Dedicated Funding Programme for Publicly-funded Schools

Project Number:	2020/0077
Name of School:	聖傑靈女子中學 St. Catharine's School for Girls
Project Title:	STEM 創客教室 Establishment of STEM Room
Beneficiaries:	Secondary
Estimated Number of Direct Beneficiaries:	Student:890 Teacher:62 Parent:0 Others (Please specify): 0

1. Project Needs

1.1 Project aim(s)

STEM education is a curriculum based on the idea of educating students in four specific disciplines: Science, Technology, Engineering and Mathematics. This project aims at renovating the Multimedia Learning Centre into a STEM room furnished with STEM equipment and resources. The learning via multimedia will not be affected while the teaching and learning are expected to be enhanced. With the use of STEM Room, school-based STEM curricula in and across different subjects will be refined. Implementing the learning of CLO, a 3D fashion design software program in Technology and Living lessons is one of the curriculum highlights. Intra-curricular and extra-curricular learning activities will be organized to promote STEM education among students. Inter-school competitions for primary schools will be held to raise awareness of STEM education in society and forming close network with partner schools. These help to facilitate students' inter-disciplinary knowledge and develop their lifelong learning skills. Another aim of the project is to train teachers, laboratory technicians and other non-teaching staff to teach STEM education sustainably, to help to develop skills and teaching experience for further planning of STEM curriculum.

1.2 School-based innovative element(s)

The project encourages students to have hands-on experience in different learning activities of different subjects. The key innovative elements are the cross-curricular collaborations among panels and the incorporation of STEM equipment and software in lessons and activities. Learning activities will be based on topics of a KLA for students to integrate relevant learning elements from other KLAs, such as the application of micro:bit in designing rocket cars, the use of CLO in creating garment visualization, the understanding of scientific concepts through Virtual Reality(VR) experience, building devices with the help of electronic building blocks through problem-based learning, engineering the hologram etc. The tasks are daily-life driven and innovative which can arouse students' interest and strengthen their abilities to integrate and apply knowledge and skills.

For the activity highlight, Inter-school Artificial Intelligence(AI) motor car competition will be organized for primary schools. Senior form student helpers will be trained with the skills of AI device and micro:bit thus building solid foundations in guiding the participants of the primary schools to take part in the competition. They take the role of torch-bearers, handing on the flame of STEM knowledge to the juniors.

1.3 Meeting with school-based/students' needs

Item: Relevance to the school development plan of this cycle/major concern

One of the major concerns of the school's three-year development plan (2018-2021) is "to further strengthen students' positive values through the acquisition of life planning skills." and "to maximize the opportunities for students to unleash their potentials and to acknowledge students' accomplishments" is one of the strategies. Through incorporating STEM element into Science, Technology and Mathematics education, students' exploration and horizon will be widened through different varieties of inquiry-based learning activities, allowing students to emerge beyond the boundary of the textbooks and the scripted curricula.

The other focus of the school's three-year development plan is "To further enhance students' and teachers' capacity for life-long learning". STEM training workshops help to equip teaching and non-teaching staff with STEM-related knowledge and skills which are crucial to foster the on-going professional development and to create a collaborative environment among colleagues.

2. Project Feasibility

2.1 Key concept (s)/rationale(s) of the project

Item: Rationale

The rationale of this project comes from the suggestions stated in the "Report on Promotion of STEM Education - Unleashing Potential in Innovation" (December 2016) released by the Education Bureau. The main points include:

- Renewing the curricula of the Science, Technology and Mathematics Education Key Learning Areas (KLAs)
- Enriching learning activities for students
- Enhancing professional development for schools and teachers

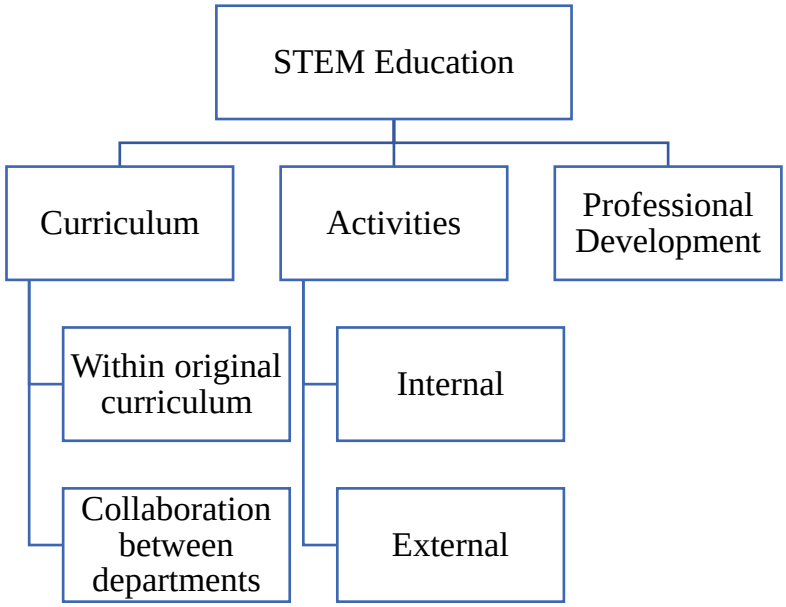
The project also takes reference from the exemplars and suggestions stated in the "2018/19 Inspection Annual Report" released by the Education Bureau. The main points include:

- Adopting a three-tier implementation model, comprising a school-based whole-class approach, a school-based pull-out enrichment programme and off-site support
- Emphasizing cross-curricular collaboration
- Using a diverse range of assessment modes

Item: Objective

The STEM room provides extra opportunities to equip students with STEM skills to meet the changes in the society and the rapid economic, scientific and technological developments around the world in 21st century. It is also furnished with computers and equipment which not only allows teachers and students to have lessons with adequate support, but also provide spaces for students to integrate and apply knowledge and skills across different STEM disciplines, thus to nurture their collaboration and problem-solving skills, as well as to foster their innovation spirits.

Framework of School-based STEM education



Item: School-based whole-class approach: Refinement of original curricula

The curricula of Science and Technology education will be reviewed with STEM element embedded. For the Technology and Living department, it is planned to implement the teaching of CLO in junior and senior form curricula. CLO is a 3D fashion design software that builds virtual, true-to-life garment visualization with cutting-edge simulation technologies for the fashion industry. S3 Students will learn the foundation skills in creating 3D virtual garment thus allowing them to execute the 3D products in senior form. Beyond the reach of simple hands-on activities, CLO can augment STEM learning by allowing students to simultaneously simulate their designs, adjust design variables and material coefficients and engage in iterative design optimization at zero cost. Students get ahead of all of these and have designers work on the 3D blocks that have actual patterns associated with it, all without having to create a physical sample until the last stage. This can facilitate students' infinite creativity with technology and drive forward a learning transformation of fashion design through digitalization. More than focusing on the virtual 3D design, the application of laser cutter in garment construction will be demonstrated in the lessons. This allow students to explore the laser technology and allow them to understand that laser cutter can cut or engrave a complex shapes and design into various fabrics. On the other hand, VR will be used in the Science education. The aim of the use of this technique is to enhance students' learning and engagement by transforming the way educational content is delivered. Students will be immersed in the virtual tour of visiting greenhouse, launching of rocket and space exploration space travel which motivate them to understand and learn.

Item: School-based whole-class approach: Collaboration

Beyond teaching the core knowledge, collaborations among panels will be carried out. Science and Computer departments will work together through the project of the application of micro:bit. Students learn and consolidate the programming knowledge with the use of micro:bit during the computer lessons. The skills to automate, collect, manage, calculate, analyze the processing of data and information can be applied in designing a rocket car for the scientific investigation project. Furthermore, the project of Physics and Mathematics departments guide students to apply the concept of light

reflection and triangle theorem in making hologram. Inquiry-based learning trains students with the Engineering design thinking process and gives them a sense of satisfaction.

Item: Activity highlight: Formation of networks for learning and development across school education

Inter-school AI motor car competitions for primary schools will be organized for the promotion of STEM education and the understanding of the development and execution of STEM curriculum in local primary schools. This programme helps to cultivate STEM literacy with partner schools and establish a STEM education network of bonding and linkage. More than that, student helpers will be trained with the skills of incorporating AI technology into micro:bit in the process of engineering the motor cars. Acting as student teachers, they take the role of torch-bearers, handing on the flame of STEM knowledge to the juniors.

2.2 School's readiness

Item: School

The school has successfully completed nine QEF projects in the past and have experienced personnel in managing and implementing QEF projects.

Item: Relevant training received/qualifications and experience acquired by teaching staff

In teacher level, the STEM coordinator is the degree holder of Master of Education, specialist in STEM education and three middle managers have joined the Intensive Training Programme on STEM Education. These programmes equipped them with an in-depth understanding of theoretical and practical issues surrounding STEM and strengthen their capacity in leadership and organization skills in planning and implementing school-based STEM-related activities with focus on holistic curriculum planning and cross-KLA or cross-subject collaboration.

Item: Curriculum highlights

In 2018/19, our school has joined the Professional Development Schools (PDS) Scheme for the promotion of STEM education through school-based Science and Biotechnology curriculum. Through the diversification of

inter-school activities such as collaborative lesson planning and peer lesson observations, teaching experience and resources sharing, the teachers and laboratory technicians succeeded in enhancing their professional capacity in the field of biotechnology and enriching their experience in planning the implementation of biotechnology experiments in junior and senior curricula.

