

JAMAICA STEAM CHALLENGE PROJECT REPORT

2023/2024

Supported by:



**MINISTRY OF
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**NATIONAL
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Advancing Education in Jamaica



WHO ARE STEMUNITY?



STEMunity, co-founded by Jorden Birch and Laura Watford, is dedicated to enriching lives by connecting communities and industries through innovative Science, Technology, Engineering and Mathematics (STEM) education. Both Laura and Jorden bring over 15 years of classroom experience to the table, along with extensive collaboration with STEM industries. They utilise their expertise to inspire underrepresented groups, creating opportunities for young people to explore and pursue careers in STEM fields. Their hands-on approach and commitment to inclusivity helps to break down barriers and foster a diverse and dynamic future workforce.

The 5PARK programme - now in its fourth year - has been instrumental in delivering engaging and educational activities to young people across the UK, Jamaica, and Cambodia. Through 5PARK activities, online escape rooms, and mixed reality resources, STEMunity has reached over 30,000 young people. This impactful initiative gained national recognition in September 2023, when STEMunity was shortlisted for The National Diversity Awards, sponsored by ITV.

Co-founders Jorden Birch and Laura Watford are passionate educators, who are committed to providing high-quality learning experiences. Their determination ensures that all young people are given the opportunity to develop essential skills that could lead to careers in Science, Technology, Engineering and Mathematics. This project holds particular significance for Jorden, whose grandmother was born and attended school in the Parish of St. Ann, Jamaica, making the outreach in Jamaica especially meaningful to her.

BACKGROUND

The project began as a collaboration between the British Council, the National Education Trust, and The Mico University College. With Dr. Andre Coy as an independent consultant, the initiative aimed to explore the current state of Science, Technology, Engineering, Arts, and Mathematics (STEAM) education in Jamaica. The initial research and production of the report were undertaken by the team from the Institute of Technological and Educational Research (ITER) at The Mico University College, highlighting the importance of a coordinated approach to enhance STEAM education.



[Full report available here](#)

Project Intent:

The project's goal is to create a unified, national STEAM-focused educational environment in Jamaica. It aims to improve the incorporation of STEAM education across all educational levels; to formalise connections between schools and industries, and to stimulate innovation through enhanced curricula and cooperation amongst stakeholders.

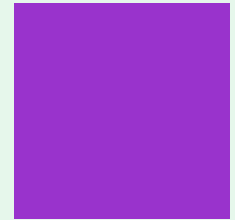
Research Results:

The study pinpointed deficiencies in training, funding and partnerships within Jamaica's STEAM education sector. It revealed that only a small fraction of students are involved in STEAM disciplines, highlighting the need for better teacher preparation, infrastructure, and alignment with global standards. Emphasis was placed on community engagement and public-private collaborations to nurture a STEAM mindset.

Future Plans:

Next steps focus on piloting a national STEAM curriculum delivered in schools across Jamaica. This report centres on implementing this pilot program, establishing a national nodal STEAM centre, and advancing a cohesive STEAM curriculum. Future steps include collaborating with examination bodies to develop appropriate assessments and adopting international STEAM standards. Further more it is our aim to enhancing collaboration amongst stakeholders to ensure continuous innovation and relevance. The pilot program will serve as a foundation for expanding STEAM education nationwide, ensuring that students benefit from an integrated and forward-thinking approach to learning.

INTRODUCTION



The Jamaica STEAM Challenge Project has been led by the British Council and the National Education Trust in collaboration with the Ministry of Education and The Jamaican Teaching Council. They have been on a transformative journey to enhance Science, Technology, Engineering, Arts, and Mathematics (STEAM) education across Jamaica. This report captures the essence of our project, which has begun to successfully integrate STEAM principles into the school curriculum. This has helped to empower both teachers and students with innovative teaching methods and collaborative learning experiences. Our findings have revealed that a STEAM approach has had a positive impact on teaching practices and student engagement, setting a solid foundation for the future of STEAM education in Jamaica.

BACKGROUND AND RATIONALE

Our Vision

Our vision for the Jamaica STEAM Challenge Project is to work towards an integrated, dynamic and inclusive educational environment, where Science, Technology, Engineering, Arts, and Mathematics are seamlessly woven into the curriculum. We aim to empower educators with innovative teaching strategies, inspire students to explore interdisciplinary connections and to foster a culture of creativity and critical thinking. By nurturing these skills, we envision preparing a new generation of Jamaican students to excel in the global economy and drive sustainable development.



Our Mission

Our mission is to launch the Jamaica STEAM Challenge Project by integrating Science, Technology, Engineering, Arts, and Mathematics into the school curriculum through a pilot initiative. We aim to provide educators with high-quality resources and training, inspire students to engage in creative problem-solving, and promote interdisciplinary collaboration. This pilot project marks the beginning of our journey to build a sustainable and dynamic Jamaica STEAM Challenge in Jamaica.

PROJECT GOALS AND OBJECTIVES



The project objectives included:

Improve Student Access to STEAM by enhancing computational thinking skills for over 1,500 young people, enabling them to engage effectively with the STEAM ecosystem in Jamaica and fostering creativity and innovation through STEAM challenges and training.

