Birchington CE Primary School

Maths & Calculations Policy

Purpose of study

"Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject."
National Curriculum 2014

Aims

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

In addition the school aims for all pupils to have equality of opportunity:

- to enjoy Mathematics, be successful and have a positive and enthusiastic attitude to the subject.
- to use Mathematics as part of their everyday life in school and at home.

Objectives

- To provide an aspirational Mathematics curriculum ensuring that all pupils follow a broad and balanced Mathematical programme based on the requirements of the 2014 National Curriculum
- To ensure that all pupils are provided with interesting and challenging tasks that enables them to achieve standards commensurate with their abilities and potential.
- To ensure that pupils can work individually, collaboratively in groups and within the whole class.
- To allow pupils to develop as independent learners, able to make decisions about their own work.
- To ensure that all pupils thrive in Mathematics, regardless of their individual unique starting point.

Principles of Teaching and Learning

Our teaching and learning strategy is based on both the Early Learning Goals for the EYFS and the 2014 National Curriculum (Yrs 1 to 6).

The Mathematics curriculum covers the following areas: Number (place value, four operations, and fractions), Measurement, Geometry (properties of shapes, position and direction) and Statistics.

Our expectation is that all pupils will be Mathematicians who should be able to:

- understand the number system
- manipulate numbers by using
    - inverse relationship
    - number bonds, times tables and other key facts
    - doubling and halving, estimate, rounding and adjusting
    - partitioning and recombining
    - x 10, x 100, x 1000 and divide by 10, 100, 1000
- be able to calculate mentally and using written calculations
- use jottings and other informal strategies
- explain methods and reasoning
- make and test predictions
- understand that Maths is not just about finding the correct answer or there being only one correct answer
- use appropriate resources
- read tables, diagrams, scales and charts
- understand a whole variety of Maths vocabulary
- know how to answer word problems and convert these to number sentences
- know how to solve a range of Mathematical problems
- develop resilience

Enrichment and Additional Educational Needs

Maths is taught in class groups across the school. Every pupil has access to challenging work within their learning group and the less able are supported ~~through~~ in a variety of ways including the use of manipulatives, differentiation, consolidation and reinforcement activities promoting confidence and refining their skills. A variety of methods are used to support gaps in learning as appropriately assessed by the teacher.

Staff are encouraged to use ICT to consolidate and extend learning to support all pupils in their Mathematical learning.

During lessons pupils may work in groups on tasks linked to the learning questions of the lesson. Teaching is organised to enable pupils of all abilities access to the learning. Following the introduction of the lesson, groups of pupils may sometimes move outside the classroom to carry out practical work, to use ICT or to work with support staff. All pupils return to be present for the plenary session at the end of the lesson. The most able pupils are provided with appropriate challenges to ensure they are stretched. In all lessons pupils are given appropriate work and support so they can access the Learning Questions. All pupils may be supported by the class

teacher or teaching assistant as appropriate. Individualised materials are used to broaden their understanding of topics when appropriate. Homework is appropriately set according to the school's Homework Policy.

Breadth and Balance

The curriculum includes a full range of Mathematical activities covering all aspects of the subject including Number, Measurement, Geometry and Statistics. We teach a balance of Fluency, Reasoning skills and Problem Solving (including practical investigations and oral activities).

Planning

The school has developed its own Schemes of Work (SoW) based entirely on the 2014 National Curriculum.

Each year group's Statutory Objectives are taught within blocks of between 1 to 6 weeks in length. Some topics are taught within one block in a year (ie Statistics) whilst topics within Number are taught in multiple blocks across an academic year. This ensures that key concepts are explicitly taught more than once in an academic year. The long-term planning has been decided upon by the Mathematics Hub.

Within each block, there are the statutory objectives that are covered and these are taught through the Key Skills that comprise those statutory objectives. The related objectives taught in the previous year are also included. Teachers predominantly use resources from White Rose Maths and the NCETM Mastery materials.

Teachers may also use gap analysis to inform planning. Weekly plans identify learning questions, teaching strategies, activities and tasks, groupings and enrichment and Steps to Success (S2S).

Our three key principles are:

- regular lessons every day
- a clear focus on direct, instructional teaching and interactive oral and practical work with the whole class and groups
- learning and applying skills and explaining mathematical thinking.

Lesson Structure

Subject:	**Approximate times**:
1. Counting activity	5 to 10 minutes (KS1 only)
2. Oral work and mental calculation Whole class work	10 to 15 minutes 'Warm up and workout'
3. Main teaching activity Teaching input and pupil activities	40 minutes (Key Stage 1) 40 - 45 minutes (Key Stage 2)*
4. Plenary	10 minutes

* Key Stage 1 Maths lesson are taught in 1 hour 10 minutes sessions between break and lunch. Key Stage 2 Maths lesson are taught in 1 hour 30 minutes sessions before break.

In addition, in EYFS, Years 1 and 2, all classes have 10 minutes daily Mastering Number in KS1 sessions to improve number bonds/subitising skills.

~~In 2023-24, the school participated in training for Mastering Number in KS2 sessions – focusing on multiplicity.~~

Frequently used resources such as digit cards, place value cards, number lines, number activities and games are available in each year group. Additional resources are kept within the Maths cupboard.

Lessons will have clear Learning Questions that are communicated to the pupils. The focus is on direct teaching that is oral and interactive. It will involve different elements for both the pupils and the staff:

- Modelling – showing how to
- Questioning reasoning– giving examples, explaining thinking, deciding what is the same/different
- Discussion & evaluation – talking about methods, errors, misconceptions, weakness
- Direction – taking care, presenting work clearly and neatly

Display will be used around the school to celebrate and illustrate good work.

Assessment, Recording and Reporting

Teachers are expected to make regular assessments of pupils' progress and record them systematically for future planning and pupil tracking. This involves:

- Informal testing of mental recall & calculation, eg times tables, number bonds
- Regular arithmetic tests
- Daily marking of children's work in books
- Regular use of Testbase materials
- Regular low stakes assessments/quizzes in class
- Assessment and recording of individual pupil's progress against each Statutory Objective on an on-going basis as and when they are taught
- 3 x termly assessments in fluency and reasoning in each year group from Year 1 Term 4 to Year 6 Term 6.
- 3 x termly assessments against the Rainbow Tracker for each pupil for data analysis
- Summative assessment weeks in May– KS SATs Years 6

Cross-Curricular Skills and Links

The teaching of Mathematics in the school is valued for the potential to apply Maths to practical activities and other areas of the curriculum as applicable.

