



Taking it to the Kids

“Africa lags far behind other regions in the number of people with critical technical skills, and the gap is projected to increase by 2030” – The African Capacity Building Foundation
“Capacity Imperatives for the SDGs” 2019

STEM

- Science
- Technology
- Engineering
- Mathematics

“Africa may hold some of the fastest developing economies in the world, but only by investing in STEM education for young people can it compete with the rest of the world.” – African Union Development Agency , June 2021

more than 60% of Africa currently
comprises younger than 25 years of
age citizens

19% of the world's population
between the ages of 15-24 is in
Africa

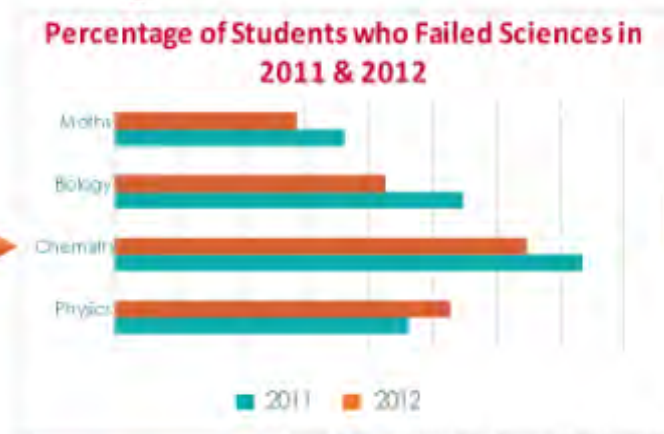
What is happening in our schools?



- Inadequate supervision of the teaching and learning process
- Limited efforts to grow systems for delivery of academic value
- Unskilled laboratory staff to support the teaching and learning process



- Poor mastery of content, inadequate practical skills and innovativeness
- Theoretical, teacher-centred approaches
- Poor Planning and preparation; assessment and evaluation of learner's work



Source: Report on Work of Candidates UCE 2012 - UNEB

30% learners taking science careers out of the required

47% Uganda needs to facilitate industrialisation



- Negative attitude towards science and mathematics
- Limited life application of sciences for regular problem solving



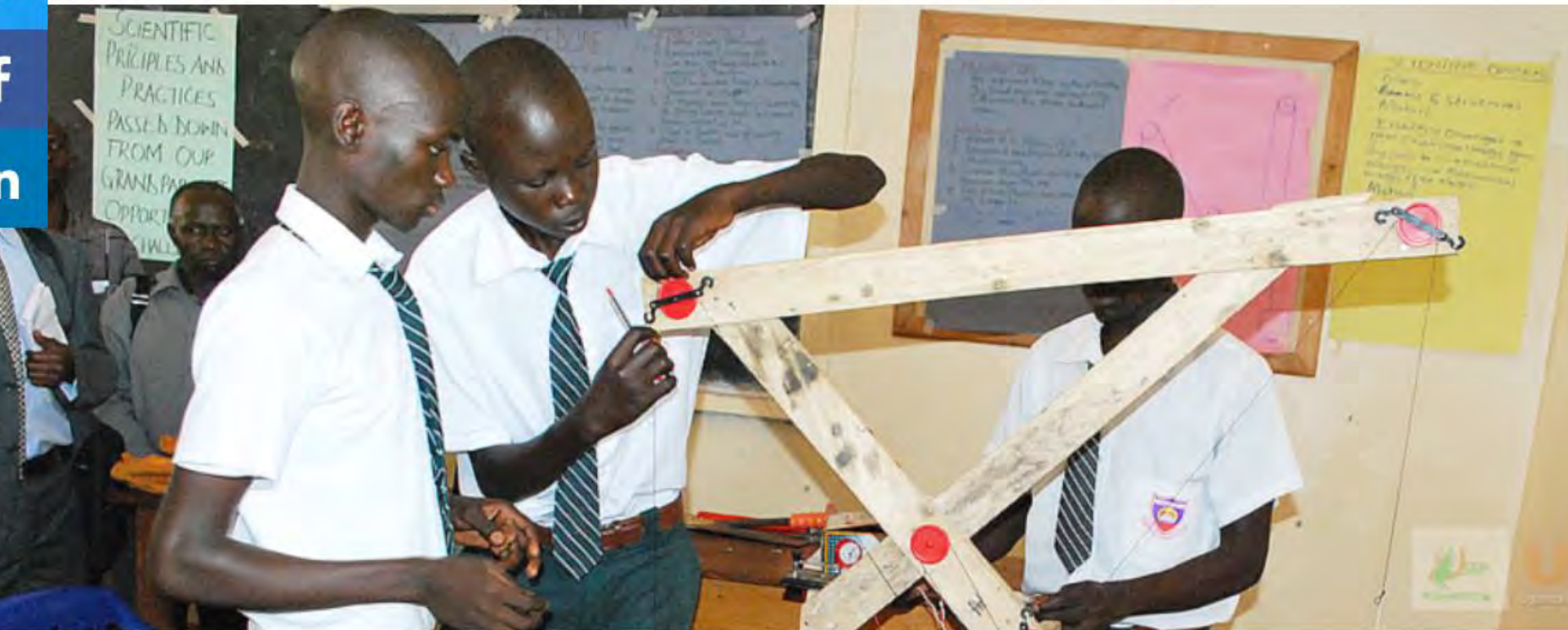
With the above situation, Ugandan's will not be positioned to understand, interpret, select, use, transmit, diffuse, produce and commercialize science and STEM knowledge to innovate competitively in the global economy



