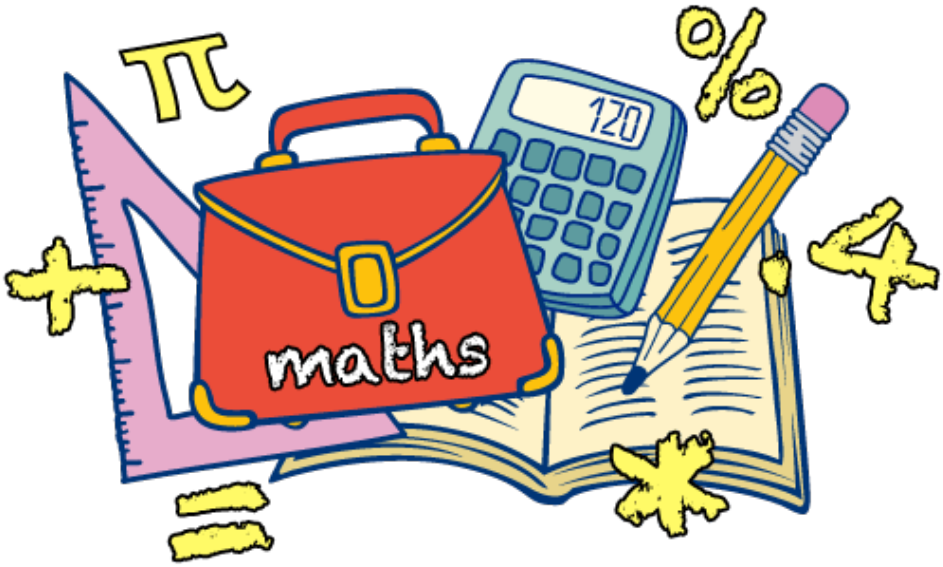
Honeywell
JUNIOR SCHOOL



Calculation Guidance for Parents and Carers

The New Curriculum at Honeywell

This booklet is designed to help parents and carers at Honeywell to support their children in learning maths. Changes to the curriculum mean that expectations are generally higher and there is a greater emphasis on arithmetic skills, both written and mental. This document explains how we teach arithmetic, covering all 4 operations: addition, subtraction, multiplication and division.

The main focus of the new maths curriculum is as follows:

Fluency
Children become fluent in the fundamentals of all maths, through varied and frequent practice with increasingly complex problems over time. Pupils have good conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems.

Reasoning Mathematically
By following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof, pupils are able to reason and explain ideas, using mathematical language.

Problem Solving
Pupils apply mathematical concepts to solve a variety of problems of increasing complexity. They are able to break problems down into a series of simpler steps and are able to persevere when seeking solutions to complex or unfamiliar problems.

Mental skills: Children are taught to make sure answers are sensible by rounding first and estimating. Their mental maths skills are developed through partitioning numbers and rounding up or down, then adjusting. They are taught to consider the most efficient and reliable method of doing any calculation.

Progression: If your child is achieving well, rather than moving on to the following year group's work, children will be challenged by more in-depth, investigative work, to allow greater mastery and understanding of concepts.

Websites: There are many excellent maths websites that you might like to use with your child at home. Please find a list of some of the best ones at the back of this document.

ADDITION

add, addition, plus, and, count on, sum, total, more, altogether

Year 3	**Mental Calculations** Add numbers mentally including: • a three digit number and ones • a three digit numbers and tens • a three digit number and hundreds - Partition numbers into Hundreds, Tens and Ones (432=400+30+2) - Know doubles and near doubles. - Know number bonds to 10 and 100. - Bridging across tens and hundreds using 'part whole'. **Written Calculations** - Add to three digit numbers using formal written column addition. 358 + 173 $\begin{array}{r} 358 \\ +\ 173 \\ \hline 531 \\ \hline 1\ \ 1 \end{array}$ **Problem Solving** - Estimate and use inverse operation to check answers. - Solve missing number problems, using number facts and place value.
Year 4	**Mental Calculations** - Partition larger numbers. - Use compensation for adding too much/too little. eg. I know that 63 + 29 is the same as 63 + 30 -1 **Written Calculations** - Add numbers with up to four digits using formal written column addition. - Add decimal numbers for money. 358 + 173 $\begin{array}{r} 358 \\ +\ 173 \\ \hline 531 \\ \hline 1\ \ 1 \end{array}$ £184.50 + £58.32 $\begin{array}{r} £184.50 \\ +\ £\ 58.32 \\ \hline 242.82 \\ \hline 1\ \ 1 \end{array}$ **Problem Solving** - Estimate and use inverse operation to check answers. - Solve addition and subtraction two-step problems.

