Imperial College London

ANNUAL REPORT 2016–17

OUTREACH

▲ *Year 12 school students undertaking a titration activity in the Wohl Reach Out Lab*

CONTENTS

➜ CONSOLIDATION AND DEVELOPMENT were the two key themes for Outreach at Imperial in 2016–17 as we built on our core programmes, launched a new coding cohort programme and began the exciting process of building a new team responsible for the delivery of activities in our new Makerspace in White City.

The creation of this brand new space for Outreach has really been the pinnacle of our year and after many months of planning, seeking funding, drafting up programme plans and job decriptions, to see the Reach Out Makerspace ready to launch has been incredible. The work that we carry out in the Wohl Reach Out Lab and on campus in South Kensington is very much focused on STEM curriculum support but the Reach Out Makerspace will allow us to be more innovative and creative in the way that we deliver Outreach. Furthermore, we will be able to reach out to more pupils with an exciting variety of activities that will inspire and engage them in the core sciences using hands-on tinkering and making sessions. We like to see it as 'science by stealth' as the pupils learn through a very different method of teaching and knowledge transfer in an exciting yet nurturing environment.

Underpinning all of our work for 2016–17 has been a more in-depth analysis of the impact of our programmes. Having access to pupils' final destinations has unlocked the full scope of what we are able to achieve and how we can focus and improve on our work in the future. With a new data set from HEAT (the Higher Education Access Tracker) we could identify the outcomes of over 2000 participants that we have worked with (discussed in more detail within this report).

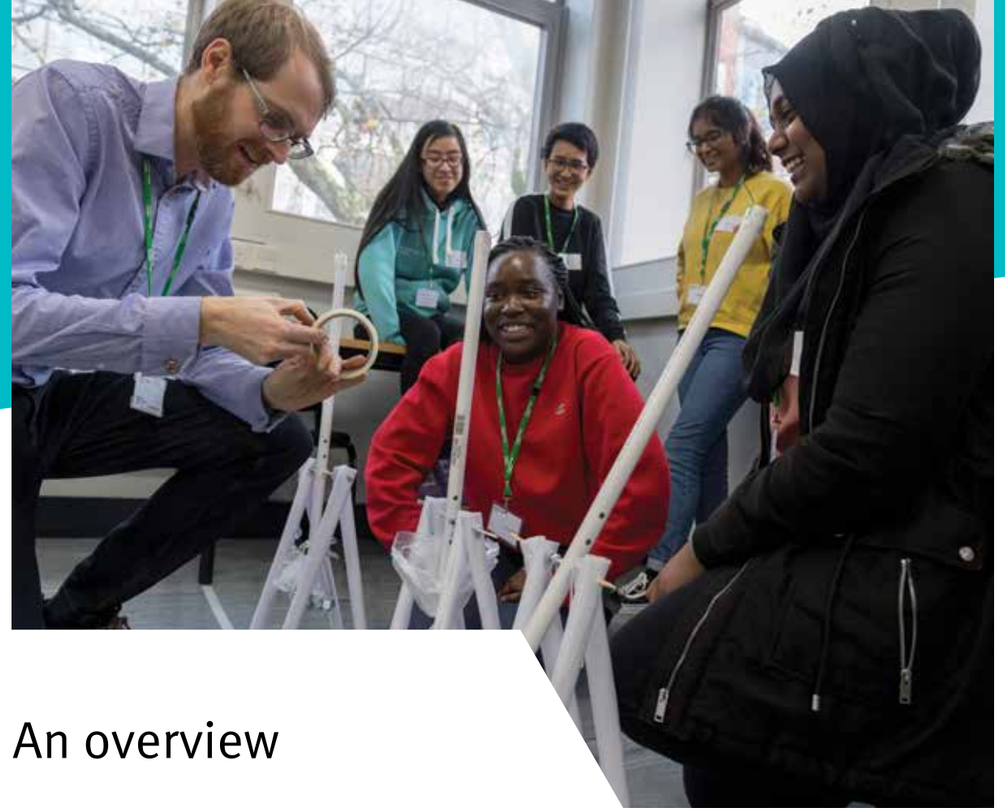
Furthermore, we now have two full time PhD students conducting research into access and widening participation to provide rigorous and robust evaluation.

We continue to build on our work with teachers at both primary and secondary level and the feedback from focus groups that we carried out in 2015–16 has allowed us to refine the package of support for schools. Our primary school hampers, for example, have been extensively trialled and researched to ensure they provide a primary school teacher with everything they need to carry out one of the Key Stage 2 science topics in one class. These activities are provided free of charge to schools that meet with our target criteria and mean that we can provide specialist tailored support right where and when it is needed the most.

2017 also saw our team being brought under the wing of the Academic Partnerships Division, led by the College's Outreach champion, Professor Maggie Dallman (Associate Provost Academic Partnerships). This is an exciting development and means that our work now joins up with Imperial's wider Societial Engagement Strategy and, in particular, with the community engagement work at White City.

Looking ahead to 2017–18, we will officially launch our new Makerspace in September 2017 with the Maker Challenge programmes kicking off as soon as the new academic year starts. We also hope to see more participants from our core cohort programmes achieve their academic goals. Raising attainment continues to be at the heart of what we do in Outreach and this focus will strengthen through more in-depth research-led analysis.

Dr Annalisa Alexander
Head of Outreach



▲ *One of our experienced STEM leaders helping STEM Potential students to explore the physics of trebuchets.*

An overview

➜ Imperial College London is a one-of-a-kind university in the UK, focusing exclusively on science, engineering, medicine and business.