In 2017/18, Scientific Investigations lessons have been implemented in S2 Science curriculum. This specially designed curriculum aims at arousing the interest of S2 students in learning science, consolidating scientific thinking & process skills, such skills equip them to move forward in the search for and integration of scientific knowledge. The learning & teaching strategies are mainly investigation-based, with scientific thinking & process skills infused and STEM learning elements integrated. On the other hand, Computer department implemented the teaching of programming skills using Scratch in S2 regular curriculum. The infusion of the skills in programme with micro:bit in S2 and programming with mBot in S3 curriculum started in 2019/20 and 2018/19 respectively. These help students to build solid foundations in coding, bridging them to carry out a higher-order thinking tasks in the future.

Item: Club and Society

Several STEM-related clubs and societies are established:

- STEM Society: To organize school activities during lunchtime or after school which increase students' exploration in STEM education.

- Makers'& Robot Club: A club that provides students time, resources, and space to design, play, tinker, collaborate, inquire, mentor, experiment, solve problems and invent with the use of micro:bit and Arduino.
- Green Society: Green fashion show is organized in cooperation with other schools. Through the merging of the elements of Design and Engineering, it provides students with an opportunity to put what they have learnt about environmental protection into practice and to enhance their creativity.
- Gemstones Club: Using the knowledge of Physics, Mathematics and Geology, students learn the skills to grade gems and identify them as synthetic or natural. This helps students who wish to be a gemologist or gem appraiser to build solid foundations.

Item: Students' Achievement

Students had joined different varieties of STEM-related extra-curricular activities and attained awards:
- 2nd runner-up in the 1st SKH Secondary Schools 3D-printed Robot Competition
- 1st runner-up in 2018/19 Geocaching Competition
- "Creative Award" winner in The First Ocean Park International Conservation STEAM Competition
- Green and Design Award in 2018/2019 Green School Program – Captain Green Scheme STEM Eco-Model Car Competition

Some students participated in '2019/20 Learning STEM through 3D Virtual Fashion Design Competition'. They used CLO, the 3D fashion software to work on design project. They were in the finalist of the competition. One of the student products is shown below (Fig.1):

Figure 1. a student's product

The learning process of the participation of the competition allowed students to self-pace their STEM adventure which piqued their interest and enthusiasm in applying STEM knowledge and skills to solve real-life problems.

2.3 Principal and teachers' involvement

School Staff: Principal and Vice principal **Duties:** Monitor and supervise, Coordinate / collaborate
School Staff: STEM Committee, including the heads of Science, Computer, Mathematics and Technology and Living panels **Duties:** Formulate plans, Monitor and supervise, Coordinate / collaborate, Plan curriculum / activities, Conduct / participate in activities, Be the Project Leader, Coordinate lesson design and development, Revise the school-based curriculum, Monitor progress and quality, Monitor the budget and expected project outcomes, Evaluate project progress and effectiveness regularly
School Staff: Teachers of STEM-related departments, Teachers-in-charge of Club and Society **Duties:** Conduct / participate in activities, Consolidate learning and teaching materials
School Staff: Laboratory technicians, Technology supporting staff and Teaching assistants **Duties:** Conduct / participate in activities, Consolidate learning and teaching materials, Provide support for all teaching activities, Review experiment activities,required apparatus and teaching materials, Maintenance of equipment

2.4 Project period

Project Start Date and End Date: from 08/2021 to 08/2023
The project lasts for 2 year(s) and 1 month(s).

2.5 Details of project activities

a. Project implementation measures

Activity 1: 1.1. Science department: Use of data loggers in scientific investigation

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science	• To arrange learning activities for S1 and S2 students: • - In Unit 2 Water, students will carry out an investigation of the change of temperature during melting of ice and find out the differences of the result if ice cubes are used instead of crushed ice. • • S2 students: • - In Unit 11 Force and Motion, students will plot distance-time graph of a trolley and investigate	• 4 periods per class, total 140 min

	how different factors affecting the speed using motion sensor.	

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Science teachers with relevant knowledge and experience

Expected outcomes:

- - S1: Students can recognize that temperature of water remains unchanged during the change in states and consolidate the concept of fair test.
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- - S2: Students are able to interpret the results of distance-time graph and identify how factors, like weight and inclined angle affect the speed of the object.

Activity 2: 1.2. Science department: VR experience of fertilization to baby development

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science	• To arrange learning activities for S1 students: • - In Unit 4 Cells, human reproduction and heredity, the processes of fertilization and baby development are invisible to students. Students will be provided with VR headsets to have a deeper understanding about the details of zygote fusion and the growth of baby in mother's uterus.	• 1 period per class, total 35 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Science teachers with relevant knowledge and experience

Expected outcomes:

- - Students become more motivated to learn and thus enhance engagement.
- - Students are able to recognize the detailed process of fusion between sperm and egg and the development of the embryo inside the mother's body and the birth of a baby.

