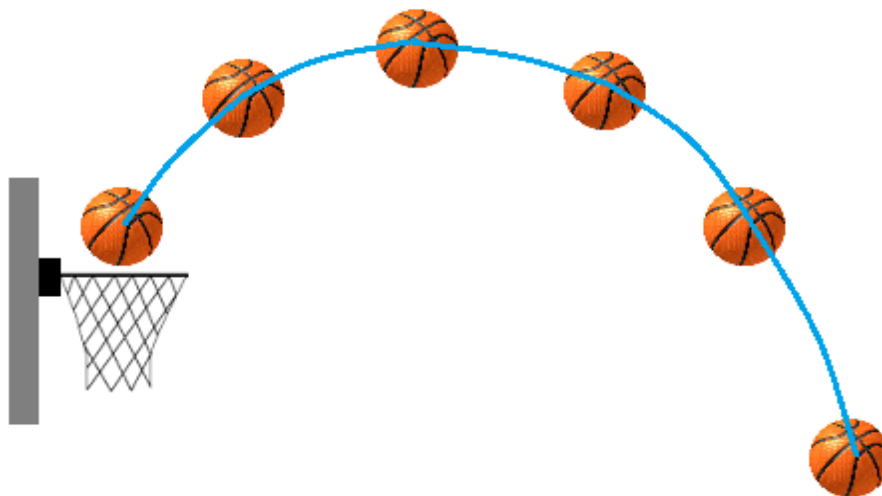


A LEVEL

MATHS RELATED COURSES

$$\begin{aligned}(a + b)^0 &= 1 \\(a + b)^1 &= a + b \\(a + b)^2 &= a^2 + 2ab + b^2 \\(a + b)^3 &= a^3 + 3a^2b + 3ab^2 + b^3 \\(a + b)^4 &= a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4 \\(a + b)^5 &= a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5\end{aligned}$$



Projectile motion: parabola

INTRODUCTION: WHY STUDY A MATHEMATICAL COURSE?

There are two types of A Level offered by the Mathematics department:

- ❖ **A Level Mathematics**
- ❖ **AS/A Level Further Mathematics**

Mathematics and Further Mathematics at A level are courses worth studying in their own right. They are both challenging and interesting. They build on work met at GCSE, involve new ideas that some of the greatest minds of the millennium have produced.

These courses are also very valuable as a supporting subject to many courses at A level and degree level, especially in the sciences, geography, psychology, sociology and medicine. A level mathematics is a much sought after qualification for entry to a wide variety of full-time courses in higher education. There are also many areas of employment that see Mathematics A level as an important qualification and they are often a requirement for the vocational qualifications related to these areas.

While studying mathematics you will use mathematical skills and knowledge to solve problems. This involves using mathematical arguments and logic to simplify real life situations. The mathematical models you produce allow you to show what is happening and what might happen as circumstances change.

A LEVEL MATHEMATICS

Qualifications required:

A grade 7 or higher at GCSE mathematics.

Exam board: Edexcel

The course covers both pure and applied mathematics.

The pure mathematics topics studied include:

Proof, algebra and functions, coordinate geometry in the xy plane, sequences and series, trigonometry, exponentials and logarithms, differentiation, integration, vectors, numerical methods.

Applied mathematics covers both mechanics and statistics, and the topics studied include:

Statistical sampling, data presentation and interpretation, probability, statistical distributions, statistical hypothesis testing, quantities and units in mechanics, kinematics, forces and Newton's laws.

Overarching Themes:

- Mathematical argument, language and proof
- Mathematical problem solving
- Mathematical modelling

The students will make use of technology such as graphical calculators and graphing software. A calculator with statistical functions is a requirement for the course, and students are strongly recommended to purchase the CG-50 calculator (available through the Maths department).

AS and A LEVEL FURTHER MATHEMATICS

Qualifications required:

A grade 8 or higher at GCSE Mathematics.

Exam board: Edexcel

Students studying AS or A level further mathematics must also study A level mathematics.

At Worcester Sixth Form College, further mathematics students study 50% pure mathematics and 50% applied mathematics. As in A level mathematics, the applied content includes both statistics and mechanics.

The Pure Mathematics topics studied include:

Complex numbers, matrices, further algebra and functions, proof, further calculus, further vectors, polar coordinates, hyperbolic functions, differential equations.

The Applied Mathematics topics studied include:

Discrete probability distributions, Poisson and binomial distributions, the central limit theorem, geometric and negative binomial distributions, hypothesis testing, chi squared tests, momentum and impulse, work energy power, elastic strings and springs, collisions.

Overarching Themes:

- Mathematical argument, language and proof
- Mathematical problem solving
- Mathematical modelling

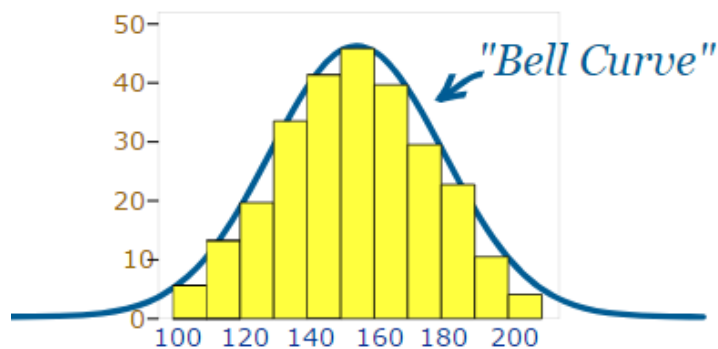
- The students will make use of technology such as graphical calculators and graphing software. A calculator with statistical functions is a requirement for the course, and students are strongly recommended to purchase the CG-50 calculator (available through the Maths department).

MATHS ACADEMY

This is an enrichment course giving the opportunity to explore topics beyond the A Level syllabus. There is also the chance to enter the UKMT Senior Maths Challenge. All Further Maths students are encouraged to enrol as are any other mathematics students who enjoy recreational mathematics.

LEVEL 3 CERTIFICATE IN CORE MATHS

We also offer Core Maths Level 3 Certificate which is equivalent to half an A level. See separate leaflet for more details.



A Normal Distribution

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