Equal Opportunities

There is a school equal opportunities policy which is applied to Mathematics. Teaching materials are chosen to reflect the culture and ethnic diversity of our society. We try to avoid stereotyping through gender or race. Pupils' performance is monitored to ensure that no group of pupils is disadvantaged and when vulnerable groups are highlighted, staff are quick to respond. In lessons the full participation of both girls and boys is encouraged and care is taken to ensure that the emphasis on whole class teaching does not disadvantage any gender group.

Health & Safety

In line with the school's health and safety policy, pupils are instructed in the safe use of all equipment. Pupils working outside a classroom will always work under supervision.

Role of Hub Driver

Please refer to the job description of that individual.

Resourcing

An annual review of resources needs is overseen by the Mathematics Hub.

This plan has had an Equality Impact Assessment and it has not identified any adverse impact at this point.

Date written: LA January 2025
To be reviewed January 2026

Calculations Policy

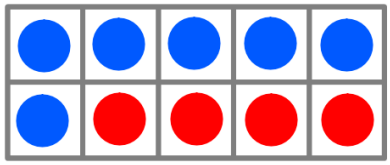
Year 1

Addition and subtraction programme of study

- Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Add and subtract one-digit and two-digit numbers to 20, including zero
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = …… – 9

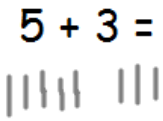
Examples:

6 + 4 = 10 10 - 6 = 4



* 5 + 3 =

5 + 3 =



5 - 3 =

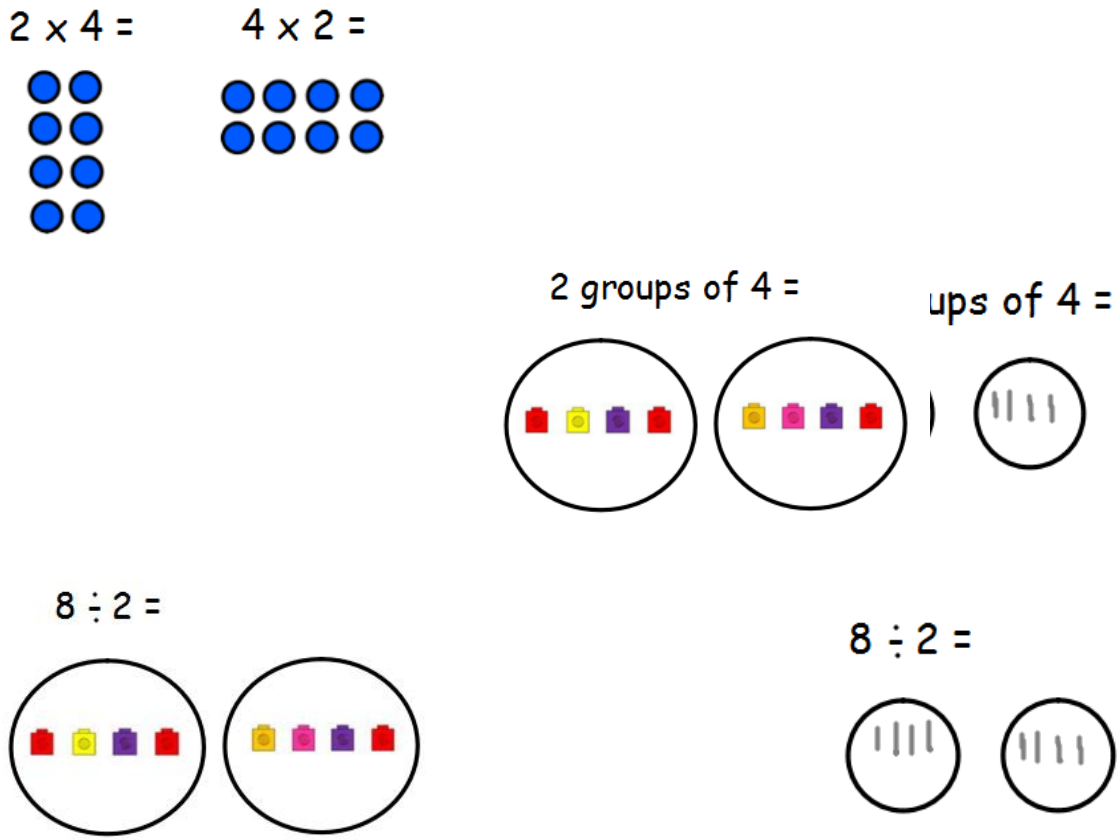
* 12 + 2 =

**Subtraction to use same equipment. For e.g. removing 3 cubes for – 3*

Multiplication and division programme of study

- 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

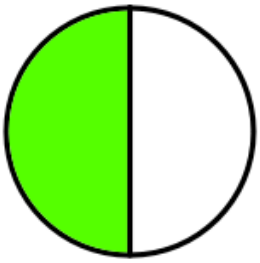
Examples

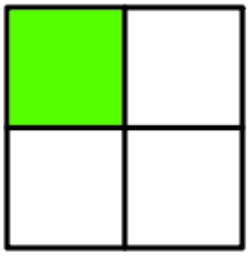


Fractions programme of study

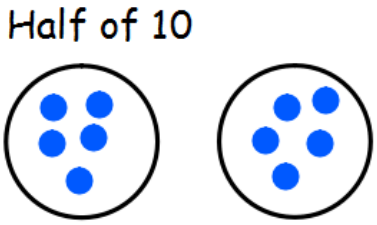
- Recognise, find and name a half as one of two equal parts of an object, shape or quantity
- Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

Examples





*using counters



Year 2

Addition programme of study

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.

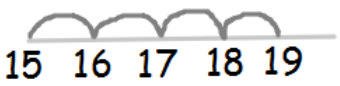
Add (and subtract) numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers.

Show that addition of two numbers can be done in any order (and subtraction from one number of another cannot).

Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

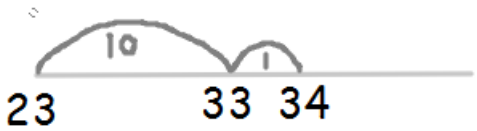
Examples:

15 + 4 =



7 + 4 + 2=

23 + 11 =



23 + 11 =

	T	O
	1	4
+	2	5
	3	9

	T	O
	2	4
+	1	8
	4	2
	1	

Subtraction programme of study

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.

(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.

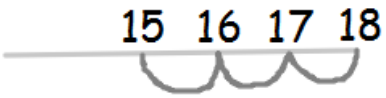
Show that addition of two numbers can be done in any order and subtraction from one number of another cannot.

Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Examples

11 - 4 =

18 - 3 =



25 - 11 =

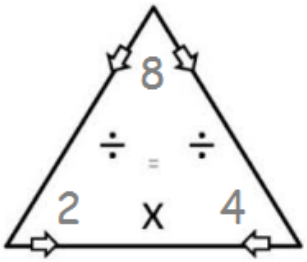
	T	O
	2	4
-	1	2
	1	2

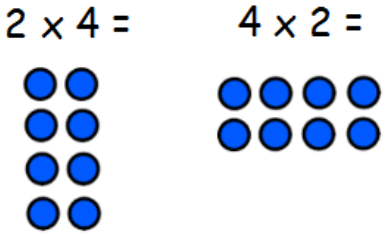
NB No exchanging taught in Year 2

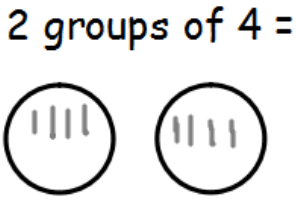
Multiplication programme of study

- 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 multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) 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.

Examples



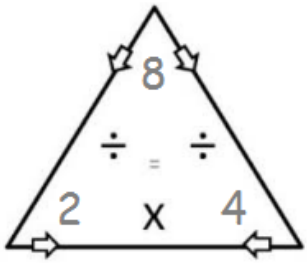


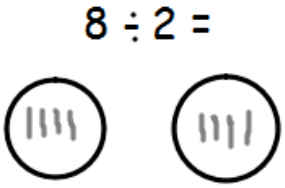


Division programme of study

- 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 (multiplication and) division within the multiplication tables and write them using the (multiplication (×),) division (÷) 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.

Examples

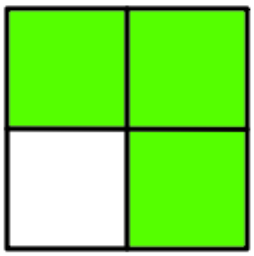


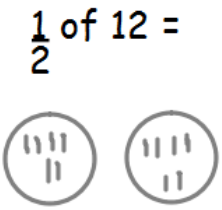


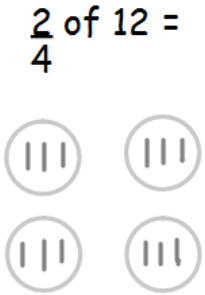
Fractions programme of study

- Recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity
- Write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2

Examples





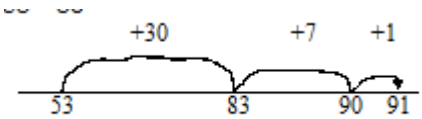


Year 3

Addition programme of study

- Add numbers with up to three digits, using formal written methods of
- columnar addition.
- 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.

Examples:



672
+ 16
688

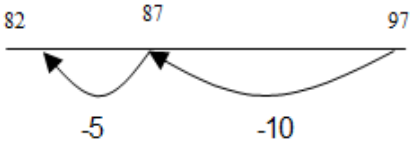
476
+403
879

	6	7	7
+	1	6	0
	8	3	7
	1		

Subtraction programme of study

- 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.

Examples



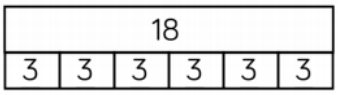
	3 ~~4~~	1 3	4
–		7	2
	3	6	2

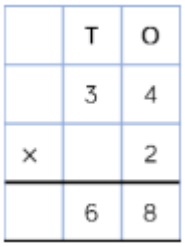
427
– 233
194

Multiplication programme of study

- 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 formal written methods.
- Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Examples

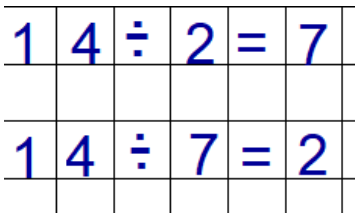


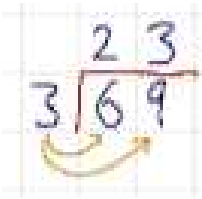


Division programme of study

- Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.
- Solve problems, including missing number problems, involving division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Examples





Adding and subtracting fractions programme of study

- Add and subtract fractions with the same denominator within one whole.

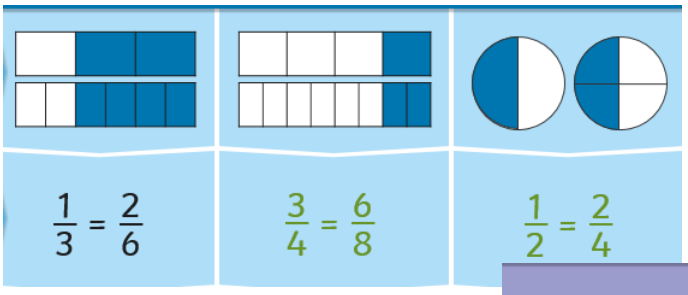
Examples

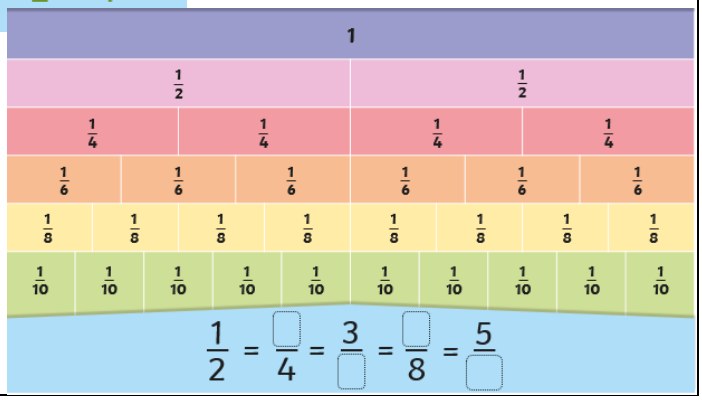
$\frac{1}{7} + \frac{4}{7} = \frac{5}{7}$ $\frac{6}{9} - \frac{4}{9} = \frac{2}{9}$

Finding equivalent fractions programme of study

- Recognise and show, using diagrams, equivalent fractions with small denominators

Example



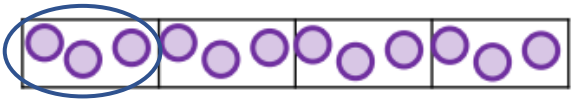


Calculating quantities programme of study

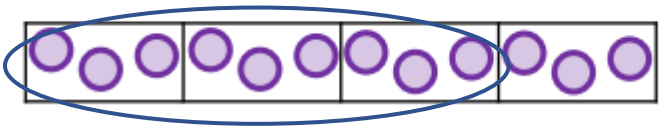
- Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

Example

Dexter has used a bar model and counters to find $\frac{1}{4}$ of 12



Dexter has used a bar model and counters to find $\frac{3}{4}$ of 12

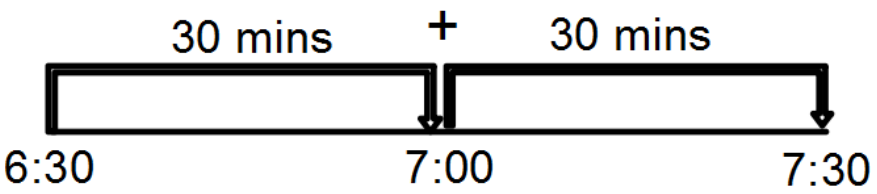


Time programme of study

- Compare durations of events [for example to calculate the time taken by particular events or tasks].

