

Year 7: Assessment statements

Subject: Numeracy through STEM



	Fundamental concepts	Process and Problem solving	Fluency	Communication
<p>Mastering</p> <p>(Indicative of student who will go on to achieve a grade 7-9 at GCSE, if they continue to progress as they are).</p> <p>Stage 3</p> <p>(Application)</p>	<p>Students are working above age related expectations for maths and have a strong understanding of concepts covered in KS2, as well as considerable fluency in their use.</p> <p>These students require no additional numeracy input to be able to access the numeracy requirements of all Key Stage 3 subjects and are ready to start the Computer Science curriculum.</p>	<ul style="list-style-type: none"> • They can independently devise an approach and strategy with which to investigate and generate solutions to problems presented to them. • They can identify and extract all relevant numerical values from text-based information. • They conduct any practical investigations having assessed risk and included control measures. • They set calculations out clearly to show the process derived in their working out. <p>These students require no additional numeracy input to be able to access the numeracy requirements of all Key Stage 3 subjects and are ready to start the Computer Science curriculum.</p>	<ul style="list-style-type: none"> • Students are fluent in their times tables up to 15 without using a written process. • They can mentally use the inverse relationship between multiplication and division up to 15 and the written processes for all other numbers including decimals, negatives, and fractions. • They show speed and accuracy in completing mental arithmetic and have well developed calculator skills allowing them to complete complex functions. <p>These students require no additional numeracy input to be able to access the numeracy requirements of all Key Stage 3 subjects and are ready to start the Computer Science curriculum.</p>	<ul style="list-style-type: none"> • They accurately communicate meaning to different audiences through precise and consistent use of terminology, symbols and mathematical conventions throughout their work. • They are able to process data independently, to appropriate significant figures, in order to make the data more effective in supporting conclusions. • They can independently produce complicated tables and graphs, plotting points with accuracy. • They understand fully the importance STEM plays in the modern world, and can link this to applications and careers, including in Computing. • They demonstrate confidence in being able to prove why an answer is correct and justify conclusions. <p>These students require no additional numeracy input to be able to access the numeracy requirements of all Key Stage 3 subjects and are ready to start the Computer Science curriculum.</p>
<p>Advancing</p> <p>(Indicative of student who will go on to achieve a grade 5-6 at GCSE, if they continue to progress as they are).</p> <p>Upper Stage 2</p> <p>(Investigation)</p>	<p>Students are working at or slightly above age-related expectations for maths, with a secure grasp of mathematical concepts from KS2 and fluency in their use.</p> <p>Mostly understands key numerical concepts, is able to select concepts in identifying and solving problems and can utilise this knowledge throughout most aspects of life and within all subjects.</p>	<ul style="list-style-type: none"> • Students are able to potential identify mathematical problems or investigations, within a broad context, which they wish to solve. • They show developing ability to research and draw upon research material, extracting values from text-based information and using it in planning and structuring investigations. • They are able to select appropriate knowledge that is relevant to solving the problems they are investigating. • They are able to devise a sequenced, multistep approach to solving or investigating problems, with minimal support and due regard for safety. • They apply the order of operations rules for all calculations. • They can carry out substantial tasks and solve quite complex problems by independently and systematically breaking them down into smaller, more manageable tasks. • They routinely use their maths skills to evaluate the accuracy and credibility of their answers, in order to identify potential errors. 	<ul style="list-style-type: none"> • Students are fluent in their times tables up to 12 without using a written process. • They can mentally use the inverse relationship between multiplication and division up to 12 and the written processes for all other numbers including decimals, negatives, and fractions. • They are proficient in the use of a scientific calculator when completing calculations in line with the Year 7 curriculum. 	<ul style="list-style-type: none"> • Students are capable of clearly and logically presenting and communicating the conclusions of investigations, using appropriate mathematical terminology, symbols and conventions. • They not only select relevant values in support of their conclusions but are beginning to process these values to make them more useful. • Students understand that calculated data cannot be more accurate than raw data. • They can independently produce tables, graphs and charts in support of their findings, ensuring these are accurately labelled with variables and units, accurately plotted points and linear scales. • They can explain why numerical skills and STEM subjects are so important in the modern world, and how their numeracy skills are relevant to STEM subjects. • They begin to give mathematical justifications, making connections between the current situation and situations they have encountered before.

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<p>Securing</p> <p>(Indicative of student who will go on to achieve a grade 3-4 at GCSE, if they continue to progress as they are).</p> <p>Lower Stage 2 (Supported investigation)</p>	<p>Students generally have a secure knowledge of the Key Stage 2 maths curriculum, but with may have a small number of gaps and/or lack fluency.</p>	<ul style="list-style-type: none"> • Students can suggest, with support, potential investigations within a context, which could utilise maths knowledge and skills. • They are sometimes able to select appropriate knowledge that is relevant to solving prescribed problems but may sometimes require support with this. • When provided, they can use a given approach to tackle a problem and draw upon their mathematical knowledge to apply a given process to solve a problem. • They are able to devise a sequenced approach to solving prescribed problems, with regard for working safely. • They adhere to the order of operations rules for most calculations. • When solving problems, with or without a calculator, they check their results are reasonable by considering the context or the size of the numbers. 	<ul style="list-style-type: none"> • Students demonstrate fluency in their times tables up to 12, although this may not be at speed and will require the written process at times and can use this knowledge to support problems involving division. • They use a written process for division calculations and multiplications above 12. • They can use a scientific calculator, with guidance, when completing calculations in line with the Year 7 curriculum. 	<ul style="list-style-type: none"> • Students look for patterns and relationships in data, presenting information and results in a clear and organised way. • They can present and communicate some conclusions from their investigations, using some appropriate terminology, symbols or conventions. • They can produce simple charts and tables to support their conclusions e.g. bar charts, with minimal support. These are accurately labelled with variables and units, with points usually plotted to an accuracy of +/- 1mm. • They select relevant values in support of their conclusions. • They can name some STEM careers which utilise mathematical concepts and say how they use them.
<p>Foundation</p> <p>(Indicative of student who will go on to achieve a grade 1-2 at GCSE, if they continue to progress as they are).</p> <p>Stage 1 (Numeracy support)</p>	<p>Students have gaps in their knowledge from Key Stage 2 mathematics, which present a barrier to the accessing numeracy components of Key Stage 3.</p> <p>They have insecurities in some of their times tables, but are generally fluent in using 2,3,4,5 and 10 times tables.</p> <p>Their mental arithmetic is limited to basic one step calculations involving addition or subtraction.</p>	<ul style="list-style-type: none"> • Students are able to utilise their mathematical knowledge to perform one or two step calculations with guidance. • They understand the rules of order of operations but do not always adhere to them. • They require considerable support in extracting information from questions and in formulating a strategy with which to conduct calculations. • They require considerable support in identifying risks and reminders about working safety, when conducting practical investigations. • They make extensive use of modelled answers as templates on which to construct their own answers but can sometimes struggle to adapt these to calculations which do not follow the same information. 	<ul style="list-style-type: none"> • Students can multiply a single digit by a double-digit number up to 12 without using a written process but will resort to column multiplication when unsure. • They use a written process for division calculations. • They can use a calculator, with guidance, when completing calculations in line with the Year 7 curriculum. 	<ul style="list-style-type: none"> • Students can communicate the answers to calculations, and how they arrived at those answers. • They can draw simple conclusions. • They can produce simple charts and tables, when provided with templates to complete or modelled examples to adapt. • They can give a simple explanation of the importance of maths and being numerate in life e.g. to help you to calculate how much change you should get in shops.