Mathematics

KEY STAGE 3 MATHS (YEAR 7)

Course Outline

Pupils will follow the KS3 programmes of study based on the new KS3 curriculum. Through the

mathematics content, pupils would be taught to:

Develop fluency:

• Consolidate knowledge and skills at KS2 and extend understanding of place value and number systems

into decimals and fraction arithmetic.

• Select and use appropriate strategies to solve complex problems.

• Use appropriate language, terminology and notation to describe and analyse numbers, algebraic

relationships, 2D and 3D shapes. • Use algebra to generalise the structure of arithmetic and formulate

mathematical relationships.

• Develop algebraic and graphical efficiency, including understanding linear and simple quadratic

functions.

• Substitute values into expressions, rearrange and simplify expressions

& solve equations.

Reason Mathematically:

• Extend their understanding of the number system to exploring their connections algebraic and graphical

representations.

• Make and test conjectures about patterns, relationships by looking for proofs and counterproofs.

• Extend and formalise their knowledge of ratio and proportion in working with measures and geometry,

and in formulating proportional relations algebraically.

• Interpret when the structure of a numerical problem requires additive, multiplicative or proportional

reasoning.

• Begin to reason deductively in geometry, number and algebra, including using geometrical constructions

• Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally.

Solve problems:

• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.

• Develop their use of formal mathematical knowledge to interpret and solve problems, including financial mathematics.

• Begin to model situations mathematically and express the results using a range of formal mathematical representations.

Subject Content

Subject content is broken down into the following broad areas:

• number

• algebra

• ratio, proportion & rates of change

• geometry & measures

• probability

• statistics.

Student Experience & Expectation

The Maths department will work closely with feeder primary schools in curriculum planning and developing and learning strategies that will facilitate the transition into secondary Mathematics.

On arrival, their primary school results will be combined with baseline assessments to set students into ability groups. Setting will continually be used after every major assessment (termly) to ensure that students are grouped where best support can be tailored towards their progress and achievement.

All students are expected to bring a school an approved Casio scientific calculator (fx-83GT PLUS or better), and a maths set that contains pen, pencil, ruler, protractor, compass and rubber to every maths lesson. Students are expected to mark their class work and reflect on what they have learned and examine what they need to do to progress further after every lesson. There will be an increased element of functional maths and cross-curricular maths to provide opportunities for students to apply their knowledge, skills and understanding in mathematical and other contexts through problem-solving.

It is expected that sets 1 to 3 will progress to do the Higher GCSE Maths and set 4 shall follow the foundation scheme of work.

KEY STAGE 3 MATHS (YEAR 8)

Course Outline

Pupils will follow the KS3 programmes of study based on the new KS3 curriculum. Through the mathematics content, pupils would be taught to:

Develop fluency:

• Consolidate knowledge and skills at KS2 and extend understanding of place value and number systems into decimals and fraction arithmetic.

• Select and use appropriate strategies to solve complex problems.

• Use appropriate language, terminology and notation to describe and analyse numbers, algebraic relationships, 2D and 3D shapes. • Use algebra to generalise the structure of arithmetic and formulate mathematical relationships.

• Develop algebraic and graphical efficiency, including understanding linear and simple quadratic functions.

• Substitute values into expressions, rearrange and simplify expressions

& solve equations.

Reason Mathematically:

• Extend their understanding of the number system to exploring their connections algebraic and graphical representations.

• Make and test conjectures about patterns, relationships by looking for proofs and counterproofs.

• Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically.

• Interpret when the structure of a numerical problem requires additive, multiplicative or

proportional reasoning.

• Begin to reason deductively in geometry, number and algebra, including using geometrical constructions

• Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally.

Solve problems

• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.

• Develop their use of formal mathematical knowledge to interpret and solve problems, including financial mathematics.

• Begin to model situations mathematically and express the results using a range of formal mathematical representations.

Subject Content

Subject content is broken down into the following broad areas:

• number

• algebra

• ratio, proportion & rates of change

• geometry & measures

• probability

• statistics.

Student Experience & Expectation

All students are expected to bring a school approved Casio scientific calculator (fx-83GT PLUS or better), and a maths set that contains pen, pencil, ruler, protractor, compass and rubber to every maths lesson. Students are expected to mark their class work and reflect on what they have learned and examine what they need to do to progress further after every lesson. There will be an increased element of functional maths and cross-curricular maths to provide opportunities for students to apply their knowledge, skills

and understanding in mathematical and other contexts through problem-solving.

It is expected that sets 1 to 3 will progress to do the Higher GCSE Maths and set 4 shall follow the foundation scheme of work.