Examples

6:30 to 7:30 = 1 hour



Year 4

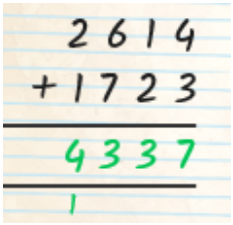
Addition programme of study

- Add numbers with up to 4 digits using the formal written methods of columnar addition 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.

Examples:

	2	4	2	0
+	3	2	5	1
	5	6	7	1

	Th	H	T	O
	3	3	5	6
+	2	4	3	5
	5	7	9	1
			1	



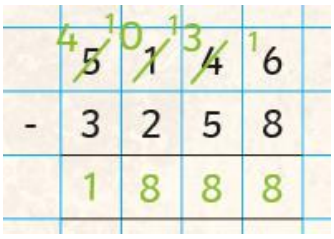
Subtraction programme of study

- 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 subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Examples

	Th	H	T	O
	3	4	5	4
–	1	2	2	4
	2	2	3	0

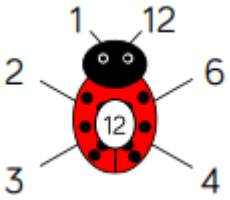
	Th	H	T	O
	5	6	~~3~~ 4	13
–	4	3	1	6
	1	3	2	7



Multiplication programme of study

- Recall multiplication facts for multiplication tables up to 12 × 12.
- Use place value, known and derived facts to multiply mentally.
- 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.

Examples



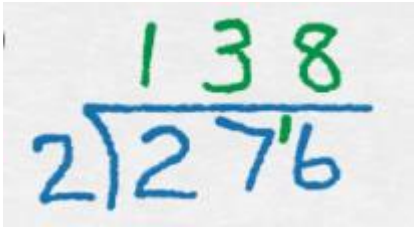
	H	T	O
		3	4
×			5
	1	7	0
	1	2	

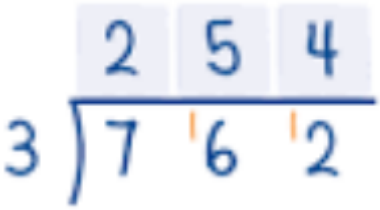
	H	T	O
	2	4	2
×			4
	9	6	8
	1		

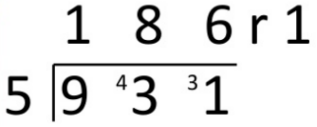
Division programme of study

- Recall division facts for multiplication tables up to 12 × 12.
- Use place value, known and derived facts to divide mentally.
- Recognise and use factor pairs and commutativity in mental calculations.
- Introduce short division method by dividing numbers up to 3 digits by a one-digit.
- Solve problems involving dividing.

Examples



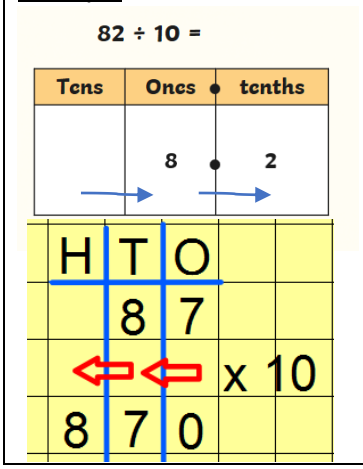


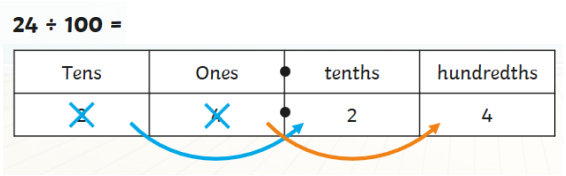


Multiplying and dividing by 1, 10 and 100 programme of study

- Use place value, known and derived facts to multiply and divide mentally.
- Multiply and divide numbers by 1, 10 and 100.

Example

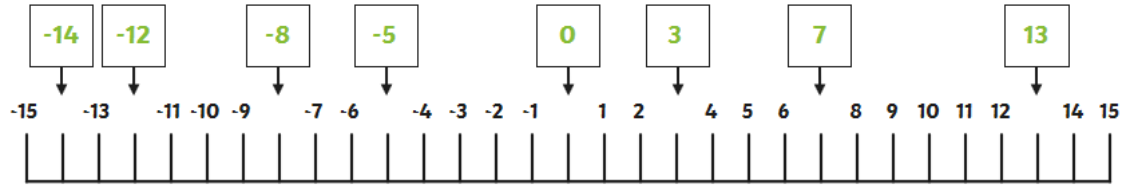


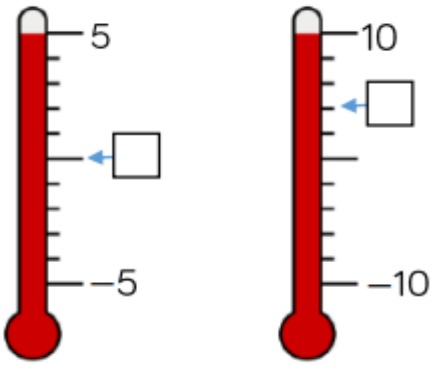


Negative numbers

- Count backwards through zero to include negative numbers.

Examples





Rounding programme of study

- Round any number to the nearest 10, 100 or 1000.
- Round decimals with one decimal place to the nearest whole number.

Example

Round 5.4 to the nearest whole.

5.4

1, 2, 3, 4 – Leave it alone

5, 6, 7, 8, 9 – Round up

=5

Round 654 to the nearest ten.