ADDITION

Year 5

Mental Calculations
- Add larger numbers, including four and five digit numbers.
- Add tenths, and a one-digit number and tenths.
- Add decimals, including whole numbers and decimals and decimals with a different number of place
- Know decimal complements of 1, eg. 0.83+0.17=1

Written Calculations
- Add whole numbers with more than four digits using formal written column addition, including adding decimals for money.

3572 + 1469

$$\begin{array}{r} 3572 \\ +\ 1469 \\ \hline 5041 \\ {\scriptstyle 1\ 1\ 1} \end{array}$$

£8714.57 + £456.24

$$\begin{array}{r} £\ 8714.57 \\ +\ £\ \ 456.24 \\ \hline £\ 9170.81 \\ {\scriptstyle 1\ \ 1\ \ \ 1} \end{array}$$

Problem Solving
- Solve multi-step problems.
- Use all four operations to solve problems involving measure (length, money etc) using decimals.
- Calculate perimeter in cm and m.
- Use angle sum facts to make deductions about missing angles.

Year 6

Mental Calculations
- Perform mental calculations using mixed operations and larger numbers.
- Use knowledge of order of operations to carry out calculations using all four operations (BODMAS).

Written Calculations
- Add six digit numbers using formal written column addition, including decimals for money.

7264.5 + 376.94

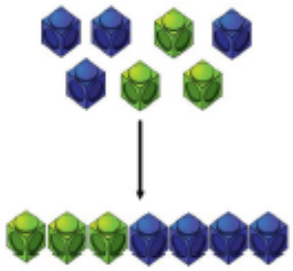
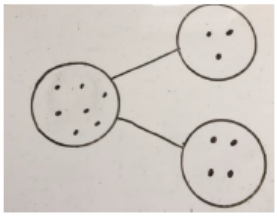
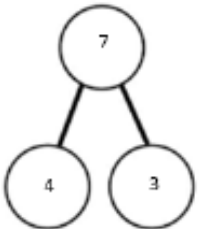
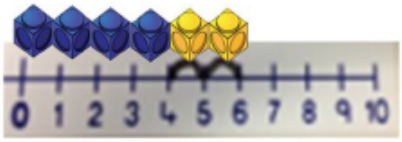
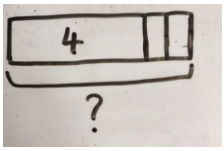
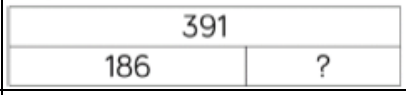
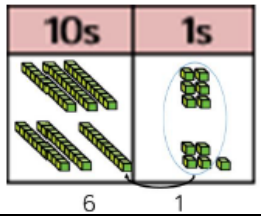
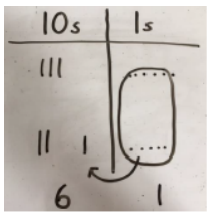
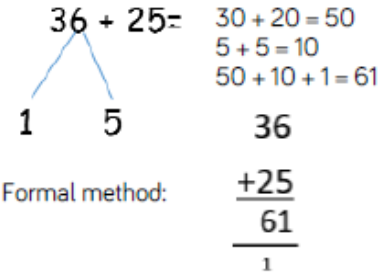
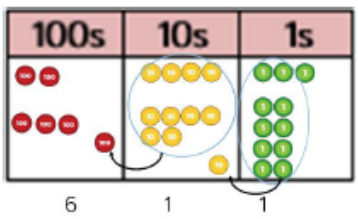
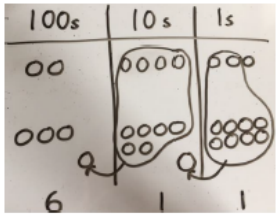
$$\begin{array}{r} 7264.5 \\ +\ \ 376.94 \\ \hline 7641.44 \\ {\scriptstyle \ \ 1\ 1\ 1} \end{array}$$

£8714.57 + £9456.24

$$\begin{array}{r} £\ 8714.57 \\ +\ £\ 9456.24 \\ \hline £18170.81 \\ {\scriptstyle \ \ 1\ \ 1\ \ \ 1} \end{array}$$

