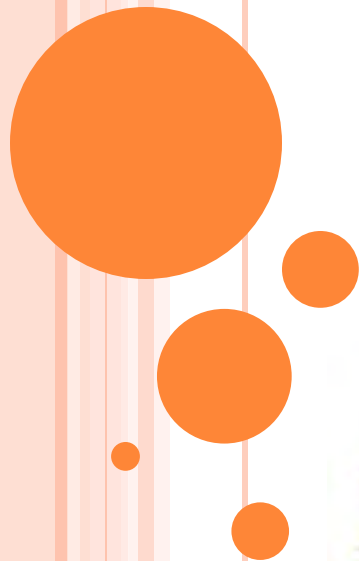


Year 4

Stay and Share

November 2016



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OUTSTANDING!



Welcome to Year 4...



Entering Class 4 means moving to a new part of the school and this is always exciting for our children. 'The Junior Block' is where the learning journey really begins to take shape and children discover many hidden talents. In this year the children have a fantastic opportunity to participate in an adventurous residential trip together, where many happy memories are made.



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It takes years to build, seconds to break and forever to repair.

POWER TRUTH

Struggle today strength tomorrow

Tolerance
Respect
Unity
Strength
Truth

Respect

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<p>SP We believe we should...</p>	<p>MO We believe we should...</p>	<p>SO We believe we should...</p>	<p>CU We believe we should...</p>
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Maths in Year 4...

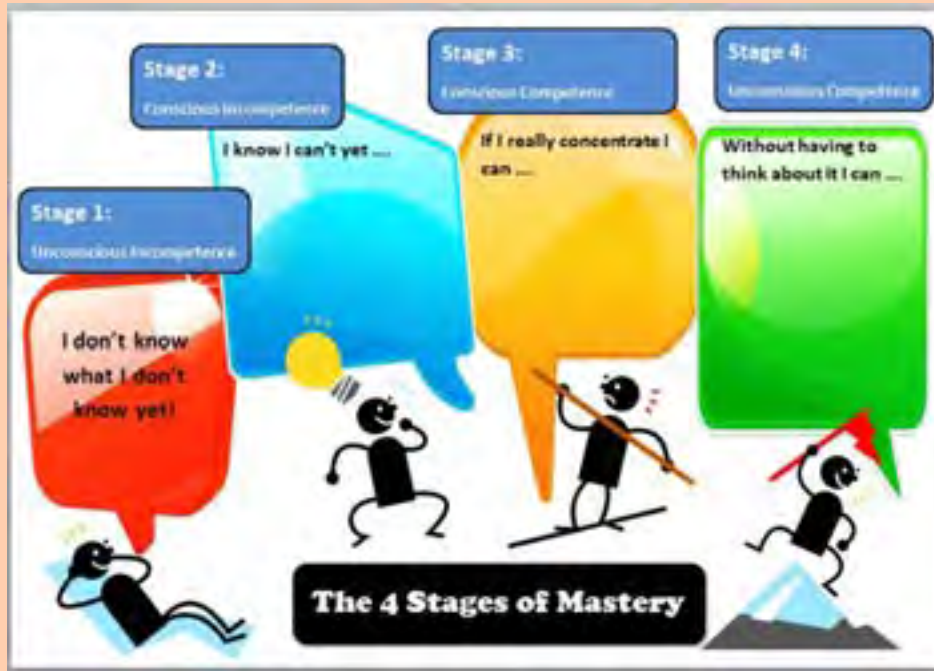
- Our main priority in maths this year is to develop the children's ability to reason, explain and master their own curriculum to have a secure subject knowledge.
- Weekly recap, consolidation and mastery lessons have so far enabled the children to develop their reasoning skills and fully understand the topics we have been exploring.





Recap, Consolidation and Mastery

? ← Answer	!
Draw it!	First I... Oh, I see! Explain
Prove it!	
Maths Story	Odd one out



mastering
MATHS



Maths in Year 4...

- Here is an example of a recap, consolidation and mastery question that we have already explored:



Year 4 Mastery Challenges	
<ul style="list-style-type: none"> Place 2500 on the number lines below. 	
\leftarrow 0	\rightarrow 5000
\leftarrow 2000	\rightarrow 4000
\leftarrow 0	\rightarrow 10000
Reflection and Reasoning:	





Working example...

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Year 4 Mastery Challenges

- Place 2500 on the number lines below.

0 5000

2000 4000

0 10000

Reflection and Reasoning:

I used my halving and I know 500 is half so I halved everything to get the answer





Maths in Year 4...

