

Rooks Heath College



Numeracy Policy

Introduction

This policy replaces any previous policy and follows the DCSF regulations and those issued by the London Borough of Harrow.

In line with the college's Equal Opportunities and Special Educational Needs policies, we aim to give all students equal opportunities to take part in all aspects of college life, as far as is appropriate, practicable and compatible with giving regard to health and safety and the efficient education of other students.

This policy takes account of the Government's aim for children to have the support they need under Every Child Matters:

- to be healthy
- to stay safe
- to enjoy and achieve
- to make a positive contribution
- to achieve economic well-being.

The policy will follow the five principles of the Children's Plan:

- to support parents and families
- to allow children to reach their full potential
- to enable children to enjoy their childhood whilst preparing for adult life
- to provide services in response to children and family needs
- to use preventative measures to help students to avoid the possibility of failure.

This policy is based on the long-standing aims of the college to encourage all students to reach the highest level of achievement that is possible for them, both in public examinations and in the development of any special talents they possess; to equip all students with the knowledge and skills necessary for coping successfully with life; and to foster the development of all students as mature and responsible individuals. This policy is founded in the College's commitment to the development and maintenance of good behaviour and a positive and inclusive ethos for all members of the College community.

Third edition June 2012

Foreword

Rooks Heath College is a mixed 11 to 18 multicultural comprehensive in the London Borough of Harrow. This policy is formulated by the Deputy Headteacher, in consultation with staff, and is monitored by other members of the college's Leadership and Management Group. The policy is subject to annual review by the college's Leadership and Management Group and is subject to approval by the Governors of the college.

Rooks Heath College believes it is the responsibility of ALL staff within the college to maximise opportunities for students to develop and improve their Numeracy and to help them to develop a positive attitude towards mathematics, in order to maintain improvement in the quality of education provided.

This Numeracy Policy has been formulated to sit within the college development plan and reflects the Government's recommended policy.

Principles

- It is the responsibility of ALL staff within the college to maximise opportunities for students to develop and improve their Numeracy and to help them to develop a positive attitude towards mathematics.
- The Mathematics department aims to recognise the explicit links between subjects, by using examples from other subject areas to highlight their expectations and unique demands.
- The Mathematics department aims to provide support for ALL departments within the college to develop Numeracy across the curriculum, and to maximise opportunities for collaboration between departments on issues relating to Numeracy.
- All departments within the college aim to encourage the selective use of the calculator and to promote non-calculator methods when appropriate.
- This policy and Appendix 1 '*A consensus of the use of Mathematics across the curriculum*' should be part of the schemes of work for all departments.

Being Numerate implies:

- An 'at'-homeness' with numbers.
- An ability to make use of Mathematics skills which enables an individual to cope with the Mathematical demands of everyday life.
- To have an appreciation and understanding of information, which is presented in Mathematical terms, for instance in graphs, charts or tables, or by reference to percentage increase or decrease.
- To appreciate and understand some of the ways in which Mathematics can be used as a means of communication.
- The use of methods of calculation, which are both efficient and effective.
- Confidence and ability in mental methods.
- Selecting the most appropriate method of calculation for a given purpose.
- An awareness of the links between different aspects of the Mathematics curriculum.

- Reasoning, justifying and proving results about number.
- Using number to represent Mathematical models of real-life situations.
- To understand and be able to use the language of Mathematics, and talk confidently about Mathematical ideas.

How do students learn to become numerate?

- Through purposeful interpersonal activity based on interaction with others.
- Through being challenged and struggling to overcome and solve problems.
- Most students are able to become numerate, but vary in their ability and the rate at which they develop their Numeracy.
- Students can develop their own strategies for calculating and solving problems, but it is their teacher's responsibility to help them to refine their methods.
- Students misunderstandings need to be recognised, made explicit and worked on.

