

GENERATING GENIUS

Working in partnership with universities to widen participation



National **HE STEM** Programme

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Introduction by Dr Tony Sewell

FOUNDER AND DIRECTOR OF GENERATING GENIUS

This booklet has been seven years in the writing. It gathers together the learning we have accumulated in our work at the sharp end of education since I founded Generating Genius in 2005. Our objective is to share it with our widening participation colleagues at universities around the country who work so hard to extend life-changing opportunities in higher education to those in some of our most disadvantaged and under-represented communities. We hope that at a time when WP departments are facing unprecedented political and financial pressures, this sharing of knowledge is particularly timely.



The booklet examines the two programmes we run, Junior Genius and Uni Genius, and presents the methodology we have developed for working with talented secondary school students from homes where there has been no tradition of higher education. It also documents how we have gone about establishing successful partnerships with schools, universities and corporate sponsors.

Why Genius?

I'm often asked, 'Why Generating *Genius*? Why can't your students just be ordinary?'

Our use of the term genius is meant to be subversive. My intention was to reinvent the notion and make it more accessible and less elitist. I saw genius as ecological rather than innate, suggesting it was possible to create conditions in which 'genius' could develop. Genius is not something sent down by God (although it helps). Really, it is about opportunity.

What has emerged with the Generating Genius programme is something completely different: genius equated with attitude, hard work and cultural legacy.

How it all began

The origins of Generating Genius date from seven years ago, when I decided to take a small group of talented 12-year-old black British boys to Jamaica and link them with a group of Jamaican boys of the same age.

***"GENIUS IS NOT SOMETHING SET DOWN BY GOD.
REALLY IT IS ABOUT OPPORTUNITY"***

In the UK, educationalists, politicians and parents were desperate to address – and reverse – the widespread academic failure among black British boys. Black people in Britain needed a good news story and here was a group of talented boys being given an opportunity to show off their potential.

Together with colleagues at the University of the West Indies, the objective was to create a science and technology camp – not a discipline usually associated with black males. The

boys would live for a month as university undergraduates, attending lectures, going on field trips and undergoing life-changing experiences.

The risks were considerable, but the results proved outstanding. The trip transformed participants' attitudes to learning once they returned home to the UK. Their academic results soared and their perceptions of what their futures might hold changed forever.

Seven years after that groundbreaking trip, and the groundswell of publicity that accompanied it, Generating Genius is working with over 500 students from all ethnic groups, helping them to acquire the skills they need to study at elite universities and become high-performers in their chosen professional field.

And finally...

I hope this booklet will provide stimulating – and, most importantly, useful – reading for everyone involved in, and concerned about, widening participation: teachers, headteachers, academics, politicians, parents. And perhaps even the students themselves!

You can find out more about us at www.generatinggenius.org.uk. And don't forget to follow us on Twitter @GeneratingG.

The widening participation landscape: Challenges, solutions and myth-busting

HARNESSING WIDER ACADEMIC SUPPORT FOR WP

In our experience, universities are extremely responsive to the idea of helping under-represented groups to gain access to opportunities at their university. Academics in individual STEM departments, however, can be unaware of the excellent work being accomplished by their WP departments and therefore may be unsure how best to get involved in WP programmes. For their part, WP departments are sometime reluctant to approach academics to participate as they do not wish to over-burden them or may be concerned that academics lack experience in working with school-level students.

At Generating Genius, our approach is to make direct contact with academics in STEM departments and to demonstrate the value of working with young people who are passionate about their area of research. Once contact is made, and the approach is explained, they are invariably happy to make a contribution. Often, universities, facing high demand from schools, feel that they have to limit WP involvement to a single, trusted team of academics who they can rely upon to deliver. But widening the pool of those who are willing to get make a contribution calls for direct contact. And as a third-sector organisation, Generating Genius is extremely well placed to offer direct support.

***“WHEN YOU MEET 12-13 YEAR OLDS WHO WANT TO
KNOW ABOUT YOUR SUBJECT, THERE'S AN ENERGY
ABOUT IT”***

At Imperial College London, for example, our contact with the malaria team yielded a highly successful programme of work (see page 16). Our feedback was that these academics,

though aware of widening participation work, had never been approached and no one had asked them to make a contribution. With help and support from the WP team, we were able to scope Imperial to find the academics who best fitted our work programme.

As Dr Sewell says: 'The academics who took part in our project were so impressed with the level these children were working at. They found it was a joy to use their own subject knowledge, especially in the STEM area. When you meet 12-13 year olds who want to know about your subject, there's an energy about it.'

The world of STEM education is relatively small and we had already built up a database of academic contacts at top universities who had approached us or we had met through networking at conferences and similar events.

