

The DfE has produced this summary on the differences between the current and new GCSE mathematics specifications. First teaching of the new specification will be from September 2015 with first examination in the summer of 2017.

Changes to GCSE maths

General points:

- The qualification will contain broader and deeper mathematical content, delivered through a single extended GCSE which will require greater examination time and greater teaching time.
- There will be additional requirements to provide clear mathematical arguments.
- Including more non-routine problems which expect students to be able to apply themselves in different ways.

Old (2011)	New (2013)	Rationale
General		
Higher tier content identified in bold.	<p>The subject content is clearly divided into three areas to more closely specify key content all students, including the less able, should be confident with:</p> <ul style="list-style-type: none"> • Content with which all students can develop confidence and competence; • Content all students will be assessed on and higher attaining students will develop confidence and competence with; and • Content only the higher attaining students will be tested on and with which the strongest students can be expected to develop confidence and competence. 	To clearly identify content all students should be confident with and content to stretch higher achievers.

Content domains not weighted	Content domains weighted: Lower tier – greater focus on number and ratio Higher tier – greater focus on algebra	To ensure lower tier students get thoroughly tested on the core content and higher tier and more stretched.
Assessment objectives very brief with 10% range to indicate proportion of content:	Assessment objectives far more detailed and proportions identified by precise number, differentiated into higher and lower tier – lower tier more emphasis on using and applying techniques, higher tier great focus on reasoning mathematically	To ensure better exams which meet the aims of more challenging, open ended question types which include fewer single-step questions to ensure students are not led through their answers and include more non-routine problems which expect students to be able to apply themselves in different ways.
Divided into sections: Number; Algebra; Geometry and Measure; Probability; Statistics	Sections: Number; Algebra; Ratio, Proportion and Rates of Change; Geometry and Measures; Probability; Statistics And sub headings	Content to do with ratio and rates of change is separated out and developed as essential concepts at this level
Examples of specific subject content changes		
<i>add, subtract, multiply and divide any number</i>	<i>apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative; understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals</i>	Specified in more detail to ensure thorough coverage of core concepts – grasp of formal written methods of calculation
<i>use ratio notation, including reduction to its simplest form and its various links to</i>	<i>use ratio notation, including reduction to simplest form</i> <i>divide a given quantity into two parts in a given</i>	Specified in more detail to ensure thorough coverage of core concepts – ratio is fundamental at this level

<p><i>fraction notation</i></p>	<p><i>part:part or part:whole ratio; express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations)</i></p> <p><i>express a multiplicative relationship between two quantities as a ratio or a fraction</i></p>	
<p>Rate of change not covered</p>	<p><i>interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion</i></p> <p><i>interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of instantaneous and average rate of change</i></p>	<p>Essential coverage of pre calculus</p>
<p>No mention of arguing mathematically</p>	<p><i>argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments and proofs</i></p>	<p>To develop skills in reasoning mathematically</p>
<p>No mention of financial mathematics</p>	<p><i>solve problems involving percentage change, including percentage increase/decrease and original value problems, and simple interest including in financial mathematics</i></p> <p><i>set up, solve and interpret the answers in growth and decay problems, including compound interest and work with general iterative processes</i></p>	<p>To support development of skills to manage personal finance, understand loans etc.</p>
<p>No mention of vectors</p>	<p><i>describe translations as 2D vectors</i></p> <p><i>apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of</i></p>	<p>Vectors are important as they describe physical processes in the real world involving velocity, position and</p>

	<i>vectors; use vectors to construct geometric arguments and proofs</i>	acceleration.
<i>understand and use the vocabulary of probability and the probability scale</i> <i>use tree diagrams to represent outcomes of compound events, recognising when events are independent</i>	<i>calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams</i>	Use of term 'expected frequencies' is an attempt to include concepts of 'natural frequencies' including Bayes Theorem about understanding the nature of conditional probability
<i>understand and use statistical problem solving process/handling data cycle</i>	No mention of statistical problem solving / data handling cycle	embedded into other subjects such as science and geography where it is explored experimentally