<https://www.ugasep.org/>

Why Science Fairs?

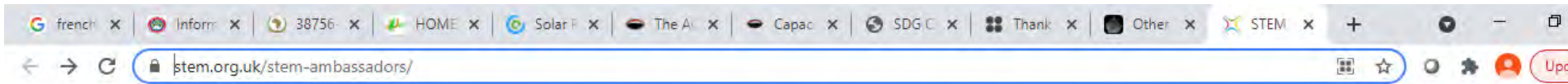
The **experience** inspires innovation and triggers interest in science to apply science today.





<https://area-network.ning.com/profiles/blogs/global-partnership-delivers-smart-classes-in-rural-kenya>

https://www.stem.org.uk/stem-ambassadors/



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STEM Ambassador Programme

Life-changing impact for young people, delivered by STEM professionals in classrooms and communities.

STEM subjects are brought to life by over 30,000 volunteers, available across the UK, all free of charge. Inspiring communicators and relatable role models, they are here to help now, by connecting online. Aspirations raised, careers illuminated and learning supported.

To request a STEM Ambassador, become one or support our inspiring programme, see below...

Working with young people



Schools and colleges

Bring the power and inspiration of STEM Ambassadors to your classroom, free of charge.

[Find out more](#)

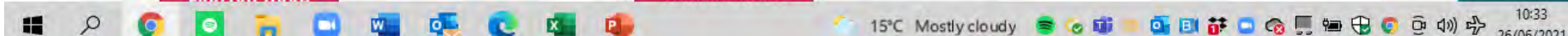


In the community

Bring the power and inspiration of STEM Ambassadors to your group of young people, free of charge.

[Find out more](#)

[Get in touch](#)



Engineering is...

creative problem solving



Find out how: [raeng.org.uk/Engineering1s](https://www.raeng.org.uk/Engineering1s)



Posters available:
<https://www.raeng.org.uk/education/schools/teaching-and-learning-resources/engineering-is-posters>

Engineering is...

beautiful



Find out how: [raeng.org.uk/Engineering1s](https://www.raeng.org.uk/Engineering1s)



https://www.raeng.org.uk/education/schools/teaching-and-learning-resources/curriculum-resources#better%20world