At Imperial, Dr Mark Richards, an academic in the physics department, played an anchor role and became our 'Trojan horse', navigating us around the complexities of a university with myriad levels of activity. We always strive to work alongside the WP department and take care not to break university protocols. We are scrupulous in asking permission from the head of WP to approach certain academics. All our emails are copied to the WP department.

We have also found that telling academics about the big corporates which are increasingly encouraging their staff to become involved in volunteer activities around WP is also key to winning buy-in. Generating Genius works with a wide range of blue-chip sponsors, including Google, Shell and Barclays (see page 24). Our message is that engagement in WP is far more than a tick-box exercise that reflects well on them within the university.

In addition, working with Generating Genius gives academics a pathway into some of the biggest global names in industry which they can use for future recruitment to their university and to fund research. WP can also be used for the professional development of their staff.

***"THEY REALISED THAT IF THEY COULD COMMUNICATE
VERY DIFFICULT AND COMPLEX SCIENCE TO 12 YEAR
OLDS, PITCHING TO POTENTIAL FUNDERS
WOULD BE EASY!"***

The malaria team at Imperial recognised that science had a communication problem. They realised that if they could communicate very difficult and complex science to 12 year olds, pitching to potential funders would be easy!

We find that it is important to stress to academics that getting involved in WP is not a distraction to their major work of research and teaching; it is an asset. They are preparing a new generation to come into their field and being challenged to communicate complex science to a young audience. And, most importantly, they discover that enthusing young people about the field of interest that is their life's work is enormously inspiring.

RESOURCES AND FINANCE IN SHORT SUPPLY: BUILDING PARTNERSHIPS

WP departments often receive requests from schools or charities to host activities for free – at considerable cost to the universities concerned. Generating Genius has built a number of partnership arrangements with universities that not only keep costs to a bare minimum but also benefit both parties. For example, in our partnership with University College London, UCL provides us with office space and full use of its lecture theatres and seminar space at no charge.

In return, we were able to bring our key activities sponsored by major global corporates such as Google and Shell to the university. We also bring some of their academics and undergraduates together with our experts to deliver programmes and mentoring to particular target groups. UCL can genuinely state that the partnership will widen access to the university.

The partnership with UCL is an intimate one in which Generating Genius feels part of the university family. By the same token, UCL has found a way to help an agency which will benefit its own access mission.

“WE HAVE STUDENTS GETTING REAL EXPOSURE TO A UNIVERSITY WHICH IS DEFINITELY OFF THEIR RADAR”

The third sector can also broker key relationships with corporates and other third-sector organisations. Often our bids to trusts and corporates are based on one of our university partnerships.

For example, our industrial chemistry programme in partnership with Durham University is sponsored by leading speciality chemicals company Johnson Matthey. London-based African-Caribbean Year 10 students go to Durham for two days where they get the opportunity to tour the campus and do some real lab work in the chemistry department. Accommodation and travel costs are met by Johnson Matthey's sponsorship.

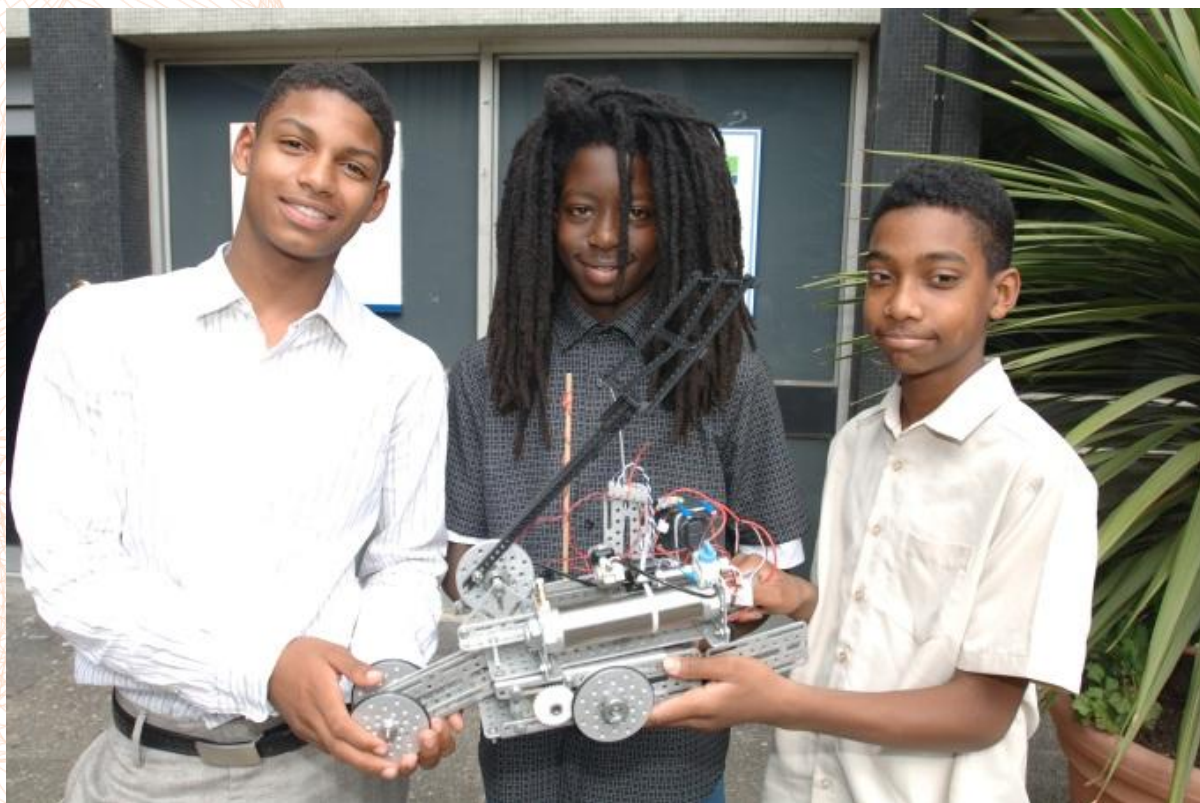
In the university labs, using Royal Society of Chemistry resources, students carry out assignments linked to the work of Johnson Matthey – for example, heterogeneous catalysis using a matrix, homogeneous catalysis, making nice-smelling esters, or studying photocatalysis using TiO₂.