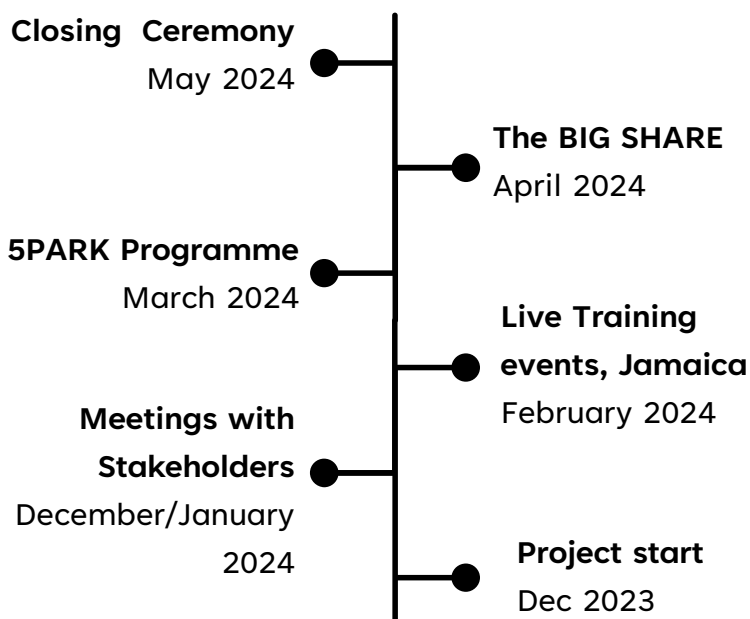
Teacher Capacity Building to provide training for 300 teachers, focusing on integrating computational thinking and entrepreneurship into the national standards curriculum, ensuring educators are well-equipped to deliver high-quality STEAM.

Facilitate Stakeholder Dialogue to organise workshops and a two-day symposium, bringing together STEAM stakeholders in Jamaica, promoting dialogue and collaboration on the future development of the STEAM ecosystem.

Establish International Partnerships to foster meaningful exchanges between UK and Jamaican schools, leveraging the British Council's expertise to support collaborative problem-solving and the application of STEAM concepts in educational settings.



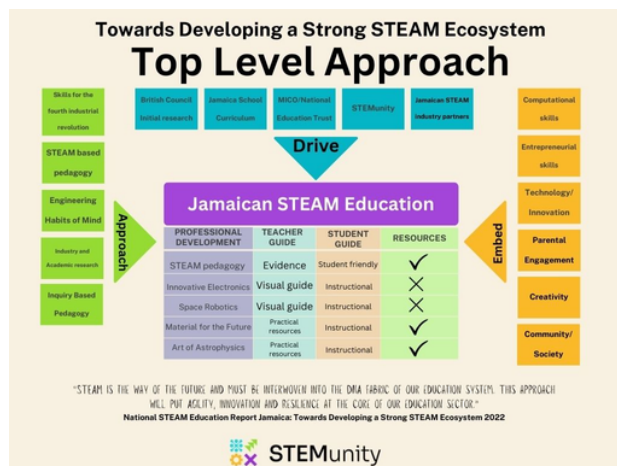
The Timeline



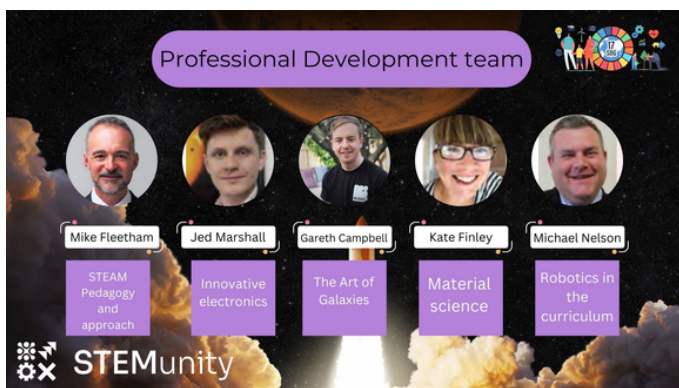
PROFESSIONAL LEARNING: SELF-PACED LEARNING



As part of our commitment to enhancing STEAM education, we developed five comprehensive professional development sessions for all teachers engaged in the project. These sessions - accessible for the next 12 months - initially focused on educational research and innovative teaching approaches. To further support the successful delivery of the 5PARK project, we subsequently added specialised courses.



Appendix 1: Top Level Approach

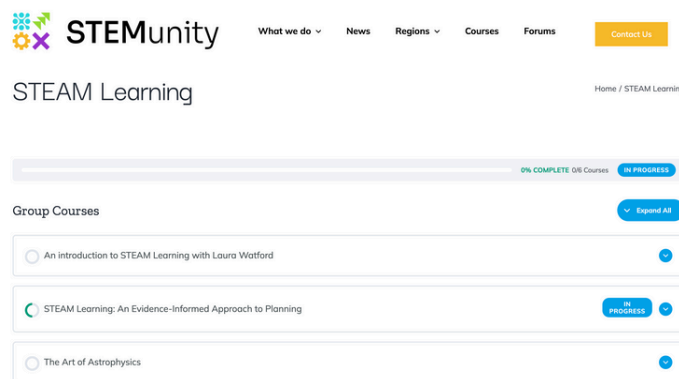


The team delivering these sessions were identified from our network of highly-skilled STEAM educators, who have extensive experience working on both the national and international STEAM projects with STEMunity. This professional development program ensures that educators are well-equipped with the latest methodologies and resources to effectively integrate STEAM concepts into their teaching practices.

115



educators registered on the STEMunity STEAM Ecosystem Courses as of the end of May 2024.



