THE BRITISH SCHOOL
OF NANJING
A NORD ANGLIA EDUCATION SCHOOL

16 Han Fu Lu, Jiangning,
Nanjing 211106, China
T +86 25 5210 8987
E info@bsn.org.cn

Mathematics Curriculum Overview

Key Stage 3-Year 6

Students learn to adjust to senior school level mathematics and are introduced to more sophisticated mathematics. This is done through an accompaniment of teacher-led learning, project-based learning and student-led discovery. Students use a mixture of mathematical software where possible and gain experience using a calculator in mathematics. They get taught problem-solving techniques and apply computational thinking to problems where possible in the form of algorithmic approaches. This is all accompanied by a focus on mathematical rigor, alongside an emphasis on appropriate use of mathematical vocabulary and associated spellings. Students are also exposed to mental strategies throughout the year, as well as frequent exposure to mental mathematics – to aid in not only mathematical vocabulary but listening to mathematics in English.

During Year 6, there is a larger emphasis on the Number section as this is fundamental to gaining confidence in the other areas.

Number

Students revisit numeracy facts and techniques, they have been taught throughout primary school. Students begin with reinforcing their knowledge of the applying the four operations ($+, -, \times, \div$). During this they review formal addition and subtraction followed by long multiplication and division. Students also learn mental strategies and techniques for the four operations such as partitioning and factoring etc. They also exposed to the relationship of multiplying and dividing by 10s, 100s, 1000s and higher powers of ten. Moving on, students review negative numbers, and this is emphasized throughout the year, ensuring a sound understanding of the behavior of negative numbers applied under the four operations. Students revisit applying the order of operations (BID/MA/S) in calculations.


They look at prime numbers, specifically how these are the "building blocks" of all natural numbers, and we look at finding the prime decomposition of numbers; some students go onto extend these ideas to find the HCF and LCM of two or more numbers. Alongside this, students build a solid understanding of squaring and cubing numbers and revisiting powers of ten in this area and build their number recall of squares up to 15 and cubes up to 10. Furthering this, students look at metric units and converting between metric units, some students may look at converting between metric and imperial units. Students look at rounding numbers to various powers of ten – both positive and negative numbers. Some students may look at rounding to significant figures. They then move onto using rounding to estimate calculations and reasoning whether something is an overestimate or underestimate. Students also look at fractions, decimals and percentages. These are studied in isolation and further interleaved between other topics.

THE BRITISH SCHOOL
OF NANJING

A NORD ANGLIA EDUCATION SCHOOL

16 Han Fu Lu, Jiangning,
Nanjing 211106, China
T +86 25 5210 8987
E info@bsn.org.cn

Students will look at performing the four operations with fractions and converting between improper (top-heavy) fractions to mixed numbers. Students will also convert between fractions, decimals and percentages. They will be able to perform addition and subtraction with decimals with some performing more complex multiplication and division by decimals. Students are expected to find percentages of amounts in multiples of fives, with some students extending this to more precise percentages with the aid of a calculator. Students will also look at simple number sequences and pattern spotting, alongside learning some famous number sequences (Triangular, Fibonacci, etc.)

Shape & Space
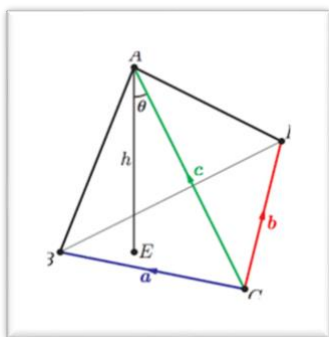
Students learn more accurate and sophisticated vocabulary describing shapes and solids and their properties. Students derive the formulae for finding the area of triangles and various quadrilaterals. Students are introduced to more geometrical notation. We then go on to combine these topics and find the area and perimeter of compound shapes consisting of polygons. Students then go on to look at transformations of shapes including horizontal and vertical translations of objects, reflections of objects in a mirror line and rotations of objects about a fixed point. Students then move on to angles and recognizing acute, obtuse and reflex angles as well as accurately measuring angles using a protractor. Some students may go on to derive the formula for the sum of interior angles in a shape and study some applications of this. They will move on to constructions and scale drawing, students will learn how to accurately reconstruct quadrilaterals as well as using pairs of compasses to construct triangles.

Algebra

A basic introduction to algebra is given (students study algebraic concepts alongside other topics in Year 6). Students will be introduced to the ideas of variables and substitution. They will firstly focus on formulae and how we use these demonstrate relationships between objects in mathematics, some examples include temperature, area and length, sides and angles. Students will learn and be expected to memorise formulae relating to shapes and angles. Some students may move on to simplifying algebraic expressions by collecting like terms and simple index laws. Applications of algebra in technology will also be covered such as use of spreadsheets and graphing software for visual representations of formulae.

$$F = \frac{9}{5}C + 32$$

Data

Students look at collecting data and how we represent data appropriately given both the quantity and the type of data collected. Data collection takes the form of tallies and frequency tables, and representation is a mixture of pictographs, bar graphs, and scatter graphs. Some students may learn to interpret data meaningfully and describe relationships between sets of data. Students will also explore the different types of averages we use and learn which is the best for different types of data.

THE BRITISH SCHOOL
OF NANJING

A NORD ANGLIA EDUCATION SCHOOL

16 Han Fu Lu, Jiangning,
Nanjing 211106, China
T +86 25 5210 8987
E info@bsn.org.cn

Technology

Students will learn through a myriad of digital mediums. Students will become proficient in their use of Microsoft Teams, OneNote, Outlook and the Office packages including Excel. Students will explore and investigate mathematics using mathematics specific software such Geogebra and Desmos where possible. Alongside this, students will gain new confidence in the use of a scientific calculator and improved dexterity and speed in calculating. We also use MyiMaths and Dr Frost Maths for students to practice fluency problems and so that students can receive instantaneous feedback alongside additional teacher feedback when appropriate.

Recommended Resources For Deeper Understanding

MyiMaths, a service we often use to assign homework. All students have a log in and can access any task from KS3 to KS5. We suggest students review classwork on here. https://www.myimaths.com/

Dr Frost Maths is an additional service that focuses on exam-style questions. Students can also access this and will be given a log in if they desire. https://www.drfrostmaths.com/

Mathtrainer is a website for students to practise their basic understanding of four operations, the website acts like an app and saves their scores. We recommend this for frequent practise. https://www.mathtrainer.org/

Complete Mathematics Timestables are fantastic for students to practise their timetables. They include different tasks as opposed to classic calculations such as arrays and recognising division facts.

https://completemaths.com/teaching-tools/digital-manipulatives/timestables

Applications for Students

The British School of Nanjing
Mathematics and Computer Science Department
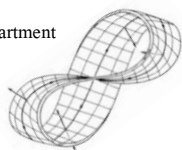
Sumaze! is a series of educational puzzle apps developed by MEI (Mathematics Education Innovation). A phone/tablet app available in four different versions depending on students' age. https://sumaze.mei.org.uk/

Geogebra applications. A collection of Geogebra features is available for download on a mixture of devices. A personal favourite of ours is the 3D calculator – students can use AR (augmented reality) to plot 3D objects around them. https://www.geogebra.org/download?lang=en

Desmos. A beautiful and simple graphing calculator for students to explore functions and more, its often updated with new features and extends to some unusual, weird and funky functions. https://www.desmos.com/

Euclidea is an elegantly designed app for students to explore constructions using a straight-edge and pairs of compasses, all performed on their device. https://www.euclidea.xyz/