Thirty minutes away from the Durham campus is Johnson Matthey's catalysts site in Billingham. There, students are able to see the lab process in an industrial context.

This is an exciting programme that really gets to the heart of good practice. We have students getting exposure to a university that is definitely off their radar. Our students get the opportunity to work on cutting-edge science in a top university laboratory and the visit to the Billingham plant demonstrates to them the relevance of studying chemistry at university to career opportunities beyond.

ROLES AND EXPECTATIONS: LACK OF CLARITY IN SCHOOLS AND UNIVERSITIES

While WP departments often comment that schools send students on programmes to which they are not suited, a core pipeline programme of talent development with the same students over a sustained period can overcome this by engaging with students who will genuinely benefit from WP programmes. King's College London and Temple University, in the US, are among the higher education institutions that have adopted this model



Methodology

The Generating Genius method works best when our students receive a body of knowledge and are given a platform to show how much they know. This in many ways is better than 'whiz-bang science' or attempts to make science 'sexy'. We also seek to re-create a university setting for our students – formal lectures, seminars, writing papers with abstracts and the application of the scientific method.

A key aspect of this standard-raising involves giving all pupils access to 'subject knowledge'. This accumulation of knowledge is what all too often differentiates state school pupils from those educated in the independent sector.

The important benefit we give to African-Caribbean students, in particular, is the idea that being knowledgeable in chemistry, physics and biology is a way of developing intellect. For African-Caribbean students often struggling with an identity crisis, we help to establish their identities as learners. We are building a community of learners being prepared for higher education.

The programme is also an attempt to build 'intellectual resilience': the university-based tasks and challenges are driven by competition, creating a situation in which there is only one winning group or individual. Tasks are never designed to relate to students' existing interests or to be relevant to their background. We want to bring them into a newer world where they will discover new facts, new theories and new perspectives.

We find it is important that:

- The students are shown that through knowledge they can realise an identity as great learners and, eventually, scientists.
- We create a community of learners in which students are protected from negative peer group pressure – and, indeed, their own negative perceptions. The notion of a science 'club' creates a sense of belonging.
- We connect the arts and sciences while retaining the integrity of a subject-based curriculum.
- We create a five-year pathway where the clear destination is university.
- We seek to build parental support and trust.
- We create a strong partnership between schools, universities, corporates and third-sector groups.
- The programme is driven by dynamic adult leadership that can be trusted over a long period and has high expectations of the students.
- We initially target students who have the potential to do well in the sciences but are in danger of losing this focus as they get older. The interest must already be present; our job is to keep the light on.
- At every opportunity, the students present their work in public. In doing this, they also present themselves, but the primary focus is on what they have learnt.

GETTING GIRLS ONSIDE IN STEM SUBJECTS

Although Generating Genius began life as a programme for boys, we now have a separate pathway for girls.

In our work with female students, we are driven by a set of core principles.

