








2019 REPORT ON MATHS CAMPS

2019 Report on Maths Camps

sami ami

Welcome

Welcome to SAMI and AMI, a partnership of a UK charity and an NGO based in Kenya, working to improve the teaching of mathematics, and its image, in schools across Africa.

This is a report about our Summer 2019 Maths Camp season, our largest to date. We ran Maths Camps for high school students in six countries, including our first Camps in francophone countries. Our network is growing rapidly, with many volunteers this summer coming back to take on leadership roles.

Our volunteers work with local teachers, students and researchers, as well as institutions such as the African Institute of Mathematical Sciences (AIMS), and Bahir Dar University in Ethiopia. It has been exciting to see the expansion of activities at established camps, and to see the first steps taken by new ones.

Each of our Camps is different, adapting flexibly to the local environment; we believe that we have found a formula which works well in a variety of settings. Our Camps are one-week long, highly interactive, and mostly residential. They are preceded by a planning week, during which local and international volunteers, several of them maths teachers, work together to develop the content for the different Camp sessions. The collaboration with local institutions, often Higher Education providers, is central to our method, as is the emphasis on extra-curricular, fun mathematics and the focus on modern technology.

This summer also saw the establishment of AMI Ghana, a partner NGO launched on 3rd May 2019 during a Cross Pollination Workshop in Ghana on Educational Initiatives. Set up by alumni of the AIMS network and previous Maths Camps, AMI Ghana will coordinate the Allotey Maths Camp, and help scale up other activities such as Maths Clubs in Ghana and beyond.

Since 2011 our Maths Camps have given inspiration to hundreds of students and teachers across Africa. Our hope is that the knowledge shared, the resources created, and the new contacts forged will provide improved educational opportunities throughout the year for many more youngsters.

Emily Fleming

Executive Director
Supporting African Maths Initiatives (SAMI)

Zach Mbasu

Founding board member and CEO
African Maths Initiative (AMI)

… and the rest of the SAMI / AMI team

Our mission

There are huge variations in the quality of education across Africa – and access to it. Mathematics, in particular, proves problematic for students and teachers alike, falling far short of global standards. But there is no shortage of passionate, enthusiastic and talented individuals in these countries with powerful ideas to improve the current state of Maths education.

SAMI was founded in 2013 as a means to support these local initiatives, and provide the expertise and funding necessary to implement, sustain and scale these ideas. By working directly with local individuals and organisations that have support and contacts within mathematics education, SAMI is well positioned to help deliver high impact solutions where they are most needed.

APPROACH

All projects live by the following principles:

Working with Partners	Supporting charities and NGOs to implement local and pan-African Maths Initiatives
Mathematical Education	Scaling projects in African countries at primary, secondary and university levels
Empowerment	Providing support for grass-root initiatives to develop into sustainable solutions
Research and Development	Assist research and development projects to access mathematics and statistical expertise
Leapfrogging	Creating awareness of cutting-edge technology, methodologies and ideas that provide the opportunity for local initiatives to become world leaders
User of Technology	Assisting in the provision and effective evaluation of the use of new technologies in the classroom to motivate and engage learners for improved outcomes

PROJECTS

The main areas of our work are focused across a range of projects, including:

MATHS CAMPS

Week-long camps of games, puzzles and activities to inspire students outside the curriculum

MATHS CLUBS

Student-led activities to run in schools to promote a joy of maths throughout the year

DIGITAL COMMUNITIES INITIATIVE

Using technology to improve livelihoods throughout entire communities

AFRICAN DATA INITIATIVE

Open software being developed in Africa to help people make better use of data

Maths Camps

BAHIR DAR CAMP, ETHIOPIA

The seventh edition of the Bahir Dar Maths Camp was held at Bahir Dar University, Ethiopia, over two weeks in July 2019, co-organised with the Mathematics Department. The camp has been financially supported for some years by the University's outreach program, and its past success means it is now firmly established as part of the annual University Calendar. The camp was run by five international volunteers and eight high school teachers and lecturers. 50 students took part; one male and one female student representing each of 25 high schools.

