Edward Peake Church of England Middle School		
Topic: Addition, Subtraction, Multiplication and D	**Year: 6**	**NC Strand:**

What should I already know?	
• How to add/subtract whole numbers with more than four digits using the column method • How to use my knowledge of rounding to estimate answers for calculations and problems • How to use inverse operations to check my answers to addition and subtraction calculations • How to use my knowledge of addition and subtraction to solve multi-step problems • How to find multiples of whole numbers • How to list the factor pairs of whole numbers • How to find the common factors of two numbers	• How to recall prime numbers up to 19 • How to find out (establish) if a number less than 100 is a prime number • How to explain if a number is a square number by finding it's factors • How to find the cube numbers of an integer • How to multiply a whole number by 10, 100 and 1000 • How to divide a whole number by 10, 100 and 1000 using a place value chart • How to multiply by a multiple of 10, 100 and 1000

What will I know by the end of the unit?	
• How to use column addition and subtraction with multidigit calculations • How to decide if mental, informal or column methods of addition and subtraction are more appropriate for a calculation • How to multiply a four digit number by a two digit number • How to use short division to divide a 4 digit number by a 2 digit number • How to use my knowledge of factors to answer division questions • How to divide a 3 digit number by a 2 digit number • How to divide 4 digit numbers by 2 digit numbers using long division • How to divide using long division where answers have remainders	• How to divide a 4 digit number by a 2 digit number and know when rounding is appropriate to use for interpreting the remainder • How to find the common factors of two numbers and present this in a venn diagram • How to find common multiples of two numbers using numbers outside of my known times table facts • How to break a number down into it's prime factors • How to explore relationships and solve problems involving prime and square numbers • How to use order of operations to complete calculations • How to use estimation and mental methods to carry out calculations efficiently • How to reason and apply my understanding of calculations, inverses and commutativity to use known facts when calculating

Vocabulary			
increase	get larger in size, number or quantity	**multiply**	a mathematical operation where a number is added to itself a number of times
altogether	to join two or more numbers or quantities to get one number	**product**	the result when two numbers are multiplied
add		**divide**	to divide or division is sharing or grouping a number into equal parts.
		share	
more	Involves addition	**prime factor**	a factor that is prime
Sum /total	the result of addition.	**factor**	a number that divides exactly into another number
		common factor	factors of two numbers that are the same
subtract	to take one quantity away from another.	**prime number**	a number with only 2 factors: 1 and itself
		composite number	a number with more than two factors
Less/fewer	the difference between two quantities or values involves subtraction.	**multiple**	a number in another number's times table
		common multiple	multiples of two numbers that are the same

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		square numbers	the result when a number has been multiplied by itself
decrease		**cube numbers**	the result when a number has been multiplied by itself 3 times
difference		**prime number**	a number with only 2 factors: 1 and itself
solution	the answer to a problem.	**round**	to change a number to a more convenient value.

Diagram/ Key information

When children start to multiply 3d x 3d and 4d x 2d etc, they should be confident with the abstract:

To get 744 children have solved 6 x 124
To get 2480 they have solved 20 x 124

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

Answer: 3224

Use of the 'bus stop method' using grouping and counters. Key language for grouping- how many groups of X can we make with X hundreds'- ***this can also be done using sharing!***

615 ÷ 5

Step 1: make 615

Step 2: Circle your groups of 5

Step 3: Exchange 1H for 10T and circle groups of 5

Step 4: exchange 1T for 10ones and circles groups of 5

This can easily be represented pictorially, till the children no longer to do it.
It can also be done to decimal places if you have a remainder!

$$5\overline{)615}\ \begin{array}{l} 123 \\ {\scriptstyle 1\ 1} \end{array}$$

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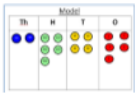
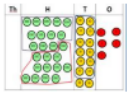
Long division

Concrete	Pictorial	Abstract
 2544 ÷ 12 How many groups of 12 thousands do we have? None  Exchange 2 thousand for 20 hundreds.  How many groups of 12 are in 25 hundreds? 2 groups. Circle them. We have grouped 24 hundreds so can take them off and we are left with one.  Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2.  Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2	Children to represent the counters, pictorially and record the subtractions beneath.	Step one- exchange 2 thousand for 20 hundreds so we now have 25 hundreds. Step two- How many groups of 12 can I make with 25 hundreds? The 24 shows the hundreds we have grouped. The one is how many hundreds we have left. Exchange the one hundred for 10 tens. How many groups of 12 can I make with 14 tens? The 14 shows how many tens I have, the 12 is how many I grouped and the 2 is how many tens I have left. Exchange the 2 tens for 20 ones. The 24 is how many ones I have grouped and the 0 is what I have left.

Investigate/Homework tasks

- Homework will be set from the booklet issued by your teacher
- You should complete at least 30 minutes of maths tasks on Maths Whizz (not games). Please attend help sessions if you do not have access to the internet at home
- Additional work you could complete:
  - Find out more about the meaning of the vocabulary list using http://www.amathsdictionaryforkids.com/
- To challenge yourself:
  - Investigate the key questions typed in red text
  - Explain the key questions typed in purple text

Key skills/Timeline/Topic Questions

- Using Column addition/Subtraction
  - What happens when there is more than 9 in a place value column?
  - Can you exchange between columns?
  - When you are given part of a solution to column addition or subtraction how can you find the missing digits?
  - Is the column method always the best method? Can you explain giving examples
- Long Division
  - What does the arrow represent?
  - How can multiples help us divide?
- Why do we subtract the totals from the starting number?
- Why is the context of the question important when deciding how to round the remainders after division?
- What is a factor?

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• When multiplying what is it important to remember when, multiplying by tens? • Make up a multiplication question and solve it using long multiplication? What do you have to remember when you are multiplying by numbers in different columns? • What strategy can you use to find the lowest common multiple of different numbers?	• How do you know you have found all the factors of a given number? • How does a venn diagram show a common factor? Where are the common factors? • What is a prime number? • What is a composite number? • Are all prime numbers odd? • Is 1 a prime number?