- We are implacably opposed to the idea of trying to make science 'girly'; we want to make girls like science.
- Girls often seek to have science made relevant to careers, but this needs to be balanced with helping them to develop a perception that subjects such as physics have an inherent value as an academic study.
- A significant number of girls want to find a link between science and helping people.
- Girls seem to enjoy team activities more than working as individuals.
- Use of language is key: if science is explained from a 'masculine' viewpoint, girls will feel alienated.
- Girls often work better in single-sex groups rather than alongside boys.
- Girls respond to a positive tone and a can-do attitude to learning and research.
- We try to break down the stereotype role of women scientists not being glamorous and youthful.
- We refuse to show our students pictures of girls in hard hats as a metaphor for 'women are actually capable of doing engineering'!

KEY POINTS

- Think about **preparation** as much as aspiration when working with school students: it is vital that students have the necessary subject knowledge to progress to the university course of their choice.
- The value of supplying prospective students with **information** should not be underestimated: many inner-city students fear that they are coming to an environment where they will feel socially isolated. Exploding myths about food, accent, music and ethnically specific hair-care can be enormously effective in allaying fears – these concerns may be worrying students more than university fees. This can be achieved by ensuring that students are given the opportunity to meet students and role models from environments similar to their own.
- Many students have had no experience of a **formal academic environment**, with lectures, seminars and tutorials. Providing opportunities for them to experience some of them and, crucially, to undertake research and independent study will be invaluable preparation for progression to university.
- Opportunities for students to meet **admissions tutors** are enormously beneficial. Advice about completing the Ucas form, course selection and interviews build confidence.
- Linking university activities with **local industry and commerce** demonstrates to students that there is a clear career pathway from higher education to employment

Our Programmes

Based at University College London, Generating Genius works, alongside a wide range of partner schools and universities, with hundreds of high-achieving children and young people from challenging backgrounds where there has been no tradition of entry to higher education. Through our two personalised support programmes, we aim to enable at least 90 per cent of participants to win places at elite Russell Group universities. Generating Genius alumni, now undergraduates, in turn become mentors to course participants, feeding their experience back into the programmes.

We currently run two programmes, Junior Genius for children aged 12-16, and Uni Genius, for those aged 16-plus. We place a strong focus on STEM subjects (science, technology, engineering and maths).

“WE DO NOT BELIEVE IN PRIZES FOR ALL. ULTIMATELY, THERE IS OFTEN ONLY ONE WINNER”

‘The programmes we offer are intended to be challenging,’ says Dr Sewell. ‘The students are expected to maintain a high standard of self-discipline, behaviour and academic performance. We do not believe in prizes for all. Whilst one can learn from the experience of the journey, ultimately there is often only one winner.’

‘By bringing together academically talented students from some of the most challenging social circumstances, our programmes are able to offer a unique educational experience, one geared both to the students’ high abilities and to their need for peers who share their academic abilities and their love of learning.’

‘This is a nurturing programme where students have a sense that they are on a journey from 11 to 18. This rites-of-passage programme is based on intellectual and social challenges. They learn that poverty, race and gender are not barriers to academic success.’

JUNIOR GENIUS

Junior Genius works with schools to identify talented students aged 12-16 from diverse backgrounds who have a passion and instinct for science and technology.

The pupils follow an inspirational programme of research, lecturing and mentoring and eventually go on to address their peers, schools and communities about their experience. In practice, they take on a role of standard-bearers for science subjects.

How is this achieved?

We provide summer schools of which at least a week is residential.

We work in partnership with universities and other higher education institutions.

We work with both primary and secondary schools.

We establish a meaningful and long-lasting relationship with parents as well as participants.

We work with children in a wide range of disciplines, including science – physics and chemistry; engineering – robotics technology, web design and bio-medical engineering engineering; medicine – malaria and diabetes.

We are also concerned about the emotional intelligence of young people and use a variety of games and strategies to develop conflict-management and negotiation skills.

In addition, we provide leadership training in which course participants are trained in project management and problem-solving and helped to develop an awareness of different styles of leadership. They are also instructed in communication, debate, interviewing technique and presentation skills, all of which will serve them well on the journey to university interviews and future careers.

UNI GENIUS

Launched last year, our Uni Genius programme has already attracted over 300 students. While the pursuit of good exam results is crucial, we also believe that the acquisition of invaluable cultural, knowledge and social capital is vital if students are to gain access to elite universities.