KEY STAGE 4 MATHS (YEAR 9)

Course Outline

With SATs abolished at KS3, our KS4 starts from Year 9 to allow opportunity for creativity tasks/projects as well as increased levels of assessment and monitoring in our KS4 curriculum. Students will continue to develop their knowledge and skills in:

• number

• algebra

• ratio, proportion and rates of change

• geometry & measures

• probability

• statistics.

In each topic area, the curriculum will seek to equip students with the ability to:

– develop fluency in the recall and use of essential skills;

– reason mathematically which will require students to use and apply standard mathematical techniques to independently solve problems;

– extend problem solving to mathematical or other contexts. These will be problems where the students use and apply standard techniques to reason, interpret and communicate mathematically.

Assessment

Students will be set written homework twice a fortnight and this can be supplemented with online homework from www.mymaths.co.uk and other sources.

At the end of every unit students will be assessed for mastery and understanding. This can be in the form of an assessment homework or end of chapter test. The results will be used to track their progress during the term. The new curriculum is based on a spiral model where units are expected to be taught once and applied in other units. Increasing assessment and monitoring to ensure mastery before moving on is essential to meet the demands of the new curriculum. At the end of every term students will do a formal assessment that can be a standardised test to monitor overall progress.

There is opportunity for students to access online resources for homework support and/or extra practise.

Links to the websites are:

www.justmaths.co.uk

www.mrbartonmaths.com

Access to Digital versions of text books can be found in

www.kerboodle.co.uk

Students have their own user name and password.

Institutional code: pu4

New Assessment Regime

A lot of the content in the current Higher paper will be migrated to the new foundation paper. Almost all of

the existing formulae provided in the current higher & foundation papers will no longer be available from summer 2016. Students will have to memorise these formulae. There will be formulae provided for some of the new content like equations of motion.

There is likely to be three papers for each tier paper with one calculator and two non-calculator papers. Each paper is likely to be 1 hour 30 minutes with 80 marks per paper. The final details of this are not yet available.

Below is the breakdown of the weightings of assessed topic on the new GCSE Maths:

Tier Topic area Weighting

Foundation Number

Algebra

Ratio, proportion & rates of change

Geometry & measures

Statistics & probability 22 — 28%

17 — 23%

22 — 28%

12 — 18%

12 — 18%

Higher Number

Algebra

Ratio, proportion & rates of change

Geometry & measures

Statistics & probability 12 — 18%

27 — 33%

17 — 23%

17 — 23%

12 — 18%

The old qualification of grade A* – G will be replaced with grades 9 to 1, with 9 being the highest

achievable grade and grade 1 being the lowest. There are further details of the breakdown in the DfES

website

Foundation tier grades will be 1 to 5 and higher tier grades will be 4 to 9, with grade 3 allowed (instead of

a U Grade).

Progression

Students can progress from GCSE Maths level 1/2 to level 3 qualifications either by doing Core

Mathematics (proposed Post 16 Maths for students not doing A Level Maths) or GCE Mathematics and

GCE Further Mathematics.

Mathematics can be also be combined with other disciplines such as GCE in the Sciences, GCE

Geography, GCE Psychology and GCE Economics.

In addition to this, there are diploma pathways that also require qualifications in Mathematics.

KEY STAGE 4 MATHS (YEAR 10 & 11)

Course Outline

This cohort will be the first to sit the new GCSEs. In the new KS4 curriculum students will continue to

develop their knowledge and skills in:

• number

• algebra

• ratio, proportion and rates of change

• geometry & measures

• probability

• statistics.

In each topic area, the curriculum will seek to equip students with the ability to:

• develop fluency in the recall and use of essential skills;

• reason mathematically which will require students to use and apply standard mathematical techniques

to independently solve problems;

• extend problem solving to mathematical or other contexts. These will be problems where the

students use and apply standard techniques to reason, interpret and communicate mathematically.

Assessment

Students will be set written homework twice a fortnight and this can be supplemented with online homework from www.mymaths.co.uk and other sources.

At the end of every unit students will be assessed for mastery and understanding. This can be in the form of an assessment homework or an end of chapter test. The results will be used to track their progress during the term. The new curriculum is based on a spiral model where units are expected to be taught once and applied in other units. Increasing assessment and monitoring to ensure mastery before moving on is essential to meet the demands of the new curriculum. At the end of every term students will do a formal assessment that can be a standardised test to monitor overall progress.

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Mathematics can be also be combined with other disciplines such as GCE in the Sciences, GCE Geography, GCE Psychology and GCE Economics.

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