- Here is an example of a recap, consolidation and mastery question that we have already explored:

Year 4 Mastery Challenges

- Complete these calculations:
 $7 \times 8 =$ $7 \times 4 \times 2 =$
 $5 \times 6 =$ $5 \times 3 \times 2 =$
 $12 \times 4 =$ $12 \times 2 \times 2 =$

Which calculations have the same answer? Can you explain why?

Reflection and Reasoning:





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Year 4 Mastery Challenges

- Complete these calculations:

$7 \times 8 = 56$	$7 \times 4 \times 2 = 56$
$5 \times 6 = 30$	$5 \times 3 \times 2 = 30$
$12 \times 4 = 48$	$12 \times 2 \times 2 = 48$

Which calculations have the same answer? Can you explain why?

Reflection and Reasoning:

RS the same but just split the number into products of 3

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Maths in Year 4...

- Here is an example of a recap, consolidation and mastery question that we have already explored:

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Reflection and Reasoning:

Year 4 Mastery Challenges	
<ul style="list-style-type: none"> I am thinking of 2 secret numbers where the sum of the numbers is 16 and the product is 48. What are my secret numbers? Can you make up 2 secret numbers and tell somebody what the sum and product are? 	
Reflection and Reasoning:	





Working example...

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Year 4 Mastery Challenges

- I am thinking of 2 secret numbers where the sum of the numbers is 16 and the product is 48. What are my secret numbers? Can you make up 2 secret numbers and tell somebody what the sum and product are?

Reflection and Reasoning: I had to find the factors of 48

$$\begin{array}{r}
 1 \\
 2 \\
 3 \\
 4
 \end{array}
 \begin{array}{r}
 48 \\
 24 \\
 16 \\
 12
 \end{array}$$

$$4 + 12 = 16 \checkmark$$

Product - 30
Sum - 11

What are my secret numbers?

The class enjoyed solving your word problem.





Visual Images...

	base-10 blocks		2-color counters
	pattern blocks		geoboards
	calculators		unifix cubes



connecting cubes	dice
counters	colored counters
counting bears	base ten blocks





Visual Images...

- Visual images have become a main focus when introducing new concepts to the children to enable them to actually see their learning in picture formation.
- With every new concept introduced, the children will explore it in the following way:
 - *Using real life contexts*
 - *Visual images to provide a visual aid*
 - *Application to a range of different questions*





Working example...

You can use pictorial representations to see how many there are altogether. Rather than just counting each flower, children can use their times tables knowledge to find the answer.

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In Focus

How many flowers are there altogether?

Let's Learn

1

1 group of 6
 $1 \times 6 = 6$

2 groups of 6
 $2 \times 6 = 12$

3 groups of 6
 $3 \times 6 = 18$

4 groups of 6
 $4 \times 6 = 24$

There are 24 flowers altogether.





Working example...

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Lesson 3

Multiplying by 9

Focus

How many fish are there in all?

Learn

1 group of 9
 $1 \times 9 = 9$

2 groups of 9
 $2 \times 9 = 18$

3 groups of 9
 $3 \times 9 = 9 + 18$

We can use arrays to visually represent a multiplication.

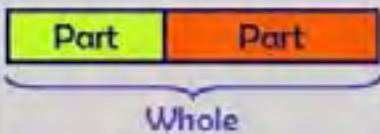




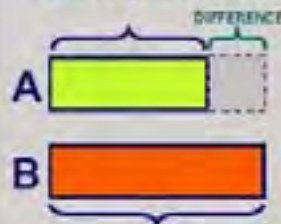
The Bar Model

Solving Problems with Bar Modeling

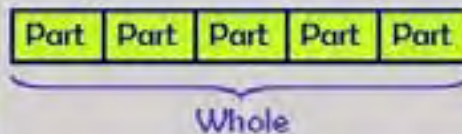
Part-Part-Whole



Comparison

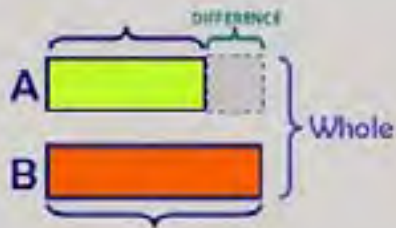


Equal Parts of a Whole

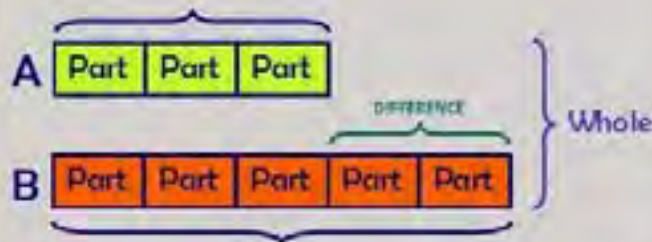


an Equal Part is a UNIT

Comparison AND Part-Part-Whole



Comparison AND Equal Parts of Wholes



an Equal Part is a UNIT



Working example...

