SOUTH MOLTON
COMMUNITY COLLEGE
supporting success

Numeracy Policy

Adopted by the Governing Body: October 2015

AIMS OF THIS POLICY

- to promote a consistent and effective approach to numeracy throughout the college
- to help develop and reinforce the numeracy skills of students

WHAT IS NUMERACY?

'Numeracy can be defined as the ability to process, communicate and interpret numerical information in a variety of contexts.'

Pupils should be able to:

- have a sense of the size of a number and its place in the number system
- know and recall basic number facts
- apply their knowledge of number to solve problems mentally
- calculate accurately
- use a calculator sensibly
- recognise the correct operation to solve a problem
- solve problems involving more than one step
- check answers for reasonableness
- explain their methods, using the correct terminology
- suggest suitable units for measurements and make sensible estimates of measurements
- explain and make predictions from numerical data in graphs, charts and tables

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CLASSROOM PRACTICE

All staff can help support numeracy in the classroom as follows:

1. Establishing rules for the use of calculators and rulers
2. Encouraging the use of certain techniques to aid mental arithmetic
3. Maintaining an awareness of language, conventions and common misconceptions
4. Accuracy of calculations that are specific to your subject

MATHS LEADERS

Maths leaders are selected voluntarily from the top set in year 11. They are required to offer a help and support club that will run in Room 3 every lunchtime for all year groups.

NUMERACY SUPPORT BOOKLETS

Each tutor will have a pack of numeracy booklets for use with KS3 students during tutor time. Initially these booklets will be available for year 7 students, but they will be rolled out to the whole of KS3 over the next two years (by Sept 2017).

CALCULATORS

All students should have their own calculator which should be available for all lessons. Students should be able to use their calculators with understanding and should always have a mental estimate for each calculation. **Students must not treat the availability of a calculator as a necessity for using it.**

Appendix – Extra notes that may help non-mathematicians incorporate numeracy into their lessons.

MENTAL ARITHMETIC TECHNIQUES

Encourage the use of a) complements, b) distributivity and c) commutativity.

Examples: a) 65+?=100 (hundred's complement)
b) 18x17= 20x17-2x17
c) 17x3=3x17

LANGUAGE, CONVENTIONS AND COMMON MISCONCEPTIONS

LANGUAGE		
1.	Use of '='	It may sound obvious but remember that this means 'equals'! There is a different symbol (≈) that means 'approximately equals' e.g. 11.49 ≈ 11 is correct but 11.49 = 11 is incorrect. NB The = sign may take on a slightly different meaning in ICT.
2.	Oral notation of brackets	e.g. 5 + 4 x 3 = 17 but (5 + 4) x 3 = 27 The difference between these two calculations can usually be explained orally by emphasising the numbers and operators differently but it can cause confusion.
3.	Multiplying/ dividing by 10	Beware saying 'add a nought/subtract a nought' when multiplying or dividing by 10 because it does not work for decimals. e.g 4.6 x 10 does not equal 4.60
4.	'Move the decimal place'	Never say this - it contradicts all the principles of place value. The decimal place stays fixed and the number moves.
5.	Negative numbers	The number -3 is 'negative three' rather than 'minus three' despite what weather forecasters say! Avoid saying 'two minuses make a plus'.
6.	Subtraction	When subtracting you should 'carry' rather than 'borrow' as 'borrow' implies that you will pay back.
7.	cm^2	'cm^2' should be read as 'square centimetres', not 'centimetres squared' (5 centimetres squared = 25 square centimetres). Similarly, cm^3 should be read as cubic centimeters.
8.	Histogram/ Bar Chart	These are different types of graph. Histogram: The area of each bar represents the frequency. Bar Chart: The height of each bar represents frequency. It is good practice to use bar charts for **discrete** data e.g shoe sizes (there should be spaces between the bars) or better still to use a stick graph. Histograms should be used for **continuous** data e.g. length of foot.
9.	Correlation	A correlation of +1 indicates that the plotted data fits to a line with a positive gradient. A correlation of -1 indicates that the plotted data fits to a line with a negative gradient. A correlation of 0 indicates that the plotted data does not fit to any line at all. Eg it is possible to talk about a strong positive correlation.

CONVENTIONS		
1.	Writing large numbers	Commas are no longer used when writing large numbers (since we joined the EU!). Instead leave a space after each block of 3 digits (four digit numbers are usually written without a space). e.g. 56 041 678
2.	Rounding numbers	It is convention to round up from 0.50 and down from 0.49. e.g 12.5 would become 13 but 12.49 would become 12.
3.	Units	Values should include units, unless inappropriate.
4.	Labelling axes on graphs	Without labelling a graph is meaningless. Make sure students number the axes with equal intervals and that the numbers lie on a gridline rather than a space. e.g. Given masses of 1kg, 1.2kg, 2.5kg, 3.8kg & 20kg some students will write on a scale putting **these** numbers 1cm apart.
5.	Line graphs	The horizontal axes of graphs should be used for the independent variable (usually Time).
6.	Writing probability	Examination boards will not accept answers given in the form 'one out of two' or '2 to 1'. Probabilities should be given as a fraction, decimal fraction or percentage.
7.	Time	Avoid using a decimal point with time as this implies base 10 is being used. Eg 3:25 pm or 1525 hrs but not 3.25 pm or 15.25 hrs.
8.	Writing money and length etc	Money should be written using £ or p but not both. e.g 123p or £1.23 but not £1.23p. Similarly, 1234mm, 123.4cm or 1.234m but not 1m23cm4mm
9.	Order of operations	x and ÷ should be executed before + and – (brackets first).
10.	Lining up decimal points	Eg 10.3 3.14 202.4

COMMON MISCONCEPTIONS		
1.	Use of '='	This is often used incorrectly in problems which take two or more steps to solve. e.g Correct: 2 x 3 = 6 6 + 4 = 10 Incorrect: 2 x 3 = 6 + 4 = 10
2.	Calculator displays and money	Students often have difficulty interpreting amounts of money such as £3.50 as the calculator will not show the zero. A common mistake is to interpret this as 3 pounds, 5 pence.
3.	Calculators and standard form	Calculator representation is sometimes different from the written notation and students find this confusing. e.g. Written notation: 4.6×10^7 Some calculator displays may show 4.6E07. An answer given in this form will not be accepted by examination boards.
4.	Length of numbers	Students commonly think the longer the number is, the larger it is. This does not work for decimals. E.g. 0.003695 < 0.0038
5.	Significant figures	Students sometimes think that noughts after the decimal place are not significant. Eg 14.00 (4sf) may end up as 14 (2sf).
6.	Lines of best fit	Students often think that these have to pass through the origin and that they have to be a straight line.

POLICY WRITTEN BY
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