BMAT KS3 Level Descriptors: Maths
BMAT KS3 Level 1- 8

In Maths each level descriptor is a set of topics that a student needs to understand in order to be at that level. If you press control and left click on any of the topics listed it will open a link to a website, www.mathsgenie.co.uk, which will show a video explaining the topic in more detail and has questions with solutions for you to practice.

1	*Students use mathematics as an integral part of classroom activities. They represent their work with objects or pictures and discuss it. They recognise and can use a simple pattern or relationship.*
	Students can add, subtract and multiply 1 and 2 digit numbers, can divide a 2 digit number by a single digit. Students can write a fraction, can order and simplify fractions. Students can identify place value. Students can round to the nearest 10, 100 and 1000. Students can identify, add, subtract, multiply and divide negative numbers. Students can identify square and cube numbers. Students can identify factors and multiples. Students can plot coordinates on an axis. Students can read and draw pictograms.

Addition and Subtraction

Multiplication and Division

Writing, Simplifying and Ordering Fractions

Place Value

Rounding

Negative Numbers

Powers and Roots

BIDMAS

Factors and Multiples

Coordinates

Pictograms

2	*Students select the mathematics they use in some classroom activities. They discuss their work using mathematical language and are beginning to represent it using symbols and simple diagrams.*
	Students can solve simple problems with and without a calculator. Students can find a fraction of an amount. Students can convert between simple fractions/decimals and percentages. Students can simplify simple fractions and write algebraic expressions. Students can use a function machine. Students can solve one step equations, work out missing angle using basic rules. Students can find the area and perimeter of rectangles and triangles. Students can find basic probability. Students are able to draw bar charts and pie charts.

Calculation Problems

Using a Calculator

Fractions of an Amount

Fractions, Decimals and Percentages

Simplifying Expressions

Writing an Expression

Function Machines

Solving One Step Equations

Angles

Area and Perimeter

Basic Probability

Averages

Bar Charts

Pie Charts

3	*Students try different approaches and find ways of overcoming difficulties that arise when they are solving problems. They are beginning to organise their work and check results. Students show that they understand a general statement by finding particular examples that match it.* Students can add, subtract, multiply and divide fractions. Students understand how to estimate. Students can write and simplify ratios, find proportions of an amount. Students can work out simple percentages and find percentage change. Students can put data in a two way table. Students can work out simple exchange rate and do unit conversions. Students are able to understand and make simple scale drawings.	Fractions Estimating Writing and Simplifying Ratio Ratio Proportion Percentages Percentage Change Two Way Tables Exchange Rates Conversions and Units Scale Drawings
4	*Students develop their own strategies for solving problems and use these strategies both in working within mathematics and in applying mathematics to practical contexts. They look for patterns and relationships, presenting information and results in a clear and organised way.* Students are able to substitute positive and negative integers into expressions. Students can solve two step equations. Students are able to draw linear graphs. Students can find the area and circumference of a circle. Students understand and can apply the four basic transformations. Students can find the are of a compound shape. Students can use and apply basic laws of indices. Students can find the HCF and LCM of a pair of numbers. Students can form and solve algebraic equations. Students can find the nth term of a sequence. Students can find the surface area of cuboids.	Substitution Solving Equations Drawing Linear Graphs Area and Circumference of Circles Transformations Area of Compound Shapes Indices Prime Factors, HCF and LCM Forming and Solving Equations Sequences (nth Term) Surface Area

5	*In order to explore mathematical situations, carry out tasks or tackle problems, students identify the mathematical aspects and obtain necessary information. They check their working and results, considering whether these are sensible.*
	Students can use Pythagorean theorem to find the missing sides of a triangle. Students can find angles made with parallel lines. Students can work out the volume of a prism and cylinder. Students can find angles in a polygon. Students can solve simple inequalities and display them on a number line. Students can expand and factorise linear expressions. Students can find simple loci and construct triangles. Students can solve more complex probability questions. Students can draw and interpret a scatter graph. Students can find error intervals.

