All Saints C of E Primary School

Year 6 Multiplication and Division

By the end of Year Six, children have been taught to:

<table>
<tr><th>Objective</th><th>Why is it important? Things to watch out for! Taught strategies</th></tr>
<tr><td>Multiply multi-digit numbers up to 4 digits by a 2 digit whole number using long multiplication</td><td>By Year 6 children are expected to know their times tables up to the 12x, which enables them to calculate efficiently with larger values
<table>
<tr><td>5 4 3 2
x 2 4
1 1
2 1 7 2 8
+1 0 8 6 4 0
1 3 0 3 6 8</td><td>The first row in the ‘answer’ box is the product of multiplying 5432 x 4.
The second row in the ‘answer’ box is the product of multiplying 5432 by 2. To ensure this calculation is correct, a 0 is placed in the second row to hold the place value because in real terms 5432 is multiplied by 20 not 2. If a 0 was not included when the products were added, the calculation would be wrong.

Errors which can occur
• The zero is not put on the second row in the answer box, which would lead to the wrong answer.
• When values are carried, they can become mixed up with other digits or not added back in. If this causes a problem, using a different colour pencil for the carried values makes it clear.</td></tr>
</table></td></tr>
<tr><td>Divide numbers up to 4 digits by a 2 digit number using long division</td><td>
<table>
<tr><td>32 r 4
6) 1 9 6
- 1 8 0 (30x6)
16
- 1 2 (2x6)

4</td><td>By Year 6 children will be familiar with this strategy and be able to apply their knowledge of times tables up to 12x12 and be able to scale up accordingly.</td></tr>
<tr><td>2 7 1 remainder16

24) 6 5 2 0
- 4 8 0 0 (24X200)
1 7 2 0
- 1 2 0 0 (24X50)
5 2 0
- 4 8 0 (24X20)
40
- 24 (24X1)
1 6</td><td>This strategy builds on the previous one, however it can be quite demanding in terms of the ability to multiply with larger values as well as scaling up using existing times tables knowledge.</td></tr>
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</table>

This strategy is a strategy which is quite demanding in terms of keeping track of what is happening in the calculation as well as being able to multiply with larger values.