The screenshot shows a web browser window with the URL <https://www.raeng.org.uk/education/schools/teaching-and-learning-resources/curriculum-resources#better%20world>. The page header features the Royal Academy of Engineering logo and navigation links for 'Support us', 'About us', and 'Login'. A main navigation bar includes 'Policy', 'UK Grants & prizes', 'Education' (highlighted), 'Diversity & inclusion', 'Global', 'Events', 'News', and 'Publications'. A search icon is located on the right. Below the navigation is a breadcrumb trail: 'Home > Education > Schools > STEM Learning Resources > Resources to Enrich the STEM Curriculum'. The main heading is 'Resources to Enrich the STEM Curriculum'. A sidebar on the left lists 'STEM Learning Resources' with sub-links for 'RAF100: Aiming for Awesome', 'Other STEM Support Organisations', 'After School Club Resources', 'Support resources', and 'Resources to Enrich the STEM Curriculum'. The main content area contains a paragraph: 'Resources to enrich the STEM curriculum are great for using in the classroom to add context to the curriculum, or as a STEM challenge day.' followed by a list of links: 'Engineering in a pandemic', 'This is engineering: Entertainment', 'Power up!', 'Light saver', 'Code and rescue!', 'Engineering a better world', 'Engineering materials for a greener planet', 'Engineering in the movies', and 'Mission to mars'. The browser's taskbar at the bottom shows various application icons and the time 10:28.