135



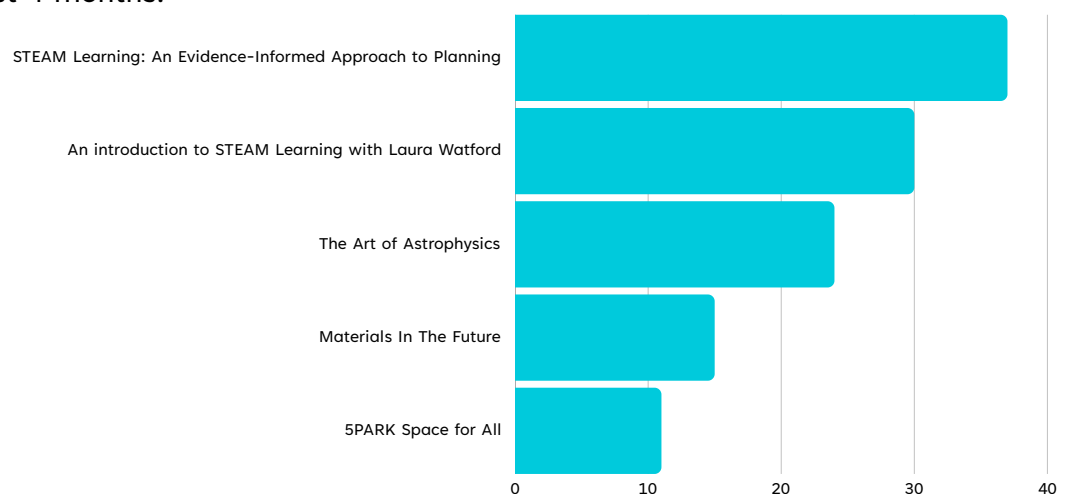
STEAM-based professional development courses have been completed as of the end of May 2024.



PROFESSIONAL LEARNING: PARTICIPATION RATES



The following table summarises the completion rates for the professional development courses, offered to teachers engaged in the Jamaica STEAM Challenge Project. These courses aimed to equip educators with the necessary skills and knowledge, to effectively implement STEAM education in their classrooms. The completion rates highlight the level of engagement and participation among the educators to date, and the courses have only been open to educators for the past 4 months.

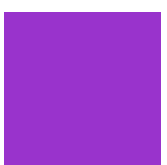


In addition, two more courses - Robotics and Electronics/Physics - will be released by the end of June. All courses will be accessible until the end of January 2025, marking 12 months of availability to educators from Jamaica and linked British Council schools in the UK.



Educators who complete all courses, demonstrating their impact through community forums by the end of August 2024, will be eligible for the first Level 1 Accreditation as a STEAM Ecosystem Educator.

Additionally, on completion of the course, teachers will receive an instant PDF certificate. This documentation has been well-received by educators as it allows them to immediately include the training in their professional development portfolios.



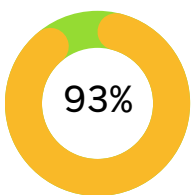
PROJECT LAUNCH: TEACHERS



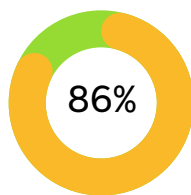
During the project, Jorden Birch and Laura Watford travelled to Jamaica to facilitate live professional development sessions, and to launch the 5PARK Jamaica STEAM Challenge project to the 20 Jamaican schools involved in the programme.

Lead Teacher Event 02/02/2024

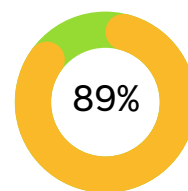
On 2nd February 2024, we hosted a lead teacher event in Kingston, Jamaica, bringing together four teachers from each of 20 schools across the island, representing a diverse range of curriculum disciplines. During this session, we explored the theories and evidence supporting a STEAM approach to learning. Additionally, we modelled activities that utilised computational thinking skills, and developed the Engineering Habits of Mind to provide practical, hands-on experiences for the participating educators. This event was instrumental in showcasing the effectiveness of STEAM education, whilst also enhancing the professional development of teachers from various educational backgrounds.



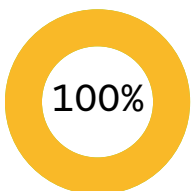
93% of teachers would like to participate in the project next year.



86% of teachers are likely to adopt aspects of the programme into their lessons to teach the curriculum.



89% of teachers agreed that the British Council has given them ideas, which have changed the way they teach.



100% ALL of teachers are now more confident in making links between STEAM subjects, and will share ideas from this experience with other teachers in their school.

“The overall delivery was exceptional!”
“It's a good interactive and hands-on experience.”



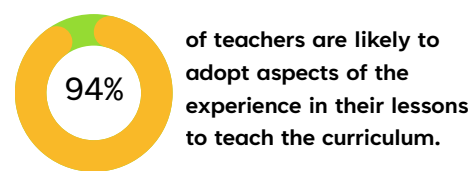
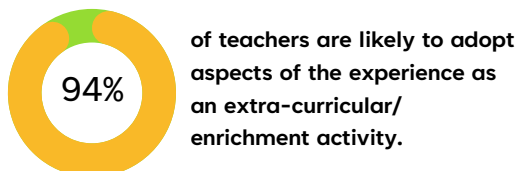
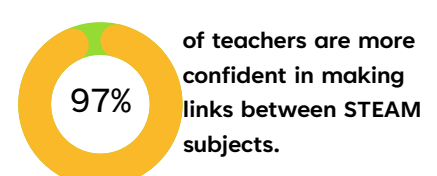
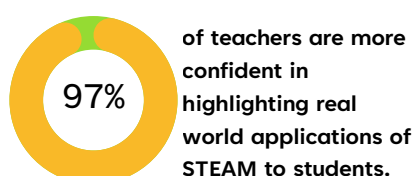
PROJECT LAUNCH: TEACHERS



The lead teachers from the 20 schools from across Jamaica brought a group of students to Kingston for the launch of the Jamaica STEAM Challenge 5PARK programme.