What the programme provides:

- Large-scale and small-scale **speaking events** providing both information and inspiration. Speakers include university admissions tutors, teachers from schools with a track record in getting students into top universities, and Uni Genius alumni who are now undergraduates.
- **Career-related events** run by those who have succeeded in their fields, inspiring Uni Genius participants to focus on achieving their career ambitions following graduation.
- **University-profile preparation** providing ‘recognition’ activities which can be used to flag up candidates’ talents and achievements. These are invaluable for Ucas personal statements and university interviews.
- **Talent assessment** is provided as part of a university preparation programme, which includes tracking a Russell Group university pathway.
- **University links** include visits to Russell Group universities, including Oxbridge, meetings with admissions tutors, and opportunities for social contact with undergraduates from different backgrounds.
- **Industry links** validate how a degree can enhance career prospects, as well as providing opportunities for internships and high-quality work experience.
- **Personalised programmes** help students to understand exactly how they can tailor their specific situation to maximise their chances of winning a place at a top university.
- Students are given access to the Uni Genius **online community** where they can access information, courses and share experiences.
- Students and staff from participating schools and sixth-form colleges have access to over **1,200 resources** covering careers, education and university life.
- Students have access to our **c-mentoring service** which matches those who have taken part in the Uni Genius programme and are now university students with current participants. We also have a number of mentors who are already established in their chosen careers.

- **Summer schools:** this year's is run by In2scienceUK and provides the opportunity for students to work alongside practicing scientists

In Partnership with Schools

RECRUITMENT AND PROGRESSION: JUNIOR GENIUS AND UNI GENIUS

Tracking and monitoring student progress through assessment

We liaise with schools to obtain regular reports on students' attendance, behaviour and attainment. Generating Genius is also developing its own standardised assessment tool to measure impact. This could take the form of exam board questions, controlled assessments or practicals.

Early recruitment: entry points to Generating Genius

Primary school

Recruitment should take place in the summer term of Year 5.

- Generating Genius can influence parents' secondary school choices by providing advice and guidance (the application deadline is usually the first term of Year 6).
- Results from Key Stage 2 Sats are not always an accurate reflection of a child's ability; assessment data from Generating Genius will provide a wider picture of academic potential.
- Transition: there is a trend, most prevalent in African-Caribbean boys, towards a drop in attainment following transition to secondary school. Generating Genius's summer programme and sustained liaison with schools will support pupils to remain on track and engaged.
- In order to be included in the Gifted & Talented register at secondary school, students must achieve level 5s – the highest grade – in English, science and maths at KS2. The national average is level 4.

Secondary school

Recruitment should take place in the summer term of Year 9, at the end of Key Stage 3.

- GCSE courses begin in Year 10 and there is a trend towards a dip in attainment at the start of the academic year. As with primary pupils, Generating Genius summer programmes will support students to remain on track and engaged.
- Most schools run work experience programmes in Years 10/11 and Generating Genius is able to provide extremely high-quality placements through our investors/partners.

Strengthened links with primaries and secondaries

- Generating Genius is based in London and therefore seeks to work with targeted boroughs, and within these to forge partnerships with clusters of schools. In east London's Hackney, for example, the six clusters include one which consists of one secondary and five primaries.
- There are a number of key whole-school areas with which Generating Genius can engage; each often attracts its own funding and has a co-ordinator or lead teacher. These are: Gifted & Talented programme, STEM, Raising Ethnic Minority Achievement, Widening Participation, and Spiritual, Moral and Cultural Development.

Enhancing the school curriculum

- We believe more activities should be tailored for enhancement of STEM subjects in line with the national curriculum and in order to support students moving from A grades to A*.
- There should be opportunities for students to be introduced to new skills in an A-level standard programme, designed by a specialist teacher.

Parental engagement

- We seek to organise at least two Generating Genius parent/carer evenings at which information is provided about education policy and debate, GCSE options, career pathways, EBacc, and Russell Group universities.
- Parents/carers should be given the opportunity to visit a university with their child in order to gain a better understanding of entry to higher education.
- We seek to send termly reports to parents/carers.

Case Study a programme of study

INSPIRING YOUNG MINDS

Over the years, Generating Genius has run a number of study programmes in association with leading British universities. The malaria project was run by Imperial College London in the final week of its three-week summer school. The Generating Genius participants were 24 British boys of African-Caribbean heritage aged 12-13. The academics who ran it recognised this as a particularly impressive piece of work by children who had barely started secondary school. To see the PowerPoint presentations the children made at the conclusion of the project, email tony@generatinggenius.org.uk.



THE PROJECT

The students were given an overview of malaria by a world authority on the subject, Professor Robert Sinden. They were then presented with a scenario based on the village of Matola in Mozambique, where academic research had already been undertaken. None of the project participants had detailed prior knowledge of malaria.

The group was split into five teams who had to compete with one another. The endgame was to bid for funds and resources by presenting in front of a panel of distinguished academics. The team judged to have made the strongest case received a trophy. In addition, each team had to submit a two-page paper summarising their research (see below). The authors of the paper judged best by the panel were also awarded a prize. The time scale for the project was four working days.

The participating students were from Holy Family Technology College, Walthamstow; Sedgely School, Lewisham; Hackney Free and Parochial Church of England School; Icknield High School, Luton.

