



Numeracy Policy

Approved by Governors on:	12 June 2019
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AIMS

The teaching of numeracy is the responsibility of all staff and our primary aim is to ensure all students leave school with the ability to cope with the numerical demands of everyday life. To support this all teachers should, when appropriate, provide students with the opportunity to:

- Handle number and measurement competently; mentally, orally and in writing.
- Use calculators accurately and appropriately.
- Interpret and use numerical and statistical data represented in a variety of forms.
- To support the maths department in their teaching staff are asked to:
- Encourage students to show a method, rather than the answer only.
- Use estimation as a method for checking answers
- Highlight the importance of making mistakes to aid the learning process

Maths Department

The maths department strives to keep update with the mathematical techniques required in other subjects and will provide assistance and advice to other departments so that a correct and consistent approach is used; highlighting the potential difficulties likely to be experienced in various age and ability groups. The department aims to equip students with the necessary numeracy skills by the time they are needed in other subjects through a regular review of their SoW. Every effort is made during maths lessons to draw on the interests and experiences pupils have, this include the work done in other subject areas.

Subject Teachers

All teachers should ensure that they are familiar with the correct mathematical language, notation and techniques (see appendix for the school's calculation policy), relating to their own subject, and encourage students to use these correctly.

Numeracy should be embraced when lesson planning and when in conversation with pupils. The following table highlights when numeracy can be used in each subject area.

Cross Curricular Opportunities:

Subject	Opportunities
Art	Transformations inc. tessellations (Escher), reflective and rotational symmetry, scale drawing, geometric shapes in art (Kandinsky, Mondrian), 2D and 3D modelling, ratios and proportion.
English	Frequency of words (Shakespeare vs. Bacon), interpretation of graphs and charts in media.
Geography	Measures, coordinates, scales, converting units, graphs and charts.
History	Timelines dates, interpreting statistics, history of maths.
ICT	Spreadsheets and the use of formulae, databases, flowcharts, charts and graphs.
MFL	Money, time, reading numerical signs and information.
Music	Counting, rhythm, scales, intervals, patterns and symbols.
P.E	Units, measuring, recording, calculations including distance, speed and time, accuracy and angles.
R.E	Dates and the calendar, interpreting statistics.
Science	Arithmetical calculations, graphs and charts, measuring, golden ratio and the Fibonacci sequence in nature.
Technology	Measuring, conversions, ratio and proportion, time, money, constructions, plans and elevations, geometry in design.

Calculation Policy

Division

Bus Shelter Method

	0	3	2
6	1	19	12

With remainders

	0	3	2r.2
6	1	19	14

Misconceptions

Pupils get confused with the use of the remainder either adding it to the number in the next column or not using it in subsequent calculations.

Addition

Partitioning

$$356 + 292$$

$$300 + 200 = 500$$

$$50 + 90 = 140$$

$$6 + 2 = 8$$

$$\underline{500 + 140 + 8 = 648}$$

Misconceptions

Pupils forget the "place value" of the numbers. When adding 50 & 90 they add 5 and 9 instead.

Multiplication

The Russian Method*

46 x 38

	4	6	
1	1	1	3
7	3	4	8
1	4	8	

= 1,748

Misconceptions

Pupils forget to “carry” 10’s into the next column or do not add these when they have done so.
 *also known as the Chinese or Gelosia method.

Division

“Chunking” on number on a number line

Without Remainders

192 ÷ 6

10 x 6 = 60

20 x 6 = 120

30 x 6 = 180

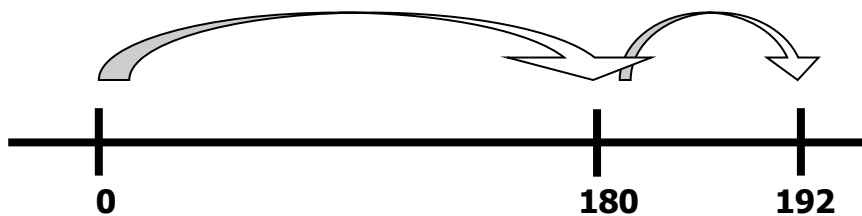
2 x 6 = 12

30 x 6 = 180

2 x 6 = 12

192

192 ÷ 6 = 32



Misconceptions

Pupils put the division around the wrong way or add the incorrect numbers at the end of the calculation.

Things to Consider

Addition/Subtraction

Pupils need to be comfortable with place value. The longer version of column addition can be taught as a lead up to the shorter version. Pupils need to be secure in the knowledge that 10 units can be exchanged for 1 ten etc.

Multiplication

The grid method relies on pupils being confident with multiplication of larger numbers that are factors of 10. The Russian method requires pupils to have a secure knowledge of multiplication facts up to 9 x 9.

The Russian method is very useful when multiplying decimals.

Division

Pupils need to have a secure knowledge of their times tables in order to be able to divide.

Approaching division using multiplication facts makes the concept

MULTIPLICATION

The Grid Method

	40	6	
30	1,200	1 180	= 1,380
8	320	48	= 368
	4	8	<u>1,748</u>

Misconceptions

Incorrect multiplication of larger numbers involving factors of 10. For example $20 \times 20 = 4,000$ rather than $20 \times 20 = 400$

ADDITION

Column Addition

$$356 + 292$$

LONG VERSION

$$\begin{array}{r} 300 + 50 + 6 \\ + 200 + 90 + 2 \\ \hline 500 + 140 + 8 \\ \hline = \underline{\underline{648}} \end{array}$$

SHORT VERSION

$$\begin{array}{r} 356 \\ + 292 \\ \hline \underline{\underline{648}} \end{array}$$

Misconceptions

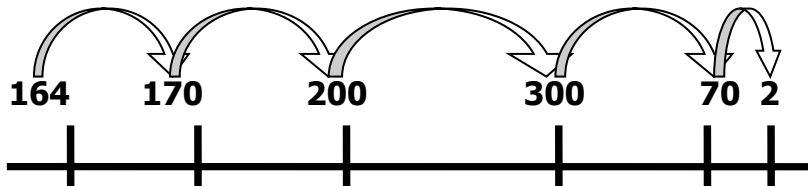
Pupils forget to carry numbers over or do not do this correctly. Pupils forget to add "carried" numbers or write 2 digits in one column.

SUBTRACTION

Number Line

$$372 - 164$$

$$+6 \quad +30 \quad +100 \quad +70 \quad +2$$



$$100 + 30 + 70 + 6 + 2 = \underline{208}$$

Misconceptions

Pupils count the starting position as "one jump" along the number line.

Column Subtraction

$$372 - 164$$

Long Version

$$\begin{array}{r} 60 \\ 300 + 70 + 12 \\ - 100 + 60 + 4 \\ \hline 200 + 0 + 8 \end{array}$$

$$= 208$$

Short Version

$$\begin{array}{r} 372 \\ - 164 \\ \hline 208 \end{array}$$

Misconceptions

Pupils always take the smaller number away from the larger number regardless of the calculation.