Activity 3: 1.3. Science department: Building a solar powered robot

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science	• To arrange learning activities for S1 students: - In Unit 5 Energy, students will be learning the concept of energy conversion. In order to consolidate the knowledge, students will be building 3 types of solar powered robots using the same set of components. Without a standard manual, students can build 3 modes of robots using their creativity and spatial awareness. In rolling and walking modes, students learn the energy change from electrical to kinetic energy. In rope-climbing mode, the energy converts from electrical to both kinetic and potential energy. Through this activity, students are able to master their skills in connecting simple circuit, enhance their learning in energy conversion and assemble their creations using engineering skills.	• 2 periods per class, total 70 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Science teachers with relevant knowledge and experience

Expected outcomes:

- - Students are able to understand the concept of energy conversion and simple circuit system using model simulation.
- - As the robot can be switched between rolling, walking and rope climbing modes, students develop the mechanical skills in assembling a new mode of robot using the same materials through trials and errors.

Activity 4: 1.4. Science department: VR interactive module of riding roller coaster

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science	• To arrange learning activities for S1 students: • - In Unit 5 Energy, students will be provided with VR headsets to have a ride in roller coaster. • - Changes between kinetic and potential energy in each point of the running track will be shown during the ride of the roller coaster. • - VR interactive assessment will be done.	• 1 period per class, total 35 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Science teachers with relevant knowledge and experience

Expected outcomes:

- - Students learn and understand the transformation between kinetic and potential energy in relation to the change of height.
- - The concept of energy conservation is consolidated: showing that energy cannot be created or destroyed.
- - Students become more motivated to learn and thus enhance engagement.

Activity 5: 1.5. Science department: VR virtual tour of the greenhouse and zero carbon building

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science	• To arrange learning activities for S2 students: • - In Unit 7 Living things and air, students will be provided with VR headsets to explore how different systems in greenhouse facilitate the photosynthesis of plant and how different facilities, such as vertical green and photovoltaic panels in zero carbon building help to maintain zero net emission of greenhouse gas per year.	• 1 period per class, total 35 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Science teachers with relevant knowledge and experience

Expected outcomes:

- - Students are able to identify the factors affecting the rate of growth and photosynthesis of the plant, such as temperature, humidity etc.
- - Students learn the principal of the green facilitates, such as how to remove pollutants in the air to mitigate the effects of air pollutant and how to capture sunlight for generating electricity without the release of carbon dioxide.

Activity 6: 1.6. Science department: Making simple model with electronic building block

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science	• To arrange learning activities for S2 students: • - In Unit 8 Making use of electricity, students will be provided with construction kits of electronic building block. They need to build several models to solve daily-life problems, such as metal detector and intruder alarm etc. The procedures of the lesson are as follow: • a. Step 1: Provide students with a scenario • b. Step 2: Brainstorm of ideas • c. Step 3: Constructing an Algorithm • d. Step 4: Build a device using electronic building block • e. Step 5: Evaluation	• 2 periods per class, total 70 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Science teachers with relevant knowledge and experience

Expected outcomes:

- - Through problem-based learning, students are trained to apply Engineering design process which is an important scientific method in STEM-related problem-solving projects.
- - To strengthen students' logical thinking through constructing Algorithm.

- - Students are able to identify and understand the application of building blocks/modules of the electronic systems including the input, processing and output devices.
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- - Students can also learn the functions of common components in a pneumatic system and recognize the related
- symbols.

Activity 7: 1.7. Science department: VR experience: Launching of rocket and space exploration

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science	• To arrange learning activities for S2 students: • - In Unit 11 Force and motion, students will be provided with VR headsets to see how emission of gas helps in launching the rocket and have a virtual tour of the universe.	• 1 period per class, total 35 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Science teachers with relevant knowledge and experience

Expected outcomes:

- - The concept of action and reaction can be consolidated and explore the knowledge about the main planets in space.

Activity 8: 2.1. Technology and Living department: Use of CLO in 3D fashion design

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Technology • Key Learning elements: 1. Features of 3D CAD "CLO" 2. Operating environment 3. Workflow of making 3D garment 4. Pattern Tools 5. Fabric 6. Special sewing types	• To arrange learning activities for S3-S5 students: • S3: - To understand the theories of fashion design principles: proportion, emphasis, formal and informal balance, contrast and harmony.	• S3: 10 periods per class, total 350 min • S4: 8 periods per class, total 280 min