THE TEAMS

The five teams were given a specific aspect of research on which to focus.

Environmental control

Their case: removal of mosquito breeding sites and development of ways to keep homes mosquito proof.

Vector control

Their case: use of pesticides, insecticides and insect repellent as the most viable means of controlling malaria.

Drug control

Their case: the most effective way of treating malaria is through drugs.

Vaccination

Their case: future prevention is through the development of vaccine.

Biocontrol

Their case: the 'natural' way to control malaria is through the control of their ecology and, for example, the introduction of transgenic (GM) mosquitoes.

THE SCENARIO

'You [the students] are concerned about the state of public health in the village of Matola in Mozambique. It is an old community of brick houses that has recently had to receive a large number of refugees.

The refugees live in huts made from reeds from the swamps that surround the southern (brackish) and western (freshwater) edges of the community. The rainy season is fast approaching, a time of year at which there is always a sharp increase in the number of malaria cases.'

THE PAPER

The students were told that the paper they presented to the expert panel must conform to the model of an academic scientific paper, with an abstract, introduction, detail on materials and methods, results, conclusion and references.

BRIEFING NOTES

The teams were presented to with briefing notes to kick-start their research.

The Environmental Control Team

As *Plasmodium*, the parasite that causes malaria, can only be transmitted by the bite of a female mosquito, minimising the contact between these 'vectors' and humans can be a very effective and simple way of controlling and preventing the spread of the disease. Possible methods are:

Housing

- Use of netting
- Improved house design
- Housing location: dangerous sites, safer sites.

Infection source reduction

- Removal or destruction of small breeding sites
- Filling mosquito sites
- Improved drainage
- Tree planting.
- Spreading polystyrene beads on water to prevent mosquito breeding.

How useful would these methods be? Would there be any drawbacks? How appropriate would they be in Matola? What other methods could be used?

The Vector Control Team

What are the most appropriate means of using insecticides to kill mosquitoes?

Is the objective (A) to kill as many mosquitoes as possible or (B) to kill those mosquitoes that are most likely to transmit malaria?

Option A

Mosquitoes have two distinct stages in their life cycle. The eggs are laid in water and the larvae are aquatic; the adults hatch from pupae and live on land. Breeding sites range from small puddles to large rice fields. What are the possible breeding sites in Matola and what problem might the application of insecticides pose?

Option B

To transmit malaria, the female must bite twice – once to pick up the parasite from an infected person and once to pass it on to the next person. Most of the mosquitoes that transmit malaria in Africa feed indoors and at night. Mosquitoes are very heavy after taking a blood meal and rest on the indoor walls of houses.

Applying insecticides indoors is called *indoor residual spraying* (IRS).

The other method is insecticide treated bednets (ITNs) whereby mosquito nets are treated with insecticide to protect all those sleeping under the net.

What would be the environmental impact of these methods? What is the cost? Is a single method appropriate for the entire village?

The Drug Control Team

Drugs are currently the only treatment for malaria victims: can they be used to wipe out malaria from Matola?

What drugs are currently available and which are the best?

Sometimes malaria becomes resistant to drugs that are used for a long time – how can this be avoided?

What dose should be given to each resident?

Where should the drugs be given out and what equipment would be used?

How could you persuade the villagers to help you implement your plan?

Eradication of malaria is expensive – how much money would you need and how much would be saved in the long run?

The Vaccine Team

There is currently no malaria vaccine, but what type of vaccine is the most promising avenue of research?

Blood stage vaccines

Sporozoite vaccines: prevent infection of the liver and therefore infection of red blood cells.

Liver stage vaccines: act on liver stages and result in red blood cells not being infected.

Transmission blocking vaccines: people who are immunised produce antibodies which are taken up by mosquitoes, where the antibody will encounter its target. Development of the parasite in the mosquito is reduced/blocked, and when the mosquito bites again, infection will not be transmitted.

Obstacles

Antigenic variation: ability of the parasite to vary its composition, thereby confusing the immune system

Polymorphism: parasites of the same strain can have minute variations in their proteins

Antibody concentration: this declines over time.

Storage and transport: some vaccines have to be kept at fridge or freezer temperature

Education: will villagers understand the goals of immunisation and allow themselves to be vaccinated?

Population movement: people moving in and out of the village.

Should every villager be vaccinated, or only particular individuals or sub-groups? What are the costs involved and who is going to pay?

THE BIOCONTROL TEAM

Biocontrol is the control of pests through interference with their ecology using predators, parasites or pathogens. There are a number of possible methods:

Larvivorous (larvae-eating) fish which eat mosquito larvae so that fewer become adults. What are their advantages over insecticides? What are the breeding grounds in Matula and are the fish suitable for these areas?