General camp themes included Mathematical Thinking, Geometry, Population Dynamics, Cryptography and Programming. Evenings were spent in small groups, with students and volunteers playing card and board games for relaxation and discussion. Meals were shared in a communal hall. A new feature was the presence of lecturers and high school teachers interested in learning how to run a Maths Camp alongside the high school students. A separate training session was held for this group.

RWANDA CAMP

Our first Rwanda Maths Camp took place in late July 2019, hosted and supported by the African Institute for Mathematical Sciences (AIMS) in Kigali. The camp was run by a team of eight local and three international volunteers. Participants included 39 Rwandan high school students, 22 of whom were female, drawn from the entire country, and 16 Rwandan high school Maths teachers. Alongside our Camp, a training session was also held for the first Rwandan Mathematics Olympiad squad.

The weekend before the Camp began, students participated in a 'Run for Science', and did Maths busking on the streets. A Career Event was also held with three Rwandese scientists as panelists enthusing the students about studying science. The Camp sessions spanned many areas of mathematics, with an emphasis on problem solving; some sessions contained elements of gentle competition between different groups to encourage team spirit and friendship.

Maths Camps

ALLOTEY MATHS CAMP, GHANA

25 volunteers from five countries organised the Allotey Maths Camp 2019, hosted at the African Institute for Mathematical Sciences (AIMS) Ghana, Accra. 65 students, including 35 females, attended from 39 junior and senior high schools from across the country, together with a number of students from Ivory Coast and Benin. Four school teachers came to learn about the Camp and take away practical ideas for their classrooms. This year's camp had themes in Cryptography, Game Theory, Geometry, Mathematical Thinking, Programming and Research, alongside sessions of physical activity, a treasure hunt and teacher training sessions. Students learned how to solve mathematical problems in different ways, including through the use of technology; it was wonderful to see their growing confidence, and how well they learned to work in groups.

The research session allowed volunteers to share their research work with the students and gave them insights into how mathematicians can impact the world. A particular high point of the camp was the Scottish country dancing led by Angela, a Ghanaian volunteer who had done her PhD at Glasgow University. The Camp is named in honour of the renowned late Ghanaian mathematician Professor Francis Allotey, who had supported the Ghana Camp since its inception in 2014, as well as the development of mathematics in general across Ghana. Continued local support has been provided by AIMS Ghana.

TOGO CAMP

The Togo Camp, our first in a French-speaking environment, was held on the shore of the Gulf of Guinea, in the coastal town of Aneho, in early August 2019. Our international volunteers came from the UK, Germany and Benin, and were complemented by a strong local team. The 38 students were mostly from southern Togo, with five students travelling from Benin to francophone countries. The Camp, unlike most others, took place in a primary school; the environment required a more offline approach. Nevertheless, with tablets borrowed from AMI Ghana, and private laptops, computer sessions could still go ahead. These were a highlight of the camp for many of the students.

The themes for the week were Cryptography, Dynamical Systems, Geometry, Special Numbers and Mathematical Thinking. As a real-life application of the ideas presented, the session on dynamical systems included a discussion of disease modelling. With a highly motivated volunteer from Benin at the Camp, there is potential for expansion next year. SAMI is engaged in translating existing Maths Club material into French to help support the expansion of Clubs to francophone countries.

Maths Camps

KENYA CAMP

Kenya is where the ideas leading to AMI and SAMI were first conceived, and the location of our original Maths Camp in 2011. The 2019 Camp was held in late August 2019 at Manor House Agricultural Centre, Kitale, Western Kenya. 42 students participated at the Camp, 24 of them girls, drawn from 36 different schools across the country.

Facilitators included four teachers, eleven local and seven international volunteers. The Camp included sessions on Programming, Probability, Optimisation, Graph Theory, Game Theory, as well as puzzles and mathematical games. Students were introduced in particular to mathematical models of conflict and cooperation between intelligent rational decision-makers, in the form of zero-sum games such as the prisoner's dilemma. They also experienced the maths behind different forms of encryption, and logistical problems such as timetable scheduling. All the activities were designed to encourage creativity, problem solving, collaborative skills and communication, as well as to get students to engage with real-world data.

