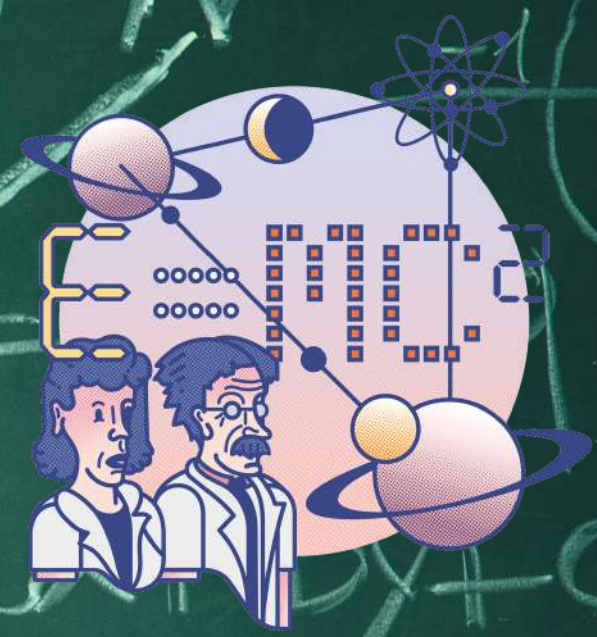
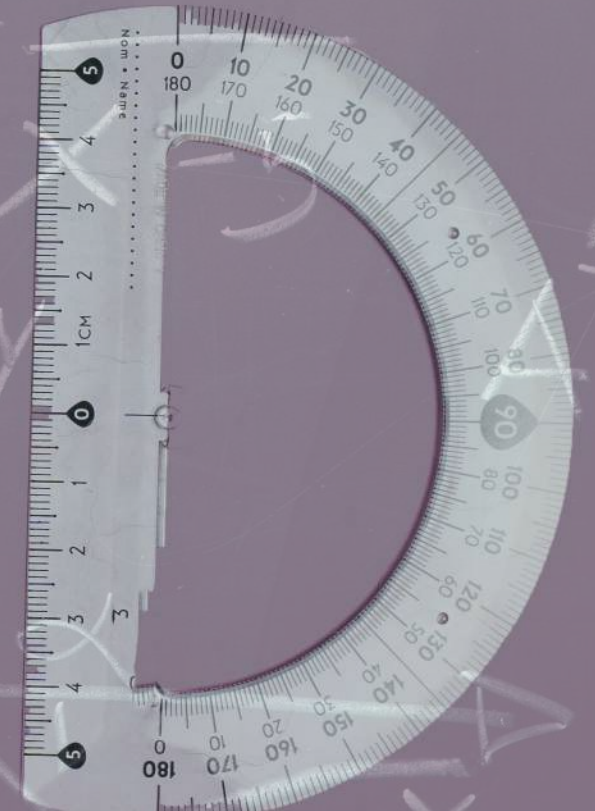
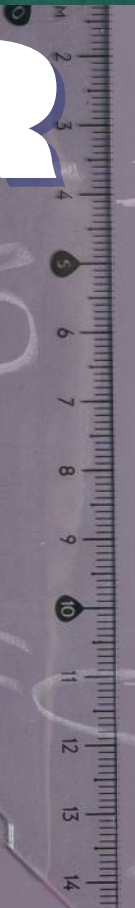
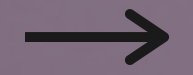


U2 TUITION



11+ MATHS SUMMER BOOSTER COURSE



Overview

Our Summer Course is aimed at building the key skills needed to achieve top grades in Maths at 11+. Students will develop their exam technique, problem solving, number theory, geometry and probability skills, through inspiring and interactive sessions that get them thinking outside of the box.

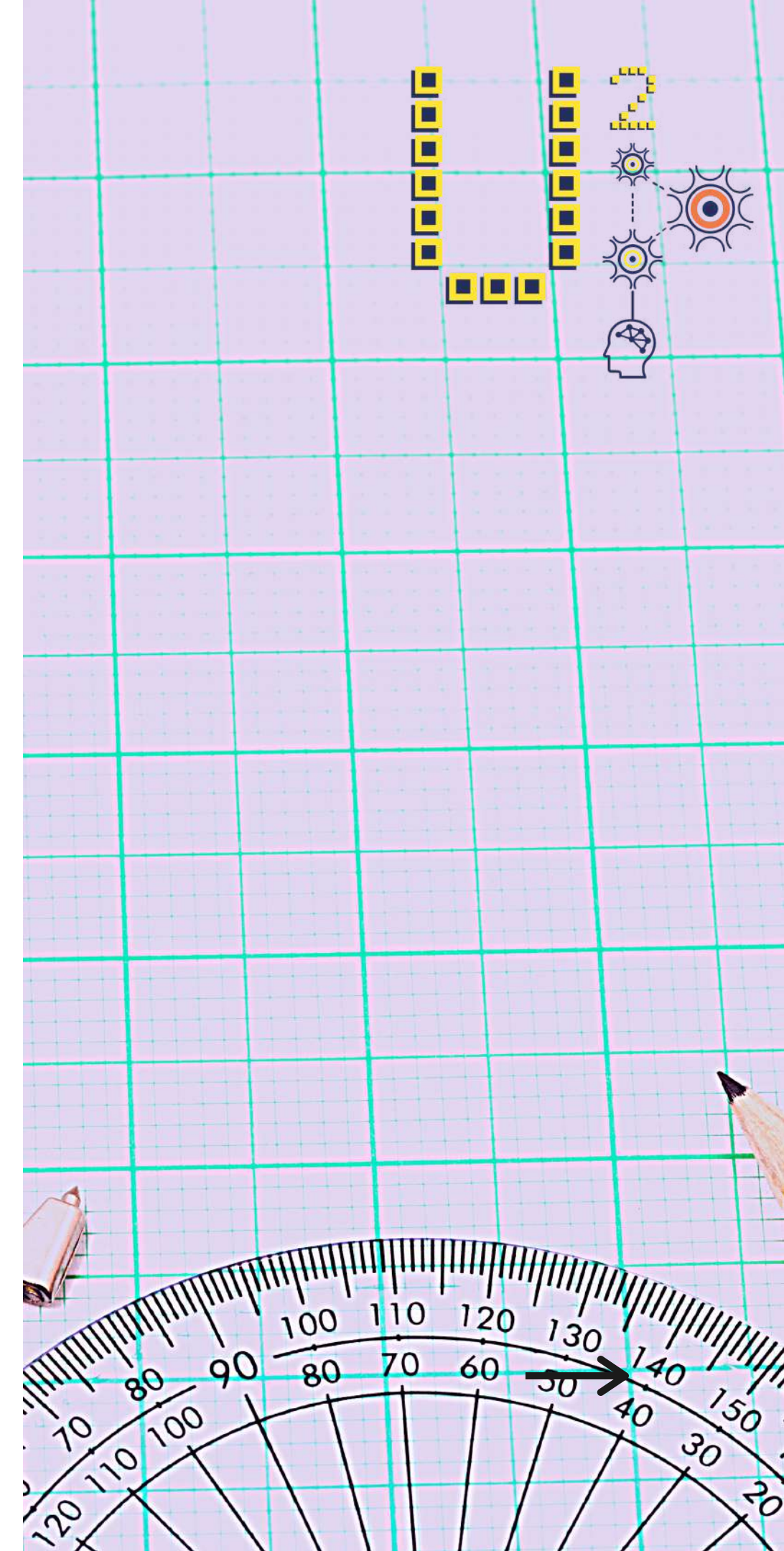
What to Expect

Each class aims to develop students' Maths skills and consolidate the key content needed for the 11+ Maths exams at the Top UK Schools. The course aims to challenge students applying to the most academic schools, pushing beyond the National Curriculum level.

Topic areas have been carefully selected to mirror the most common question types found in different styles of 11+ exam. Students will also work extensively on their exam technique and are taught how to apply what they are learning within an exam situation.

Logistical Details

All classes will take place online. All links will be provided c.1 week before the course commences. Our host will set optional tasks between sessions to ensure students are engaged between classes.



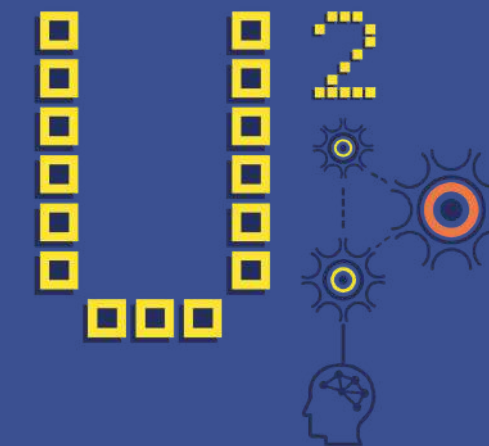
Our Host



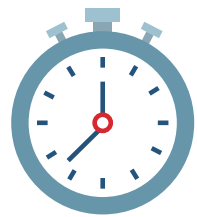
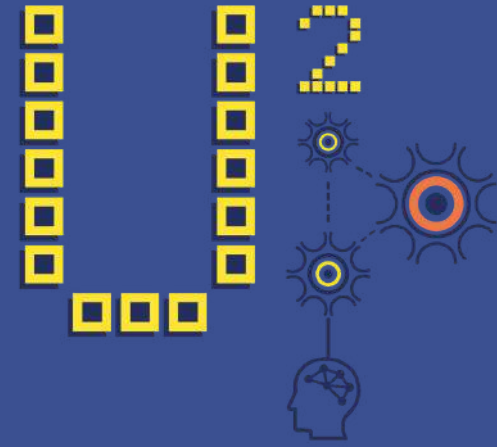
Isabella

Isabella is currently at the University of Oxford, specialising in Mathematics at Hertford College. Prior to attending Oxford, Isabella achieved three A*s in Maths, Further Maths and Physics at A Level, and competed at a high level in national Maths Olympiad competitions. She also achieved 9 A*s at GCSE and was an Academic Scholar at her school.

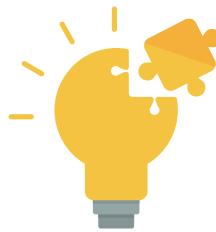
Isabella is deeply committed to education and spreading the joy of Maths, and this is reflected in her worth ethic and enjoyable lessons. Isabella is passionate about helping students achieve their goals and finds it very rewarding, especially when a student sees their own improvement and is proud of themselves. She is extremely well placed to provide support for students in both 11+ Maths and Non-Verbal Reasoning. She is up-to-date on entrance requirements to a number of top UK schools and has recently had success supporting students in entry to City of London School and Westminster. She is clued in on the best revision and examination techniques, and also mentors in UKMT/Olympiad, working to enhance students' problem solving skills.



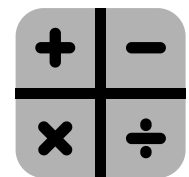
Summary of Key Skills to be Worked On



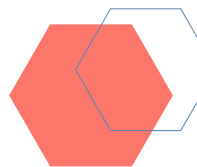
Exam Technique: How to structure answers efficiently and effectively to achieve the most marks



Problem Solving: How to tackle a problem effectively



Number Theory: Prime factors, HCF and LCM



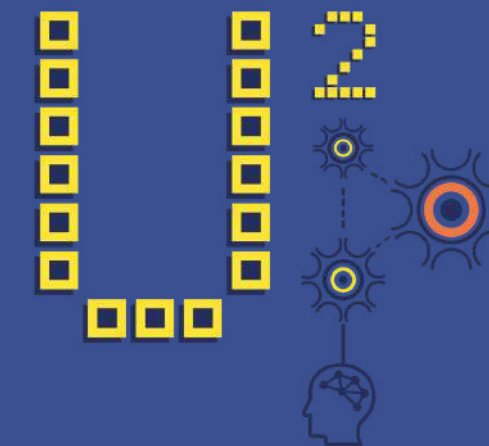
Geometry: Shapes and angles



Probability: Graphs and Venn diagrams

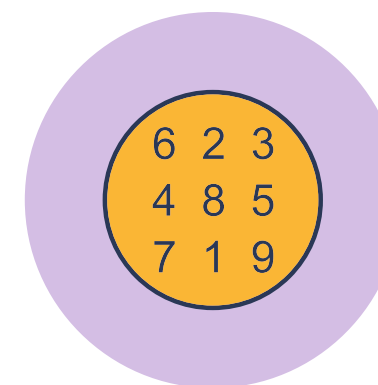


The Agenda



Lesson 1: Introductory Lesson

This lesson is aimed at getting to know the students and to gauge their strengths, weaknesses and learning styles. The session will start with a few past paper questions on a variety of topics, noting which questions are particularly challenging for the cohort. We will also lay down the basics for the course, including use of negative numbers, BIDMAS, fractions and percentages. Finally we will look at some “model” answers to questions and discuss if there are any shortcomings or improvements that could be made, in order to instil the importance of clear workings out.

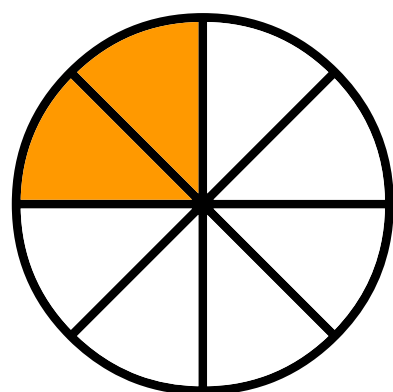
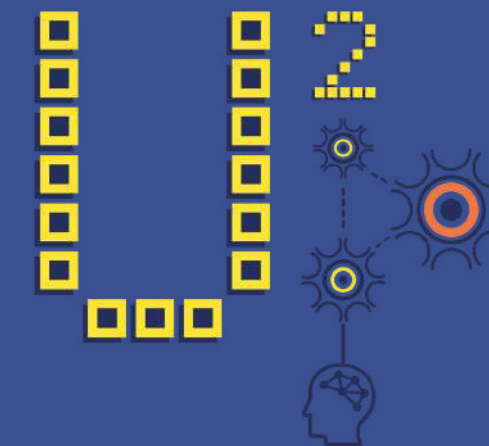


Lesson 2: Number Theory Introduction

This lesson will begin with a discussion on factors of numbers and what it means to be prime. There will also be an extension question about whether prime factorisation of a number is unique (Fundamental Theorem of Arithmetic) - this will get the students thinking outside of the box of school syllabuses. Following this, we will recap the divisibility rules and how this relates to a checking if a number is prime or composite. If there is time left, we will cover how to calculate the HCF and LCM of pairs and trios of numbers.



The Agenda



Lesson 3: Further Number Theory and Ratios

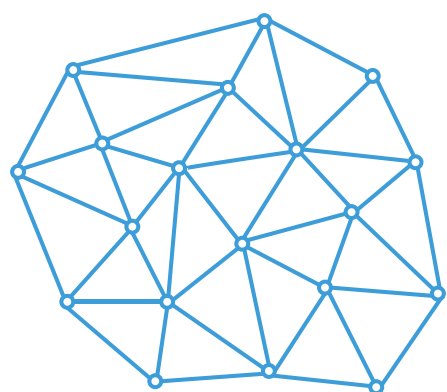
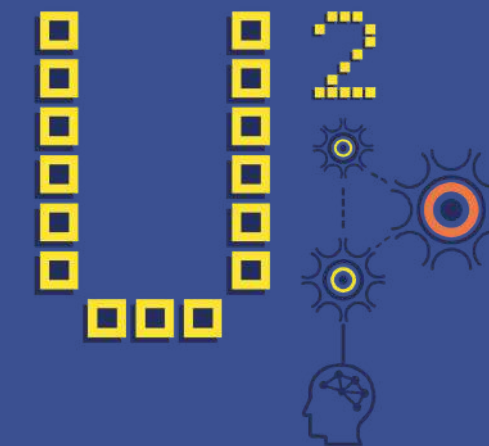
Depending on the general levels of understanding of HCM and LCM from the previous lesson, we will continue reviewing this, and discuss what it means to be co-prime or relatively prime. We will then cast our minds back to the first session, and see how these new techniques can help us to add and multiply fractions. Next, each student will be asked individually to convert quickly between various fractions, decimals and percentages. This will lead nicely onto calculating percentages of an amount, focusing particularly on word problems (ie. sales in a shop), and unit conversion.



Lesson 4: Geometry, Algebra and Halfway Check-In

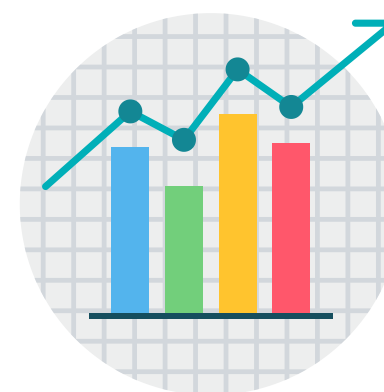
The session will begin with a group exercise: pupils will be presented with different shapes to see how much information they can recall about each one. As an extension, we may cover Euler's Rule for 3D shapes, which is a helpful tool for some questions involving counting edges. This will lead nicely into regular polygons, their internal angle sum and volume of 3D shapes, and how algebra is useful for some questions on these topics. We will also cover what it means for an angle to be acute, obtuse or reflex. For the latter part of the lesson, students will be asked to independently answer questions from the first half of the course. Based on the results, we will review any gaps in knowledge. →

The Agenda



Lesson 5: Transformations, Tessellation & Algebra

The lesson will begin with explaining what it means for a shape to “tessellate” and students will be asked whether they have encountered this in their day to day life (ie. bathroom tiles). We will then cover different transformations of shapes, including reflections, translations, rotations, enlargements, and what rotational symmetry means. Students will be asked to transform a shape and present their solution to the class. Continuing on from the previous lesson, we will look at simple, linear algebraic equations, including how to solve and simplify them. If there is time, we will look at sequences and how this relates to algebra.

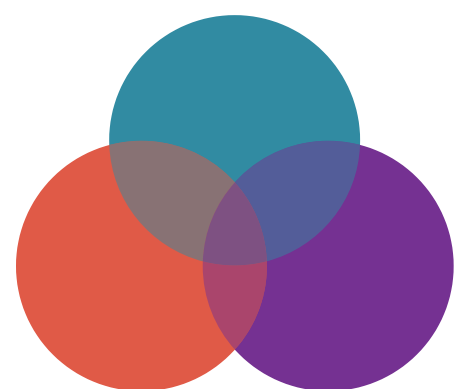
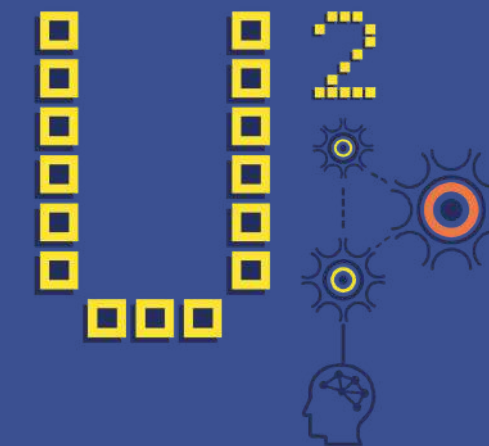


Lesson 6: Graph and Data Interpretation

Firstly we will understand how to read co-ordinates, and that a line is a collection of points that follow the same rule/link between x and y. This leads us on to cover how to read graphs, including using them for unit conversion as taught earlier in the course. We will discuss correlation and whether this always implies a link between two events. It is then important to review how to calculate the three different averages and the range from listed data and tables. Finally we will do a quick quiz on all of this information, including identification of different types of graphs (scatter graph, pie chart, bar chart).

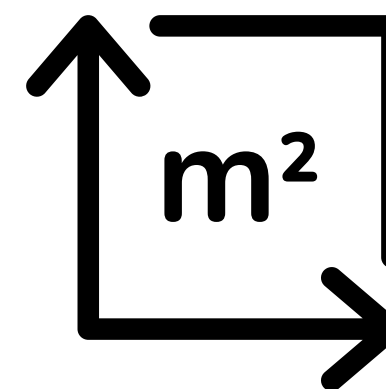


The Agenda



Lesson 7: Probability and Venn diagrams

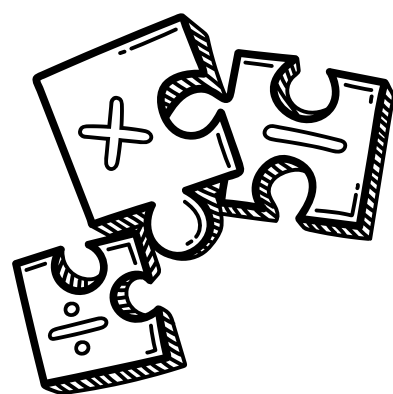
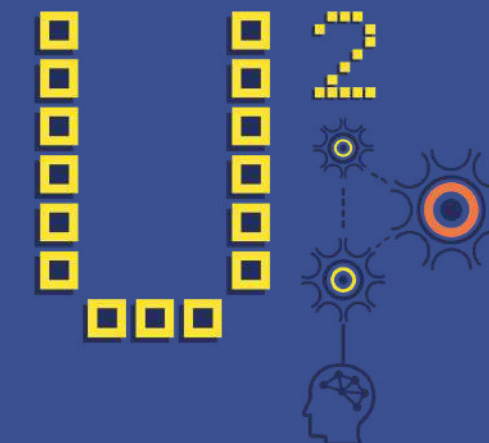
This lesson will begin with asking the students if they can think of events that are impossible, unlikely, equally likely, and certain and why. By the end of the lesson, they should be able to calculate probability of single and mutually exclusive events, and what it means for two events to be independent. We will consider classic examples like picking marbles out of a bag, and draw tree diagrams for all possible outcomes. Finally, the pupils will be shown how to draw sample space diagrams, and how to interpret Venn diagrams for overlapping events. This should link back to independence.



Lesson 8: Speed, Perimeter, Surface Area and Final Recap

There are often questions relating to speed, distance and time in the 11+, so we will cover the equation linking them and jump straight into some exam questions. This should link back to our graph interpretation from Lesson 6, and students will be asked to describe what a distance/velocity graph represents at different stages. We will then cast our minds back to geometry, but this time from the perspective of perimeter and surface area. To conclude the course, we will review any gaps in knowledge, which will most likely be algebra skills. Next, we will look at the final half of a past paper and review how to write our formal solutions with the perfect amount of working displayed. →

The Agenda



Optional Extension Session 1: Maths Challenge Problems

The main focus of this lesson is getting to know the students' ability and knowledge beyond the basic 11+ syllabus. We will begin with a few more abstract style problems that involve innovative ideas instead of fact recall, in order to test their problem solving skills. These will be reviewed in high detail with attention paid to the method of writing answers. To conclude the lesson we will work on some Maths Challenge problems covering a variety of topics.

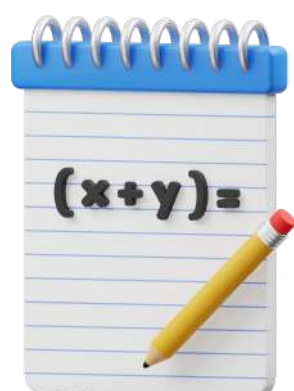
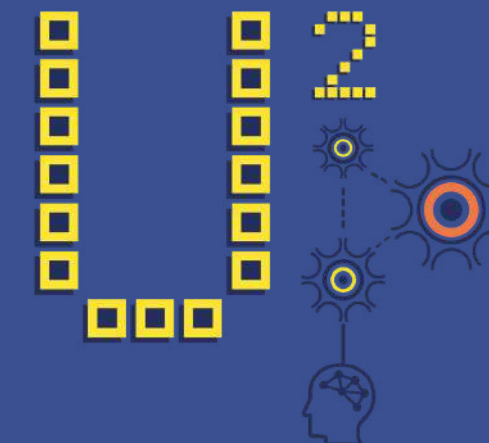


Optional Extension Session 2: Combinatorics, Counting and Number Theory Challenge Problems

To begin this lesson, we will revise what it means to be prime, and revisit the Fundamental Theorem of Arithmetic. The students will discuss whether there are an infinite number of primes and if not, what the largest one they can think of is. I will then explain what it means for two numbers to be relatively prime, and how this links to HCF and LCM. This leads nicely onto combinatorics, which is the mathematics of counting and arranging options. We will cover problems on how many ways to walk from A to B, how many ways can people sit around a table, and more.

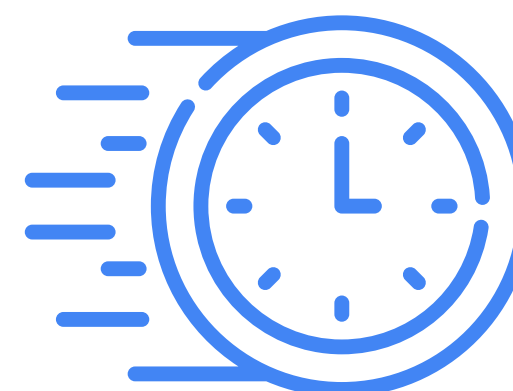


The Agenda



Optional Extension Session 3: Algebra Problem Questions

Many problems can be massively simplified by using algebra, even at a lower level. We will start the lesson with a problem that we can solve using both trial and error and algebra. Using the former method, students will notice how this can often be tedious and lead to errors. We will then introduce what it means to label an unknown variable with a letter and basic skills of how to use it. Finally, after lots of practice, we will redo the first question posed with our new skills and observe the improvement.



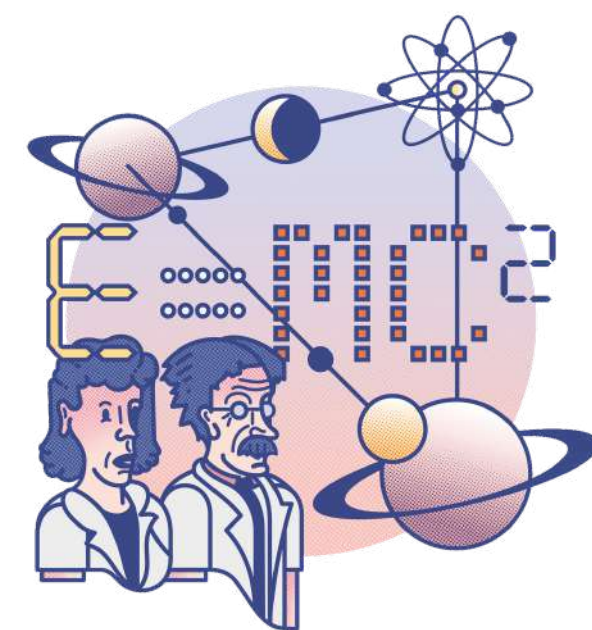
Optional Extension Session 4: Speed Time Equations and Mental Maths

Speed, distance and time questions are often disguised in questions, instead asking when two people will meet or how a candle melts. It is important to understand that they all relate to the same equation, applied differently. The second half of the lesson will comprise of relay and shuttle challenges to test the students mental speed. The questions will require quick calculations, but most importantly, pattern spotting. To conclude the course, we will do some past paper questions and fill in any gaps in the students' knowledge.




Any questions? Get in touch!

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