Toxorhynchites is a mosquito variety whose larvae like to kill and eat other mosquito!

Would this mosquito be able to survive around Matula and would this technique control malaria in the area?

Insect-killing bacteria – for example BTi (*Bacillus thuringiensis israelensis*) – kills mosquito larvae with a toxin that is not harmful to humans. BTi is available as a dried powder or tablets to put in water where mosquito larvae live. What are their advantages and disadvantages over insecticides?

Entomopathogenic (insect killing) fungus could be used to control mosquito numbers in people's homes, for example, but this is untested in the field. How safe and effective would it be?

Sterile insect technique (SIT) uses sterile male mosquitoes, which compete with the wild males. But the insects they mate with cannot lay eggs. A large number of mosquitoes would be required: what problems would this pose? How long would it take to be effective and what would happen to the mosquito population in the following years around Matula?

Transgenic or genetically modified (GM) mosquitoes could be used to fight malaria. What would the practical and ethical problems

Generating Genius: How we work

- Identifying **academic/scientific talent** in under-represented communities.
- **Out-of-school programmes** to develop and enhance talented students (summer schools, weekend workshops etc).
- Organising and leading **activity and adventure-based motivational trips** to the Caribbean and other countries for able students from under-represented communities.
- Encouraging students to aspire to study at **top-tier universities**.
- **Support and guidance** for students in applying to top-tier universities
- Workshops on **student talent development** and widening participation.
- Consultancy services and lectures on **widening participation** and **social mobility**.

For further details, contact Tony Sewell at tony@generatinggenius.org.uk or phone him on 07956 598503.

Working with generating genius

What students, schools, universities and sponsors say about us

STUDENTS

All this wouldn't have happened if not for our involvement with the Uni Genius programme. It has opened the doors to so many opportunities for us youths seeking a better future. Thank you -Jenifer

All these Generating Genius experiences were important to me as I know not many people get such opportunities. They have given me confidence and encouraged the attitude that I can achieve whatever I want in life. We were pushed and exposed to a new branch of university science on every trip. My personal statement for Ucas was jam-packed full of extracurricular science-related activities. I applied to study biochemistry at five Russell Group universities and got an offer from all of them. -Marcus, now an undergraduate at Bristol University

Amongst the many things I learnt was that students who attend state schools may be less privileged than those who attend private schools, but they should not be intimidated. What matters is their potential and whether they are passionate about their future aspirations. -Venessa

Charlieeeee!!!!

I'm very very happyyy!!

I got 5As with a 100% in three exams!!!!

The best AS result! (Most As)

A 100% in core 1 maths and core 2 maths and a 100 percentile in chemistry.

-Ahmed [email to Charlie Michael, Uni Genius project manager]

People have talked about lectures but you never really know exactly what they are like unless you've experienced it yourself. We were split into pairs and we were able to use drills and different tools to help us join two bones back together. Me and my friend were supervised by a surgeon! We learnt about the bones, different types of fractures, the tools and the techniques. I'll probably remember the experience for the rest of my life. -Siddy

UniGenius has been the trigger for the best experiences of my life yet. We've had amazing opportunities so far, socialised with others our age and learnt new skills. This has given us the chance to really improve our CV with some well-known companies such as BT, Google, and Generating Genius itself. The lectures gave us an insight to university life and a glimpse of what it can offer us. Most importantly, it helps us adapt to the work-environment and discover our aspirations. -Arta

“UNI GENIUS HAS BEEN THE TRIGGER FOR THE BEST EXPERIENCES OF MY LIFE”

SCHOOLS

I really enjoyed the opportunity to inform and advise students on the Ucas application process. Their enthusiasm was infectious, their questions detailed, and I look forward to offering any future support to them that I can. -**Oliver Carr, Darrick Wood School**

Working with the staff of Generating Genius was a hugely positive experience: they proved themselves to be professional and committed to profoundly important educational values. The students were self-confident and ambitious, and I have no doubt that, together, they will be able to make a transformative difference to the lives of so many, and that in turn will change our society for the better. We look forward to working with them in the future. -**David James, director of educational enterprises and International Baccalaureate, Wellington College**

UNIVERSITIES

The students from Generating Genius demonstrated an excellent range of skills, talent and academic abilities. They were enthusiastic and engaged throughout the time they spent with us. I would welcome the opportunity to work with Generating Genius again in the future. -**Tanya Popeau, Senior widening participation outreach officer, Royal Holloway, University of London**

I very much enjoyed working with the Uni Genius Programme. The students were all highly motivated, and enthusiastic about the opportunity. Many of them seemed serious about applying to Cambridge, and were taking the right steps to make their applications competitive. I was impressed by the work of Generating Genius in bringing this group together at no cost to the students. -**Andrew Lomas, schools liaison officer, St John's College, Cambridge**

