



Practical science in Sierra Leone



Geography



Key facts about Sierra Leone

- Slave trade
- Population - c. 7 million
- Size - 27,700 sq miles (Ireland is 32,595 sq mi)
- Official language - English
- Spoken languages - Temne, Mende and Krio
- Natural resources - diamonds, titanium ore, bauxite, iron ore, gold, chromite
- 70% below poverty line
- One of the 10 poorest countries in the world (currently 8th poorest)
- Political instability
- 1991-2002 – bloody rebel war and huge atrocities
- 2014-2016 Ebola!

UK response to Ebola

The engagement work in Makeni post-Ebola

Prof Ian Goodfellow

Head of Virology, Cambridge University

Wellcome Trust funding

Establishment of the engagement team and
its remit

"The Ebola outbreak was sparked by a bewitched aircraft that crashed in a remote part of Sierra Leone, casting a spell over three West African countries – but a heavily alcoholic drink called bitter Kola can cure the virus."

"Some members of the community thought it was a bad spirit, a devil or poisoning."

At the beginning of the outbreak, many did not believe that the disease existed. "I thought it was a lie (invented) to collect money because at that moment I hadn't seen people affected in my community."

How I got involved

Workshop 21 June 2016 to develop
educational resources around
infectious disease

4 visits (two in 2017, one in 2018 and
2019)

The infectious disease programme

4 day senior school programme

2 hour primary school programme



My brief

- To deliver practical science activities to teachers and students in a country where practical science is virtually non-existent



My challenge

- How to introduce practical science when there are no or inadequate labs, no equipment, no running water, no gas, limited electricity and no culture of scientific inquiry, questioning, group work, analysis, etc
- Could I deliver and how would it be received by the teachers and the students?

The team 2019



My preparation

SIERRA LEONE **SCIENCE**



The practical manual

18 (initially 48) practical activities covering biology, chemistry, physics and psychology

Every activity requires basic equipment/materials, sourced in SL or taken out by me

Each activity based on limited assumed knowledge or knowledge which can be easily taught

Some of the activities

Osmosis in potatoes

Pulse rate and exercise

Static electricity

Vital capacity of lungs

Boiled or raw egg?

Catalase and H_2O_2

Looking at fingerprints

Reaction times

Pendulum

Brain hat

Articulating hands

Dancing raisins

Stroop test

Floating eggs

The three phases

1 I train the team

2 The team train the
teachers

3 The teachers teach the
students

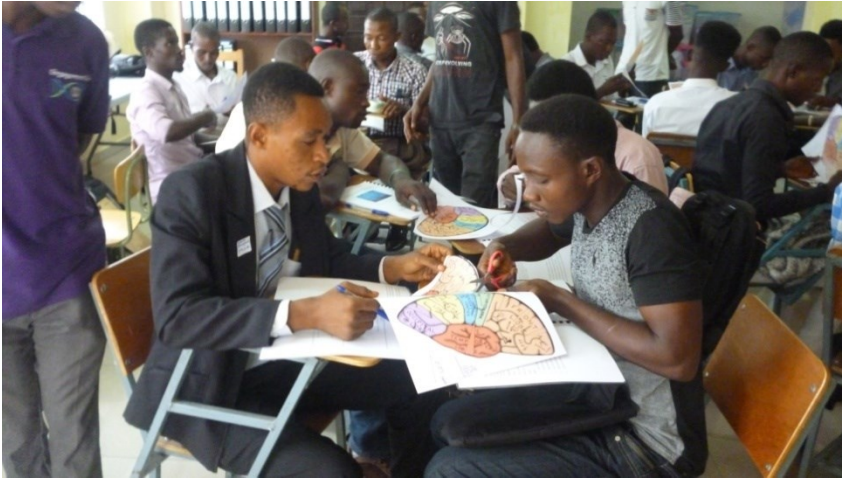
Phase 1 -Training the team







Phase 2 - Training teachers in Makeni



Feedback from teachers

“I have been a teacher for five years and have never done life practicals in any of the science subjects before”

“For us in Sierra Leone science is a mystery, everything is formed without performing experiments”

“I write to express thanks and to appreciate Ian for this timely training. Honestly, from my school days I haven't seen practical materials but with him I was able to do and see practical things that I have read for the past few years. I may want to make the brain hat as an example. It has given me the feeling to advice all and sundry not to hit anybody on the head because every part of the head is useful”

“I hope and pray such training continues and to extend it to other parts of the country. I wish as science teachers we should be having such beautiful training at least every month”

“Assist us with some of the materials as this is one of the key factors that pupils are seeing science to be very difficult as they have little or no idea about practical activities”

Phase 3 – Teachers teach students



Feedback from students

“This is the first time for me to do this. I just feel to do this every day”

“I Alimamy Kamara, I’m hereby concluding that all you have done for me and my colleagues makes me fill with a greatful enjoyment”

“It makes me to be proud of myself if I become a scientist as a female, really that was delightful and great to myself. I also enjoy the teaching made by our wonderful teacher”

“Before this time we were not having no idea on practicals. We love you”

“I want to be a nurse so I need help for me to be a better science student”

“Please help us to have enough science instrument and we wish this man to come back again to our country and our school”

How do we design and deliver a practical science programme?

Get funding!

Create a practical science kit with accompanying manual

Appoint and pay a local co-ordinator, train them and get a secure base from which they can operate

Appoint the rest of the team and train them

Locate schools and get a contact in each school

Hold a training day for teacher contacts

Develop a programme of schools who want to do practicals

Get transport for visiting schools with the kit

Get feedback and adjust the activities as necessary

Keep all data and feedback for evaluation

Challenges

Reliability of members of the team

Security of materials

Expectations of payment by teachers

Timekeeping

Lack of organization and planning

Lack of understanding about the need for regular meetings, agendas and minutes

Can it work?	YES
Is it easy?	NO
Will things go wrong?	YES
Will you get frustrated?	YES
Is it worth it?	YES
Will it develop over time?	YES
Will it be appreciated?	YES
Does it make a difference?	YES
Is it sustainable?	YES with funding
Is it transferable?	YES

My vision

To use this model elsewhere in Sierra Leone, other African countries and anywhere in the world where it can enhance and improve practical science teaching

I'll engage with anyone, anywhere to help them set up a practical science programme

My thanks go to



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