

**In the mathematics faculty we aim to inspire the mathematician in every student, developing fluency and confidence in using maths to reason and solve problems. We seek to do this without placing limits on the attainment of any student and while developing universal human values including anti-racism and challenging sexism, homophobia and other forms of discrimination.**

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| ***Year 7 Learning Journey*** |
| **Autumn** |
| Integers - What are the elements that all the whole numbers are made of? The language of mathematics - Why do we need a universal mathematical language? Proportional reasoning What mathematical magic is there in Harry Potter? Rational numbers - What’s between the whole numbers on a number line?  |
| *INTEGERS AND BUILDING A MATHEMATICS CLASSROOM*1. Properties of natural numbers.
2. Negative numbers
3. Securing fluency in arithmetic with integers
4. Understanding the importance of prime numbers
5. How to work and learn in a maths classroom

*LANGUAGE OF MATHEMATICS*1. Why we need a universal language for mathematics
2. The importance of the equals signs
3. How arithmetic works
4. The idea of a variable
5. Hypatia and the mathematics of integers
6. Euclid, Egypt and the foundations of mathematics
7. Brahmagupta and zero and negatives
 | *PROPORTIONAL REASONING*1. Why multiplication is a key to solving proportion and scaling problems
2. Ways of representing multiplicative relationships
3. Reasoning with multiplication and scaling

*RATIONAL NUMBERS*1. Equivalence - a key idea in mathematics
2. Arithmetic with fractions, decimals, place value and representing fractions as decimals
3. Arithmetic with decimals- understanding and fluency
4. (Challenge) Irrational numbers and approximating them with rational numbers.
5. Abdul Hasan al-Uqlidisi and the origin of decimals
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| **Spring** |
| Grid Algebra I What’s the point of algebra? Introduction to shape Which shape contains the biggest area? Introduction to Ratio. How can you know whether two paint mixes will give the same colour? |
| *GRID ALGEBRA 1*1. Equivalent calculations in arithmetic
2. Generalising from arithmetic to algebra and equivalent expressions in algebra
3. The laws of algebra
4. Manipulating and simplifying expressions using equivalence- collecting like terms, expanding, simplifying, substitution

*INTRODUCTION TO SHAPE*1. What is perimeter and area.
2. Estimating perimeter and area for irregular shapes
3. Finding formulas for working out areas of regular shapes Solving problems with area and perimeter using algebra and coordinate geometry
 | 1. The Greek and Latin roots of much mathematical language

*GEOMETRIC REASONING 1*1. What is angle?
2. Drawing and measuring angles
3. Language of lines
4. Reasoning with angles
5. Translations and vectors
6. Rotations
7. Parallel lines and angles
8. Proving the angle sum in a triangle
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| **Summer** |
| Collecting and Representing data- How could we work out the average height of a student in year 7? Estimation 1 – If I launched a rocket to the moon, and I was 1° off, how badly would I miss? |
| *COLLECTING AND REPRESENTING DATA*1. Collecting data
2. Representing data- pictograms, infographics. bar and vertical line charts, pie charts, two-way tables
3. Calculating with and interpreting data- common errors, drawing conclusions, communicating.
4. Data in context and carrying out a project.
 | *ESTIMATION 1*1. Estimating everyday objects.2. Rounding with integers and decimals. 3. Rounding with significant figures. 4. Sensible rounding- square and cube roots, calculations in context |
| Recommended reading/videos: History of negative numbers: <https://nrich.maths.org/5961>Hypatia: <https://massivesci.com/articles/hypatia-math-science-heroes/>Euclid: <https://www.gresham.ac.uk/lectures-and-events/euclid> | Places to visit:Bank of England museum: [www.bankofengland.co.uk](http://www.bankofengland.co.uk) – free. Winton maths gallery science museum: [www.sciencemuseum.org.uk](http://www.sciencemuseum.org.uk) free gallery with lots of mathsRoyal Observatory Greenwich: [www.rmg.co.uk](http://www.rmg.co.uk) again not free but lots of great maths stuff to see and interact with.  |