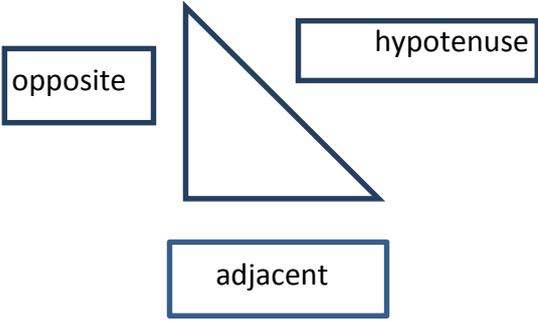
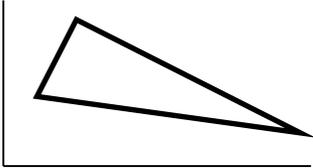
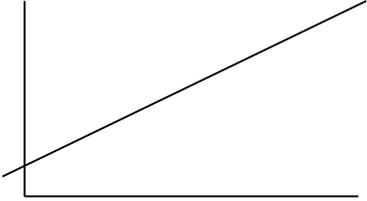
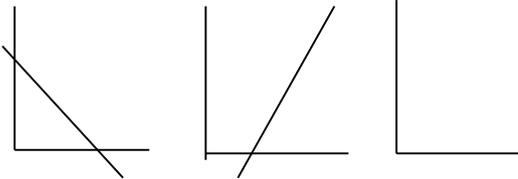
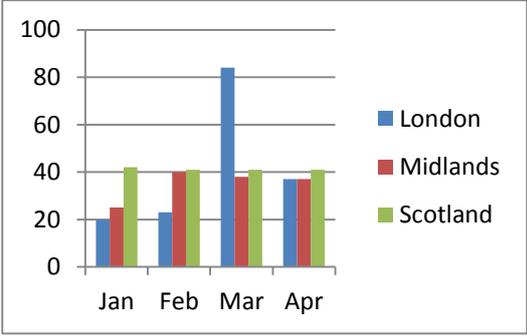
How is it best to teach students to become numerate?

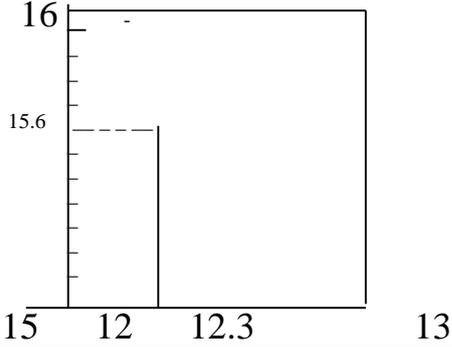
- Teaching and learning are complimentary.
- Learning is based on dialogue between teacher and student, but also between student and student.
- Learning about Mathematical concepts and how to apply them should develop together, alongside each other.
- The connections between different Mathematical ideas need to be acknowledged in teaching. (Connectionist theory)