We can use the pictorial representation to split a total into groups. Then take this to create a bar model.

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Making 2 groups of 12



24



12 beans multiplied
2 times

$$2 \times 12 = 24$$

2 groups

We can also write $12 \times 2 = 24$.

Putting 24 beans into 2 equal groups

$$24 \div 2 = 12$$

Each group has
12 beans

Putting 24 beans into groups of 12

$$24 \div 12 = 2$$

There are 2 groups



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Bar Modelling

- There are 2452 people at a theme park. 538 are children, how many are adults?

Maths in Year 4...

The Bar Model is a tool the children use to support their maths learning in problem solving situations to help interpret the questions they are exploring.



Working example...

At a recent clean up of the playground, The 3 children collected 196 pieces of rubbish. Callum collects 64 pieces, Louis 73, so how many has Bonnie collected?

- Read the problem.
- Identify important information.
- Recognise which operation is needed.
- Create a bar model to represent this.
- Solve using the most efficient method.

Handwritten student work on grid paper:

3) $64 + 73 = 137$ $196 - 137 = 59$

137	?	64	196
64	73	73 +	137

196
 -70 -30 -100

 Bonnie collected 53 bits of rubbish





Methods explored...





Maths in Year 4...

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Compact addition methods



The above methods and understanding of partitioning and place value will be used to support the step into using compact column methods.

Children are shown to start on the least significant number (the 'units') and add the columns from right to left hence the operation being shown on the right.

Example

In the below example you add the units/ones; $7+5=12$. There are 2 units in '12', and 1 ten, hence 2 in the 'units' column, and 1 in the 'tens' column.

$$\begin{array}{r} 587 \\ 375+ \\ \hline 2 \end{array}$$

The next stage is to look at the 'tens' column, ensuring that place value is maintained (e.g. verbally stating $80+70$, rather than $8+7$).

$$\begin{array}{r} 587 \\ 375+ \\ \hline 62 \\ \hline 1 \end{array}$$

Continue until all columns have been totalled.

$$\begin{array}{r} 587 \\ 375+ \\ \hline 962 \\ \hline 1 \end{array}$$





Maths in Year 4...

Formal written methods (3/4)



This process is then repeated for three-digit numbers, with the children experiencing first the calculation without a need to 'exchange' and then involving 'exchanging'.

Example
 $243 - 122 = ?$

$$\begin{array}{r} 243 \\ - 122 \\ \hline 121 \end{array}$$

so $243 - 122 = 121$

Example
 $443 - 237 = ?$

$$\begin{array}{r} 443 \\ - 237 \\ \hline 206 \end{array}$$

Example
 $400 - 199 = ?$

$$\begin{array}{r} 400 \\ - 199 \\ \hline 201 \end{array}$$

While teaching this method it is vital to reinforce the importance of choosing the most efficient method to subtract, e.g. $300 - 12$ would be quicker to solve mentally; subtracting 10 and then 2.





Maths in Year 4...

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Multiplication

Vocabulary associated with multiplication 2 3 4

It is important for children to see that the solution to the questions '4x3' and '3x4' are identical. However, in doing so we will emphasise that the actual representation of the two questions (through jottings or other models) are not. For example, '4x3' represents 4 'lots of' 3, whilst '3x4' asks for 3 'lots of' 4 items.

Understanding this and how the numbers can be manipulated in a number sentence will help to show the commutative law of multiplication, and how multiplication relates to division.

Times table facts should be taught up to 12x_, alongside their corresponding division facts.

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Commutative law





Maths in Year 4...

Multiplication

Extended grid method



Here the children will use the grid method for numbers, where both numbers are greater than 9.

Example

$$72 \times 34 = ?$$

An exercise book costs 72p.
How much would it cost for a class of 34 children?

x	70	2	
30	2100	60	= 2160
4	280	8	= <u>288</u> +
			2448

It does not matter which number is on the top, and which is down the side of the grid.