CAMEROON CAMP

Our first, non-residential Camp in Cameroon was held in late August 2019, hosted at the English-language Pinnacle of Success Academy, Yaoundé. It was organised in collaboration with St Peter's College, Oxford.

Around 60 high-school students attended the Camp, which was facilitated by four international and nine local volunteers, including local school teachers. The students were divided into four houses, represented by different colours and named after female African mathematicians such as Joséphine Guidy-Wandja, an Ivorian mathematician and the first African woman with a PhD in mathematics. The activities of the camp were organised around the following themes: Shapes and Counting, Maths in Nature, Computer Science, Mathematical Thinking, Physical Activities and Maths in Sign Language.

FORTHCOMING: UGANDA CAMP

Our first Uganda Maths Camp is planned, in collaboration with Makerere University, Kampala and the Eastern Africa Network for Women in Basic Sciences, for early 2020.

sami ami

Alumni stories

CABRINE

"My journey started in 2011, when I attended my first Maths Camp in Maseno, Kenya. Since then, I have had a different story to tell about my performance in maths and generally all subjects. The Camp gave me a wider perspective on maths and helped me to discard the negative stereotype that revolves around it. I became a maths guru at school. My school also became a beneficiary, following the installation of maths packages on our school computers."

Cabrine is now completing her degree in Economics and Statistics at the University of Nairobi. She has volunteered for AMI activities back in Western Kenya during school breaks. She has been the driving force behind the idea of AMI starting new maths clubs, and supporting existing ones, in local schools with Maths Camp style material.

A maths club session in Rafiki secondary school being facilitated by Cabrine

EVANS

"Mathematics extends beyond the classroom understanding of multiplication, addition, subtraction and even division. I got a better understanding of this when I attended the Maseno Maths Camp in 2012, during my last year in school. I used to consider Mathematics to be a boring and irrelevant subject. So I had low expectations on my first day at the Camp. But by the end of that day, I could see how most things involve maths. The active participation of everyone made the Camp lively and friendly for learning new things. Mathematical games, computer sessions, mathematical thinking, statistics sessions and inspirational talks from the organizers - it was a fully packed week. I am really happy that I was able to attend, three months before taking my final high school exam; it led to an improvement in my math grades and even grades in other subjects."

Evans graduated this year with a degree in Statistics from the University of Maseno, and is now working as a Research Methods support scientist on an agricultural project in Western Kenya, funded by the McKnight Foundation.

sami ami

SAMI / AMI Maths Camps in numbers

OUR STORY FROM 2011 TO 2019

29 Maths Camps in **7** African countries

1607 Student participants

~800 boys

~800 girls

176 International volunteers

342 Volunteers from hosting organizations

£10 Average SAMI contribution per student

2018 SAMI financials

Income **24K**

26.2K Expenditure

Charity no. 1161994
Company no. 09458921

sami ami

SAMI & AMI Teams

Chris Clarke (Executive Director, SAMI) is an app developer, maths teacher, and trainer from the UK. He first became involved with projects in Africa whilst studying mathematics at the University of Warwick, through their Warwick in Africa scheme. Since then he has spent time working in education in South Africa and Kenya, as well as the in the UK.

Emily Fleming (Executive Director, SAMI) has been a teacher since 2003, after gaining a BSc in Mathematics from Edinburgh and a PGCE from Oxford. She has taught at Edinburgh Academy and Bexley Grammar School, and is currently working at the Lycée Français Charles de Gaulle, UK.

Jeff Goodman (Executive Director, SAMI) began teaching in 2004 after graduating from Boston University with degrees in both Education and Mathematics and obtaining an MSc in Statistics from the London School of Economics. He is currently working at the Lycée Français Charles de Gaulle, UK.

Franca Hoffmann (Non-Executive Director, SAMI) completed her PhD in Mathematics at University of Cambridge, UK, and is currently a postdoctoral researcher in applied mathematics and von Karman instructor at California Institute of Technology, US. Passionate about sharing mathematical ideas with people at all levels and of different backgrounds, since 2011 she has been involved in maths and science education initiatives across the African continent, from maths camps to research and teaching at university level.