7. Design elements 8. Mannequin 9. Background and rendering 10. Self-practice sessions 11. Project work	- To understand the theories of fashion design elements: colours, lines, silhouette, fabric patterns and textures, fashion details and features. - To use the 3D VR skills to design captioned garment: 1. to understand the features of the 3D operating environment. 2. to understand the workflow of 3D garments, the skills of CLO, for creating 3D VR clothing. 3. to design 3D VR clothing individually to review students' learning of the design processes which involve the design principle and design elements. • S4: - To understand the theories of fashion design principles: proportion, emphasis, formal and informal balance, contrast and harmony, unity, repetition, radiation, gradation and scale. - To understand the theories of fashion design elements: colours and colour groups, lines, silhouette, fabric patterns and textures, fashion details, fashion features and garment types. - To further enhance the 3D VR skills to desisgn different garments: fabric pattern & texture tools, special sewing process, the use of mannequin. S5: - To further enhance the 3D VR skills to design different garments: fabric pattern & texture tools, special sewing process, the use of mannequin.	• S5: 10 periods per class, total 350 min

	- To enhance their design and rendering background. - To self-practice all 3D VR skills - To work out a design folio for the School-based Assessments which include students' researches, mood boards, styling boards, design specifications and design illustrations through 3D CLO skills.	

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Technology and Living teachers with relevant knowledge and experience

Expected outcomes:

- S3: Individual design illustrations of outfits consist of a T-shirt and a summer skirt with different patterns and colours. A display of the design illustrations will be exhibited to show the learning outcomes.
- S4: Formation of the individual design illustrations of different outfits with different patterns and colours. An exhibition of design illustrations and finished garments will be held.
- S5: Formation of the individual design portfolios and the physical garments. Students can choose to submit their CLO products as their School-based Assessments of DSE.

Activity 9: 2.2. Technology and Living department: Garment and clothing construction by laser cutter

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Technology: for specific edge finishing for engraving fabric surface	• To arrange learning activities for S4/S5 students: - To understand the purposes of edge finishes. - To understand different methods of edge finishes for different weight and thickness of fabrics. - To understand the trendy fashion with laser-cut edges/patterns. - To understand the uses of laser cutting: Neatening and engraving	• 3 periods per class, total 105 min

	- To demonstrate the use of laser cutter to cut and neaten the raw edges of fabric, especially for a very thin fabric. - To demonstrate the use of laser cutter to engrave fabric to create different patterns, especially for a very thick fabric.	

Number of school personnel and/or appointed project staff involved and respective duties:

- S4/S5 students: To design and make a patterned fabric by laser cutting. It is an annual topic for senior Technology and Living students.

Expected outcomes:

- - Students are able to finish a physical garment with extreme accuracy, clean cuts and sealed fabric edges to prevent fraying.

Activity 10: 3.1. Computer department: Programming with Minecraft

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Technology	• To arrange learning activities for S2 students. The learning and teaching procedures of 13 tasks are as follows: - Tasks 1 – 5 are for students to familiarize the programming with blocks to control the worker and “repeat” is introduced to reduce the number of blocks used. - Starting from task 6, there are varieties in fulfilling the tasks. For each task, students are required to design at least two solutions to solve the problem. - Using the minimum number of blocks to fulfil the basic requirement of the task. - Using the minimum number of blocks to finish all the jobs (Example: find all the items,	• 4 periods per class, total 140 min

	mine all the coal/iron blocks etc.) - Starting from Task 11, selection of "if" is included. - After finishing Task 6 – 13, students work in pairs/groups to comment on each one's program (Criteria: Use the least number of blocks to do the most amount of work).	

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Computer teachers with relevant knowledge and experience

Expected outcomes:

- Students should be able to use block programing technique to control the worker.
- Students should be able to use "repeat" to minimize the number of blocks used in their programs.
- Students should be able to use the selection of "if" to trigger appropriate actions.
- Students should be able to describe and reflect how well a program is designed (use the least number of blocks to do the most amount of work).

Activity 11: 3.2. Computer department: Programming with micro:bit

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Technology	• To arrange learning activities for S2 students. The learning and teaching procedures are as follows: - To provide basic to advanced micro:bit programming training for students to design projects using micro:bit. - 6 tasks printed on worksheets will be given to students that involve the micro:bit block programming techniques of output, input, use of variables, conditional statement, loops, mathematics and event timestamp.	• 4 periods per class, total 140 min

	- After finishing the first task, the methods of uploading the micro:bit programs to micro:bit will be introduced: 1. From micro:bit website (desktop/laptop computers) to micro:bit through USB cable 2. From micro:bit App (iPad/tablet) micro:bit through bluetooth - After finishing the basic requirements of each task, students are encouraged to make use of what they have learnt to program the micro:bit. - Students are also encouraged to work with their classmates to finish the tasks or try out their own programs.	