Resources to Enrich the STEM Curriculum

STEM Learning Resources >

RAF100: Aiming for Awesome

Other STEM Support Organisations

After School Club Resources

Support resources

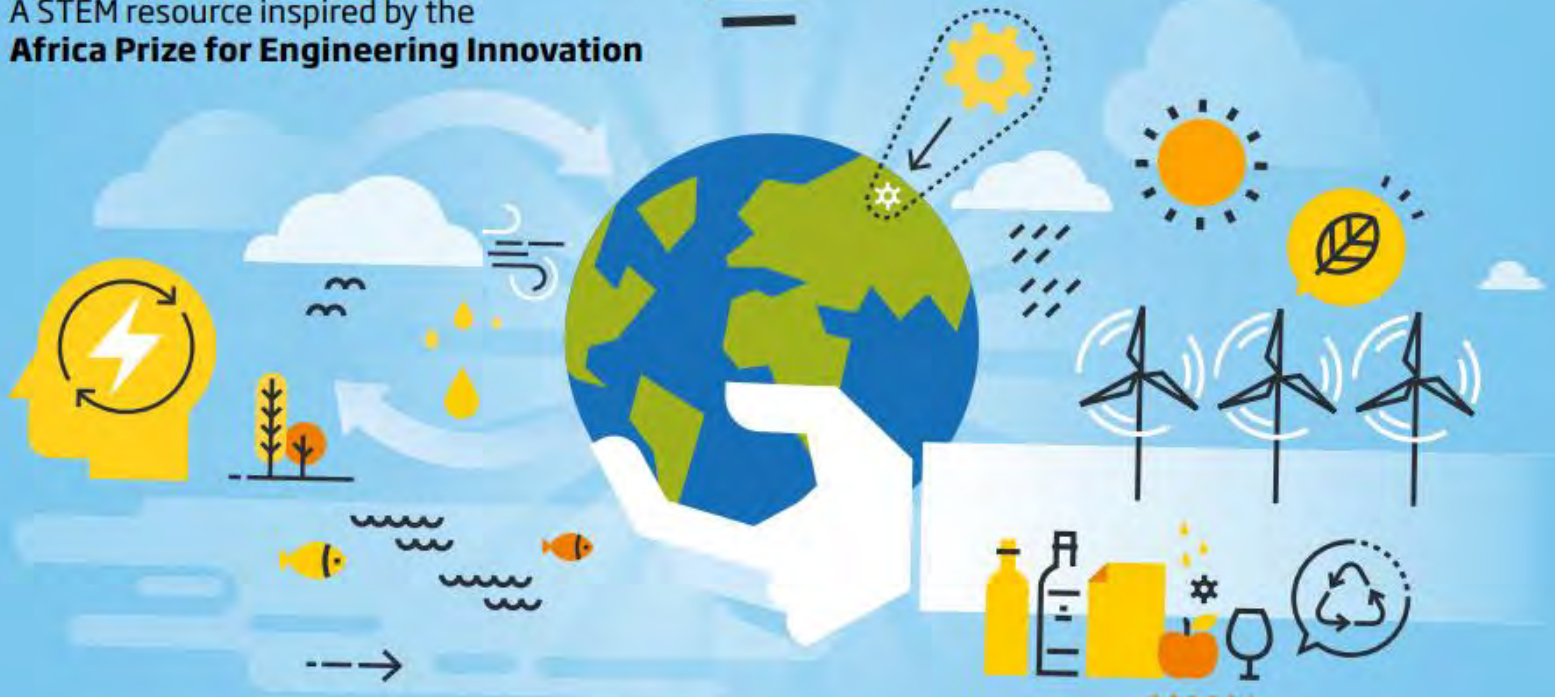
Resources to Enrich the STEM Curriculum

Resources to enrich the STEM curriculum are great for using in the classroom to add context to the curriculum, or as a STEM challenge day.

- [Engineering in a pandemic](#)
- [This is engineering: Entertainment](#)
- [Power up!](#)
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- [Engineering materials for a greener planet](#)
- [Engineering in the movies](#)
- [Mission to mars](#)

ENGINEERING A BETTER WORLD

A STEM resource inspired by the
Africa Prize for Engineering Innovation



https://www.raeng.org.uk/RAE/media/Publications/Activity%20Resources/EaBW-Core-Guide_WEB.pdf



The Shell Centenary Scholarship Fund



RESOURCE CONTENTS

In this booklet

- | | Page |
|--|------|
| 1 Setting the scene
Starter activities for pupils to familiarise themselves with world geography. | 8 |
| 2 Research task: Africa - a diverse continent
Starter activities for pupils to familiarise themselves with the geography of Africa. | 11 |
| 3 Sustainable Development Goals
Critical thinking tasks that introduce the Sustainable Development Goals to young learners. | 12 |
| 4 Africa Prize for Engineering Innovation
Starter activities for pupils to familiarise themselves with the Africa Prize for Engineering Innovation and its relation to the Sustainable Development Goals through an interactive map. | 14 |
| 5 Be Part of the 'World's largest lesson'
Design challenge for young learners to come up with creative solutions to improve the lives of those around them.
We suggest you start this project after you have completed at least a couple of the activities from 'In the box' as listed (right). | 15 |

'In the box' - activities inspired by innovators

- | | |
|---|--|
| 1 DEXT Science Set
Learn about building electric circuits using the DEXT Science Set developed by Michael Asante-Afrifa and Charles Ofori Antipem from Ghana. The skills you learn from this booklet will be useful for the challenges in the other activity sets in this series. | |
| 2 SolarKoodo
Activities inspired by a solar-irrigation system developed by Safiatou Nana from Burkina Faso. | |
| 3 Majik Water
Activities inspired by an innovative water collection and deposit scheme by Beth Koigi from Kenya. | |
| 4 The Vertical Farm
Activities inspired by a vertical farming system developed by Paul Matovu from Uganda | |
| 5 Muzikol
Activities inspired by an online music marketing and social media application developed by Nges Njungle from Cameroon. | |
| 6 Smart Havens Africa
Activities inspired by an affordable housing project developed by Anne Rweyora from Uganda. | |

Teachers
Tell us what you think of this resource!

Take our short survey for a chance to win £500 of robotics/coding equipment for your school.

Scan this QR code on your phone or go to <http://stemresources.raeng.org.uk/teacher-survey/>



THE CHALLENGE

1. Take at least 12 photos of your classmate, changing their movement slightly in each picture. Print the photos and stick them to the strip template on the next page.
2. Alternatively, you can draw a dancing cartoon character in each frame (see **Figure 1**).
3. Cut out the strips and stick the ends together to form a ring with the images facing inwards.
4. Cut vertical slits into the black heavy card and stick to a circular base (such as a paper plate) using tape or a glue gun to make a cylinder.
5. Insert a pencil in the centre of the base and secure with the glue gun.
6. Insert your animation strip and spin the handle to see your drawings come to life (see **Figure 2**).