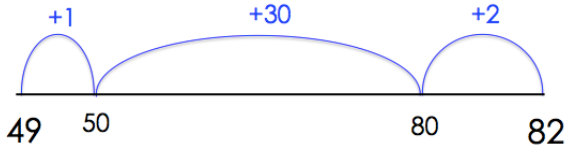
Problem Solving
- Solve multi-step problems using all operations.
- Solve problems involving measure, using decimals.
- Add positive and negative numbers.
- Use symbols and letters to represent variable and unknowns (algebra)

Progress in Teaching: Addition

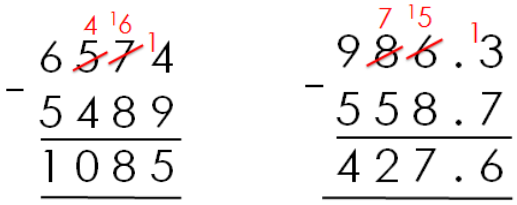
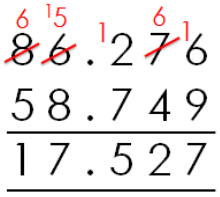
Concrete	Pictorial	Abstract
Combining two parts to make a whole. 	Children to represent the cubes using dots or crosses. 	4 + 3 = 7 Four is a part, three is a part and the whole is 7. 
Counting on using number lines, using cubes or frog. 	A bar model which encourages children to count on rather than count all.  	What is 22 more than 41? What is the sum of 22 and 41? What is the total of 42 and 22? An abstract number line can be used.
TO +TO using base 10. Continue to develop the understanding using partitioning and place value. 36 + 25 = 	Children to represent base 10 in place value columns. 	Looking for ways to make 10. 
Use of place value counters to add HTO + HTO etc. When there are 10 in the ones column we exchange them for one 10 etc. 	Children to represent the counters in the place value chart, circling when they make an exchange. 	243 +368 611 1 1

SUBTRACTION

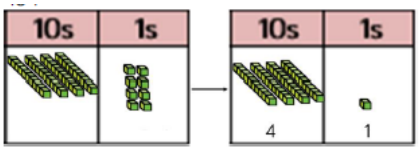
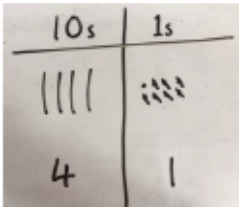
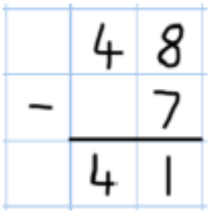
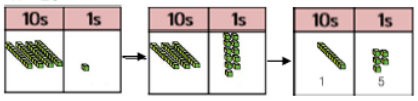
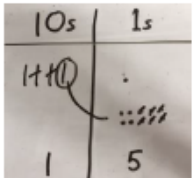
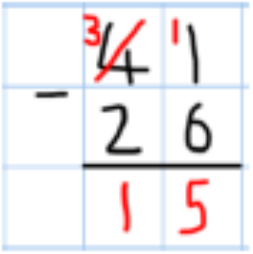
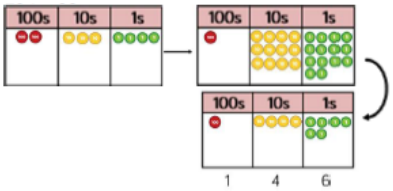
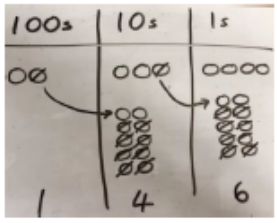
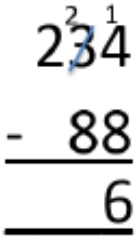
subtract, less, take away, count back, fewer, minus, difference

Year 3	**Mental Calculations** - Subtract numbers mentally including: • a three digit number and ones • a three digit numbers and tens • a three digit number and hundreds **Written Calculations** - Subtract numbers by counting up using jumps along a number line. - Subtract numbers up to three digits, using formal written column subtraction. 82 – 49  56 − 24 = 32 **Problem Solving** - Calculate time and money problems. - Solve missing number problems. - Estimate and use inverse operation to check answers.
Year 4	**Mental Calculations** - Subtract increasingly larger numbers mentally. - Find small differences by counting up. - Subtract the nearest multiple of ten and adjust. - Partition larger numbers to subtract. - Visualise number line without jottings. **Written Calculations** - Subtract numbers with up to four digits using the formal written column method with exchanging. - Estimate and use the inverse to check answers. 454 − 326 = 128 **Problem Solving** - Solve two step problems in context. - Calculate time and money problems. - Solve missing number problems. - Estimate, compare and calculate different measures.