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  2 7 1 remainder 16
24) 6 5  2  0
  - 4 8
    1 7  2
    1 6  8
        4  0
        2  4
        1  6
```

Step 1 – How many times will 24 go into 65. 24x2 = 48 We then subtract 48 from 65 leaving 17.
Step 2 –.24 will not go into 17 so the 2 from 6520 to create 172.
Step 3 – 24x 7 = 168 We then subtract 168 from 172 leaving 4.
Step 4 – 24 will not go into 4 so we drop the 0 from 6520 down to create 40.
Step 5 – 24x1=24 We then subtract 24 from 40 leaving 16.

Use knowledge of the order of operations, BODMAS to carry out calculations with all four operations

BODMAS refers to the order in which calculations are carried out.

B rackets
O rders (powers, square, square roots, cubes)
D ivision
M ultiplication
A ddition
S ubtraction

Example problems

Compare 31 + 9 × 7 and (31 + 9) × 7 What's the same? What's different?	Put brackets in these number sentences so that they are true. 12 – 2 × 5 = 50 12 – 8 – 5 = 9 10 × 8 – 3 × 5 = 250

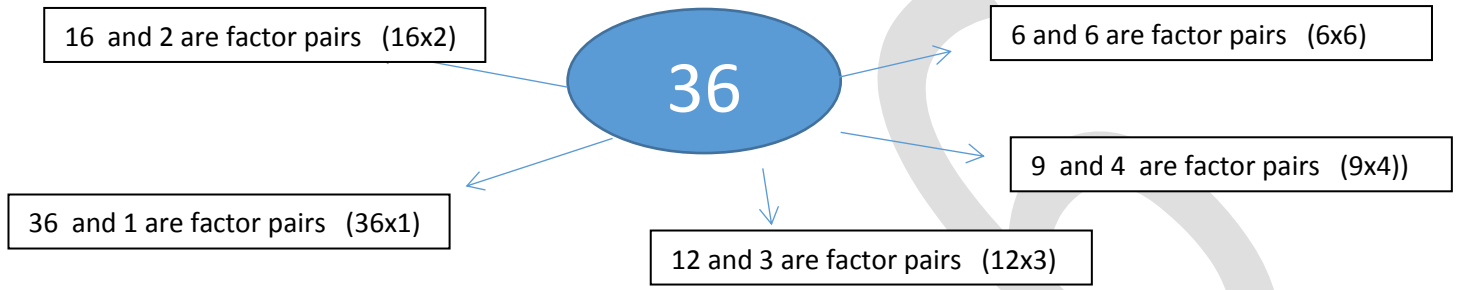
Identify common factors, common multiples and prime numbers

Multiples are 'lots of' multiplication facts, therefore the product (answer) of a multiplication calculation, whereas a factor is linked to division. The key to identifying multiplies and factors is being able to recall all multiplication and division facts up to the 12 times tables.

For example:
8 is a multiple of 4 and a factor of 16
6 is a multiple of 3 and a factor of 36

Year 6

The term 'factor pairs' refers to the two values multiplied together to create an specific answer. For example the factor pairs for 36 are:



A *prime number* is a number that only has two factors which are one and itself. *Composite numbers* are basically numbers that are not prime numbers. Mathematics really does have a language all of its own and not being able to recall the vocabulary it can hinder children's ability to access questions or tasks.

2, 3, 5, 7, 11, 13, 17, 19, 23……..

Common misconceptions
That one is a prime number! (It does not satisfy the rule of having two factors because it only has one.)

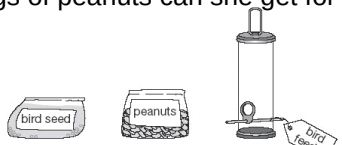
Solve problems involving all four operations

Children often have the mathematical skills and knowledge to solve problems. However, how it is worded can often cause confusion and make children doubt their mathematical ability. Problem solving is a complex skill and requires children to think more and often do more. Children begin to realise that the answer or operation to apply to the problem may not jump out at them. Children have to understand the context of the problem, the vocabulary within the problem and from that make decisions as to what they actually have to do to solve the problem. From the problems below, children need to **firstly recall their knowledge of money then** children have to **read** and **understand** what the problem is asking them to do **and then recall** how to use an efficient **strategy** for adding, subtracting, multiplying or dividing.

Example problems

A shop sells boxes of chocolates. One box costs £3·99. A second box costs £2·60. A third box costs £6·45. What is the difference in price between the most and least expensive boxes? The shop also sells packets of sweets. One packet costs £1·39. Ramesh has a £10 note and he wants to buy the chocolates costing £2·60 . How many packets of sweets can he also buy?	Miriam and Alan each buy 12 tins of tomatoes. Miriam buys 3 packs each containing 4 tins. A pack of 4 costs £1·40. Alan buys 2 packs each containing 6 cans. A pack of 6 costs £1·90. Who gets the most change from a £5 note?

A shop sells food for birds. Lara has £10 to spend on peanuts.
How many bags of peanuts can she get for £10?



£3.79 £1.35 £8.95

Amir has £20. He wants to buy a bird-feeder and 4 bags of bird seed. How much **more** money does he need?

Ben buys **three** bottles of milk and **six** cakes. How much does he spend altogether?



99p 49p

Chris saves **50p** coins. He has saved **45** of them. How much money has Chris saved?

Michelle has saved **£8.40** in **20p** coins. How many **20p coins** does Michelle have?

Cinema tickets cost **£3.65** each. Hannah buys **4 tickets**. How much does Hannah pay?



Nico buys a box of popcorn and two milkshakes. How much does Nico spend **altogether**?

Year 6