654

1, 2, 3, 4 – Leave it alone

5, 6, 7, 8, 9 – Round up

=650

Adding and subtracting fractions programme of study

- Add and subtract fractions with the same denominator

Examples

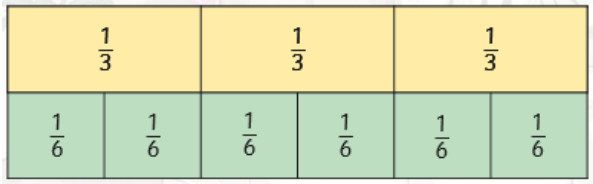
$\frac{1}{7} + \frac{4}{7} = \frac{5}{7}$ $\frac{2}{4} + \frac{5}{4} = \frac{7}{4}$ $\frac{1}{4} + \frac{3}{4} + \frac{2}{4} = \frac{6}{4}$ or $1\frac{2}{4}$

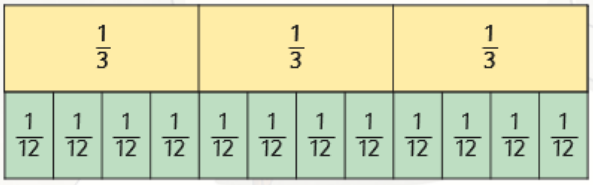
$\frac{6}{9} - \frac{4}{9} = \frac{2}{9}$

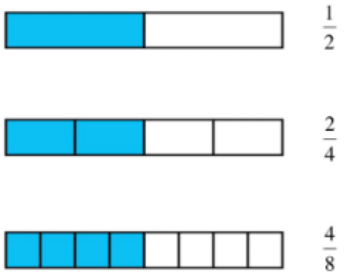
Finding equivalent fractions programme of study

- Recognise and show, using diagrams, families of common equivalent fractions.
- Recognise and write decimal equivalents to $\frac{1}{2}, \frac{1}{4}, \frac{1}{3}$

Example







$$\frac{1\times 2}{2\times 2}=\frac{2}{4}$$

$$\frac{1\times 4}{2\times 4}=\frac{4}{8}$$

Calculating quantities programme of study

- Solve problems involving increasingly harder fractions to calculate quantities.

Example

$\frac{1}{4}$ of 36 = 36 ÷ 4 = 9

$\frac{1}{4}$ of 36 = 36 ÷ 4 = 9

$\frac{2}{4}$ of 36 = 36 ÷ 4 x 2 = 18

$\frac{3}{4}$ of 36 = 36 ÷ 4 x 3 = 27

Year 5

Addition programme of study

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

Examples.

789 + 642 becomes

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

Answer: 1431

$$\begin{array}{r} 72.8 \\ +54.6 \\ \hline 127.4 \\ \hline 1\ 1 \end{array}$$

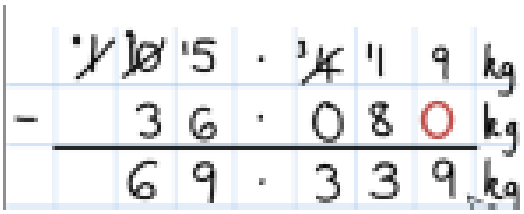
Insert zeros for place holders.

$$\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ +\ 1.300 \\ \hline 93.511 \end{array}$$

Subtraction programme of study

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

Examples



Multiplication programme of study

- 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
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign

Examples

12

1	12
2	6
3	4

2741 × 6 becomes

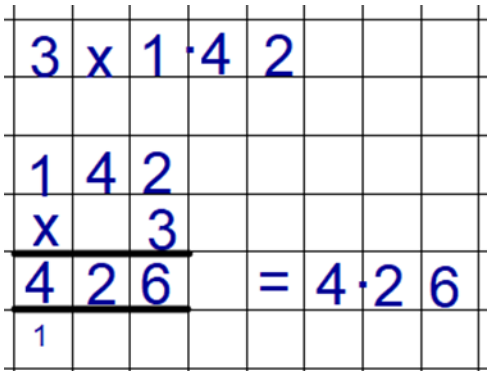
$$\begin{array}{cccc} 2 & 7 & 4 & 1 \\ \times & & & 6 \\ \hline 1 & 6 & 4 & 4 & 6 \\ \hline & 4 & 2 & & \end{array}$$

Answer: 16 446

124 × 26 becomes

$$\begin{array}{cccc} & 1 & 2 & \\ & 1 & 2 & 4 \\ \times & & 2 & 6 \\ \hline 2 & 4 & 8 & 0 \\ & 7 & 4 & 4 \\ \hline 3 & 2 & 2 & 4 \\ \hline 1 & 1 & & \end{array}$$

Answer: 3224

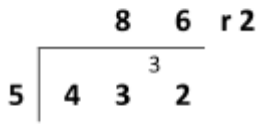


Division programme of study

- 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
- Pupils interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding
  (for example, 98 ÷ 4 = 98/4 = 24 r 2 = 24 ½ = 24.5 ≈ 25).

Examples

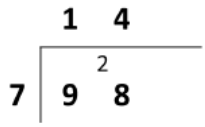
432 ÷ 5 becomes



Answer: 86 remainder 2

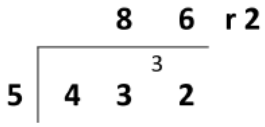
Short division

98 ÷ 7 becomes



Answer: 14

432 ÷ 5 becomes



Answer: 86 remainder 2

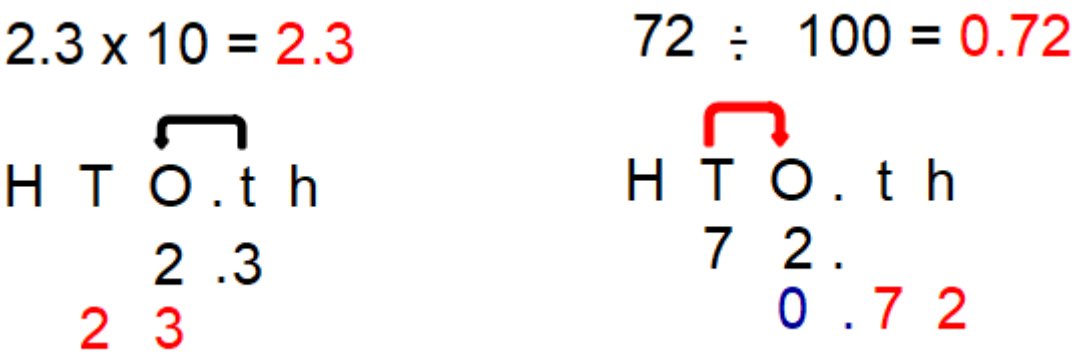
496 ÷ 1

Answe

Multiplying and dividing by 1, 10, 100 and 1000 programme of study

- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.
- use their knowledge of place value and multiplication and division to convert between standard units of measure e.g. g to kg, cm to m.