SUBTRACTION

Year 5	**Mental Calculations** - Subtract increasingly larger numbers. - Use rounding to check answers. - Subtract decimals, including mixed and whole numbers. - Subtract tenths and one-digit numbers and tenths. **Written Calculations** - Subtract whole numbers with more than 4 digits using the formal written column method. - Subtract decimals.  **Problem Solving** - Estimate and use inverse operation to check answers. - Use rounding to check answers. - Solve multi-step problems in context, deciding which operations and methods to use and why.
Year 6	**Mental Calculations** - Perform mental calculations using mixed operations and larger numbers. - Use knowledge of order of operations to carry out calculations using all four operations (BODMAS). **Written Calculations** - Subtract whole numbers with more than 4 digits using the formal written column method. - Solve problems involving the calculation and conversions of units of measure, using decimal notion of up to three decimal places.  **Problem Solving** - Solve multi-step problems in context, deciding which operations and methods to use and why. - Use knowledge of BODMAS to solve calculations using all operations. - Subtract positive and negative integers for measure, eg. temperature. - Use symbols and letters to represent variable and unknowns (algebra).

Progress in Teaching: Subtraction

Concrete	Pictorial	Abstract
Column method using base 10. 48 – 7 = 	Children to represent the base 10 pictorially. 	Column method or counting back. 
Column method using base 10 and having to exchange. 41 - 26 = 	Represent the base 10 pictorially, remember to show the exchange. 	Formal column method. Children must understand that when they exchanged the 10 they still have 41 because 41 equals 30 + 11. 
Column method using place value counters. 234 – 88 = 	Represent the place value counters pictorially, remembering to show what has been exchanged. 	Formal column method. Children must understand what has happened when they crossed out the digits. 

MULTIPLICATION

lots of, repeated addition, groups of, times, product, multiple, multiplication, array, multiply

<table>
<tr>
<td>Year 3</td>
<td>
Mental Calculations
- Recall multiplication and division facts for 2, 3, 4, 5, 8 and 10 times tables.
- Calculate statements for known multiplication tables, including two digit times one digit numbers.
- Use doubling to connect 2, 4, 8 multiplication
- Know inverse multiplication and division facts.
- Know the commutative law for known multiplication facts
eg. 4 x 12 = 12 x 4
- Complete missing number statements 4 x __ = 28

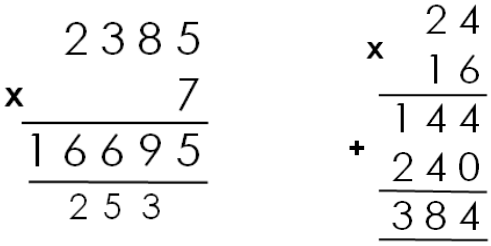
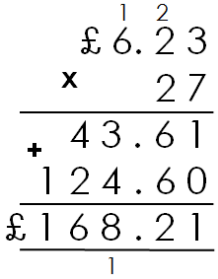
Written Calculations
- Write and calculate statements for known multiplication tables, including two digit times one digit numbers.
- Use the grid method to solve written calculations.
35 x 7
<table>
<tr><td>X</td><td>30</td><td>5</td></tr>
<tr><td>7</td><td>210</td><td>35</td></tr>
</table>
210 + 35 = 245

Problem Solving
- Solve one-step mental and written problems, eg. I have 8 packets of crayons. Each packet contains 12 crayons. How many do I have in total?
- Solve problems with measure.
- Recognise equivalent fractions.
</td>
</tr>
<tr>
<td>Year 4</td>
<td>
Mental Calculations
- Recall multiplication and division facts for tables up to 12 x 12.
- Use place value and known facts to multiply mentally, including multiplying by 0 and 1 and multiplying three numbers.
- Link facts with times table knowledge, eg. X5 is half of x10
- Multiply by 10 and 100, using knowledge of place value.
- Recognise and use factor pairs.