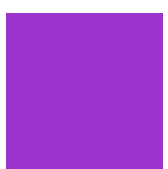
Master teacher event

Forty-five master teachers attended a full day of professional development, focused on the ‘train the trainer’ approach. We reviewed the research and evidence supporting STEAM-based learning, examined examples of computational thinking tasks, and modeled professional development strategies for implementing a STEAM approach in the classroom. The day was a tremendous success, though some educators expressed disappointment in not receiving additional 5PARK kits for their students. The expertise and experience present was invaluable and significantly contributed to the development of the teaching resource booklet that accompanied the 5PARK pack.



“Excellent mission and I'm committed to it's success as we collaborate to assure the quality of student engagement in STEM.”

“Very informative session. I look forward to being a part of the course.”



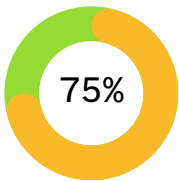
PROJECT LAUNCH: STUDENTS



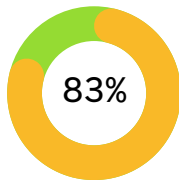
To ensure that the next stages of the programme would have a sustainable legacy for future participants, we ensured bespoke training was given to a network of ‘Master Teachers’, who would continue to drive the STEAM agenda in Jamaica.

Launch Event 07/02/2024

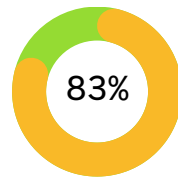
Over 100 teachers and students gathered in Kingston for a full day of hands-on STEAM activities. Participants engaged in various STEAM challenges, using low-cost materials. Activities included using toilet paper to model the scaled planets in the solar system and the building of rocket cars from balloons and corrugated plastic. Both students and teachers also had the opportunity to hear from the inspirational role-model, Dianne Plummer, an engineer and children's author. Students received diffraction glasses from The University of Portsmouth’s Institute of Cosmology and Gravitation, enhancing their learning experience. Additionally, members of the Ministry of Education joined us throughout the day, further highlighting the event's significance.



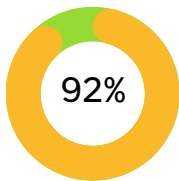
of schools agreed that all of their students learnt to be resourceful when finding a solution to a problem during the session.



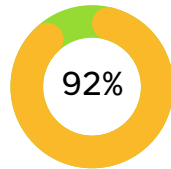
of schools agreed that all of their students learnt to work with others in a team during the session.



of schools agreed that all of their students problem-solved and come up with creative solutions during the session.



of schools agreed that all of their students learnt from their mistakes during the session.



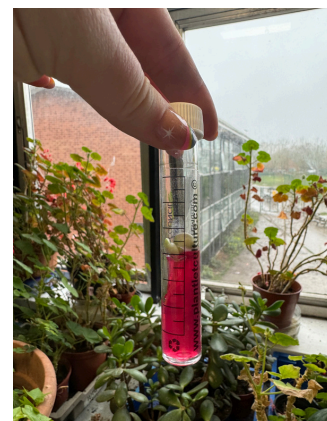
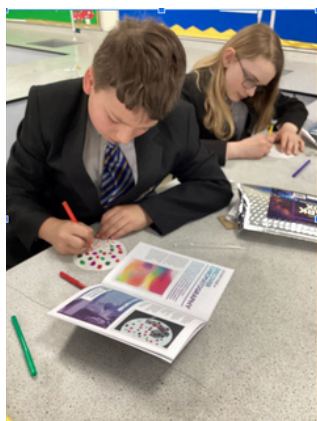
of schools agreed that all of their students felt supported and encouraged during the session.

“The students liked the creativity of the projects. They liked the environment and how warm everyone was to each other and the way the presenters communicated. They also liked how everyone worked together and seeing the different schools.”

JAMAICA STEAM CHALLENGE: 5PARK PROGRAMME



A total of 300 5PARK packs were shipped to schools and participants in Jamaica as part of the Jamaica STEAM Challenge programme. Each student pack contained all the materials and resources needed to complete 5 different 5PARK challenges, plus 2 additional bonus activities. Students from 20 Jamaican schools participated simultaneously with students from 5 UK schools. All the schools were internationally partnered in clusters, giving students the opportunity to meet and present their projects online throughout the programme.



The 5PARK box includes a detailed student guide that outlines the steps for each task. Additionally, there is a teacher guide and a comprehensive teacher plan that connects the Engineering Habits of Mind, with effective teaching strategies and tools, facilitating the integration of this approach into the curriculum.

The student activity books feature embedded 3D models of the planets for exploration and videos that play triggers are scanned through the Halo AR app. Using the app, students can view a 3D model of the planets in the solar system, explore the model in the 3D playground and even place it on the ceiling to visualise the scale and size of the planets. This interactive experience enhances their understanding and engagement with the material.



Lesson Summaries
This is an example of how a lesson might look, with suggested thinking-based activities. Feel free to adapt and change these activities to suit the learners in your learning space.