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Computer teachers with relevant knowledge and experience

Expected outcomes:

- Students should be able to upload the micro:bit programs from desktop/laptop computers (micro:bit website) to micro:bit through USB cables.
- Students should be able to upload the micro:bit programs from iPad (Apps version) to micro:bit through blue-tooth.
- Students should be able to use micro:bit block programming to output the built-in display options and musical notes: Built-in output blocks (display string/number/icon/arrow and play tone) and Control block (Pause).
- Students should be able to use micro:bit block programming to input in different ways: Event driven (on pressing A/B/A+B button, pins 0/1/2 and light level, shake etc.).
- Students should be able to use micro:bit block programming to manipulate variables and do calculations.
- Students should be able to use micro:bit block programming selection tasks (if-then, if-then-else).
- Students should be able to use micro:bit block programming to perform iteration tasks (repeat-times-do, while-do).
- Students should be able to use micro:bit block programming with timestamp.

Activity 12: 3.3. Computer department: Programming with Scratch

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Technology	• To arrange learning activities for S3 students. The learning and teaching procedures are as follow: - A catch-ball game will be used to introduce some basic scratch block programming techniques of creating a game. - The basic elements of creating a game will be introduced while working on developing the catch-ball game. - The scratch block programming techniques are introduced while working on developing the catch-ball game. - After finishing the catch-ball game, students are required to add features to the game, for example falling with different speeds and adding different levels to the game. - Each student is required to provide a story for her game to make her game more meaningful to be played. - After the new games are finished, students will be given time to present their games to their classmates.	• 8 periods per class, total 280 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Computer teachers with relevant knowledge and experience

Expected outcomes:

- Students should be able to describe the basic elements of designing a game: Game start (to initialize the game by setting the score to 0, positioning the sprites to their starting position, hiding/showing different sprites/backgrounds etc.), Problem (automatically performed by the pre-set program),

Player's task (to control the sprite to catch the ball and avoid the ball from hitting the ground) and Game end (the ball hits the ground, "Game Over" is shown and everything stops).

- Students should be able to apply the event, motion and sensing Scratch programming blocks to control the movement of the sprites.
- Students should be able to apply the control Scratch programming blocks (forever, if-then, wait, stop etc.) to control the flow of the program.
- Students should be able to apply the event Scratch programming blocks of "broadcast" and "when I receive" to trigger actions from one sprite to other sprites.

Activity 13: 3.4. Computer department: Programming with mBlock and mBot

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Technology	• To arrange learning activities for S3 students. The learning and teaching procedures are as follows: - Introduction to the mBot and mBlock: Structures of the mBot and the use of mBlock to connect the mBot with trouble shooting techinques. - After finishing the basic requirements of each task, students are encouraged to modify the task and make it more challenging, for example rearranging the maze. - Students are also encouraged to work with their classmates to finish the tasks and try out their own ideas in programming the mBots.	• 8 periods per class, total 280 min

Number of school personnel and/or appointed project staff involved and respective duties:

- To be taught by Computer teachers with relevant knowledge and experience

Expected outcomes:

- Students should be able to describe the basic structure of the mBots (Different sensor positions, different ports and related pins etc.).
- Students should be able connect to the mBots to desktop/laptop computers through mBlock app and USB cable.

- Students should be able to perform basic direct control of the mBots from desktop/laptop computers through mBlock app and USB cable.
- Students should be able to control the mBots directly / design programs to fulfill the following tasks:
    1. Display different LED light signals.
    2. Compose simple songs with the musical notes.
    3. Maze task: Players use the light sensor to control the mBot.
    4. Maze task: mBot uses the ultrasonic sensor solve the maze problem.
    5. Line-follower task using different paths.
- Students should be able to carry out calibration for the sensors and moving parts to make fine adjustment.

Activity 14: 4.1. Collaboration between Science and Computer department: Rocket car competition

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science and Technology	• Mode of collaboration: S2 students will learn the concept of programming micro:bit in computer lessons and the knowledge will be applied in designing the rocket car in science lessons. Computer teachers will take the initiative to provide professional knowledge in teaching micro:bit to Science teachers. • To arrange learning activities for S2 students. The learning and teaching procedures are as follow: - To learn about the Newton's Third Law (the concept of action and reaction) through experiments and discussion. - To learn about the concepts of friction including how friction resists the relative motion of solid surfaces, causes energy loss and applies in daily life.	• Total 240 min

	- To explore factors affecting the amount of air resistance through the air-brake car activity. - Using the computer simulation software to calculate drags and lifts and test different aerodynamics designs. - To understand the applications of infrared and infrared sensors on the micro:bit timing gate. - To apply the knowledges learned and use the computer simulation software to facilitate the design of a model rocket car. • STEAM for all Fun Day in post-exam activity: "Race to the line" competition.	

Number of school personnel and/or appointed project staff involved and respective duties:

- Role of teachers: teaching the concepts and conducting the competition.
- To be taught by Science and Computer teachers with relevant knowledge and experience. To be supported by company with technology project running experience.

Expected outcomes:

- To foster students' strength in scientific investigation and STEM education through inquiry-based learning.
- To allow students to apply interdisciplinary knowledge e.g. Using the computer simulation software to design the shape of a model rocket car, using wind tunnel experiment to understand the concepts of drag and lift to further evaluate the design of the rocket car and understanding the application of the micro:bit scientific data logger including measuring and collecting performance data of the model rocket cars for analysis.

Activity 15: 4.2. Collaboration between Mathematics and Science department: Making hologram

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science and Mathematics	• To arrange learning activities for S3 students: • - By applying concepts of reflection and triangle theorem, students are guided to make	• 4 periods, total 140 min

	their own holograms to project a virtual 3D image.	

Number of school personnel and/or appointed project staff involved and respective duties:

- Role of teachers: teaching the principle and guiding the students to finish the products.
- To be taught by Mathematics and Physics teachers with relevant knowledge and experience.

Expected outcomes:

- -To consolidate the concepts of light illusion and geometry. To train students with the Engineering design thinking process.

Activity 16: 5.1. Activities organized by STEM Society

Implementation Period:

09/2021 - 07/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science, Technology and Mathematics	• To arrange extra-curricular activities for all students: • - STEM fair at school: Game booth from different departments to promote subject-based STEM knowledge • - STEM courses in Mobile classroom: Brain wave idea controlling mindlink spider and Minecraft coding • - F.1 AI Motor car competition	• During lunchtime or after school

Number of school personnel and/or appointed project staff involved and respective duties:

- To be coordinated by Teacher-in-charge of STEM Society with relevant knowledge. To be supported by company with technology project running experience.
- Role of teachers: Planning of the rundown, Coordinating the preparation work of each activity and providing advice for evaluation.
- Role of service provider: Providing equipment, tuition, after-service and technical support to both students and teachers.

Expected outcomes:

- - To build an atmosphere for students to explore STEM education in out-of-timetable sessions. To provide opportunity
- for meaningful STEM learning and for students to engage in.
- - To develop students' sense of responsibility by acting as student teachers.

Activity 17: 5.2. Activities organized by Makers' and Robot Club

Implementation Period:

09/2021 - 08/2022

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science, Technology and Mathematics	• To arrange extra-curricular activities for all students: • - Training workshop for students to join STEM-related competitions. • - Organize Inter-house mBot competition	• 900 min Training workshop per academic year

Number of school personnel and/or appointed project staff involved and respective duties:

- To be coordinated by Teacher-in-charge of Makers' and Robot Club with relevant knowledge. To be supported by company with technology project running experience.
- Role of teachers: Planning of the rundown, Coordinating the preparation work of each activity and providing advices for evaluation.
- Role of service provider: Providing equipment, tuition, after service and technical support to both students and teachers.

Expected outcomes:

- - To build an atmosphere for students to explore STEM education in out-of-timetable sessions.
- - To provide opportunity for students to engage in the meaningful STEM learning.

Activity 18: 6. Forming local Primary School Network

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science, Technology and Mathematics	• To arrange STEM booths on Open day for primary schools: • - Molecular gastronomy workshop • - Constructing 3D model by 3D pen and 3D printer • • To arrange Inter-school AI motor car competitions for primary schools:	• One day for the Open day • 6 hours workshops for student helpers • 5 hours workshops for participants from primary schools • 3 hours competition

	• - Step 1: Provide training workshops for student helpers to learn the incorporation of AI technology into micro:bit • - Step 2: Approach at least 5 primary schools to join the programme • - Step 3: Provide training workshops for participants from primary schools • - Step 4: Hold competition • - Step 5 (Optional): Provide sharing sessions in primary schools and collaborate with partner schools	

Number of school personnel and/or appointed project staff involved and respective duties:

- To be coordinated by Teacher-in-charge of STEM committee with relevant knowledge. To be supported by company with technology project running experience. The trainer is required to have relevant qualification and at least 3 years of experience in training of STEM workshop.
- Role of teachers: Planning of the rundown, recruiting participants, bridging the communication between primary schools, coordinating the preparation work of the activity and providing advice for evaluation.
- Role of service provider: Providing equipment, tuition, after service and technical support to both students and teachers.

Expected outcomes:

- - To form linkage with primary schools to promote STEM education and provide support services to a cluster of partner schools.
- - To enhance elite students' hands-on skills. To sharpen students' generic skills by providing social service.

Activity 19: 7. STEM sharing session

Implementation Period:

09/2022 - 08/2023

Key learning stages and key learning areas/subjects/learning elements	Content	Number of sessions
• Science, Technology and Mathematics	• - Sharing session will be organized for the whole school during the Assembly at the end of the school year. The sharing session will include students'	• Assembly 70 min • 45 min during lunchtime

	sharing and product displays which aim at summarizing the project activities, consolidating students' learning experiences and showcasing their learning outcomes. • - Product display will be carried out in the STEM Fair to allow participants of the activities to execute their learning outcome.	