Example



Rounding programme of study

- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- round decimals with two decimal places to the nearest whole number and to one decimal place

Example

Round 3475 to the nearest ten.

3 4 7 5

1, 2, 3, 4 – Leave it alone

5, 6, 7, 8, 9 – Round up

=3480

Round 4.56 to one decimal place.

4.5 6

1, 2, 3, 4 – Leave it alone

5, 6, 7, 8, 9 – Round up

Adding fractions programme of study

- add fractions with the same denominator and denominators that are multiples of the same number
- practise adding fractions to become fluent through a variety of increasingly complex problems.
- extend their understanding of adding fractions to calculations that exceed 1 as a mixed number.

Examples

$\frac{3}{4} + \frac{1}{3} =$ LCM= 12

x3 x4

$\frac{3}{4} = \frac{9}{12}$ $\frac{1}{3} = \frac{4}{12}$

x3 x4

$\frac{9}{12} + \frac{4}{12} = \frac{13}{12} = 1\frac{1}{12}$

Subtract fractions programme of study

- subtract fractions with the same denominator and denominators that are multiples of the same number
- practise subtracting fractions to become fluent through a variety of increasingly complex problems.
- extend their understanding of subtracting fractions to calculations that exceed 1 as a mixed number.

Example

$\frac{3}{4} - \frac{1}{3} =$ LCM= 12

x3 x4

$\frac{3}{4} = \frac{9}{12}$ $\frac{1}{3} = \frac{4}{12}$

x3 x4

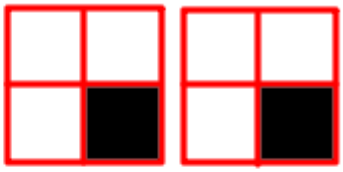
$\frac{9}{12} - \frac{4}{12} = \frac{5}{12}$

Multiply fractions programme of study

- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- Pupils connect multiplication by a fraction to using fractions as operators (fractions of),

Example

$\frac{1}{4} \times 2$



$\frac{1}{4} \times \frac{2}{1} = \frac{2}{4}$

Find 2/3 of 12

$\frac{2}{3}$ of 12 =

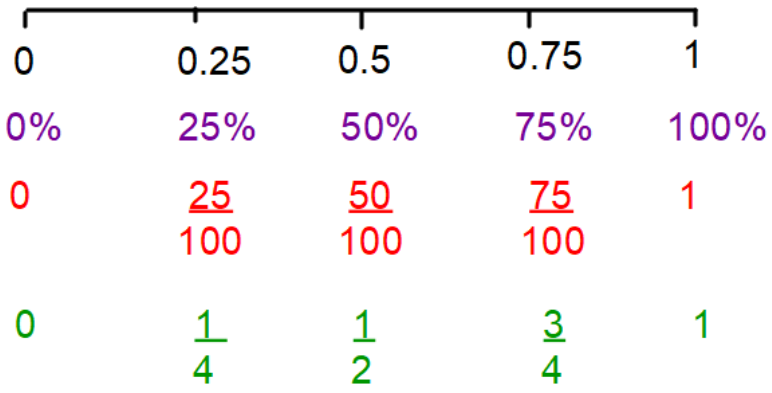
$\frac{1}{3}$ of 12 = 12 ÷ 3 = 4

$\frac{2}{3}$ of 12 = 4 x 2 = 8

Percentages programme of study

- recognise the per cent symbol (%)
- understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
- solve problems which require knowing percentage and decimal equivalents of ½ , ¼, 1/5, 2/5 and those fractions with a denominator of a multiple of 10 or 25
- Pupils should make connections between percentages, fractions and decimals for example, 100% represents a whole quantity, 1% is 1/100, 50% is 50/100, 25% is 25/100 and relate this to finding 'fractions of'.

Example



25% of 40

25% = 1/4

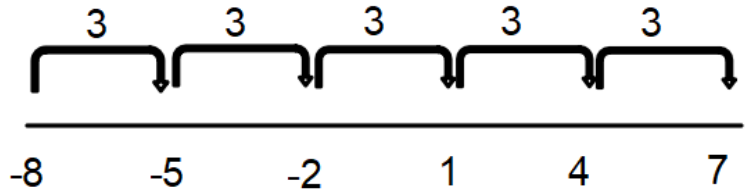
1/4 of 40 = 40 ÷ 4 = 10

Negative numbers

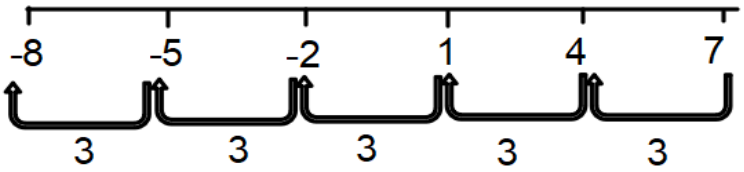
- interpret negative numbers in context
- count forwards and backwards with positive and negative whole numbers, including through zero

Examples

Counting forwards



Counting backwards



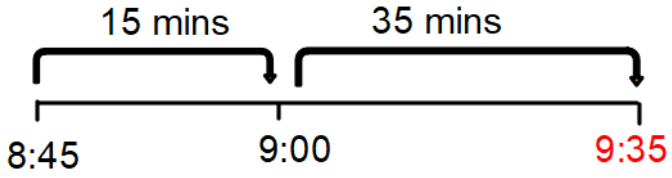
Time programme of study

- solve problems involving converting between units of time
- use all four operations in problems involving time, including conversions (for example, days to weeks, expressing the answer as weeks and days).

Examples

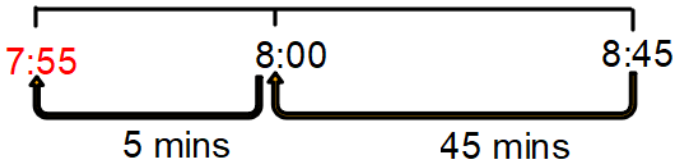
Addition

8:45pm + 50 mins = 9:35pm



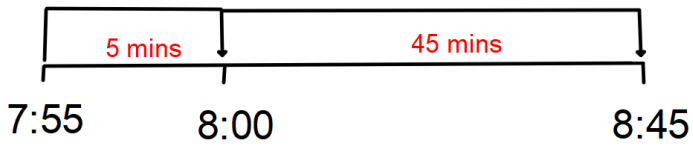
Subtraction

8:45pm - 50 mins = 7:55 pm



Duration

7:55pm to 8:45 pm = 50 mins



Year 6

Addition programme of study

- 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).
- Pupils practise addition, for larger numbers, using the formal written methods of columnar addition.