Lesson	Title, Learning Objectives, Driving Questions	Activities and Guidance
1.	<p>Universe in Your Hand</p> <p>Learning objectives Explore the conditions and distance of planets and galaxies to identify a suitable location for life.</p> <p>Engage Learn and explain ideas of resources and structures that would be necessary to sustain life in a location in the chosen location.</p> <p>Driving questions How might we design a sustainable method of life in a location in the chosen location?</p>	<p>Linked Engineering Habits of Mind Skills</p> <ul style="list-style-type: none"> ASK: Problem-finding PLAN: Systems thinking IMAGINE: Visualising CREATE: Creative Problem-solving <p>Engage</p> <p>Introduction to Interstellar Travel</p> <p>Begin with a discussion on the concept of interstellar travel and the possibility of inhabiting other planets or galaxies.</p> <p>Show Video 1 Clip about the Virgin Galactic trip to spark interest and curiosity.</p> <p>Mapping Ideas</p> <ul style="list-style-type: none"> Encourage students to ask questions about the feasibility and challenges of space travel and planetary habitation. Pose the big question: "Could we have future holidays and the opportunity to inhabit other planets or galaxies? What would we need to do to make this a possibility?"

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Process	Qualities and Abilities	Engineering Ideas and solutions
Engineering Design Process	<p>ASK</p> <p>Problem-finding Identifying a problem to solve.</p> <p>Systems thinking Understanding the relationships between different parts of a system.</p> <p>Systems thinking creating Developing a plan to solve the problem.</p> <p>Visualising Creating a mental image of the solution.</p> <p>Adapting Modifying the solution to fit the needs of the situation.</p> <p>Systems thinking Understanding the relationships between different parts of a system.</p> <p>Adapting Modifying the solution to fit the needs of the situation.</p> <p>Systems thinking Understanding the relationships between different parts of a system.</p> <p>Adapting Modifying the solution to fit the needs of the situation.</p>	<p>IMPROVE</p> <p>Problem-finding Identifying a problem to solve.</p> <p>Improving Making the solution better.</p>

Document below adapted from "Thinking like an Engineer" resources from University of Manchester

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Appendix 2: Sample Teacher Guide

Appendix 3: Sample Assessment

Appendix 4: Sample Activity



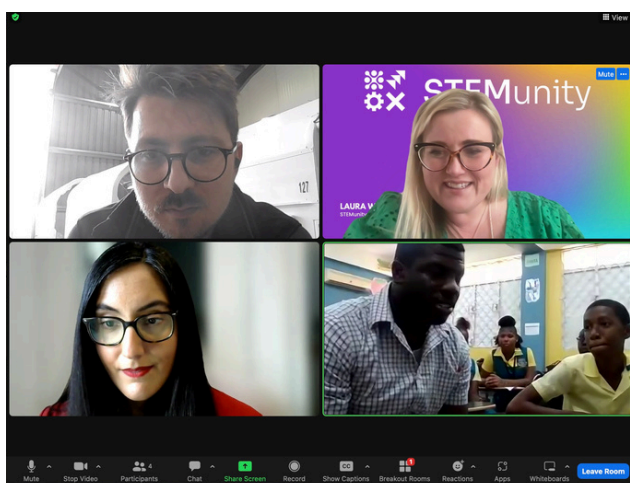
“These tasks were very thought-provoking and interesting, I like that they were simple, yet effective at developing certain thinking skills.”

THE BIG SHARE ONLINE EVENT APRIL 2024



In addition to the 300 5PARK packs that were shipped to schools and participants in Jamaica as part of the Jamaica STEAM Challenge programme, a further shipment of resources was sent to 5 UK schools, working in partnership with the programme.

All the schools were internationally partnered in clusters, giving students the opportunity to meet and present their projects online throughout the programme.



In an online event, Halvard Grimstad and Vinita Marwaha Madill, engineers from 'This is Engineering', joined us to celebrate our hard work and provide feedback on the brilliant ideas from students in Jamaica and the UK. The event included a celebration video, showcasing the outstanding work produced by the young people. The students shared their views and experiences, making the event a vibrant and engaging celebration of their achievements in the Jamaica STEAM Challenge programme.

The quality of the students' ideas and presentation skills was exceptionally high. Both Vinita and Halvard were highly impressed by their communication abilities and innovative concepts.



Check out the celebration video.

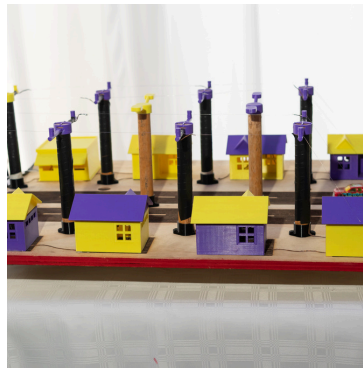
“The STEAM challenge successfully engaged students and captured their interest, fostering enthusiasm for hands-on learning and exploration.”

CLOSING CEREMONY MAY 2024, KINGSTON

The final Innovation Challenge invited Jamaican schools to apply the skills and knowledge acquired through the Jamaica STEAM Challenge Programme to solve a real-world problem in their local context. Students were tasked with selecting a community issue and designing a solution or prototype to address it. Drawing from their experiences with 5PARK activities and British Council events, students were encouraged to think collaboratively to consider the cultural context of their solutions.



Appendix 5: Innovation Challenge



Appendix 6: Innovation Challenge timeline

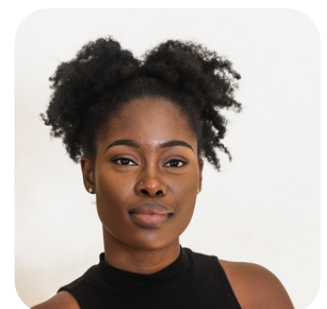


“The British Council is proud to have partnered with the MOEY and NET and UK partner STEMunity, bringing UK expertise and an international perspective to the programme. The initiative has been successful in increasing the capacity of teachers in supporting young people to acquire 21st century skills around STEAM. This is a critical step in developing the Jamaica STEAM Challenge in Jamaica, where the educational system is actively responding to the needs of the business sector.”