James Kaleli (Board Member, AMI) has a PhD in climatic statistics and is a lecturer at Maseno University, Kenya.

Danilo Lewanski (Non-Executive Director, SAMI) is an Italian-born postgraduate researcher at Institut de Physique Théorique Paris. A maths busker devoted to maths education, he has been engaged in teaching activities in Tanzania, Ghana, Kenya and Rwanda.

Zach Mbasu (Founding board member and CEO, AMI) is an experienced maths teacher, passionate about Technology Integration in Education. He has a Bachelor's degree in Education Science and a Master's degree in Applied Statistics from the University of Maseno.

Michael Obiero (Board Member, AMI) has a PhD in Mathematics from the University of Illinois, and is a mathematics lecturer at Maseno University, Kenya. He is a founding member of AMI, and was closely involved in establishing the first Maths Camps at Maseno.

Georg Osang (Non-Executive Director, SAMI) is a PhD student working at the intersection of mathematics and computer science at the Institute of Science and Technology, Austria. He was a tutor at AIMS Ghana in 2014 and has been involved in SAMI/AMI math education initiatives since then.

Danny Parsons (Volunteer) has been involved in various education initiatives across Africa, including at AIMS Schools Enrichment Centre, South Africa, and in Kenya with AMI and SAMI. He is co-founder of IDEMS International, a social enterprise focused on work in development, education and the mathematical sciences.

David Stern (Founder, AMI) grew up in Niger, returning to the UK and Germany for his university studies. For six years he worked as a lecturer in the School of Mathematics, Statistics and Actuarial Sciences at Maseno University in Kenya. He is co-founder of IDEMS International, a social enterprise focused on work in development, education and the mathematical sciences.

Balazs Szendroi (Non-Executive Director, SAMI) is Professor of Pure Mathematics at the University of Oxford, and Martin Powell Fellow and Tutor in Pure Mathematics at St Peter's College, Oxford. Since 2010, he has been engaged in research and training initiatives in East Africa, teaching master students, collaborating with local mathematicians and working with institutions.

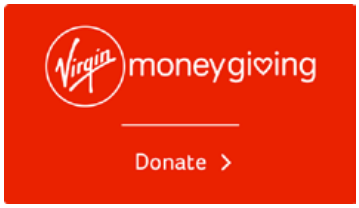
Francis Torgbor (Founder, AMI Ghana) is a PhD student at the University of Cape Coast, Ghana. He was the initiator of the Ghana Maths Camps.

sami ami

Ways to support us

Our website has the links https://samicharity.co.uk/donate/
and has the shortest URL.

DONATE DIRECTLY



You can donate to SAMI via Virgin Money Giving. This allows for up to 25% gift aid to be claimed on all donations, with processing fees kept to an absolute minimum. This way we can ensure all money donated is used to the greatest possible effect.

https://uk.virginmoneygiving.com/charity-web/charity/finalCharityHomepage.action?uniqueVmgCharityUrl=supportingami

DONATE AS YOU SHOP

easyfundraising.org.uk
feel good shopping

Retailers such as Amazon, Tesco and Expedia will donate a percentage of purchases made when visiting once you are signed in to EasyFundraising on your browser.

https://www.easyfundraising.org.uk/causes/sami/?t=Easyfundraising-lo

smile.amazon.co.uk

We are registered with Amazon Smile. If you shop via smile.amazon.co.uk and choose us as your charity, then Amazon will donate 0.5% of the net purchase price of eligible purchases to SAMI.

sami ami

Volunteer with SAMI

WE WOULD LIKE TO HEAR FROM
MATHEMATICAL SCIENTISTS
AND EDUCATORS
SOCIAL MEDIA AFICIONADOS
WEBSITE EDITORS
GRANT WRITERS
FUNDRAISERS
ETC. ETC.

Please do get in touch if you would like to put your skills to a good cause!

sami ami