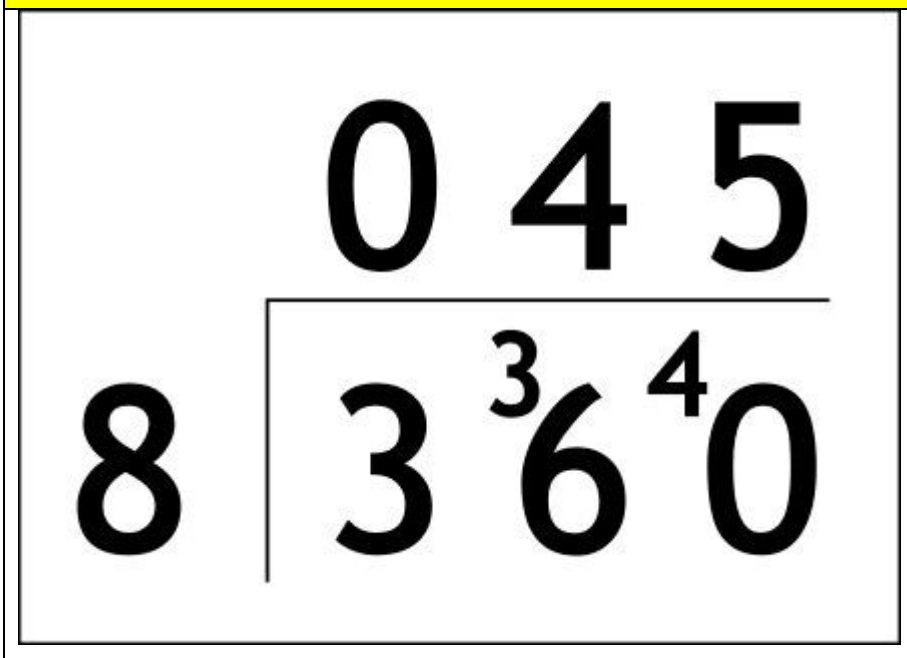
Manipulatives:

See previous years

Images:

See previous years

Abstract:



Year 5- Division

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- identify multiples and factors, including finding all factor pairs of a number, common factors of two numbers, know and use the vocabulary of prime numbers and establish whether a number up to 100 is prime
- multiply and divide numbers mentally drawing on known facts
- divide numbers up to 4 digits by a one-digit number using a written method and interpret remainders appropriately for the context
- divide whole numbers and those involving decimals by 10, 100 and 1000.

Our Objectives: **Green numbers show the sequences for each objective**

- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation including scaling **5.2, 5.3, 5.6, 5.8, 5.11, 5.13**
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers **5.3, 5.8, 5.13**
- multiply numbers up to 4 digits by a one– or two-digit number using a formal written method including long multiplication for two-digit numbers **5.3, 5.8, 5.13**
- multiply and divide numbers mentally drawing upon known facts **5.3, 5.8, 5.13**
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context **5.3, 5.8, 5.13**
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 **5.1, 5.3, 5.5, 5.7, 5.8, 5.10, 5.12, 5.13**
- recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) **5.8, 5.13**
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes **5.3, 5.8, 5.13**
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign **5.3, 5.8, 5.13**
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers **5.8, 5.13**
- establish whether a number up to 100 is prime and recall prime numbers up to 19 **5.8, 5.13**
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates **5.8, 5.13**
- solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those with a denominator of a multiple of 10 or 25 **5.8, 5.13**
- identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths **5.7, 5.13**
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams **5.13**
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints **5.13**

Manipulatives:

See previous years

Images:

See previous years

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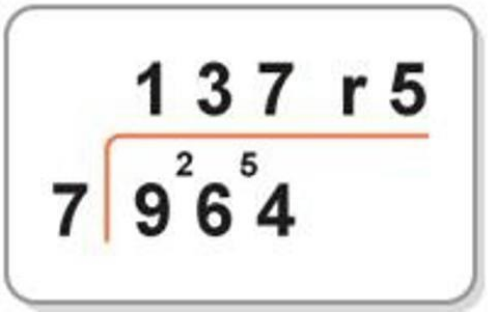

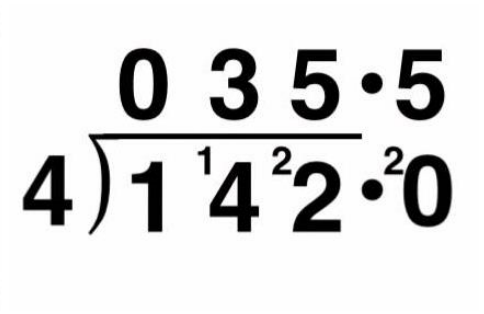

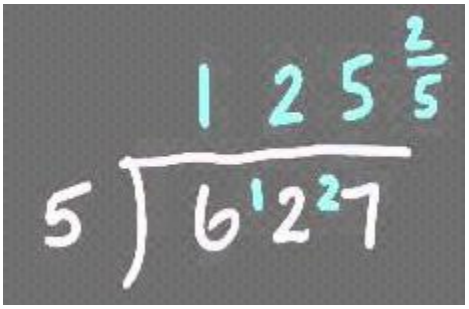

Year 6- Division

Curriculum 2014 Statutory Requirements:

Pupils should be taught to:

- divide numbers up to 4 digits by a two-digit number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division as appropriate.

Our Objectives: **Green numbers show the sequences for each objective**

- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places **6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.10, 6.11, 6.12, 6.13**
- solve problems involving addition, subtraction, multiplication and division **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**
- express missing number problems algebraically **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- use simple formulae **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- generate and describe linear number sequences **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- find pairs of numbers that satisfy an equation with two unknowns **6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14**
- enumerate possibilities of combinations of two variables **6.2, 6.3, 6.4, 6.6, 6.8, 6.9, 6.11, 6.13, 6.14**
- solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- interpret and construct pie charts and line graphs and use these to solve problems **6.2, 6.3, 6.6, 6.7, 6.8, 6.11, 6.12, 6.13**
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication **6.3, 6.8, 6.13**
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context **6.3, 6.8, 6.13**
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context **6.3, 6.8, 6.13**
- perform mental calculations, including with mixed operations and large numbers **6.2, 6.3, 6.6, 6.8, 6.11, 6.13**

identify common factors, common multiples and prime numbers **6.3, 6.8, 6.10**

Manipulatives:

See previous years

Images:

See previous years

Abstract: