KS2 Maths

Parents Morning

15/5/15

Aims for session:

- To explain how we teach the written methods for the four operations over KS2 (addition, subtraction, multiplication and division)
- To discuss the new national curriculum for Maths, which is statutory for all children from September 2015

Addition

Year 3 - Add numbers with up to 3-digit

Year 4 - Add numbers with up to 4 digits

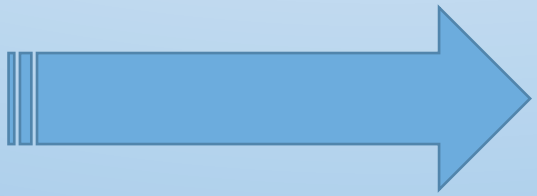
Year 5 - Add numbers with more than 4 digits - including money, measures and decimals with different numbers of decimal places

Year 6 - Add several numbers of increasing complexity

Addition – Year 3

Introduce the **expanded column addition** method:

$$
\begin{array}{r}
236 \\
+\ 73 \\
\hline
9 \\
100 \\
200 \\
\hline
309
\end{array}
$$



Move to the **compact column addition** method, with carrying:

$$
\begin{array}{r}
\overset{1}{2}36 \\
+\ 73 \\
\hline
309
\end{array}
$$

Addition – Year 4

Continue with compact column addition with 4 digit numbers, to include adding money and measures.

$$\begin{array}{r} 3517 \\ + \quad 396 \\ \hline 3913 \\ \ 1\ 1 \end{array}$$

Addition – Year 5

Use compact column addition to add over 4 digit numbers, including money, measures and decimals with different numbers of decimal places

$$\begin{array}{r} £23.59 \\ +\ £\ 7.55 \\ \hline £31.14 \\ 1\ 1\ \ 1 \end{array}$$

$$\begin{array}{r} 19.01 \\ +\ \ 3.65 \\ \ \ 0.70 \\ \hline 23.36 \\ 1\ 1 \end{array}$$

Pupils should be able to add more than two values, carefully aligning place value columns.

Addition – Year 6

Adding several numbers with different numbers of decimal places (including money and measures):

- Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row.
- Zeros could be added into any empty decimal places, to show there is no value to add.

$$
\begin{array}{r}
59.770 \\
+\ 23.361 \\
9.080 \\
1.300 \\
\hline
93.511 \\
\scriptstyle 2\ 1\ 2
\end{array}
\qquad
\begin{array}{r}
81059 \\
+\ 20551 \\
15301 \\
3668 \\
\hline
120579 \\
\scriptstyle 1\ 1\ 1\ 1
\end{array}
$$

Subtraction

Year 3 - Subtracting with 2 and 3-digit numbers

Year 4 - Subtract with up to 4-digit numbers

Year 5 - Subtract with at least 4-digit numbers - including money, measures and decimals with different numbers of decimal places

Year 6 - Subtracting with increasingly large and more complex numbers and decimal values.

Subtraction – Year 3

Introduce partitioned column subtraction method

STEP 1: introduce this method with examples where **no exchanging** is required

$$89 - 35 = 54$$

$$\begin{array}{r} 80 + 9 \\ -\ 30 + 5 \\ \hline 50 + 4 \end{array}$$

STEP 2: introduce **'exchanging'**

$$73 - 47 = 26$$

$$\begin{array}{r} {}^{60}\not{7}0 + {}^{1}3 \\ -\ 40 + 7 \\ \hline 20 + 6 \end{array}$$

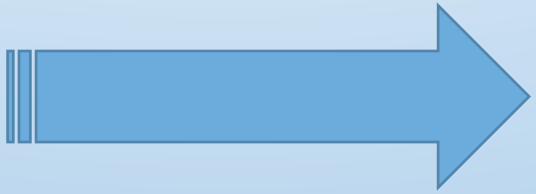
STEP 3: once pupils are secure with the understanding of 'exchanging', they can use the partitioned column method to subtract any 2 and 3 digit numbers

Subtraction – Year 4

Continue with partitioned column subtraction with ‘exchanging’, using larger numbers:

$$2754 - 1562 = 1192$$

$$\begin{array}{r} 2000 + \overset{600}{\cancel{7}00} + \overset{1}{5}0 + 4 \\ -\ 1000 + 500 + 60 + 2 \\ \hline 1000 + 100 + 90 + 2 \end{array}$$



Move onto compact column subtraction:

$$\begin{array}{r} \overset{6}{2}\overset{1}{\cancel{7}}54 \\ -\ 1562 \\ \hline 1192 \end{array}$$

Plenty of opportunities will be given to apply this to money and measures

Subtraction – Year 5

Subtract with at least 4 digit numbers, including money, measures and decimals

$$\begin{array}{r} {}^{2}\cancel{3}{}^{1}\cancel{1}0\,\cancel{5}1\,\cancel{6} \\ - \quad 2\,1\,2\,8 \\ \hline 2\,8\,9\,2\,8 \end{array}$$

$$\begin{array}{r} {}^{6}\cancel{7}{}^{1}\cancel{1}0\,\cancel{6}1\,\cancel{9}8\,\cancel{.}1 \\ - \quad 3\,7\,2.5 \\ \hline 6\,7\,9\,6.5 \end{array}$$

Subtraction – Year 6

Subtracting with increasingly large and more complex numbers and decimal values

$$\begin{array}{r} {}^{0}\cancel{1}\,{}^{1}4\,{}^{9}\cancel{1}\cancel{0}\,{}^{1}\cancel{1}\cancel{0}699 \\ -\quad 89949 \\ \hline 60750 \end{array}$$

$$\begin{array}{r} {}^{0}\cancel{1}\,{}^{9}\cancel{1}\cancel{0}\,{}^{1}\cancel{1}\cancel{0}\,{}^{3}\,{}^{1}\cancel{4}19\ \text{kg} \\ -\quad 36.080\ \text{kg} \\ \hline 69.339 \end{array}$$

Multiplication

Year 3 - Multiply 2-digits by a single digit number

Year 4 - Multiply 2 and 3-digits by a single digit, using all multiplication tables up to 12 x 12

Year 5 - Multiply up to 4-digits by 1 or 2 digits

Year 6 - Short and long multiplication as in Y5, and multiply decimals with up to 2d.p by a single digit

Multiplication – Year 3

Introduce the **grid method** for multiplying 2-digit by single-digits

Eg. 23 x 8 = 184

X	20	3
8	160	24

160 + 24 = 184

Multiplication – Year 4

Developing the **grid method:**

Eg. 136 x 5 = 680

X	100	30	6
5	500	150	30

500

150

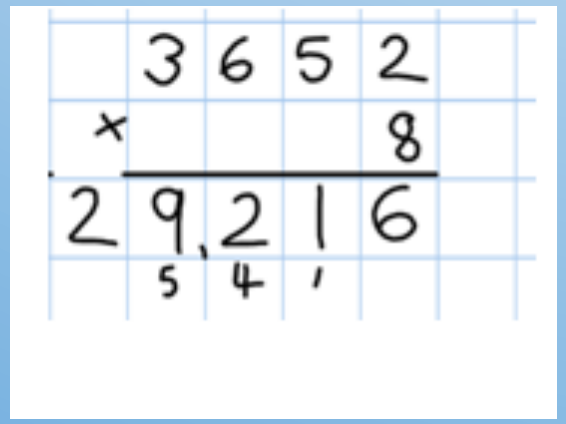
+ 30

680

Multiplication – Year 5

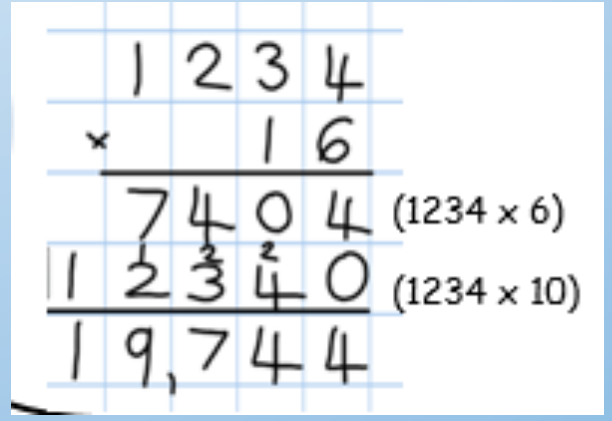
Introduce short multiplication for multiplying by a single digit:

$$\begin{array}{r} 327 \\ \times \quad 4 \\ \hline 1308 \\ 1\ 2 \end{array}$$

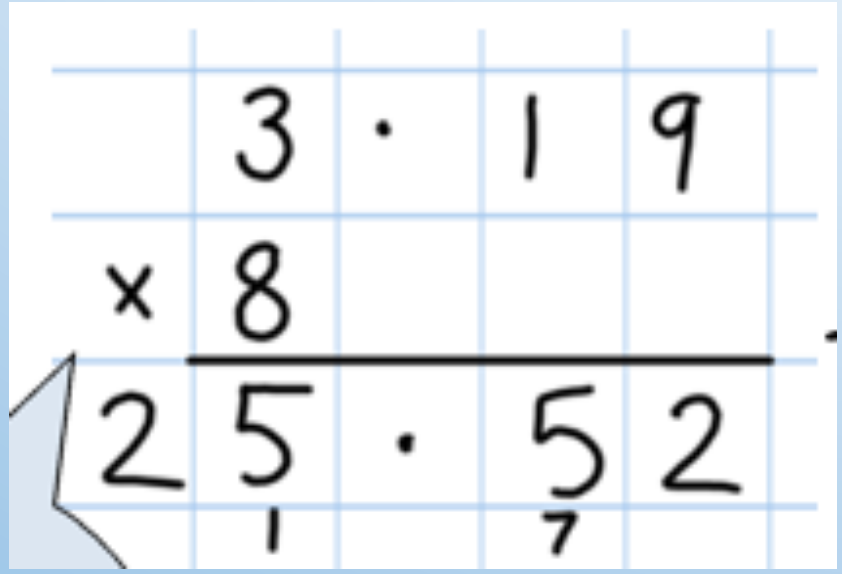


Introduce long multiplication for multiplying by 2 digits

$$\begin{array}{r} 18 \\ \times \quad 13 \\ \hline 54 \\ 180 \\ \hline 234 \\ 1 \end{array}$$



Multiplication – Year 6



Use short multiplication (see Y5) to multiply numbers with more than 4-digits by a single digit; to multiply money and measures, and to multiply decimals with up to 2d.p. by a single digit

Use long multiplication (see Y5) to multiply numbers with at least 4 digits by a 2 digit number

Division

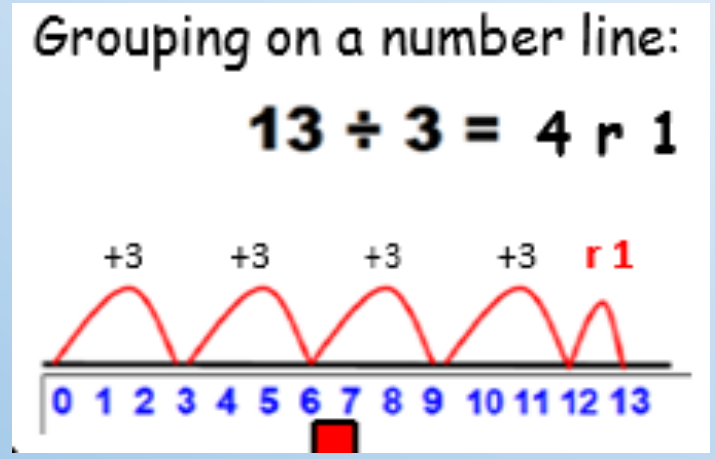
Year 3 - Divide 2 digit numbers by a single digit