SPONSORS

Generating Genius is tackling the really important challenge of helping disadvantaged kids advance in the sciences, and gain access to universities that they might never even consider. At Google, we believe education in science, technology, engineering and maths is of paramount importance for society. If businesses in the UK are to thrive in the digital future, we must ignite children's passion for STEM subjects, nurture their abilities, and grow the engineers of the future. We are delighted to support Generating Genius in their efforts to ensure that children from all backgrounds have the opportunity to excel in the sciences. -**Shuvo Saha, industry director, FMCG and healthcare, Google UK**

Barclays is delighted to partner Generating Genius on this exciting programme to help young people from disadvantaged and culturally diverse backgrounds prepare for corporate culture and develop the skills needed to succeed. -**Mark McLane, head of diversity, Barclays**

**"THE STUDENTS DEMONSTRATED AN EXCELLENT
RANGE OF SKILLS, TALENT AND ACADEMIC ABILITIES"**

The best thing about Generating Genius is that whilst others wring their hands about a lost generation of talent, Tony Sewell and his team have got on and done something about it. The work of Generating Genius shows that there is real talent in Britain's black communities, and that there are young people ready and able to join Britain's professional elite, if only they are given the chance to shine.-**Trevor Phillips, chairman, Equality and Human Rights Commission**

So often young people from underprivileged backgrounds find themselves in a place where they badly need help and guidance to harness and channel their potential, but can find none. That is why Generating Genius is so vitally important in helping open up opportunity for young people at a critical time in their lives. Congratulations on developing such an excellent Uni Genius programme. -**Wilfred Emmanuel-Jones, 'The Black Farmer', former prospective parliamentary candidate for the Conservative Party**

Thank you very much for providing such a great bunch of students to attend our workshop. Every one of them was a real pleasure to work with and displayed a really inspiring and positive attitude from start to finish. The Olympic presentations that the students came up with for a potential product to be sold in line with the 2020 Olympics were the best that we've seen yet, as they put genuine effort and passion into the task and I really think the students took a lot from the three days.-**Jake Walker, Work inspiration project manager, BT**

Our partners



OUR SCHOOL PARTNERS INCLUDE:

- Christ the King Sixth Form College, Lewisham, London
- Crossways Academy, Brockley, London
- Graveney School, Wandsworth, London
- Haggerston School, Hackney, London
- Kingsford Community School, Newham, London
- Portslade Aldridge Community Academy, East Sussex
- Preston Manor High School, Wembley, Middlesex
- St Aloysius' College, Islington, London
- St Martin-in-the-Fields High School for Girls, Lambeth, London
- Sir George Monoux Sixth Form College, Walthamstow, London
- Sydney Russell School, Dagenham, Essex

OUR UNIVERSITY PARTNERS INCLUDE:

- Brunel University
- Cambridge University
- Cass Business School, London
- City University London
- London School of Economics and Political Science
- Oxford University
- Queen Mary, University of London
- Royal Holloway, University of London
- Royal Veterinary College, University of London
- School of African and Oriental Studies, University of London
- School of Medicine, University of Leeds
- Southampton University
- University of the West Indies
- University College London

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Appendix

TRAINING WORKSHOP EXERCISE

Read the best-practice criteria below. Discuss them in teams and give a mark out of ten for each criterion.

Good practice in widening participation centrally means:

- Working with teachers, including conferences and workshops.
- Good collection of data and using it to inform practice.
- Working with pupils, including visits to the university and activities in schools and colleges.
- Working with parents, families and carers who might be unfamiliar with higher education.
- Working with external partners such as supplementary schools, community groups and charitable organisations to support under-represented groups
- Holding residential and non-residential summer schools.
- Engaging university students to act as role models through a variety of schemes.
- Training admissions tutors in WP and increasing awareness of WP activities.
- Using the Web as a means of WP.
- Devising schemes to retain students, in particular a comprehensive transition programme.
- Using the university's academic collections to reach out to younger pupils.
- Monitoring and targeting of activity to ensure the university is working with appropriate groups.

Good practice in widening participation in academic departments means:

- Adhering to, and advancing, the university's WP strategy.
- Working with teachers, including conferences and workshops.
- Working with pupils including visits, workshops, masterclasses, shadowing and work placements.
- Ensuring training of admissions tutors and other staff concerned with interviewing and admissions in cultural awareness and WP issues.
- Making use of information about applicants' educational background supplied by the outreach and admissions office.
- Monitoring the constitution of the home undergraduate intake with regard to aspects of students' backgrounds.
- Seeking advice from the outreach office when developing outreach and undergraduate recruitment events and targeting schools and colleges for activities or publicity.

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