Pythagoras

Angles in Parallel Lines

Volume of a Prism

Cylinders

Angles in Polygons

Inequalities

Expanding and Factorising

Loci and Construction

Probability

Scatter Graphs

Error Intervals

6	*Students carry out substantial tasks and solve quite complex problems by independently and systematically breaking them down into smaller, more manageable tasks. They interpret, discuss and synthesise information presented in a variety of mathematical forms, relating findings to the original context.*
	Students can find direct and inverse proportion. Students can work out reverse percentage problems. Students can writes numbers in standard form. Students can change the subject of a formula. Students are able to expand and factorise quadratics. Students can solve simultaneous equations. Students can find the gradient and equation of a line. Students can find the volume of spheres and cones. Students can find compound interest and depreciation. Students can find the mean from a frequency table. Students can draw and interpret a distance time graph. Students can use and work out probability from a Venn diagram. Students can use formulas to work out speed and density.

Direct and Inverse Proportion

Reverse Percentages

Standard Form

Changing the Subject of a Formula

Expanding and Factorising Quadratics

Simultaneous Equations

Gradient of a Line

Equation of a Line

Spheres and Cones

Similar Shapes (Lengths)

Compound Interest and Depreciation

Averages from Frequency Tables

Real Life and Distance Time Graphs

Venn Diagrams

Speed and Density

7	*Starting from problems or contexts that have been presented to them, students explore the effects of varying values and look for invariance in models and representations. They progressively refine or extend the mathematics used, giving reasons for their choice of mathematical presentation and explaining features they have selected.*

Students can change recurring decimals into fractions. Students can apply fractional and negative laws of indices. Students can solve repeated percentage change, expand triple brackets and find the equations of parallel and perpendicular lines. Students can find areas and volumes for similar shapes. Students can enlarge with a negative scale factor. Students can apply circle theorem rules to find missing angles. Students can draw and interpret cumulative frequency and box plots. Students can solve quadratics through factorising and find missing angles and sides with trigonometry. Students can work out areas of sectors and find arc lengths. Students can find exact trigonometry values. Students can solve simultaneous equations graphically and use probability trees. Students can calculate bearings.

- Recurring Decimals to Fractions
- Fractional and Negative Indices
- Repeated Percentage Change
- Expanding Triple Brackets
- Parallel and Perpendicular Lines
- Inequalities on Graphs
- Similar Shapes (Area and Volume)
- Enlarging with Negative Scale Factors
- Circle Theorems
- Cumulative Frequency
- Box Plots
- Solving Quadratics
- SOHCAHTOA (Trigonometry)
- Sector Areas and Arc Lengths
- Exact trig values
- Solving Simultaneous Equations Graphically
- Probability Trees
- Bearings

8	*Students develop and follow alternative approaches. They compare and evaluate representations of a situation, introducing and using a range of mathematical techniques. They reflect on their own lines of enquiry when exploring mathematical tasks. Students communicate mathematical or statistical meaning to different audiences through precise and consistent use of symbols that is sustained throughout the work. They comment constructively on the reasoning and logic, the process employed and the results obtained.*

Students understand and can simplify surds. Students can perform calculations with bounds and find direct and inverse proportion using formulas. Students can solve quadratics using the formula and factorise harder quadratics with a coefficient greater than 1. Students can solve and simplify algebraic fractions and rearrange harder formulas. Students can find the area of a triangle using the sine rule. Students can apply sine and cosine rules. Students can identify congruent triangles and solve 3D Pythagoras and trigonometry problems. Students understand conditional probability and can complete the square. Students can find the nth term of a quadratic.

- Surds
- Calculating with Bounds
- Direct and Inverse Proportion
- Quadratic Formula
- Factorising Harder Quadratics
- Algebraic Fractions
- Rearranging Harder Formulae
- Finding the Area of Any Triangle
- The Sine Rule
- The Cosine Rule
- Congruent Triangles
- 3D Pythagoras and Trigonometry
- Conditional Probability
- Completing the Square
- The nth Term of a Quadratic Sequence