Year 4 - Divide up to 3 digit numbers by a single digit

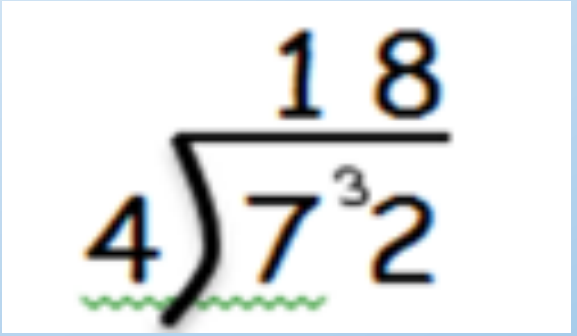
Year 5 - Divide up to 4 digit numbers by a single digit, with remainders

Year 6 - Divide at least 4 digits by both single digit and 2 digit numbers (including decimal numbers and quantities)

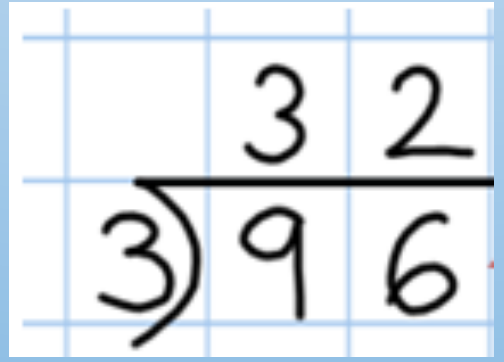
Division – Year 3



Short division with remainders occurring within:

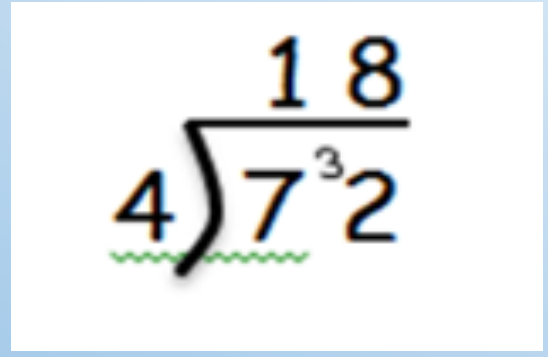


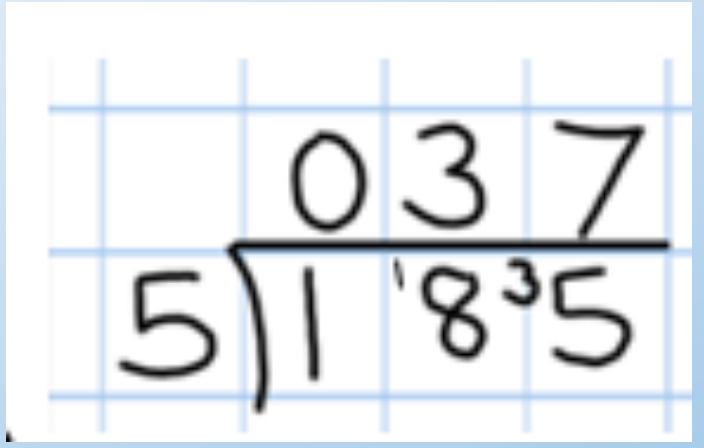
Short division:

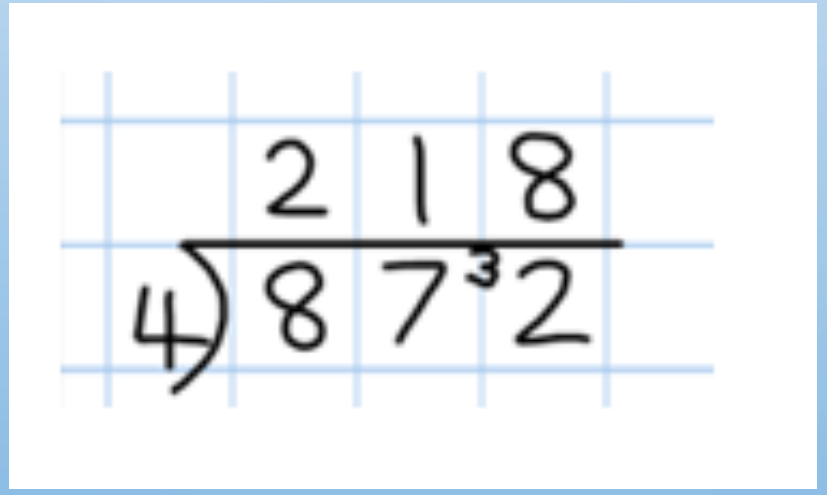


Division – Year 4

Short division with
remainders occurring within:

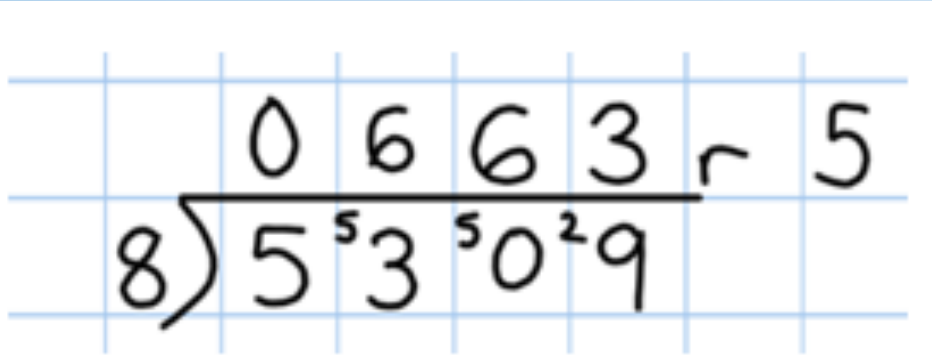






Division – Year 5

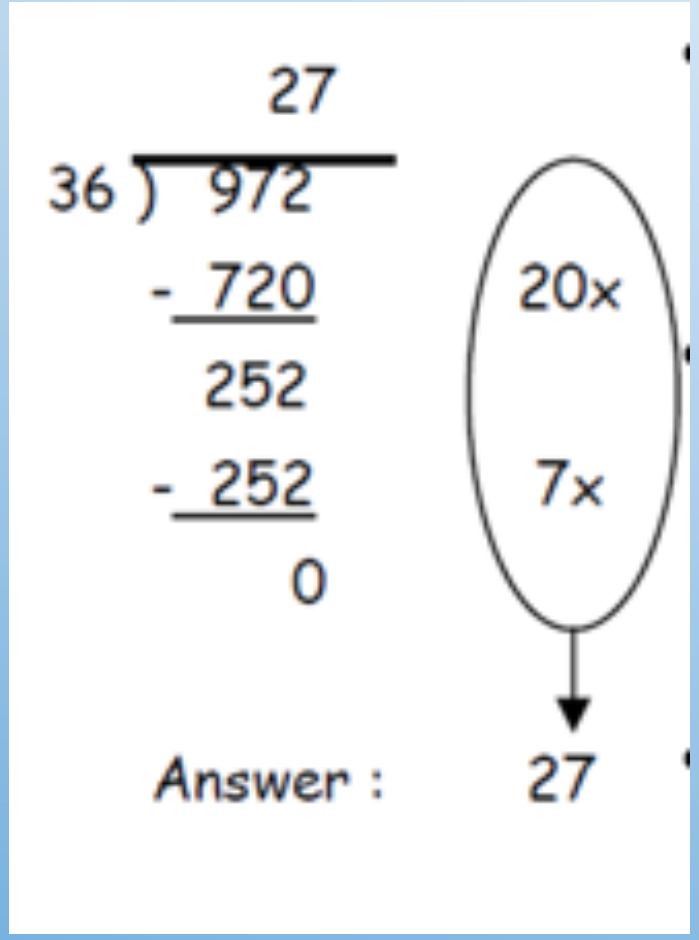
Short division with remainders:



Now that pupils are introduced to examples that give rise to remainder answers, division needs to have a real life problem solving context, where pupils consider the meaning of the remainder and how to express it, i.e. as a fraction, a decimal, or as a rounded number or value , depending upon the context of the problem

Division – Year 6

Introduce long division:



Find out how many 36s are on 972 by subtracting ‘chunks’ of 36 until zero is reached (or until there is a remainder).

New Curriculum - Y3

Multiplication & Division

☐ **recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables**

- multiply seven by three; what is four multiplied by nine? Etc.
- Circle three numbers that add to make a multiple of 4
- 11 12 13 14 15 16 17 18 19
- Leila puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with?
- At Christmas, there are 49 chocolates in a tin and Tim shares them between himself and 7 other members of the family. How many chocolates will each person get?

☐ **write and calculate mathematical statements for multiplication and 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**

- One orange costs nineteen pence. How much will three oranges cost?
- Mark drives 19 miles to work every day and 19 miles back. He does this on Mondays, Tuesdays, Wednesdays, Thursdays and Fridays. How many miles does he travel to work and back in one week?

☐ **solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.**

- Miss West needs 28 paper cups. She has to buy them in packs of 6. How many packs does she have to buy?

New Curriculum - Y3

☐ **recognise and show, using diagrams, families of common equivalent fractions**

- Recognise that five tenths (5/10) or one half is shaded.

- Recognise that two eighths (2/8) or one quarter (1/4) of the set of buttons is ringed

- Here is a square.

- What fraction of the square is shaded?

- Recognise that one whole is equivalent to two halves, three thirds, four quarters… For example, build a fraction 'wall' using a computer program and then estimate parts.
- Recognise patterns in equivalent patterns, such as:
- 1/2 = 2/4 = 3/6 = 4/8 = 5/10 = 6/12 = 7/14 and similar patterns for 1/3, 1/4, 1/5, 1/6, 1/10.

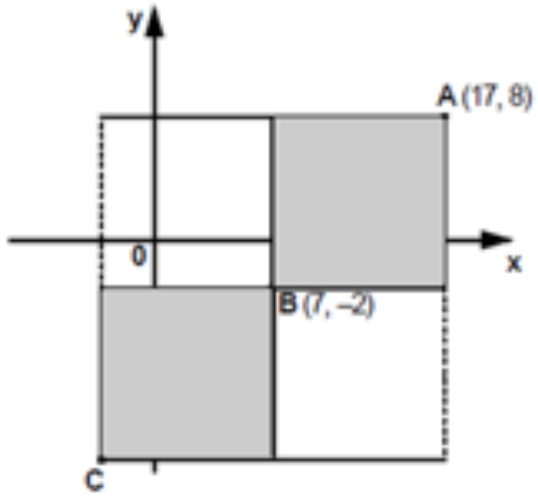
New Curriculum - Y6

Geometry – Position & Direction

☐ **describe positions on the full coordinate grid (all four quadrants)**

Children should be able to answer questions such as;

The two shaded squares below are the same size.

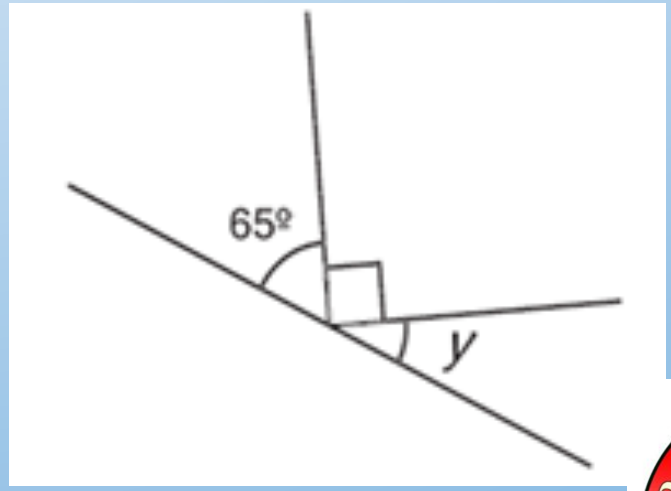


A is the point (17,8). B is the point (7,-2).

What are the co-ordinates of the point C?

♣ **recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.**

Children should be able to calculate the size of angle 'y' in this diagram without using a protractor.



Thank you!