Examples.

789 + 642 becomes

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

Answer: 1431

$$\begin{array}{r} 72.8 \\ +54.6 \\ \hline 127.4 \\ \hline 1\ 1 \end{array}$$

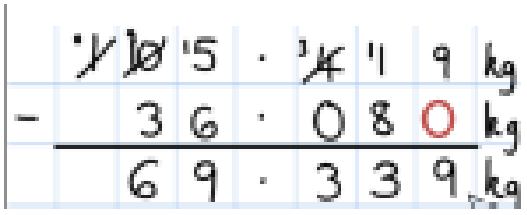
Insert zeros for place holders.

$$\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ +\ 1.300 \\ \hline 93.511 \end{array}$$

Subtraction programme of study

- 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).
- Pupils practise (addition) subtraction (multiplication and division) for larger numbers, using the formal written methods of columnar addition and subtraction,

Examples



Multiplication programme of study

- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- Solve problems involving (addition, subtraction) multiplication (and division).
- Pupils practise multiplication for larger numbers, using the formal written methods including short and long multiplication.
- Multiply one-digit numbers with up to two decimal places by whole numbers.

Examples

12	
1	12
2	6
3	4

2741 × 6 becomes

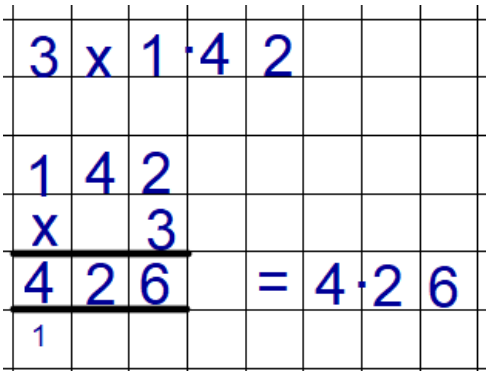
$$\begin{array}{r} 2\ 7\ 4\ 1 \\ \times\ \ \ \ \ 6 \\ \hline 1\ 6\ 4\ 4\ 6 \\ \hline \ \ 4\ \ 2 \end{array}$$

Answer: 16 446

124 × 26 becomes

$$\begin{array}{r} \ \ 1\ \ 2 \\ \ \ 1\ 2\ 4 \\ \times\ \ \ 2\ 6 \\ \hline 2\ 4\ 8\ 0 \\ \ \ 7\ 4\ 4 \\ \hline 3\ 2\ 2\ 4 \\ \hline \ 1\ \ 1 \end{array}$$

Answer: 3224



Division programme of study

- 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.
- 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.
- Solve problems involving (addition, subtraction, multiplication and) division
- Pupils practise division for larger numbers, using short and long division.
- Use written division methods in cases where the answer has up to two decimal places.

Examples

432 ÷ 5 becomes

$$\begin{array}{r} 8\ 6\ r\ 2 \\ 5\overline{)\,4\ 3^{3}\ 2} \end{array}$$

Answer: 86 remainder 2

Long division

432 ÷ 15 becomes

$$\begin{array}{r} 2\ 8\ r\ 12 \\ 15\overline{)\,4\ 3\ 2} \\ 3\ 0\ 0 \\ \hline 1\ 3\ 2 \\ 1\ 2\ 0 \\ \hline 1\ 2 \end{array}$$

432 ÷ 15 becomes

$$\begin{array}{r} 2\ 8 \\ 15\overline{)\,4\ 3\ 2} \\ 3\ 0\ 0 \quad 15\times 20 \\ \hline 1\ 3\ 2 \\ 1\ 2\ 0 \quad 15\times 8 \\ \hline 1\ 2 \end{array}$$

$$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$$

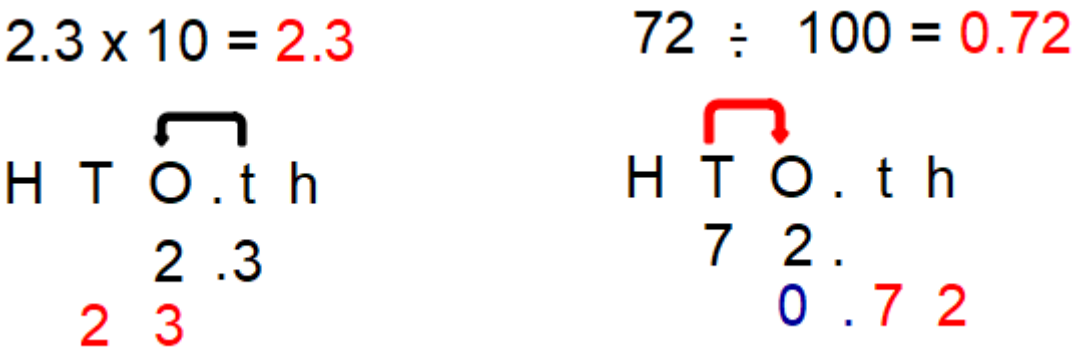
432 ÷ 15 becomes

$$\begin{array}{r} 2\ 8\cdot 8 \\ 15\overline{)\,4\ 3\ 2\cdot 0} \\ 3\ 0 \\ \hline 1\ 3\ 2 \\ 1\ 2\ 0 \\ \hline 1\ 2\ 0 \\ 1\ 2\ 0 \\ \hline 0 \end{array}$$

Multiplying and dividing by 1, 100 and 1000 programme of study

- Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.

Example



Rounding programme of study

- round any whole number to a required degree of accuracy
- for simple fractions with recurring decimal equivalents, pupils learn about rounding the decimal to three decimal places, or other appropriate approximations depending on the context.
- 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

Example

Round 3475 to the nearest ten.

3 4 7 5

1, 2, 3, 4 – Leave it alone

5, 6, 7, 8, 9 – Round up

=3480

Round 4.56 to one decimal place.