EXTENSION

Use wood and plastics to build a longer lasting more durable zoetrope. Add a motor to generate the spin.

YOUTUBE GUIDE

www.bbc.co.uk/cbbc/thingstodo/art-ninja-zoetrope-make?collection=art-ninja-makes



Figure 1

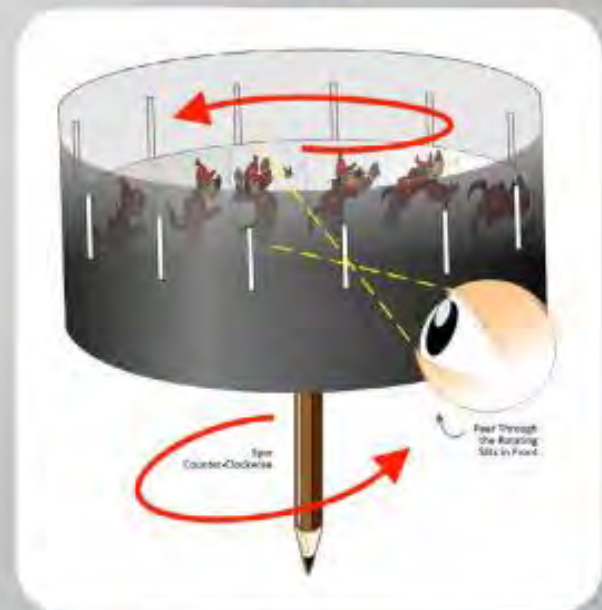


Figure 2



<https://www.engineeringforchange.org/get-involved/2021-fellows/>

E4C FELLOWSHIP 2021

The E4C Fellowship is a workforce development program at the intersection of engineering and global development, serving to activate and empower early-career engineers worldwide to solve local and global challenges. Providing a unique platform to develop soft skills and connect with mentors and peers from all continents, the E4C Fellowship offers leadership development opportunities preparing the next generation of technical professionals to reach their fullest potential and advance the United Nations' Sustainable Development Goals. E4C Fellows deepen their understanding of global development through targeted research, analysis and engagement with the E4C's cross-sector partners and [community of experts](#). The 2021 Cohort of E4C Fellows is part of a global network of extraordinary [Fellow Alumni](#) dedicated to infusing engineering rigor into world-changing development efforts. To learn more about our impact visit our [impact dashboard](#).

Learn more about [the Fellowship program](#) and [Frequently Asked Questions \(FAQs\)](#).



FELLOW '21

Julius Mugaga

Biomedical Engineering, Bioinformatics focus, M.Sc.

Makerere University Uganda

Research Collaboration Chemonics

What motivated you to pursue engineering for global development?

As a little boy of 13, I grew up in a metal fabrication workshop run by my father and on a daily basis we made unique designs of doors, windows and all sorts of fabrication. This was a great inspiration that shaped my future towards engineering, although I harbored some desires of being a medical doctor. The introduction of Biomedical Engineering in Uganda in 2011 brought a perfect match for my desires; now I could train and work in the healthcare



[Soap Dispenser Challenge - Response Innovation Lab Uganda and Engineers Without Borders -- USA - YouTube](#)



<https://britishcounciluk.eu-west.catalog.canvaslms.com/browse/coreskills-indepth-courses/courses/tctps2>



Teaching Critical Thinking and Problem Solving

Self-paced

ENROLL

Continuos Professional Development to

- * Schools Academic Managers,
- * Teachers of Science &
- * Laboratory Staff

OUTCOMES

Teacher Effectiveness

Laboratory Staff Effectiveness

Schools' Academic Management System Effectiveness

School Academic System Growth through

- * Academic Progress Scorecard
- * Teacher Mentorship Program

Academic System Effectiveness

Improved Science Learning Process Compliance

Improved School Administration

OUTCOMES

Improved Learner Science Competences

- * Motivation & Career Talks
- * Science Fairs

OUTCOMES

Increased Career Path Choices

Improved Learner Innovations

Improved Learner Science Grades



Teacher quality is the most important in-school factor affecting student achievement and success