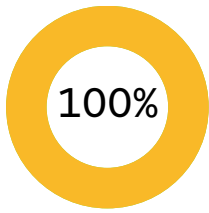
Damion Campbell, Country Director Jamaica and the English-Speaking Caribbean, British Council

“Approaches utilising STEAM skills and pedagogy have become increasingly relevant to education as the world becomes more globalised and technologically dependent. Against this, it is vital that teachers are prepared to engage students with these approaches and that students are equipped with the knowledge and skills that not only prepare them to operate competitively in such a landscape but to be nation-builders through critical thinking and innovation. The British Council, along with key partners MOEY, NET, JTC and STEMunity, are proud to play a part in this process through the delivery of the STEAM Challenge Education Programme.”

Kathrine Johnson, Project Manager Cultural Engagement, British Council

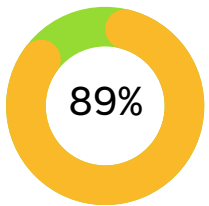
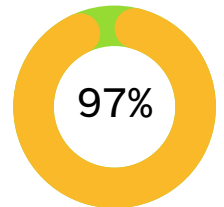


KEY SUCCESSES FROM THE LIVE TRAINING EVENTS



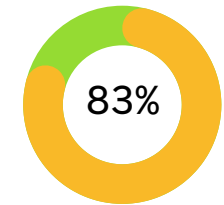
ALL of teachers in the programme are now more confident in making links between STEAM subjects and will share ideas from this experience with other teachers in their school.

97% of teachers are more confident about highlighting real world applications of STEAM to students.



89% of teachers agreed that the British Council has given them ideas, which have changed the way they teach.

83% of schools agreed that all of their students problem-solved and come up with creative solutions during the session.

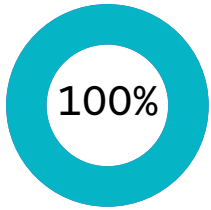


The objectives of the Jamaica STEAM Challenge Project were closely aligned with the key outcomes observed. The project aimed to enhance educators' confidence and ability to integrate STEAM subjects, which was successfully achieved as all participating teachers reported *increased confidence* in linking STEAM disciplines, also committed to sharing their new insights with colleagues. Furthermore, 89% of teachers acknowledged that the British Council provided ideas that transformed their teaching methods. The project's focus on practical problem-solving and creativity was evident, with 83% of schools reporting that their students developed problem-solving skills and devised creative solutions during the sessions. In addition, 97% of teachers felt more confident in demonstrating real-world applications of STEAM, ensuring that students could connect their learning to practical and relevant contexts. These outcomes highlight the project's success in achieving its goals of fostering innovation, collaboration and real-world relevance in STEAM education.



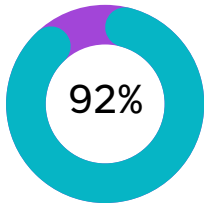
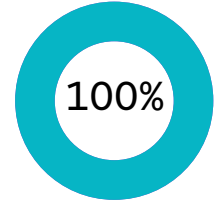
“The British Council's STEAM program has truly revolutionised the way students from Cumberland High School see STEAM education. Based on their engagement with the project, they realise that STEAM subjects can be both exciting and relevant to real-world applications. This program has enhanced their understanding and appreciation of Science, Technology, Engineering, Arts, and Mathematics, making these fields more accessible and inspiring a new level of enthusiasm for learning.”

EVALUATION OF WHOLE PROGRAMME



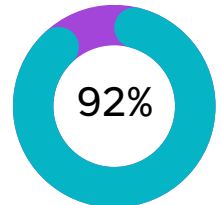
All the teachers fed back that they would be keen to participate in future STEAM based programmes in the future.

All the teachers said that the experience has influenced the way that they will teach the curriculum in the future.

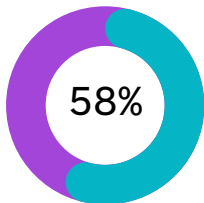


92% of teachers said that they are now more confident about connecting STEAM subjects.

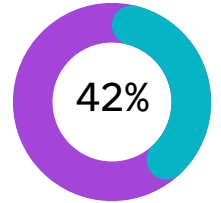
92% of teachers are now more confident about connecting STEAM curriculum to careers.



All schools stated that they schools are supportive of embedding a STEAM approach:



58% said to a large/very large extent
42% to a small extent/some extent



"Students were able to collaborate and figure out solutions to problems by brainstorming and working as team."

"Some of us have always been fascinated with engineering and have participated in various engineering related activities throughout my life. I see this task as an opportunity to build on my desire to gain knowledge. In addition, A few of us also considering the pursuit of a career in engineering in the future."

"The STEAM challenge successfully engaged students and captured their interest, fostering enthusiasm for hands-on learning and exploration."

RECOMMENDATIONS AND NEXT STEPS



Recommendations to nurture the STEAM ecosystem:

1. Introduction of New Courses

To nurture the STEAM ecosystem, STEMunity will introduce new courses in robotics and electronics/physics by the end of June, enriching the existing curriculum with advanced, practical skills in high-demand fields. Continuous professional development will be provided through webinars, workshops and online forums, ensuring educators stay updated with the latest STEAM methodologies. An accreditation system will also be established to recognise and reward educators' participation and contributions.