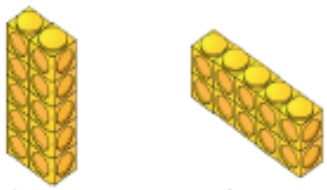
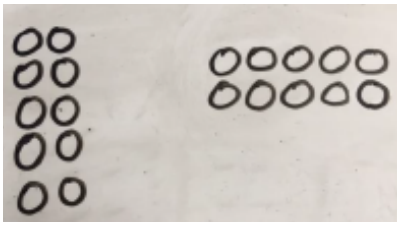
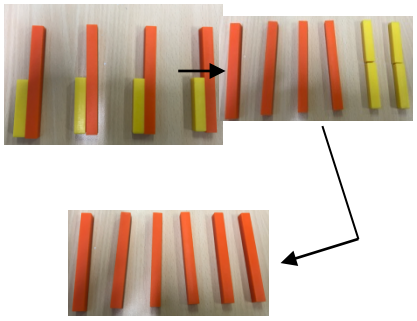
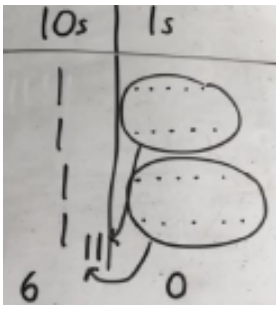
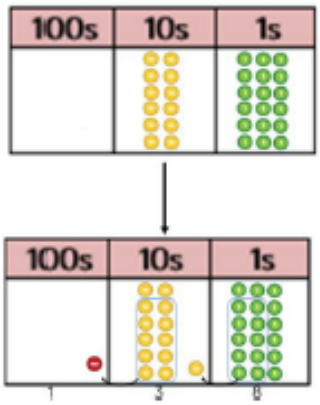
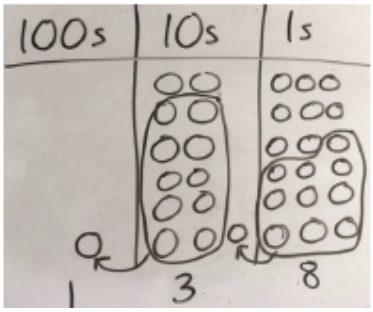
Written Calculations
- Multiply two and three digit numbers by one digit numbers using formal written layout.
385
x 7
2695
53

Problem Solving
- Solve problems involving multiplying and adding, using the distributive law.
- Convert units of measurement.
</td>
</tr>
</table>

MULTIPLICATION

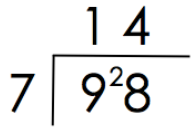
Year 5	**Mental Calculations** - Multiply numbers mentally, drawing on known facts. - Multiply whole numbers and those involving decimals by 10, 100 and 1000. - Identify multiples and factors. - Identify prime numbers up to 100. - Recognise and use square and cube numbers. **Written Calculations** - Multiply numbers up to 4 digits by a one or two digit number - Use the formal written method of short multiplication when appropriate. - Use the written formal method, including long multiplication for two digit numbers.  **Problem Solving** - Solve problems using knowledge of factors of multiples, squares and cubes. - To use all four operations to solve problems using measure, using decimals. - To convert between different units of measurements.
Year 6	**Mental Calculations** - Perform mental calculations including mixed operations and large numbers. - Estimate to check answers. - Identify the value of each digit in a three digit number. - Multiply numbers by 10, 100 and 1000. - Identify common factors, multiples and prime numbers. **Written Calculations** - Multiply multi-digit numbers up to 4 digit whole numbers using the formal written method. - Multiply numbers with up to two decimal places by whole numbers.  **Problem Solving** - Use knowledge of the order of operations (BODMAS) to carry out calculations using the four operations.

Progress in Teaching Multiplication

Concrete	Pictorial	Abstract
Use arrays to illustrate commutativety. Counters and other objects can also be used.  2 lots of 5 5 lots of 2	Children to represent the arrays pictorially 	Children to be able to use an array to write a range of calculations e.g. 10 = 2 x 5 5 x 2 = 10 2 + 2 + 2 + 2 + 2 = 10 10 = 5 + 5
Partition to multiply using cuisenaire rods. 4 x 15 = 	Children to represent the concrete manipulatives pictorially 	Children to be encouraged to show the steps they have taken 4 x 15 10 5 10 x 4 = 40 5 x 4 = 20 40 + 20 = 60
Formal column method with place value counters. 6 x 23 = 	Children to represent the counters/base 10 pictorially. 	Formal written method 6 x 23 = 23 × 6 138 1 1 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3224