4.5 6

1, 2, 3, 4 – Leave it alone

5, 6, 7, 8, 9 – Round up

Adding fractions programme of study

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

Examples

$\frac{3}{4} + \frac{1}{3} =$ LCM= 12

x3 x4

$\frac{3}{4} = \frac{9}{12}$ $\frac{1}{3} = \frac{4}{12}$

x3 x4

$\frac{9}{12} + \frac{4}{12} = \frac{13}{12} = 1\frac{1}{12}$

Subtract fractions programme of study

- Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

Example

$\frac{3}{4} - \frac{1}{3} =$ LCM= 12

x3 x4

$\frac{3}{4} = \frac{9}{12}$ $\frac{1}{3} = \frac{4}{12}$

x3 x4

$\frac{9}{12} - \frac{4}{12} = \frac{5}{12}$

Multiply fractions programme of study

- Multiply simple pairs of proper fractions, writing the answer in its simplest form

Example

$\frac{3}{4} \times \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$

Dividing fractions programme of study

- Divide proper fractions by whole numbers.

Example

$$\frac{3}{4} \div 5 =$$

$$\frac{3}{4} \div \frac{5}{1} =$$

keep change flip

$$\frac{3}{4} \times \frac{1}{5} = \frac{3}{20}$$

Finding the whole from a fraction programme of study

- Pupils use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity.

$\frac{1}{4}$ of $x = 36$ What is x?

$36 \times 4 = 144$

$x = 144$

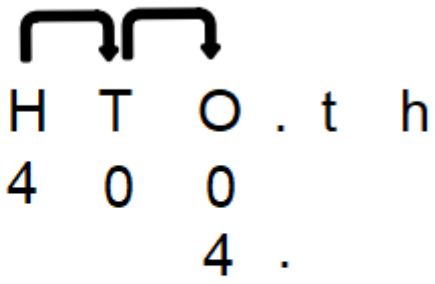
Percentages programme of study

- Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.

Example

15% of 400 =

1% of 400 = 4



15 x 4 = 60

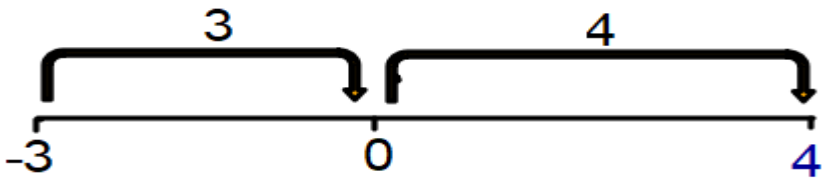
Negative numbers

- Use negative numbers in context, and calculate intervals across zero.

Examples

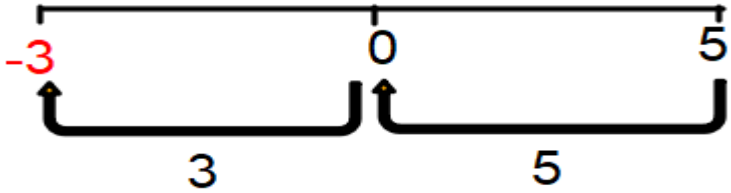
Addition:

$-3 + 7 =$



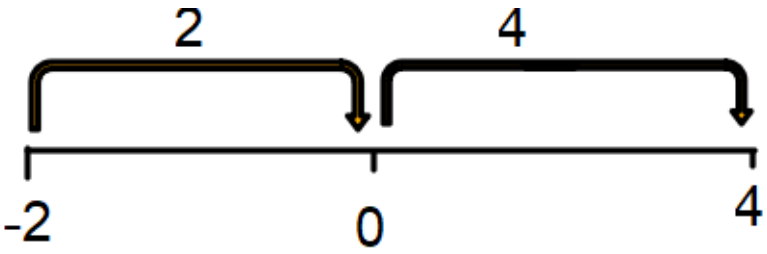
Subtraction:

$5 - 8 =$



Difference

The difference between 4 and -2



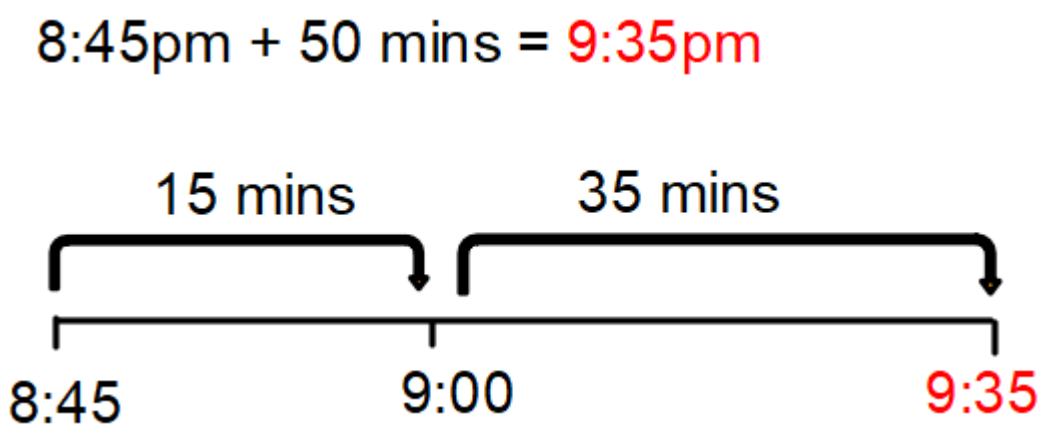
$2 + 4 = 6$

Time programme of study

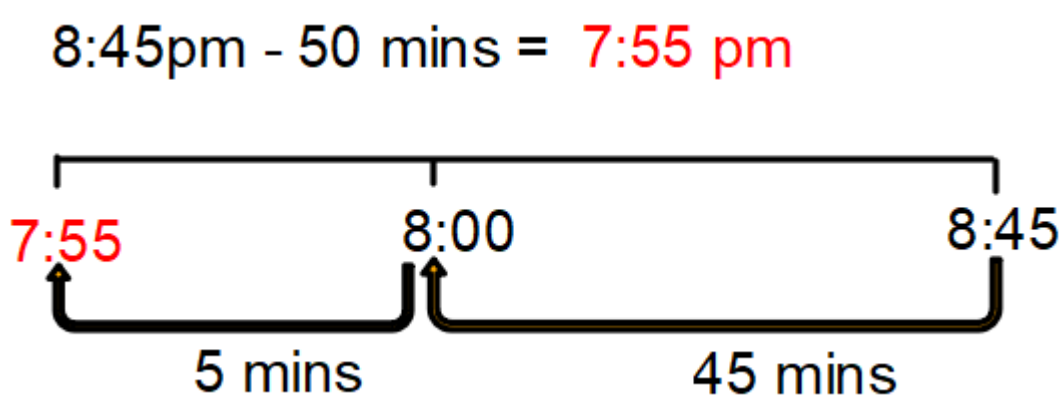
- solve problems involving the calculation of units of measure

Examples

Addition



Subtraction



Duration