2. Continuous Professional Development

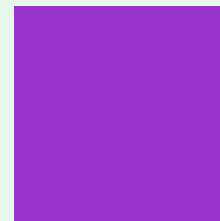
Next steps for STEMunity include implementing a train-the-trainer model, where master educators are trained in STEAM methodologies and then train other teachers within their schools and regions. The program will scale to include more schools across Jamaica, with a phased expansion plan that builds on the pilot program's success. Resource allocation, regular assessments, and a feedback mechanism will ensure the program remains relevant and impactful.

Teachers have emphasised the need for integrating feedback to continuously improve the curriculum and creating professional learning communities for collaboration. Local educational leaders, appreciating the specific context of Jamaican schools, will lead these PD efforts, ensuring they are culturally relevant and effective. Facilitating international exchanges with UK schools will further enrich the program. The train-the-trainer approach, supported by ongoing PD and strong stakeholder collaboration, will foster a culture of innovation and critical thinking, preparing Jamaican students for future challenges.

We would love to empower local educators and students to become leaders in the STEAM approach, driving innovation and training within their communities. This will involve setting up working groups of educators in Jamaica who can develop and lead STEAM initiatives in their schools and regions. By fostering leadership at the local level, these groups will collaborate on curriculum development, share best practices, and mentor others in the community. Through regular training sessions and collaborative projects, local leaders can ensure that STEAM education is not only dynamic and inclusive but also deeply rooted in the specific needs and contexts of their communities, creating a sustainable and impactful educational ecosystem.



CONCLUSION

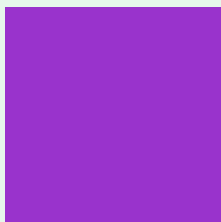


The Jamaica STEAM Challenge Programme has been a transformative initiative, fostering innovation, collaboration, and a robust educational framework across Jamaica. Through comprehensive professional development, hands-on learning experiences, and international participation, we have successfully enhanced the integration of Science, Technology, Engineering, Arts, and Mathematics into the school curriculum.

Our efforts have empowered educators with new teaching methodologies and resources, significantly improving their confidence in linking STEAM subjects and demonstrating real-world applications. The enthusiastic participation of students in problem-solving and creative challenges has underscored the effectiveness of our approach, preparing them to excel in the fourth industrial revolution landscape.

Looking ahead, we are excited to expand the programme, introduce new courses, and provide continuous support to educators. The establishment of international exchanges and virtual collaboration will further enrich our educational ecosystem, ensuring that the benefits of STEAM education are far-reaching and inclusive.

This report highlights the achievements and positive outcomes of the pilot phase, setting a solid foundation for future growth. We remain committed to building a sustainable and dynamic STEAM ecosystem that will continue to inspire and equip the next generation of innovators and leaders.



REFERENCES AND APPENDICES



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British Council and National Education Trust (2021). National STEAM Education Report Jamaica: Towards Developing a Strong STEAM Ecosystem. Prepared by Dr. Andre' Coy. Kingston: British Council.

Appendix

- Appendix 1 Top Level Approach Diagram
- Appendix 2 Sample Teacher Guide
- Appendix 3 Sample Assessment
- Appendix 4 Sample Activity
- Appendix 5 Innovation Challenge
- Appendix 6 Innovation Challenge Timeline

THANK YOU!

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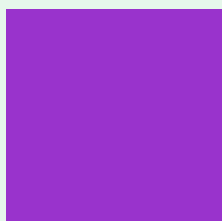
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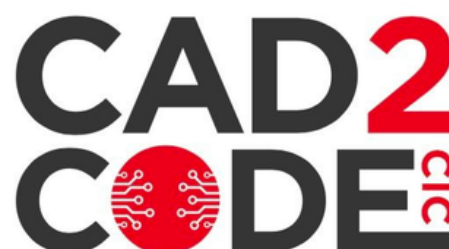
PARTNERS WITH STEMUNITY



Since 2019, STEMunity have collaborated with Leonie at Amazelab to develop the 5PARK pack, designed to bring accessible, engaging activities to young people. This initiative supports the development of Engineering Habits of Mind both in school and at home. Our goal is to inspire students to explore, innovate and create, fostering their skills and imagination. Through these activities, we aim to cultivate a lifelong passion for learning and problem-solving in the engineers of tomorrow.



Professional Development Team



Appendix 1: Top Level Approach

Towards Developing a Strong STEAM Ecosystem

Top Level Approach



“STEAM IS THE WAY OF THE FUTURE AND MUST BE INTERWOVEN INTO THE DNA FABRIC OF OUR EDUCATION SYSTEM. THIS APPROACH WILL PUT AGILITY, INNOVATION AND RESILIENCE AT THE CORE OF OUR EDUCATION SECTOR.”



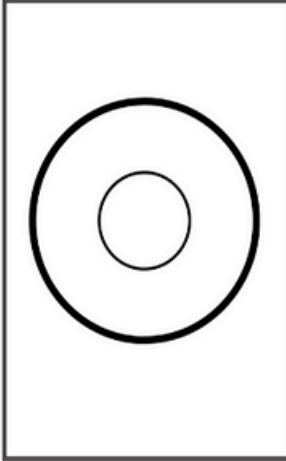
National STEAM Education Report Jamaica: Towards Developing a Strong STEAM Ecosystem 2022



Appendix 2: Sample Teacher Guide

Lesson Summaries

This is an example of how a lesson might look, with suggested thinking-based activities. Feel free to adapt and change these activities to suit the learners in your learning space.