DIVISION

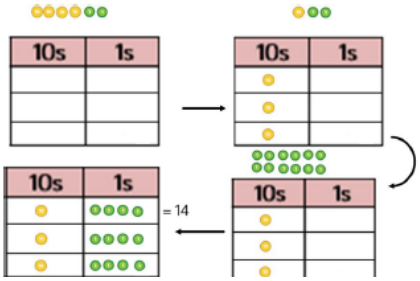
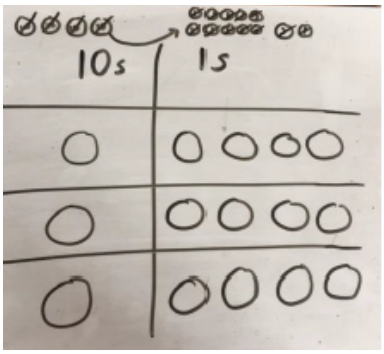
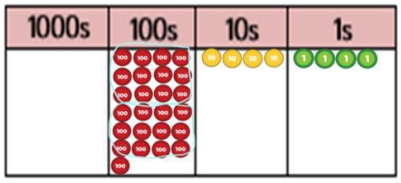
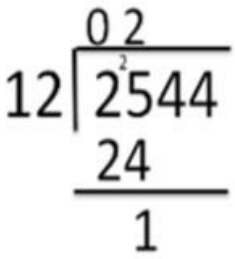
lots of, groups of, share, group, half, divide, divide by, division, factor, array, remainder

Year 3	**Mental Calculations** - Recall division facts related to known times tables (x 2, 3, 4, 5, 8, 10) **Written Calculations** - Write and calculate mathematical statements using known times tables, including two-digit numbers times one-digit numbers. 5 x 7 = 35 7 x 5 = 35 35 ÷ 5 = 7 35 ÷ 7 = 5 **Problem Solving** - Solve problems in contexts, including measuring and scaling contexts (eg. The garden is four times as long as X)
Year 4	**Mental Calculations** - Recall related division facts up to 12 x 12. - Divide mentally drawing upon know facts. - Divide whole numbers, involving decimals by 10, 100 and 1000. - Recognise and use factor pairs and commutativity. **Written Calculations** - Introduced to remainders in a number of contexts using known facts (Eg. for 13 ÷ 4, know that 12 ÷ 4 = 3 with one remainder). - Use the formal written method for short multiplication.  **Problem Solving** - Recognise that hundredths arise when dividing an object by 0ne hundred and dividing tenths by ten.

DIVISION

Year 5	**Mental Calculations** - Recall related division facts up to 12 x 12. - Divide whole numbers and those involving decimals by 10, 100 and 1000. **Written Calculations** - Divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately, eg. as fractions, decimals or by rounding. $5\overline{)4\ 3^{3}2}$ $\begin{array}{r}8\ 6\ \text{r}2\end{array}$ Answer = $86\frac{2}{5}$ **Problem Solving** - Solve problems involving multiplication and division including using knowledge of factors, multiples and cubes. - Solve problems involving all four operations. - Solve problems involving multiplication and division, including scaling by simple fractions.
Year 6	**Mental Calculations** - Perform mental calculations including mixed operations and large numbers. - Identify common factors, common multiples and prime numbers. **Written Calculations** - Divide numbers up to four-digits by a two-digit whole number using the formal written method of short division. - Divide numbers up to four-digits by a two-digit number using the formal written method of long division. $11\overline{)4\ 9^{5}6}$ $\begin{array}{r}4\ 5\ \text{r}1\end{array}$ Answer = $45\frac{1}{11}$ $15\overline{)4\ 3\ 2.0}$ $\begin{array}{r}2\ 8.8\end{array}$ $\begin{array}{r}3\ 0\\ \hline 1\ 3\ 2\\ 1\ 2\ 0\\ \hline 1\ 2\ 0\\ 1\ 2\ 0\\ \hline 0\end{array}$ **Problem Solving** - Solve problems involving all four operations. - Use knowledge of the order of operations (BODMAS) to carry out calculations using the four operations. - Use estimation to check answers.

Progress in Teaching Division

Concrete	Pictorial	Abstract
Sharing using place value counters 42 ÷ 3 = 14 	Children to represent the place value counters pictorially 	Children to be able to make sense of the place value counters and write calculations to show the process. 42 ÷ 3 = 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14
Long division using place value counters  We can't group 2000 into 12 so we will exchange them.  We can group 24 hundreds into 12 which leaves with 100		

Useful Maths Websites

Your child has their own personal log in for Abacus Maths, which will be given to your child by their class teacher. Follow this link to get to the log in page: https://www.activelearnprimary.co.uk
Our school code is m7ch

https://www.bbc.co.uk/sport/supermovers/42612499 (Times tables)

https://www.topmarks.co.uk

www.bbc.co.uk/bitesize/ks2

http://www.primaryhomeworkhelp.co.uk

http://mathsathome.lgfl.org.uk

www.mathsframe.co.uk

www.coolmath4kids.com