
GO FURTHER...
The National Mathematics and Science College
Independent Sixth Form College >

COME RUN WITH THE SWIFT.

Introduction from the Principal

Among the best schools in the UK, **The National Mathematics and Science College** is the only boarding school in the UK dedicated entirely to STEM (Science, Technology, Engineering and Mathematics) education. As such, we are unique, and something unique is always worth a closer look.

Our philosophy of teaching, our proven latticework of pastoral care, and even our new residential buildings all help our students to leave their comfort zones. Then extraordinary things can happen: the rate of progress accelerates dramatically. Here there are no barriers to how far or fast you can progress. **We never slow talent down.**

We are a community of like-minded people, with some of the finest, most successful teachers in the country.

Come see us. Come talk to our teachers and students. Come to **The National Mathematics and Science College.**

GO FURTHER, COME RUN WITH THE SWIFT.

Dr Andy Kemp
Principal

OUR PURPOSE

"What we're really excited about is taking people with real potential in maths and science, and enabling them to take that as far as it can go, to be the people who will be at the top of their universities, who will go on to be game changers in their careers afterwards... what we create is the environment to take those highly specialist interests and pursue them with no limits."

Dr Andy Kemp, Principal

Academic excellence is at the heart of everything we do at The National Mathematics and Science College. We are a vibrant community of like-minded passionate mathematicians and scientists. We work together to tackle challenging problems which go well beyond the confines of the curriculum.

ACADEMIC

An important part of being the best is the emphasis we place on 'Practicals' in the laboratory. Here, the Science and our students really come alive. Their eyes light up. They become not students but Scientists. The focus on practical work is, our students tell us, what sets The National Mathematics and Science College apart. It is our laboratory work that helps our students see a clear path from knowledge, to a career, to a rewarding life.

We believe in the value of specialism, and our two-year A-level programme presents the pinnacle of specialist pre-university study anywhere in the world. Most of our students will study four A-levels from our range of STEM subjects, with the majority going on to achieve an A* grade.

For those not yet ready to start the two-year A-level programme, either because of age, experience, or language skills, we offer a one-year Pre A-Level programme designed to get students ready to thrive in our A-level programme.

EXCELLENCE

PRE A-LEVEL PROGRAMME

This is a one-year programme which acts as a preparatory course for the A-level programme. During the year students will learn Mathematics, Chemistry, Biology, Physics, Economics and Computer Science as well as developing their English language skills.

Students who are successful in the Pre A-level programme can then proceed onto our two-year A-level programme.

A-LEVEL PROGRAMME

This is a two-year programme, where students choose between three or four subjects to learn in great depth. Students can choose from Mathematics (including Further Mathematics), Chemistry, Biology, Physics, Economics, Computer Science and the EPQ (Extended Project Qualification).

Students from our A-level programme routinely go on to study at the top universities in the world.

We teach mathematics in a way that develops deep mathematical thinking and an understanding of the interconnectedness within the subject. Students learn to do much more than answer standard problems using standard techniques. Using the A-level content as a structure to build from we encourage students to adopt a greater level of mathematical rigour, justifying and proving concepts as they go. In addition, students are prepared to enter national and international mathematics competitions as well as undertaking STEP and MAT entrance papers all of which require a level of fluency and creativity which is central to being a great mathematician.

Some students study mathematics to develop the language and tools necessary to excel in the sciences, whereas others embrace the natural beauty and joy of mathematics for its own sake, but all of them experience something of the majesty which makes mathematics the queen of the sciences.

QUESTIONS

- **What happens if we are allowed to square root a negative number?**
- **How can we explore infinite processes?**
- **How do I prove √2 can't be written as a fraction?**
- **We all know the perimeter of a circle is 2πr, but what is the formula for the perimeter of an ellipse?**
- **Does an infinite paint tin always contain enough paint to paint itself?**

MATHEMATICS >

"Mathematics is the queen of the sciences and number theory is the queen of mathematics"

Carl Friedrich Gauss

"Be a physical chemist, an analytical chemist, an organic chemist, if you will; but above all, be a chemist"

Ira Remsen

CHEMISTRY

Over the last two hundred years or so the chemical industry has really transformed human life. The products of chemistry – medicines, plastics, textiles, fertilizers, foods - underlie the very foundation of modern civilization, saving and improving lives around the globe. From waste disposal to food production, from new medicines to solar energy, chemistry is the driving force for solving scores of crucial problems that humans will face this millennium. The origin of life is quintessentially a chemical problem and whilst Darwin told us how life evolved, it is chemists who are at the forefront of answering how life started. How did the simple molecules on an early Earth self-assemble to form self-replicating chemical structures such as nucleotides, ribose, amino acids and lipids? Chemistry at NatMatSci is taught through practical work, where students develop a 'hands-on, minds-on' approach to maximise their learning. In addition, students prepare for national and international competitions, including the RSC Chemistry Olympiad, Cambridge C3L6 competition and the IChO, where they develop the abilities to apply their learning to novel contexts and think independently.

A-level Chemistry is an essential subject for students planning to study medicine, veterinary science, or dentistry. Chemists still have to develop perfectly biodegradable plastics, or materials which can replace our current plastics, that are destroying both land and the oceans. We need to develop fertilizers and agricultural products that do not persist in the environment, and create even better technologies for dealing with global pollution problems. Maybe a chemist from NatMatSci will be the person that makes a global contribution to these issues.

QUESTIONS:

- **Are two atoms of the same element identical?**
- **Is glass really a liquid?**
- **Why does tomato juice make the odour of skunks go away?**
- **Why is ice slippery?**
- **How can we reverse the effects of global warming?**
- **How can chemists solve the global plastic pollution problems?**

"NatMatSci provides the opportunity to meet great people and make long lasting relationships"

"I chose to come to NatMatSci because I wanted to experience a learning environment focused on Science and Mathematics, in order to mould my understanding of these subjects. I enjoy every moment at school, but my most notable memory so far would be learning about relativity for the first time, and exploring the ideas of time dilation and the famous twin paradox. That was such a fascinating week!"

"NatMatSci is a wonderful environment which allows my aspirations in STEM fields to flourish, with teachers and students who are passionate about these fields. There are chances for healthy competition through Olympiads, and extension work, as well as a strong emphasis on problem solving. Morever, NatMatSci provides the opportunity to meet great people and make long lasting relationships."

STUDENT PROFILE:

ILAN

YEAR 1 STUDENT FROM UGANDA

The world needs biologists like never before. Climate change, pandemics, disease, species loss, ecosystem collapse and sustainable food production are all problems requiring the skills of a biologist to solve.

Biology is a science for the 21st century – a science that can help us move beyond today. So far in this century, no other science has claimed more Nobel Prizes than Biology, reflecting the rate at which new biological advances are changing the world. This is even more remarkable when we consider that there is no Nobel Prize for Biology – biologists end up winning the Nobel Prizes for Chemistry or Medicine instead!

Studying Biology at A-level at NatMatSci prepares you for a diverse range of careers and sub-disciplines in the wider world, such as genomics and gene editing, protein structure and drug design, medicine, neuroscience, psychology and psychiatry, ecology and conservation, zoology and botany. Biologists can find themselves working in a hospital, a laboratory, a rainforest, an ocean, a farm or an office. Few other subjects can offer so much variety of research topics or working environments. As our students work their way through the Biology course, their education is extended by learning about new developments in the field of Biology, taking part in journal discussion groups, competing in national and international academic competitions, and through conversation with other incredible students and their teachers.

We develop adaptable students, capable of applying their knowledge to new and unfamiliar situations. We help build the independent learning skills within our students that will equip them, not only for a wide range of careers, but also for life itself.

QUESTIONS:

- **Can we explain how such diversity of life-forms came to be?**
- **Can life evolve on other planets, and, if so, what would it look like? Would it be based on carbon?**
- **How can billions of electrical signals and trillions of connections lead to an experience of consciousness in the brain?**
- **How is ageing controlled?**
- **How can we live sustainably on this planet without destroying ecosystems?**
- **How can we manipulate organic molecules to cure diseases and correct mistakes in the genome?**

BIOLOGY

"Biology is the most powerful technology ever created. DNA is software, proteins are hardware, cells are factories."

Arvind Gupta

"Humans are natural-born scientists. When we're born, we want to know why the stars shine; we want to know why the sun rises."

Michio Kaku

PHYSICS

In Physics we study the most fundamental ideas about how the universe works. All of science rests on this bedrock, and Physics underpins the technology that drives our modern world. Studying Physics at The National Mathematics and Science College is about attempting to explain the universe in terms of simple models. A model might be created to help us predict the result of a specific experiment, but good models can be used to explain many things. An understanding of waves, for example, can help us to study sea water, traffic jams, car suspension systems, light and even electrons.

Studying Physics with us involves both measurement of the real world – experiments – and then the application of thought and mathematics to find the principles explaining what we see. Our students work through derivations and proofs for themselves, giving them a deeper understanding of the concepts they meet in our Physics courses. Because all of our students take A-level Mathematics, they are able to apply their numeracy to solve more complex physical systems than is possible in most pre-university environments, preparing them superbly for the higher study of science.

QUESTIONS:

- **How could you describe yourself (your height, your age, your mass) to someone who used a different system of units? Are there absolute units?**
- **Does 'F' always equal 'ma' ?**
- **What actually is a magnetic field?**
- **'g' is not 9.81ms^{-2} everywhere; it is a function of latitude. Why? (And do you therefore 'weigh' less on the Equator or the North Pole?)**

"I'm sincerely grateful to all the staff for the amazing time I have had at NatMatSci"

"I want to thank NatMatSci with all my heart for all the support it gave me during college years. I'm sincerely grateful to all the staff for the amazing time I have had there."

"I'm currently studying Physics and Molecular and Cell Biology as part of Natural Sciences course at UCL. It has been challenging with the biology so far, as it is all new, but my chemistry knowledge has definitely helped me grasp some fundamental biological mechanisms."

STUDENT PROFILE:

MARIA

ALUMNI FROM RUSSIA CURRENTLY READING NATURAL SCIENCES AT UCL

COMPUTER SCIENCE >

Computer Science has found its way into the heart of all STEM subjects. At The National Mathematics and Science College we encourage all our students to develop an understanding of the power that coding can play in scientific exploration, whether through the A-level programme or through one of our societies. The modelling potential of computers, coupled with a detailed understanding of the science, opens up an incredible world of potential, making use of machine learning and big data approaches to provide new insights and breakthroughs. Our students will have the skills to be at the forefront of this new wave of scientific exploration.

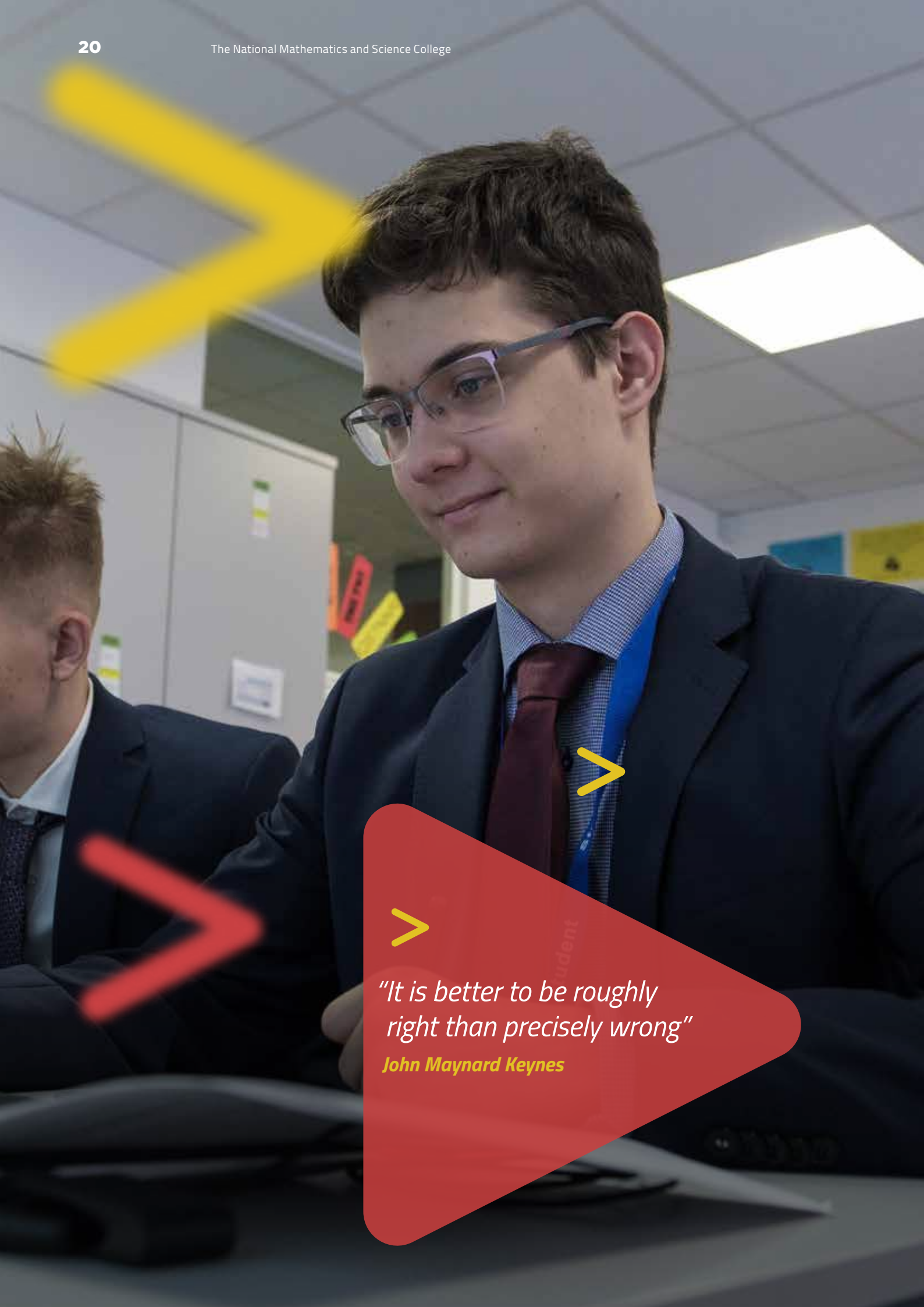
Computer Science offers the opportunity for students to develop advanced projects as part of their studies, whether that is the building of a physical 8-bit computer from simple electronic circuits or learning to program a drone to fly around the College avoiding obstacles, developing genetic algorithms to play Tetris, or perhaps simulating a complex predator prey model using a matrix of LED boards. If you have an idea for an interesting project this can become an important part of securing a top grade in your A-level studies.

QUESTIONS:

- **How does a computer actually work?**
- **What is the RSA cryptography, and why is it so fundamental to modern life?**
- **What do we really mean when we talk about Artificial Intelligence?**

"In my vision, the student programs the computer and, in doing so, both acquires a sense of mastery over a piece of the most modern and powerful technology and establishes an intimate contact with some of the deepest ideas from science, from mathematics, and from the art of intellectual model building."

Seymour Papert



"It is better to be roughly right than precisely wrong"

John Maynard Keynes

Economics is about choices and the fact that each choice has a cost. It relates to every aspect of our lives, from the personal decisions we make as individuals to the choices made by businesses and governments that can affect the whole of society. The economic way of thinking can help us all make better choices.

The study of Economics uses ideas from multiple sciences – ranging from statistics to psychology – in order to explain how people act to improve their economic well-being. Economics isn't simply about numbers but rather it analyses the world around us from social, financial and cultural perspectives.

Through studying Economics, you will gain an understanding of the central role prices play as the logic that organises our world. The subject can also provide valuable knowledge for making decisions in everyday life. Economic models are tools that we can use to analyse such things as the value of a particular financial investment opportunity, the benefits of a particular career path, or the likely impacts of public policies such as providing free universal health care, raising the minimum wage or imposing a sugar tax.

QUESTIONS:

- **Why are sports players and fashion models paid more money than doctors and nurses?**
- **What is inflation – and how can a government try to cure it?**
- **Why does the price of petrol fluctuate so frequently?**
- **Should the government put a tax on red meat in order to tackle climate change?**
- **Is bitcoin really a currency?**
- **Is it true that the gap between the rich and the poor is getting bigger?**

ECONOMICS

Young Jun represented the UK as part of the team of 4 students in the International Biology Olympiad, and has an offer to read Biology at Oxford.

STUDENT PROFILE:

YOUNG JUN

YEAR 2 STUDENT FROM KOREA

"I was attracted to NatMatSci because of the school's academic focus on sciences, teachers who are genuinely passionate about the subjects that they teach, and the inspiring atmosphere among the students!"

"I have learned not only the academic knowledge and skills I will need in my career but how to become an independent and caring individual through interactions with teachers and other students alike. If you have a love of asking questions, sharing and exploring ideas - if you have a love of science that you are keen to share with like-minded students - I would say NatMatSci is the place for you."

ENGLISH
AS AN ADDITIONAL LANGUAGE

English has established itself as a global language which is crucial for university entry in the UK and a career in STEM. For that reason, there is a strong focus on all four skills (reading, writing, speaking, listening) in every subject at The National Mathematics and Science College.

Students whose first language is not English must have achieved a level equivalent to CEFR B1 (IELTS 5.5) in order be accepted on to the A-Level course. Students will then follow an English language course which is tailored to their needs, with extra one-to-one support given if necessary, and a bespoke advanced course for those who excel. The societies programme includes options which enhance communication and writing skills, and students are entered for national creative writing competitions throughout the academic year.

Students take the Cambridge examinations (PET/FCE/CAE) in Pre A and Year 1, and then work towards the IELTS examination to prepare for university.

QUESTIONS:

- What are the greatest challenges facing the world today?
- How many different ways can you use the phrasal verb, 'get on'?
- What is the difference between future continuous and future perfect continuous?
- How many synonyms can you think of for the word 'difficult'?

"If you talk to a man in a language he understands, that goes to his head. If you talk to him in his own language, that goes to his heart."

Nelson Mandela

GREATER CHALLENGES

For the best and brightest STEM students in the world, we must provide challenges which stretch them beyond the confines of the A-level curriculum. This is why we encourage and support our students to enter various national and international competitions and Olympiads. The National Mathematics and Science College celebrates per capita more success in Olympiads than any other UK school.

BELOW ARE SOME OF OUR HIGHLIGHTS:

- Year on year, our students consistently rank in the global top 4% of schools competing in the prestigious International Euclid Mathematics Contest.
- Top performing UK school in the international Physics Olympiad "Physics Bowl".
- Consistent success in Hypatia and Fermat international contests.
- Large number of Gold Medals awarded each year in the Royal Society of Chemistry Olympiad
- Students selected for UK national team in each of 2019-2022 International Chemistry or Biology Olympiads.

1:5
STUDENTS GAINED PLACES AT
OXFORD & CAMBRIDGE

DESTINATIONS

Our students are supported by our expert team of advisers, who help them through the whole application process from thinking about careers to choosing the right course and university, compiling their application, and preparing them for any assessments and interviews. As a result, they regularly go on to some of the top universities in the world to study a range of Mathematical, Scientific and Healthcare related degrees.

OVER 50% WENT TO A G5 UNIVERSITY

UNIVERSITY OF OXFORD
UNIVERSITY OF CAMBRIDGE
IMPERIAL COLLEGE LONDON
KING'S COLLEGE LONDON
LONDON SCHOOL OF ECONOMICS

100%

OF STUDENTS GAINED OFFERS FROM RUSSELL GROUP UNIVERSITIES

"Everyone was smiling and the students started to chat and everyone was really welcoming which made the first day unforgettable."

"I want to study medicine and as an international student, but studying medicine, especially in UK, is a hard task to achieve. I chose NatMatSci because it demonstrated that it can help me to become what I want. All the support and effort that they put in to understanding me during the application process, and interviews has given me the confidence to succeed."

"I have changed schools a lot in the past and every time that I had to start the new school was a bit of a nightmare: people ignoring you, and you standing there not knowing what to do; it wasn't like this in NatMatSci at all! Everyone was smiling and the students started to chat and everyone was really welcoming which made the first day unforgettable. There's lots of support at NatMatSci, as much as you could want or need. The teachers don't care how many questions you ask, they love to talk about their subjects so are always happy to answer!"

STUDENT PROFILE:

SAHBA

YEAR 1 STUDENT FROM IRAN

GREATER ENRICHMENT

Our aim at The National Mathematics and Science College is to enable all our students to develop as confident, well rounded young people who can and will make a difference in society. We strongly believe that an excellent sixth form education should comprise of activities both inside and outside the classroom to develop the skills needed to be successful in College, at university and in their exciting futures.

In this way, College students will learn how to engage with students from other backgrounds and cultures; develop crucial leadership and teamwork skills; develop self-confidence and become positive contributors to society.

Our vibrant programme of Societies, many of which are student run, provide plenty of opportunity for students to try something new or explore a new aspect of something they love. Examples of societies include Climbing, Cryptography, Journalism, Language Learning, Literature, Model United Nations, Python Coding, Astronomy, Robotics, Chess and Drama to name just a few.

GREATER COMMUNICATION SKILLS

To be a great mathematician or scientist, it isn't sufficient to just know your subject area, you also need the skills to be able to communicate your understanding to others. That is why during their time at NatMatSci all students will have the opportunity to practice and develop their STEM communication skills.

WE DO THIS IN TWO MAIN WAYS:

STEM COMMUNICATION PROGRAMME

Through our STEM Communication Programme, NatMatSci students gain the experience necessary to become successful science and mathematics communicators.

Effective communication of science and mathematics requires an appreciation of the different approaches needed for different audiences and formats. Students will take part in activities designed to help them understand and write formal academic papers; prepare and give presentations; record video explanations of problems and ideas; and contributing to and chairing discussions and debates.

The experiences gained from these activities will enable them to thrive in their chosen careers, as well as providing additional useful experience and evidence for university applications and interviews.

ENGLISH LANGUAGE DEVELOPMENT

For our international students, our English Language programme ensures the development of their written and spoken language extends well beyond everyday colloquial English, and helps prepare them for the necessary rigours of academic discourse.

"It was my first time away from home, so I'm very glad to have support from the boarding staff"

"The boarding experience here at NatMatSci has been great fun. It was my first time away from home, so I'm very glad to have support from the boarding staff, who work hard to ensure our safety and make everyone feel at home. It also helped me to become more independent and prepared me for university life."

"There are so many great things about NatMatSci. The community - studying with like-minded people who all have a strong passion for maths and sciences. The teachers - they are very experienced and brilliant in their fields. The science 'vibe' around the college. Small size - everyone knows each other personally."

STUDENT PROFILE:

ALBERT

YEAR 1 STUDENT FROM VIETNAM

BOARDING: RESIDENCE

Boarding students live together in contemporary accommodation next door to the teaching centre in the heart of leafy Warwickshire.

Each student has their own luxury en-suite study bedroom with a double bed, desk, wardrobe, under-bed storage and highspeed wifi. The rooms provide a calm and comfortable space for students to study and live independently, within a university-style environment.

The boarding residence has a large number of open-plan kitchen and living rooms, with ample space for relaxing, socialising and eating together. The kitchens are fully equipped and have dining space, as well as comfortable seating and televisions. Meals are fully catered for in the College's onsite Alchemist's Restaurant which serves three hot meals a day plus snacks and a barista coffee service. However, students are also welcome to use the kitchens to prepare additional food and snacks outside of mealtimes.

There are a number of indoor and outdoor communal spaces for the students to enjoy including a gaming area, coffee hub, collaborative working spaces and gym/fitness facilities.

GREATER ACTIVITIES

Every year we engage with a wide range of academic, cultural and social trips and activities designed to enrich the educational experience of our students.

THESE RANGE FROM THE ACADEMIC SUCH AS VISITS TO:

- Oxford, Birmingham and Warwick universities for events and conferences
- The Natural History Museum and Science Museum in London
- Historic places such as Bletchley Park which was the home of the code-breakers during the second world war

TO THE RECREATIONAL SUCH AS:

- Local escape rooms
- Theme parks
- Theatre visits
- Concerts
- Go-karting
- Ski trips

We want all our students to gain a wide range of experiences in their time with us, and are always looking for new and exciting opportunities for to share with them.

BOARDING: HOMESTAY

For our international students, life in Britain can be quite different from home, and our Homestay option offers students a welcoming, friendly and family environment in which to adjust to life in the UK. Homestay students live with carefully chosen British families who live close to the College.

Homestay students are welcomed into the family homes and are expected to take part fully in family life. Students can expect comfortable houses, with space for relaxing, socialising and eating with their Homestay Parents.

Each student has an individual, private study bedroom which includes a desk for working. The rooms provide a calm and comfortable space for students to study and live independently, within a family-style environment.

The families our students join have been carefully selected and arranged by Sutherland Guardianship, a family business founded in 1965 by Mrs Betty Sutherland originally in their own family home – a house called Batemans – which was previously the residence of the esteemed writer Rudyard Kipling.

THE LOCAL AREA

The National Mathematics and Science College is situated on the edge of Warwick University in the leafy and picturesque area of Westwood Heath in Warwickshire. With excellent transport links it is easily accessible by rail, bus and car.

London and Birmingham can both quickly be reached allowing students to experience some of the sights and sounds of the UK.

GETTING TO US:

BY AIR

Birmingham International Airport is only 15-20 minutes from the College making travel to European airports easy with airlines such as Air France, EasyJet, Flybe, KLM and Ryanair.

London Heathrow Airport is around 90 minutes from the College and taxi transport can be arranged to pick up and drop off at Heathrow.

London Gatwick Airport is around 2 hours from the College and taxi transport can be arranged to pick up and drop off at Gatwick.

BY RAIL

Rail links to London are excellent, with the journey time from Coventry station taking just over an hour. Local railway stations provide easy access to Birmingham.

Birmingham Airport

To Birmingham

Solihull

M42

M6

A45

A441

A444

A452

A46

A445

A423

A428

A429

M40

ion

COVENTRY

The National Mathematics and Science College

The Oaks

Warwick University

Train Station

To Rugby and Cambridge

Glasgow

Edinburgh

Newcastle

Leeds

Manchester

Sheffield

Birmingham

Cambridge

Stratford-upon-Avon

Oxford

Cardiff

London

Warwick

Royal Leamington Spa

To Oxford and London

NEXT STEPS

Are you ready to come run with the swift?

If so find out more about The National Mathematics and Science College by visiting **natmatsci.ac.uk** or contacting our admissions team on **admissions@natmatsci.ac.uk**.

COME RUN WITH THE SWIFT.

The National
Mathematics and Science
College

The National Mathematics
and Science College
Westwood Way, Coventry
Warwickshire, CV4 8JB