ROOKS HEATH COLLEGE
CONSENSUS OF THE USE OF MATHEMATICS ACROSS THE
CURRICULUM

<p>Decimals The number 0.33333333is a recurring decimal and should be written 0.3 dot</p>	<p>TRIAL AND IMPROVEMENT Is the method of finding an answer to a problem with the following steps: Step 1: Guess a likely answer. Step 2: Check to see if this answer fits the given facts. (trial) Step 3: Make a better guess (improvement) Repeat until the actual answer is found or as near as you can get to it</p>			
<p style="text-align: center;">Graphs Should always be drawn using graph paper and pencil.</p>	<p>INEQUALITIES $X > 4$ can be read as 'x is greater than 4' or '4 is less than x'. $3 \geq y$ can be read as 'y is less than or equal to 3' or '3 is greater than or equal to y' $5 \geq x > 2$ can be read as 'x is greater than 2 and less than or equal to 5' Therefore the whole number value of x could be 3,4,5 only.</p>			
<p>DECIMAL PLACES(dp) Count from the decimal point. 34.5487 is 34.549 (3dp) Is 34.55 (2dp) Is 34.5 (1dp) DO NOT round up if the next number is 0-4 DO round up if the next number is 5-9</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td data-bbox="805 1189 1090 1738" style="width: 50%; vertical-align: top;"> <p style="text-align: center;">π Is the Greek letter pi You can use π as 3.1 or 3.14 but in the GCSE you should use 3.142 You can estimate answers in your head using 3 for π.</p> </td> <td data-bbox="1090 1189 1433 1738" style="width: 50%; vertical-align: top;"> <p>SQUARES AND SQUARE ROOTS $2^2 = 2 \times 2 = 4$ and $\sqrt{4} = 2$</p> <p>$1 \times 1 = 1$ $2 \times 2 = 4$ $3 \times 3 = 9$ $4 \times 4 = 16$</p> <p>$\sqrt{16} = 4$ $\sqrt{9} = 3$</p> </td> </tr> </table>		<p style="text-align: center;">π Is the Greek letter pi You can use π as 3.1 or 3.14 but in the GCSE you should use 3.142 You can estimate answers in your head using 3 for π.</p>	<p>SQUARES AND SQUARE ROOTS $2^2 = 2 \times 2 = 4$ and $\sqrt{4} = 2$</p> <p>$1 \times 1 = 1$ $2 \times 2 = 4$ $3 \times 3 = 9$ $4 \times 4 = 16$</p> <p>$\sqrt{16} = 4$ $\sqrt{9} = 3$</p>
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<p>SIGNIFICANT FIGURES (sf) Count from the first non-zero figure. 34.548 is 34.5 (3sf) Is 35 (2sf)</p> <p>0.345 is 0.0345 (3sf) Is 0.035 (2sf) Is 0.04 (1sf)</p> <p>2346 is 2350 (3sf) Is 2300 (2sf) Is 2000 (1sf)</p>				

<p>SIMILAR</p> <p>Shapes are said to be Mathematically similar if they are the same in every way except size. Eg: A real train and its model are similar.</p> <p>If you can slide a shape over another and it fits exactly then it is similar. One shape is, by definition, an enlargement of the other.</p> <p>NB: Shapes are said to be similar in English usage if they are simply roughly the same.</p> <p>In Music, we use the word imitation to describe music that is similar.</p>	<p>CONGRUENT</p> <p>Two shapes are said to be Mathematically congruent if they are the same every way including the size. EG: two trains</p>	<p>CALCULATORS IN MATHS LESSONS</p> <p>Mathematics exams: Paper 1 – Non- calculator Paper 2 – Calculator</p> <p>For every topic in Maths students learn how to solve simple problems without a calculator first, and then more complex examples that require a calculator.</p>
<p>Answers in examinations.</p> <p>Answers to questions should be given using the accuracy asked for. Eg: 2dp or 3sf</p> <p>If no accuracy is stipulated then give the full calculated answer. If you do round any answers remember to write the full answer first and then state what accuracy you have used to round. Eg: 4.345 cm = 4.4 cm (1dp)</p> <p>In DT you are required always to give measurements in mm. It is the convention to write just the number, and not mm afterwards.</p>	<p>CALCULATIONS</p> <p>Should always be shown VERY CLEARLY so that part-marks can be awarded even if the final answer is incorrect.</p>	<p>PERCENTAGES</p> <p>Any %, decimal fraction or ratio may be written in the other forms.</p> <p>Eg:</p> <p>7%</p> <p>$\frac{7}{100}$</p> <p>0.07</p> <p>7 : 100</p>
	<p>Always write FRACTIONS as</p> <p>$\frac{7}{100}$</p> <p>and never 7/100</p>	