To this end, we work with schools, colleges and community organisations across the Greater London area, working with disadvantaged students from widening participation backgrounds to raise aspirations, change perceptions, support teaching staff and stimulate interest in STEM subjects from primary through to A-level education. This is supplemented by targeted financial support for those most in need.

OUR STRATEGIC OBJECTIVES FOR THIS YEAR HAVE BEEN:

» to pursue activities targeted at capable disadvantaged school children who have potential in those subjects required for entry to Imperial;

» to help to address the problems caused by a shortage of well-qualified science teachers in state schools, namely the decline in interest and attainment in science;

» to pursue activities which raise the aspirations of school children, towards HE generally and science in particular, from primary education through to A-level and encourage them to apply to the right university for them, irrespective of their background.

2016–17 STATS

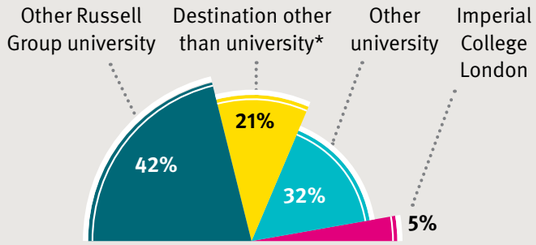
4,646 students
attended our science activities and lectures

495 schools
engaged with Imperial Outreach

470 students • **Summer Schools**
390 students • **STEM Potential Programme**
180 students • **Pathways to Medicine Programme**

2,280
Outreach team received post-school information on 2,280 of its participants aged 18 and above in 2016

Where did students go after reaching the age of 18



*For example, apprenticeships

97%
of students are studying a first degree

Average is 91% for HEAT members*

**HEAT (Higher Education Access Tracker) is a monitoring and evaluation service for subscribing Higher Education institutions. 75 UK universities are currently members of HEAT, including 17 Russell Group universities.*

88%
of students went into STEM-related courses at university

TOP 3 SUBJECTS

22% Engineering

19% Life Sciences

14% Subject allied to Medicine

Data originating from HESA and HEAT

Impactful **Spaces**

▲ *School students creating cardboard prototypes in the new Reach Out Makerspace on one of our taster activities.*

Wohl Reach Out Lab

Imperial's bespoke STEM-focused schools laboratory.

16,126 pupils have participated in 1,227 events in activities since the Lab opened.

Since the Wohl Reach Out Lab opened on our South Kensington Campus in 2010 it has been central to our core belief that using practical work will encourage students to engage more deeply with science subjects, and help to support them to continue studying STEM subjects into sixth form and beyond.

It gives pupils aged 5–17, particularly from schools with limited access to laboratories and science equipment, the chance to take part in hands-on experiments in five key areas: physics, chemistry, mathematics, biology and engineering.

Amongst these have been two long term programmes specifically focused on core science support. Over 2,422 students in Y12&13 from the Harris Federation Academies have undertaken specialist science practicals in the Wohl Reach Out Lab in the last five years, and in 2014 a generous donation enabled the team to work in collaboration to support students from Westminster Academy. Since the inception of this programme, 406 students from the school and their local feeder primary schools have taken part in engaging science classes at Imperial. This programme has grown and developed, and continues to thrive as a true partnership between a school and the College.

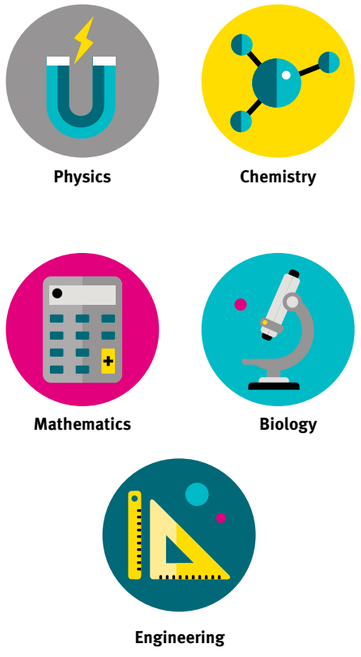
→ **www.imperial.ac.uk/schools/wohl-reach-out-lab**

"Transferable skills that students have learnt, from being safe in public places, choosing and purchasing lunch and just being in a university setting is something so simple, but can so easily be overlooked — learning life skills is fundamental to us producing well rounded individuals."

Teacher, Westminster Academy

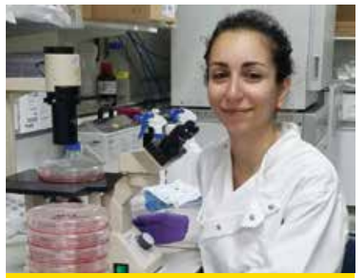
▲ *Participants undertaking a session on microscopy and mitosis in the Wohl Reach Out Lab.*

FIVE KEY AREAS



"Collaboration from Imperial has really helped me develop as a teacher, especially when devising experiments outside my subject area. The support given by the colleagues at Imperial has led to enhanced subject knowledge, which I can confirm is felt by all members of the science department."

Teacher, Westminster Academy



CASE-STUDY

Dr Rosa Porreca

The programme enables College staff to have the opportunity to disseminate their work to a wider audience. Dr Rosa Porreca was heavily involved in the programme this year, developing activities and teaching Y9, Y10 and Y12 students from Westminster Academy.

Dr Rosa Porreca in her research lab: "As a scientist working at the College as a Research Associate, I like passing on my enthusiasm for science, sharing my knowledge and communicating science to younger generations, and encouraging children to think about science as a future career. For all these reasons I decided to get involved with this programme.

This year I had the great opportunity to both develop and deliver different biology workshops for the Westminster Academy students. The students were excited, curious, fully committed to the laboratory work and have transferred their positive energy to me. To have an impact on the future generation is extremely rewarding."

The Reach Out Makerspace

State-of-the-art educational facility at Imperial's White City campus

During this academic year, an exciting development has been underway with the establishment of the Reach Out Makerspace. Based in the Invention Rooms in our White City campus, this vibrant space contains a workshop and design studio specifically created to work with young people from the local community through a series of programmes and events.

The focus of the Makerspace is to pioneer a new innovative form of engagement – providing participants with the space, time and resource to experiment, design and innovate in this unique space. The aim is to transform lives by sharing practical skills in design, innovation, manufacturing and entrepreneurship, and to build young people's confidence.

The Makerspace will be used extensively in two new programmes commencing in 2017–18 – the Maker Challenge and the Schools Challenge. Our next report will detail our first year in the space, but during this academic year we have had the opportunity to engage the local community with 'making activities' on the road with attendance at local events, and our summer taster sessions that were housed in the Invention Rooms.

➜ **www.imperial.ac.uk/schools/reach-out-makerspace**

STEM **Experiences**

▲ *Participants on the STEM Potential programme undertaking a KS5 Biology practical.*

36
Days of events

154
Number of schools students came from

STEM Potential

Non-residential cohort programme for Years 10–13

390 students joined us for STEM Potential in 2016–17 — a programme aimed at high-achieving students from backgrounds under-represented in higher education.

STEM Potential has two entry points:

YEAR 10 ➜ Students joining us in Year 10 spend two years exploring different STEM fields to gain a better understanding of subjects they may wish to study at A-level. They also attend on-campus taster events for an insight into university life. Progression from the Year 10 to Year 12 programme is not automatic but is an option depending on GCSE performance, A-level choices, aptitude and overall commitment to the programme.

YEAR 12 ➜ Year 12 students embark on a more advanced programme, covering subject-specific workshops relevant to the STEM subjects they are undertaking at A-level. Students are also paired with a current Imperial undergraduate e-mentor for peer support and information, alongside professional support from the College with their university applications, personal statements and interviews.

➜ **www.imperial.ac.uk/schools/stem-potential**

STATS

390	students took part in the 2016–17 programme
10	students from the Year 13 cohort were accepted into Imperial College London

“The teaching approach was fantastic and done in a way which allowed even the more complex ideas to stick in my brain. It really is an unmissable programme and I will forever be grateful for everyone involved for making me more confident and helping me succeed in my studies.”

Year 13 Student

“The content covered in sessions outside the curriculum really helps students expand their horizons and try to learn their subject inside out rather than sticking to a book. Sixth forms and colleges’ tend to cover everything in the specification and rarely go outside of it. The Imperial lessons went out of the way to introduce us to new concepts.”

Year 12 student

69%
Surveyed Year 13 students enrolled at a Russell Group university

“I thought the programme was extremely useful, as extra support was given for my A-level studies. I felt able to ask the helpers any questions about difficult topics. The e-mentor I had was amazing. She answered any questions I had and kept in regular contact with me.”

Year 13 Student

CASE-STUDY

Holly

A former STEM Potential student shares her experience in the programme:

“I participated in the STEM Potential programme from 2015–2017. I originate from Cumbria, over 300 miles away. It was quite a commitment travelling to London on a regular basis, but the Outreach team were committed to providing help and advice to all students who attended.

I was able to recognise that Imperial is a world class university, but that it was not unachievable for me to strive to obtain a place there. STEM Potential provided me with support and coaching in all my A-level subjects, including revision sessions in preparation for exams.

I was also importantly provided with assistance preparing my personal statement and interview practice, which I found particularly difficult. I was given an e-mentor, who always made herself available and answered all my questions promptly. This was useful when I thought of any questions I had. I was also given a taste of what university life would be like.

The STEM sessions, and all the staff and undergraduates involved in the scheme, motivated me to do my best and see that Imperial was not out of my reach. Now here I am, studying for a degree in biochemistry!”

Pathways to Medicine

Non-residential medical outreach cohort programme for Year 11

60 new students and 120 continuing students embarked on Pathways to Medicine in 2016–17, which supports high-achieving students from underprivileged backgrounds in their dream of becoming a doctor.

Pathways to Medicine was launched in early 2014 by Dr Annalisa Alexander, Professor Kevin Murphy and Dr Claire Sweetenham. Year 11 students are supported for three years until the time of their eventual application to medical schools. The focus is on addressing the barriers that some state-school students face in accessing and succeeding in medical study at university, with the ultimate goal of making the profession more representative of the population it serves.

A total of 60 students per year are offered a place on this intensive programme from a pool of over 200 applications. The selected candidates experience a wide range of carefully designed activities and guidance relevant to medicine: a week of work placement at a hospital (usually a requirement for applying to medicine); a week of non-residential summer school on Imperial's South Kensington Campus with occasional trips to other Imperial campuses; continuous e-mentoring by a current Imperial medical student; a number of taster events (eg. Obesity, iKnife) and three conferences (Junior, Senior and Interview) run by Imperial Medical Student Society (Vision).

47
Number of non-selective state schools in London students came from

180
Total number of students in 3 full cohorts

▲ *A Summer School taster event in which students engaged in an exciting CSI scenario where they used scientific skills to produce evidence obtained by careful observation and analysis of their data to solve the crime.*

➜ wwww.imperial.ac.uk/schools/pathways-to-medicine

"Gaining valuable work experience and having the opportunity to be present at the ward rounds really taught me the importance of medicine and how the stereotypical perspectives were defied. The teamwork, communication and collaboration were impressive, and after this experience I do wish to enter the medical profession."

Student on Hospital Placement, Cohort 4

▲ *Sutton Scholars student working with Adam, one of our ambassadors, during one of the on-campus sessions.*

Imperial Sutton Scholars

Non-residential cohort programme for Years 7–9

60 students joined us for the pilot cohort of Imperial Sutton Scholars in 2016–17 — a 2.5 year coding programme aimed at high-achieving KS3 students from backgrounds under-represented in higher education.

Working with 12 targeted schools this pilot programme is designed to improve the opportunities for able state school pupils from widening participation backgrounds to learn more about coding, computational skills, programming and the applications of these techniques in the sciences and engineering.

Students join us half way through Year 7 spending two and a half years exploring different aspects of STEM through coding-based projects. Students will attend up to six on-campus events each year and have a weekend residential at the start of Year 9.

➜ www.imperial.ac.uk/schools/sutton-scholars

3
Number of days of events

"The team working with the scholars are incredibly enthusiastic and dedicated. It's great to see such a relevant and valuable programme in action, reaching out to students from all over London. A massive thanks for providing this opportunity."

Parent, Imperial Sutton Scholars, cohort 1

"Thank you for this opportunity to grow and develop my knowledge and understanding of coding and programming. We don't have computer studies at school, so it's a major bonus setting up a coding club there and being able to give other students an insight into this area of studies. I wouldn't have pursued this if I hadn't been given this opportunity."

Student, Imperial Sutton Scholars, cohort 1

Year 9 Girls Engineering Summer School

Engineering-focused non-residential summer school

59 Year 9 girls from a state school background took part in this week-long summer school providing taster sessions in the different engineering disciplines.

This five-day non-residential summer school, funded by Imperial's Faculty of Engineering, is aimed at inspiring the next generation of female engineers. By engaging Year 9 students, prior to GCSE and A-level selection, there is a greater chance of impacting their subsequent course choices.

Participants take part in two sessions each day comprising a mixture of lecture and practical activities to highlight the breadth of opportunities engineering offers. The week culminates in a presentation where participants present posters detailing their favourite things they learnt during the week.

STATS

71.1% of attendees were from low-income families (less than £43k per annum)

62% would be first generation to apply to university

→ www.imperial.ac.uk/schools/summer-schools

Year 10 Insights into Science and Engineering Summer School

Residential science and engineering summer school

40 Year 10 students from around the UK had the chance to undertake experiments developed by current researchers at Imperial in this programme aimed at providing a taster of different STEM subjects.

This residential summer school aims to encourage Year 10 students to continue studying science and engineering subjects through a series of half-day taster sessions, led by Imperial academics and students.

Participants can choose between an engineering or science subject strand, for sessions that combine hands-on practical sessions and workshops in real undergraduate labs.

The summer school also incorporates a busy social programme, combining visits and events in London with activities aimed at building skills in team work and communication.

STATS

83% of attendees were from low-income backgrounds (less than £43k per annum)

65% of the attendees were from families with no prior experience of HE

→ www.imperial.ac.uk/schools/summer-schools

"The aspect I liked most was that the programme created an environment to both study and socialise in a comfortable yet serious setting."

Student, Insights

"I personally enjoyed the experience of living in the shoes of a university student in terms of accommodation, academic sessions and evening activities. I feel that the evening activities were especially fun as they showed that there is more to university life than just studying."

Student, Insights

100%

Number of students who said they were more likely to progress to university as a result of attending a Year 10 summer school.

“Meeting various members of the scientific community was both an exciting and thrilling event. The university itself was an amazing source of information, thriving with such large quantities of intelligence. My once shallow interest of going to university rapidly transformed into a dream of both hope and success.”

Student, Project STEM

Year 11 Project STEM Summer School

STEM-focused residential summer school

72 Year 11 students joined us in summer 2017 for a five-day exploration of real-life challenges in chemistry, biology or physics.

This summer school aims to address the challenges of progressing from GCSE to A-level science, which many students report finding to be a significant jump.

Participants work in project groups within their chosen subject strand, undertaking a challenging practical investigation with support from our undergraduate mentors.

Projects are developed in conjunction with Imperial researchers, drawing on up-to-date techniques and equipment to solve problems in a similar way to university research groups, with as much hands-on exposure to labs as we can fit in.

The week culminates in an academic-style conference, giving each project group the chance to present a poster detailing their investigation to their peers, leaders and invited guests.

Participants also have the chance to experience broader university life through a series of social activities. There is a focus on team building and development of social skills, and on providing an insight into the type of activities that students who attend university in London have on their doorstep.

STATS

86% of attendees were from low-income backgrounds (less than £43k per annum)

69% of the attendees were from families with no prior experience of HE

➜ www.imperial.ac.uk/schools/summer-schools

“I liked the positive attitude all the staff had towards their jobs as they all maintained a good sense of humour whilst remaining professional at all times.”

Student, Project STEM

Year 12 Engineering Summer School

Engineering-focused residential summer school

59 Year 12 students from around the UK got a taste of university life and an opportunity to explore different engineering disciplines during this summer school.

This is the first year this summer school has been organised by Imperial Outreach; previously it ran under the Headstart programme. This four-day residential summer school, funded by the Faculty of Engineering and a generous donation from an alumnus, saw participants take part in one of three ‘streams’ of engineering taster sessions across all courses offered at Imperial.

STATS:

81.4% of attendees were from low-income families (less than £43k per annum)

85% would be first generation to apply to university

➜ www.imperial.ac.uk/schools/summer-schools

“Summer School was amazing — I had so much fun learning new things, meeting new people who were like-minded and getting a taster of what different engineering courses and life as a student at Imperial would be like. This really inspired me, making me realise that I could be good enough to apply for prestigious universities like Imperial.”

Student, Y12 Engineering Summer School

Year 12 Sutton Trust Summer School

STEM-focused residential summer school

196 students from a state school background got a taste of university life when they joined us in summer 2017. This four-day residential programme runs twice each summer, covering a range of different STEM subjects at each session.

Participants take part in a challenging academic programme, covering lectures and lab sessions and the chance to carry out practical investigations. The week culminates in a presentation where participants present posters detailing the work they have covered.

Advice on applying for university also forms a core part of the programme, giving participants access to professional support with writing their personal statements.

→ **www.imperial.ac.uk/schools/summer-schools**

47%

Number of attendees who received free school meals

87%

would be first generation to apply to university

“A lot of time was dedicated to lab work which was very helpful for me as it enabled me to improve my practical skills. Also, the time dedicated to evening activities was equally important as it enabled me and the rest of my group to improve our transferable skills.”

Student, Sutton Trust Summer School

“Lots of information, a range of topics to really get to know the subject you’re thinking about, very valuable for evaluating whether you want to pursue the subject.”

Student, Sutton Trust Summer School

“I really enjoyed the mentor system. Both the academic and pastoral mentors helped to give an insight into applying to and life at university.”

Student, Sutton Trust Summer School

CASE-STUDY

Rachel

My name is Rachel, and I am from Wensleydale in North Yorkshire. I took part in the Biological Sciences course at Imperial. In the next few months, I hope to apply to Cellular and Molecular Biology at a range of universities.

I applied to the Sutton Trust Summer School to boost my UCAS application, as being on the course you have the opportunity to learn a range of useful skills and experiences. I chose Imperial simply because it was 3rd in the league tables for Biology and I wanted to prove to myself that a girl who lives in a rural area could get to the big city and take part in such a course! I also chose Biological Sciences as it is similar to what I want to do and I wanted to see if the course was for me.

During the run up to the programme I felt somewhere between nervous and excited. Nervous as London is a long way from home and a very big place, and for me, coming from a little town in the countryside, this was quite daunting. For example, on the morning of the course I travelled across London on the tube for the first time. I was excited because I would be meeting people my age with similar interests and aspirations. The course itself sounded really interesting so that was also something I was excited about.

I wanted to prove to myself that a girl who lives in a rural area could get to the big city and take part in such a course.

As I live so far north, I travelled down to London the day before. The nerves were still there of course, and at times I got a little worried about what people would think of me, whether anyone would like me, or whether I would fit in. However I started to replace those thoughts with excited ones, for example thinking about what part of the course I was looking forward to most. By the time the morning of the course came around, I was much more excited than nervous. Excited to meet new people – the students and the course mentors too who have been/are going through the education system and are success stories of their own.

Once I arrived I was overwhelmed by how friendly everyone was. All the mentors and leaders were so passionate about making sure every individual had the best possible time. I was actually surprised by how hands-on the practical sessions were, for example when we carried out the dissections we were fully encouraged to do it by ourselves while following written instructions. The leaders and mentors were there to help if we needed it but they didn’t try and interfere or take over. I was impressed by the equipment at Imperial too, for example in lessons at school we had seen pictures and videos of equipment such as a PCR machine and a centrifuge, whereas at Imperial they had such equipment for us to use. I think the biggest surprise by far was the opportunity to be on TV! I took part in an interview about educational opportunities in a rural area, which I didn’t expect to happen in a million years.

Whilst I learnt lots from the academic sessions, I think the best bits were the pastoral activities, including the formal dinner. It gave me the chance to interact and have a laugh with people my age. Of course I enjoyed the academic course too, from dissecting a mouse to replicating DNA with primers. My most memorable experience however would have to be when we built structures out of Lego that replicated one the leaders had made. I just remember laughing so much as my group kept getting it wrong.

To fellow students who are considering applying to a summer school programme but are unsure, I would say, go for it. No matter how unsure or under-confident you feel, you should just step outside your comfort zone and do it, because like me, you might learn things about yourself that you didn’t know. For example I didn’t know I would enjoy replicating DNA with primers so much but I know now that it’s something I want to learn more about.

Accelerate into Maths and Science (AIMS)

After school maths programme aimed at Year 12 students in local state schools

This year we piloted a new after school maths programme: Accelerate into Maths and Sciences (AIMS). This programme is a collaboration between Outreach and the Departments of Physics and Chemistry.

A pool of current undergraduates from across the faculties of Engineering, Medicine and Natural Sciences is used to deliver weekly, 2-hour bespoke sessions for A-level students studying maths, physics and/or chemistry. Centred around developing skills knowledge in mathematics, the course includes advanced questions that relate to a particular area of mathematics applied in science, medicine or engineering programmes that participants are likely to encounter at undergraduate level. This approach aims to not only improve mathematical rigour but also deepen conceptual understanding in science through mathematics.

Aimed at Year 12 students attending local state schools, a 6–8 week programme is run from January followed by a further programme in September and October, coinciding with the beginning of the academic year. This programme will run again in 2017–18 from donations given via Regular Giving to the Outreach Fund.

Imperial Festival Schools Day

The Imperial Festival Schools Day is part of the College-wide weekend dedicated to sharing the best science and arts on offer from the College

Imperial Festival Schools Day provides primary aged school children the chance to meet Imperial researchers and explore some of the activities on offer at the Festival before it opens to the general public. Nearly 300 pupils were invited from ten primary schools, many from the area local to the new White City Campus. Participating pupils took part in an introductory demonstration lecture, provided by Imperial alumnus Neil Monteiro, before making their way over to the main marquee guided by Imperial staff and students. Over 60 Imperial researchers were on hand to explain their work and demonstrate the science behind it with pupils driving a simulated Mars Rover, modelling the spread of disease in Africa, learning how to pop balloons with lasers and investigating how babies' bones grow, amongst many other topics. Attending schools also had the opportunity to attend a bespoke session in the Science Museum's Wonderlab, a new collaboration for this year.

> "My favourite was when we had headsets that read your mind, then if you think something really hard the car will go very fast."
> Student

STATS

- 95% of children indicated that they enjoyed visiting Imperial
- 90% of children reported that they learnt something
- 97% of participating adults (teachers and chaperones) reported that they found the day 'excellent'

→ **www.imperial.ac.uk/festival**

> "Experiments and explanations were pitched perfectly to the children. All the experiments were really interesting and varied."
> Teacher

Support in **Schools**

▲ *The Pimlico Connection is a tutoring scheme in which Imperial students tutor and mentor primary and secondary school pupils in their studies whilst raising aspirations and providing positive role models.*

INSPIRE

Unique STEM Postgraduate Certificate in Education (PGCE) Scheme

15 postgraduate students gained Qualified Teacher Status through the INSPIRE PGCE programme in 2017, helping to address the shortage of well-qualified STEM secondary school teachers in London.

INSPIRE (the Innovative Scheme for Postgraduates in Research and Education) is our intensive, 10-month PGCE training programme.

15
Number of 2016–17 graduates from the scheme

Delivered in partnership with Canterbury Christ Church University, it recruits and trains scientists with a PhD and/or Master's qualification in chemistry, engineering, maths or physics to become inspirational secondary science teachers.

INSPIRE trainees are equipped with the skills and experience not just to teach, but also to engage and enthuse pupils about science. Trainees participate in five weeks of science outreach activities, alongside taught sessions and placements in local schools, learning practical skills and demonstration techniques that bring science to life.

The offer of a generous bursary, made with support from the Foyle Foundation, helped to attract highly-qualified trainees onto the course.

➜ **www.imperial.ac.uk/inspire**

28
Number of schools that had contact with INSPIRE trainees in 2016–17

100%
Number of tutors who reported seeing the school pupils grow in confidence

The Pimlico Connection

Voluntary mentoring and peer-mentoring scheme

Over 80 student tutors were placed in 19 local state primary and secondary schools through the Pimlico Connection in 2016–17. Tutors visited schools once per week between November and March providing STEM-focused tutoring to hundreds of pupils.

"All the tutors were brilliant – well organised, enthusiastic, knowledgeable about their subjects and genuinely interested in and committed to the project."

Events and Partnerships Manager, Morpeth School

The Pimlico Connection is run by the Outreach Office in partnership with the Imperial College Union Community Connections Team. The Union provides additional support to the volunteer tutors on the programme enabling them to further develop their transferable skills and work towards accreditation through Imperial Plus.

The Pimlico Connection was established at Imperial in 1975 and has provided tutors to local schools for over 40 years. The scheme aims to provide bright and engaged role models to pupils in local schools, many of whom do not have family members with experience of higher education. The tutoring sessions are all subject-focused and co-ordinated by science and maths teachers within the school. Tutors aim to both increase pupils' academic attainment and improve their understanding of the higher education system.

➜ **www.imperial.ac.uk/schools/pimlico**

22,746

Number of students in 93 schools who benefied from the programme

School Visits Programme

A fully comprehensive service covering all aspects of higher education awareness and application.

The programme is designed to help sixth formers make informed choices and effective applications across the HE sector, to encourage pupils to apply and fulfil their potential and support parents and teachers in the assistance it provides.

The programme is tailored to the needs and requirements of each school, the vast majority of which are in the state sector and are selected on the basis that their pupil intake includes those from disadvantaged backgrounds.

➜ **www.imperial.ac.uk/schools/visits**

> “Thank you for all your efforts, advice and extraordinarily helpful feedback for the mock interviews and for the exceptionally informative and inspirational Personal Statement talk — our Year 13 tutors are genuinely seeing the impact of your advice on the improved quality of personal statement drafts that are coming in to them at present.”
>
> Head of Sixth Form, Barking Abbey School

> “The children and staff were really excited by Professor Winston’s visit and it was wonderful watching their interaction with him around the school and in assembly. It is a day that they will remember for a long time.”
>
> Headteacher, Whitfield Aspen School

Professor Lord Robert Winston

Outreach Academic Champion

Robert Winston, Professor of Science and Society and Emeritus Professor of Fertility Studies, is the academic champion of the Wohl Reach Out Lab at Imperial College London.

He is actively engaged in raising the aspirations and scientific literacy of young people aged 6–18, delivering public lectures in a large number of British and overseas universities and regularly visiting UK schools.

450

Number of schools Professor Winston addressed in 2016–17

Spectroscopy in a Suitcase

Access to modern, portable spectrometers to aid A-level chemistry teaching

The Spectroscopy in a Suitcase (SIAS) scheme, funded by the Royal Society of Chemistry, gives AS and A-level students access to modern, portable spectrometers, which they can use to analyse mystery substances.

Practical workshops provide context for the analytical techniques taught in school, with students using Infrared or NMR spectrometers to identify unknown samples. In addition to complementing the study of spectroscopy at AS and A-level, there is a strong emphasis on encouraging school pupils to consider studying chemistry at university. In 2016–17, 23 trained undergraduate and postgraduate Imperial chemistry students were involved in delivering these workshops, taking the opportunity to practise their science communication and develop transferable skills.

Imperial College London has hosted a SIAS kit since 2012 and during this time over 5,500 school students have taken part in a SIAS workshop. Teachers book a free workshop online and the Imperial Outreach team liaises between the school and the university students who will deliver the session. In 2014 Imperial also became the host of the UK & Ireland SIAS Coordinator position, a role which liaises between all 34 SIAS host universities and the Royal Society of Chemistry.

51

Schools visited

> “Thank you very much for providing these fantastic programmes to schools — a very worthwhile and engaging afternoon.”
>
> Teacher, Chessington Community College

> “It really opened our students’ eyes to the possibilities of future research and careers in chemistry.”
>
> Teacher, Finchley Catholic High School

1090

Students reached

Collaborative **Outreach**

▲ *Attended by 250 primary school pupils, the Flying Atoms show helped young people explore the principles of physics with interactive dance, theatre and music. The event included a visit to the Science Museum's Wonderlab and a post-show workshop and experiment at Imperial.*

“It was a very engaging day with engaging speakers. It cast a different perspective on science and made me see how creative it is.”
Student

Collaborative Outreach

Engagement with the public and other organisations

In 2016–17 the Outreach team has been developing new and innovative ways of working with other organisations, as well as the general public. Here are a few of the highlights:

Creative Quarter

Creative Quarter was first set up in 2006 and is now an annual event in South Kensington offering young people the opportunity to explore the latest developments in the creative industries and gain an overview of creative career paths in art, science, design, technology, music and drama.

For Creative Quarter 2016, seven institutions (the Victoria & Albert Museum, Natural History Museum, Science Museum, Royal Albert Hall, Royal College of Music, Goethe-Institut and Imperial College London) took part. There were over 4000 places booked on sessions across all the venues and more than 300 places booked for events at Imperial College London.

Experiment!

Experiment! is an exciting summer school (held this year from 25–27 July) offering young people the opportunity to explore science, music and art at Imperial College London, the Royal College of Music and the Royal College of Art. All three institutions offered hands-on workshops full of experimentation and creative thinking. Participants were able to develop their problem-solving skills and share their discoveries at the end of programme. Imperial biologist Fevziye Hasan, an expert in ecology and evolution, introduced participants to the importance of recognising trends in scientific investigation and how discerning patterns through trial and error features across STEM disciplines.