Lesson	Title, Learning Objectives, Driving Questions	Activities and Guidance
1.	<p>Universe in Your Hand</p> <p>Learning objectives Explore the conditions and distance of planets and galaxies to identify a suitable focus for their project.</p> <p>Link and explain ideas of resources and structures that would be necessary to survive and thrive in the chosen location.</p> <p>Driving questions What problems might we face in travelling to the chosen location? How might we design sustainable methods of</p>	<p>Linked Engineering Habits of Mind Skills</p> <ul style="list-style-type: none"> • ASK: Problem finding • PLAN: Systems thinking • PLAN: Visualising • CREATE: Creative Problem-solving. <p>Engage</p> <p>Introduction to Interstellar Travel</p> <p>Begin with a discussion on the concept of interstellar travel and the possibility of inhabiting other planets or galaxies.</p> <p>Show Video 1: Clip about the Virgin Galactic trip to spark interest and curiosity. https://www.virgingalactic.com/#featured</p> <p>Mapping ideas</p> <ul style="list-style-type: none"> • Encourage students to ask questions about the feasibility and challenges of space travel and planetary habitation. • Pose the big question: "Could we have future holidays and the opportunity to inhabit other planets or galaxies? What would we need to do to make this a possibility?" <div data-bbox="582 403 646 952" style="text-align: right;">   <p>CIRCLE THINKING The theme in the middle, the next circle contains your ideas, the outer frame for actions.</p> </div> <div data-bbox="646 448 933 907" style="text-align: center;">  </div>

Appendix 3: Sample Assessment



STEMunity

Process		Engineering ideas and solutions											
Qualities and Abilities		ASK			Imagine a PLAN				CREATE			IMPROVE	
Engineering Design Process		Problem finding	Systems thinking	Systems thinking	Systems thinking	Visualising	Adapting	Adapting	Systems thinking	Adapting	Creative problem-solving	Problem-finding	Improving
What does this look like?		Observing, asking questions, and researching. For example, in Planet Fashion, they might research how current space cut technology supports astronauts.	Research how systems work. For example, in Gardeners of the Galaxy, they might research the requirements for growth of the plant and the stages in which the plants will grow.	Annotate a diagram of their idea to show how it works. In the Space Rover activity, they might consider how the wheels, elastic bands work together for movement.	Idea generation. Using a thinking map such as a circle map to design ideas to solve the problem.	Designing different visuals to show the mechanisms e.g. sketches, computer designs to bring their ideas to life. This skill would fit within the activity, Universe in Young Hand.	Explore a variety of different mechanisms which would produce the same result, for example, in the Space Rover activity, they might consider different methods of placing the elastic band to propel the vehicle.	Consider existing products, such as space suits, for Planet Fashion, and can they take a good idea and adapt it?	Create their model strategically bringing together different elements from their ideas. In Planet Fashion, they might consider the cooling system and the supportive structures in the suit.	When presenting their ideas, they can take the sketch as in Space Rover, and use it to create a 3D model.	Carry out a series of tests to see if their model or experiment has any flaws. For example, in the chromatography, they might decide that certain inks contain fewer pigments and create a less desirable effect.	Review their model or experiment and look for ways they can improve it. In the Plantlet Culture investigation, they might decide to replicate the experiment with different conditions to maximise growth.	

Document below adapted from 'Thinking like an Engineering' Resources from University of Manchester

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Appendix 4: Sample Activity

ACTIVITY ONE ▶▶ UNIVERSE IN YOUR HAND

Design your own space travel poster, using the template and pens provided inviting people to inhabit your new planet or universe. Start planning your travel poster taking into consideration and including:

- Who would live there?
- How would they get there?
- Which galaxy would it be in?
- What would the population eat and how would the food grow?
- Where would they go to school, what jobs would they do?
- How would the planet be powered?

Now design and create your travel poster ready for your new planet or universe.



Scan this QR Code to download the App. You will then be able to view the universe in augmented reality!



Investigate the universe from the comfort of your 5park box! Scan the QR codes on the page to go on an augmented reality journey through the universe, what do you think exists in the universe but is yet undiscovered?

TAKE IT FURTHER

Bring your ideas to life by creating a model base camp for your planet using recycled materials, for example, a cardboard box or any type of cardboard packaging, tissue paper, yoghurt pots or bottle lids. Start to model your planet base camp creating a village on your new planet for people to live in. Make sure to include key buildings and services that would be required for your planet to reach its full potential.



THE SCIENCE

For more information about the science behind this experiment, scan the QR code.



Appendix 5: Innovation Challenge



STEMunity

STEAM ECOSYSTEM

INNOVATION *Challenge*

You've developed your Engineering Habits of Mind, completed some high level STEAM learning. Now you are going to apply that learning to compete in the national final STEAM Competition.

Pick one problem faced by your community and design a solution/prototype to solve that problem.

- Take lessons from your 5PARK Challenges
- Consider how this idea or prototype could improve life in your community.
- Think about the cultural context in which your idea will support.
- Think like an engineer but don't forget to be creative and include high quality aesthetics.

Students to work in groups, their final Innovation Challenge project will be presented to judges at the Exhibition on **Wednesday 8th May 2024**, awards will be given for: Collaboration, Innovation, Creativity, Entrepreneurship, Systems Thinking

Final ideas should be ready to submit on the template by **29th April 2024 5 pm**

Submit 

Appendix 6: Innovation Challenge timeline