<p style="text-align: center;">Trigonometry</p> <p>The following used are in the following form:</p> $\text{TAN } \theta = \frac{\text{opposite}}{\text{adjacent}}$ $\text{SIN } \theta = \frac{\text{opposite}}{\text{Hypotenuse}}$ $\text{COS } \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ 	<p style="text-align: center;">Coordinates</p> <p>Known as Cartesian coordinates they are written eg: (3,5) meaning 3 across and 5 up.</p> <p>Plot points clearly on a graph using small pencil crosses.</p> <p>Eg: A(1,2) B(2,4) C(6,3)</p>  <p>Use a ruler to join crosses if they lie on a straight line in pencil.</p> <p>If the points lie in a curve, draw a sweeping curved line.</p> <p>The graph line does not have to go through(0,0)</p> <p>Extend the line in both directions.</p>																				
<p style="text-align: center;">Scatter graphs</p> <p>If the points do not lie in a line or curve then you can draw in the line or curve of BEST FIT. You must make sure that there are, as far as is possible, as many crosses to the left of the line as to the right.</p>  <p>The line of best fit does not have to pass through (0,0)</p>  <p>Negative correlation positive correlation random</p>	<p style="text-align: center;">Bar charts</p> <p>A bar chart has bars all the SAME width and it is the height of the bars that are comparing.</p> <p>Axes must be labelled and units given.</p> <p>The chart should have a title and a legend (or key) and label the axes.</p> <p style="text-align: center;">Rainfall 1999</p>  <table border="1"> <caption>Rainfall 1999 Data</caption> <thead> <tr> <th>Month</th> <th>London</th> <th>Midlands</th> <th>Scotland</th> </tr> </thead> <tbody> <tr> <td>Jan</td> <td>20</td> <td>25</td> <td>40</td> </tr> <tr> <td>Feb</td> <td>22</td> <td>40</td> <td>40</td> </tr> <tr> <td>Mar</td> <td>85</td> <td>38</td> <td>40</td> </tr> <tr> <td>Apr</td> <td>35</td> <td>35</td> <td>40</td> </tr> </tbody> </table>	Month	London	Midlands	Scotland	Jan	20	25	40	Feb	22	40	40	Mar	85	38	40	Apr	35	35	40
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<p style="text-align: center;">Surveys</p> <p>The steps taken to conduct a survey are:</p> <ol style="list-style-type: none"> 1. DECIDE on the purpose of the survey. 2. DESIGN on observation sheet or a questionnaire 3. COLLECT the data and collate the data. 4. ORGANISE the data onto tables and graphs or onto a computer spreadsheet. 5. ANALYSE the data i.e. make some of conclusions based on and referring to the data. 	<p style="text-align: center;">Grid references</p> <p>We leave out the decimal points, and write the grid reference with six figures.</p> <p>We leave out the decimal points, and write the grid reference with six figures, like this 123156</p> 																																											
<p style="text-align: center;">Grouped data and frequency diagrams</p> <table border="1" data-bbox="252 1055 783 1249"> <thead> <tr> <th>Height of seedlings</th> <th>frequency</th> </tr> </thead> <tbody> <tr> <td>1-3</td> <td>9</td> </tr> <tr> <td>4-6</td> <td>3</td> </tr> <tr> <td>7-9</td> <td>10</td> </tr> <tr> <td>10-12</td> <td>5</td> </tr> </tbody> </table> <p>The frequency polygon is the line drawn through the middle of the top of each bar.</p>	Height of seedlings	frequency	1-3	9	4-6	3	7-9	10	10-12	5	<p style="text-align: center;">Cumulative frequency</p> <table border="1" data-bbox="818 1055 1257 1525"> <thead> <tr> <th>Mark</th> <th>number of Pupils</th> <th>cf</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>4</td> <td>4</td> </tr> <tr> <td>2</td> <td>6</td> <td>10</td> </tr> <tr> <td>3</td> <td>8</td> <td>18</td> </tr> <tr> <td>4</td> <td>6</td> <td>24</td> </tr> <tr> <td>5</td> <td>10</td> <td>34</td> </tr> <tr> <td>6</td> <td>11</td> <td>45</td> </tr> <tr> <td>7</td> <td>15</td> <td>60</td> </tr> <tr> <td>8</td> <td>8</td> <td>68</td> </tr> <tr> <td>9</td> <td>3</td> <td>71</td> </tr> <tr> <td>10</td> <td>2</td> <td>73</td> </tr> </tbody> </table>	Mark	number of Pupils	cf	1	4	4	2	6	10	3	8	18	4	6	24	5	10	34	6	11	45	7	15	60	8	8	68	9	3	71	10	2	73
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