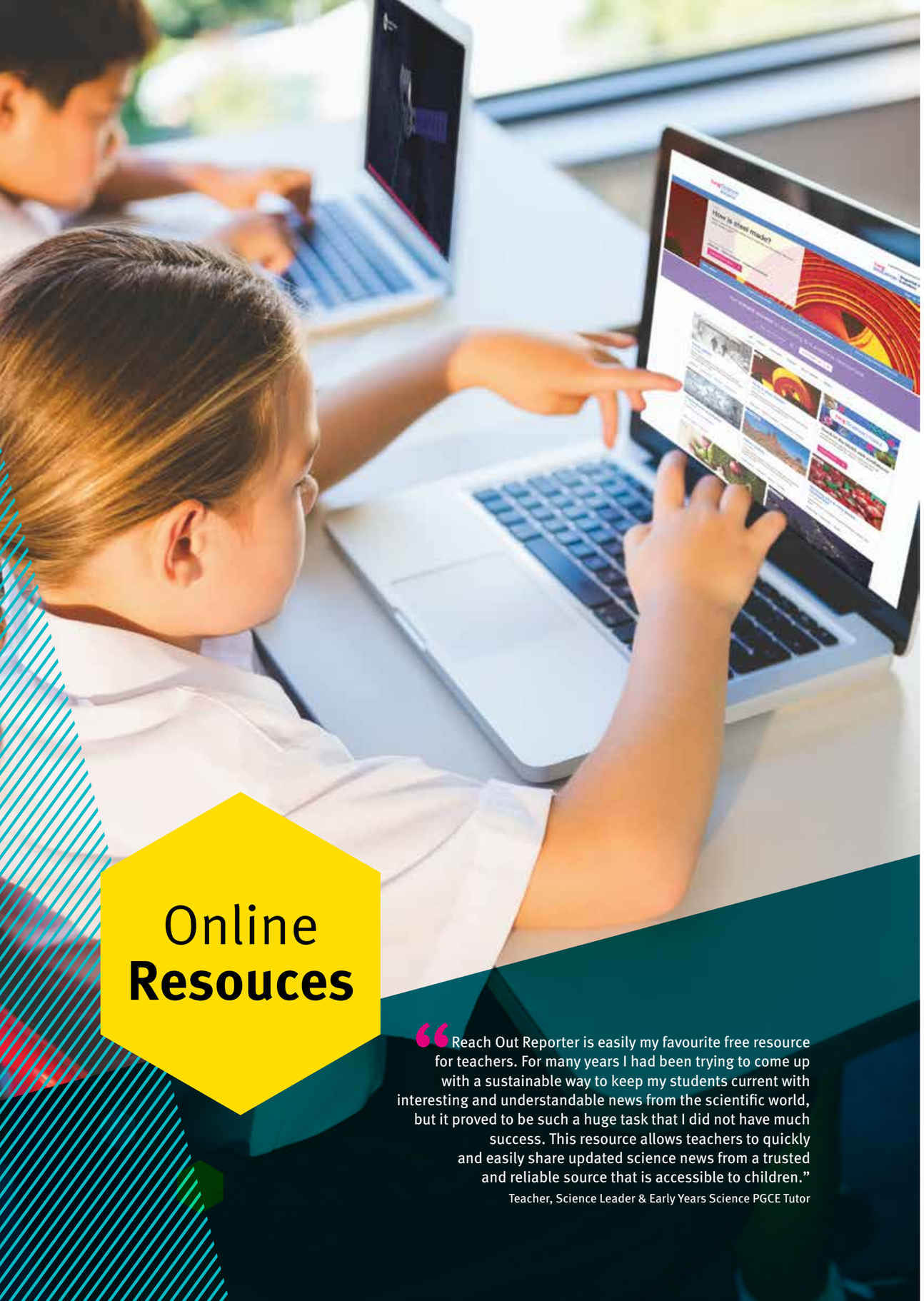
Peter & the Wolf

This programme was run in collaboration with the Royal Veterinary College and the Royal Albert Hall from January to April 2017. Aimed at Year 5 students the programme uses the story of and music from Peter & the Wolf as a focal point, with scientists and musicians developing workshops to bring the school’s curriculum of ‘Forces’ and ‘Heritage and Evolution’ to life. The workshops took place at the respective institutions and at the school, culminating in a musical performance for teachers, peers and parents.

Advancing Access

The Advancing Access Network is led by the University of Nottingham for all 24 Russell Group universities. It provides a variety of CPD resources and online events for teachers and advisers to help them support students’ progression to leading universities. Recent activities include a Virtual Teachers Conference which featured current postgraduate Imperial students.

“An unmissable opportunity to hear first-hand from experts.”
Teacher



Online **Resouces**

> “Reach Out Reporter is easily my favourite free resource for teachers. For many years I had been trying to come up with a sustainable way to keep my students current with interesting and understandable news from the scientific world, but it proved to be such a huge task that I did not have much success. This resource allows teachers to quickly and easily share updated science news from a trusted and reliable source that is accessible to children.”
>
> Teacher, Science Leader & Early Years Science PGCE Tutor

Reach Out Reporter

Free online weekly science news service for primary classrooms

Launched in November 2016, through a partnership between Imperial College London and Tigtag, Reach Out Reporter is an online primary science news service which helps teachers integrate the latest science news and topical issues into everyday teaching and learning.

Reach Out Reporter aims to introduce primary school children to the wonders of the world around them using high-quality films and other learning resources.

Reach Out Reporter explores a wide range of science-based stories each week – from hurricane-chasing meteorologists to how space litter is affecting life on earth – and aims to promote cross-curricular learning. The service also provides fun facts, answers to the most curious questions, and animal profiles to introduce students and teachers to some of the most extraordinary creatures on the planet.

The service is updated weekly with new content and is available free of charge to all primary school teachers across the UK through the generosity of The Goldsmiths’ Company. In addition to teachers the resource can also be used by anyone in the UK, including parents and children outside of the classroom as a tool for home learning.

STATS

12,000+	Unique visitors to the site
44%	Percentage of visitors that return to the site
1,000+	Number of weekly newsletter registrations

AWARDS

- 2017 Education Resources Award for Best Free Educational Resource
- Educational Multimedia Award at the 2017 Learning on Screen Awards

→ **www.reachoutreporter.com**

Reach Out CPD

Free online CPD science resource

Launched in October 2014, Reach Out CPD is a free online science Continuing Professional Development (CPD) resource for UK primary school teachers. It has been developed by Imperial College London in partnership with award-winning science teaching resource Tigtag.

This web-based programme provides teachers with resources and ideas to support their teaching and engage primary school children across the UK in the wonder of primary science.

> “My improved subject knowledge made me a more confident teacher, which in turn improved my teaching and allowed my class to benefit from clearer, more engaging science lessons.”
>
> Teacher and Reach Out CPD user

Reach Out CPD courses support teachers with core subject knowledge, fun practical activities and captivating classroom films featuring Imperial academics and contributors from other leading public science organisations. These experts shine a light on some of the latest, most exciting advances in science and present imaginative ideas to bring science to life in the classroom.

STATS

18,000	registered users in over 8,000 schools across the UK
19,000	number of hours of CPD delivered
99%	of surveyed users would recommend Reach Out CPD to another teacher
85%	of users apply the knowledge and skills gained to their teaching
71%	of users thought using Reach Out CPD has had an effect on their pupils’ attainment

AWARDS

- 2016 BETT award for Best Open Education Resource

→ **www.reachoutcpd.com**

Outreach Staff 2016–17

ANDREW TEBBUTT
Director of Student Recruitment and Outreach

DR ANNALISA ALEXANDER
Head of Outreach

DR MELANIE BOTTRILL
STEM Programmes Manager

LUKE BACON
Physical Science and Engineering Outreach Programmes Manager

SILJE ANDERSEN
Interdisciplinary Programmes Manager

JANE MARSHALL
Outreach School Visits Programme Manager

DR JENNIFER COOKE
DR CORINNE HANLON (MATERNITY COVER)
Mentoring and Tutoring Programmes Manager

DR REBECCA HOLLOWAY
School Partnership Coordinator (Secondary)

RENEE BOLING
STEM Programmes Coordinator (Pre-16)

FAY BLAKE
School Partnership Administrator

JOSE TEIXEIRA-MONTEIRO
STEM Potential Coordinator

DR CLAIRE SWEETENHAM
DR ZAHRA MOHRI (MATERNITY COVER)
Medical Outreach Officer

SIGNE ARIAS
Summer Schools and Activities Coordinator

LIZ HIDER
Schools Challenge Programme Coordinator

JING XU
Outreach Systems and Data Analyst

SARAH VINCENT
Database Assistant

KATY GLAZER
Spectroscopy in a Suitcase UK & Ireland Coordinator

KATE MULCAHY
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