- Grid method
- Importance of practising times tables at home





Worked example



Wednesday 16th November
 LO: to learn how to multiply two digit and three digit numbers by a one digit number. (I)

Success Criteria

- I can use rounding and mental methods to estimate. ✓
- I can partition each number. ✓
- I can place the numbers into the grid layout. ✓
- I can x each part of the number. ✓
- I can recombine the total and check this sounds approximately correct. ✓

~~075.~~
15

P) $256 \times 24 = 6174$

x	200	50	6	
204	800	1000	120	= 5120
4	800	2000	24	= 1024 +
			6174	✓

Now try: 125×4





Worked example

The people in the stadium are sitting in rows of 36 and there are 9 rows in each section. What is the capacity of each section? If there are 40 sections in the stadium what is the total capacity?

My friend works in the supermarket in the evening stacking shelves. He needs to stack the boxes 7 high and 15 across. How many boxes will he need?

The people in the stadium are sitting in rows of 36 and there are 9 rows in each section. What is the capacity of each section? If there are 40 sections in the stadium what is the total capacity?

1) $15 \times 7 = 105$

$\begin{array}{r} \times 10 \quad 9 \\ 7 \quad 70 \quad 99 \\ \hline 770 + 99 = 869 \end{array}$

$770 + 99 = 869$ ✓

$36 \times 9 = 324$

$\begin{array}{r} 36 \times 10 = 360 \\ 36 \times 0 = 36 = 0 \\ \hline 324 \quad 360 \\ \quad -36 \quad \quad +36 \\ \hline \end{array}$

$324 \times 40 = 12,960$

$\begin{array}{r} \times 300 \quad 20 \quad 4 \\ 40 \quad 1200 \quad 320 \quad 160 \\ \hline 12000 \\ 00800 \\ 00160 + \\ \hline 12960 \end{array}$ ✓

$\begin{array}{r} \times 30 \quad 6 \\ 9 \quad 70 \quad 54 \\ \hline 270 + 54 = \\ 270 \\ 054 + \\ \hline 324 \end{array}$

Applying multiplication to solve a word problem.



Maths in Year 4...

Multiplication

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Short multiplication



Short multiplication will then be introduced. This involves multiplying any whole number by a single digit number.

Example

$$46 \times 9 = ?$$

First, the 'unit' digit of 46 is multiplied by 9. As this results in a two-digit number, the 'tens' are then placed in the 'tens' column.

$$\begin{array}{r} 46 \\ \times 9 \\ \hline 42 \end{array}$$

Next, the 'tens' digit of 46 is multiplied by 9 (4tens x 9 = 36 tens). Since there is also 5 tens in this column from the first step, these are added to the total. We now have 41 tens (410), which can also be written as 4 hundreds, and 1 ten.

$$\begin{array}{r} 46 \\ \times 9 \\ \hline 42 \\ 360 \\ \hline 414 \end{array}$$

As there are no 'hundreds' digit in 46 to multiply by 9, we record a 4 in the hundreds column (this was from the last step).

$$\begin{array}{r} 46 \\ \times 9 \\ \hline 414 \\ 45 \end{array}$$

- Short multiplication





Maths in Year 4...



Division

Partitioning

Challenges

⊙ $\triangle \times 4 = 136$
 $\triangle = 34$ ✓

⊙ A number multiplied by four equals two hundred and eighty.
What is the number?
 ~~$280 \times 4 = 1120$~~ ⊙?
 $280 \div 4 = 70$ ⊙

$136 = 4 = 34$
 $120 \quad 16$
 $1 \quad 1$
 $30 + 4 = 34$

I partitioned the number by using my 4 times table and realize the number ten times bigger and smaller

$180 \div 4 = 70$
 $28 \div 4 = 7$
 $7 \times 10 = 70$ ✓





Worked example



Using base 10 to support partitioning to divide.





Maths in Year 4...



Division

The 'half a house' method



As the children start to use more complex methods, these continue to be supported by jottings and use of the inverse. A more formal method of division will be introduced.

Example

$$36 \div 4 =$$

How many 4s are in 36?

$$\begin{array}{r} 09 \\ 4 \overline{) 36} \end{array}$$

$$136 \div 5 =$$

How many 5s are in 136?

$$\begin{array}{r} 027 \text{ r } 1 \\ 5 \overline{) 136} \end{array}$$

Children will also learn to record a remainder as a fraction.

E.g. $27 \frac{1}{5}$

Year 4

Stay and Share

Thank-you for your continued support in your child's learning!