Number of school personnel and/or appointed project staff involved and respective duties:

- To be coordinated by Teachers-in-charge of STEM Committee.

Expected outcomes:

- - This event can showcase students' learning outcomes, recognize their achievements and encourage them to explore further.

b. Teacher training (if applicable)

Activity 1: Teachers' training workshop

Implementation Period:

09/2021 - 08/2023

Content:

- Teachers' training workshops will be organized for teachers of STEM related subjects. They can choose one or more than one sessions. The content includes:
- - Design and evaluation of STEM learning activities
- - Programming Training on Scratch
- - Electronic Circuit Design and IoT Applications using micro:bit and AI
- - AR/VR Design and Programming
- - 2D and 3D model design by 3D pen, 3D printer and laser cutter
- - Drawing 2D and 3D graphics with Wacom stylus pen and designing 3D sculptures

Number of sessions:

- 6 sessions

Teacher training conducted by school personnel/external instructor(s):

- Conducted by hired training instructor/speaker

Expected outcomes:

- Teachers can understand the curriculum planning of STEM education and the design and focus of the STEM learning activities. They also possess the skills of using the STEM related equipment.

Activity 2: Teachers' training workshop of CLO

Implementation Period:
09/2021 - 08/2022

Content:

- Teachers' training workshop will be organized for teachers of the Technology and Living department.
- - Illustrate the basic features and operation environment of 3D computer-aided design (CAD).

Number of sessions:

- 4 sessions

Teacher training conducted by school personnel/external instructor(s):

- Conducted by hired training instructor/speaker

Expected outcomes:

- Teachers can apply the 3D CAD "CLO" in creating and incorporating design features of virtual fashion garments.

c. Other measures and activities (if applicable)

2.6 Budget

a. Staff cost

Post title	Full-time equivalent	Appointment requirements	Monthly salary	Mandatory Provident Fund	Employment period (months)	Amount($)	Justification
Teaching assistant	1.0	The candidate should have a university degree in IT-related discipline.	13000	650	24	327,600	In this 2-year project, the teachers of the STEM Committee take the extra role in formulating new plans of the school-based STEM curriculum and activities. More than that, evaluations including extra lesson observations and meetings are required to monitor the progress of the project. In order to share the extra workload and to maintain a qualitied teaching in normal lesson, hiring an extra teaching assistant is recommended. The applicant is responsible for: - Mastering in the technical skills of operating, controlling and maintaining the equipment of STEM Room -Planning, implementing, execution of plan and related administrative work -Responsible for

							purchase of materials -Preparing school-based teaching and learning materials -Guiding students to participate in STEM-related extra-curricular activities and extended learning activities, especially for the student activity 5.1 and 6.
Sub-total on staff cost :							**$327,600**

b. Service cost

Item	Service details	Unit cost	Quantity	Unit	Amount($)	Justification
Teachers' training workshop:	- Design and evaluation of STEM learning activities - Programming Training on Scratch - Electronic Circuit Design and IoT Applications using micro:bit and AI - AR/VR Design and Programming - 2D and 3D model design by 3D pen, 3D printer and laser cutter - Drawing 2D and 3D graphics with Wacom stylus pen and designing 3D sculptures. The trainer is required to have relevant qualification and at least 3 years of experience in training of STEM workshop.	780 per hour	66 hours		51,480	Essential for teaching and non-teaching staff to be able to learn the technologies and ways of teaching with the new STEM materials.
Teachers' training workshop of CLO	Teachers' training workshop will be organized for teachers of the Technology and Living department. - Illustrate the basic features and operation environment of 3D computer-aided design (CAD).	780 per hour	24 hours		18,720	Essential for Technology and Living teachers to be able to learn the operation of CLO for teaching S3-5 students in school-based curriculum.

Training workshop for teachers and student helpers of AI motor car competitions	The trainer is required to have relevant qualification and at least 3 years of experience in training of STEM workshop.	780 per hour	30		23,400	Essential for student helpers and participants to be able to learn the application of micro:bit and AI concepts in operating the motor car during competition.
Sub-total on service cost :						**$93,600**

c. Equipment cost

Item	Specifications	Unit cost	Quantity	Unit	Amount($)	Justification
High performance notebook computers	with the following specifications or higher: - CPU: Intel i7-9700K or AMD Ryzen 5 3600 or above - RAM: DDR4 16 GB or higher - At least 4GB of video memory for high-res textures - Latest Nvidia drivers: GRD, Studio, Quadro-ODE - Display: 1920x1080 @ 60Hz - Storage SSD preferred, 20+ GB disk space	15,000	16		240,000	The high-performance notebook computers will be used by students to use CLO to prepare mass number of 3D virtual garment. All S3 students (around 33 students per class) are compulsory to complete the CLO learning in regular curriculum. This specification is recommended by the company of CLO Virtual Fashion for running the CLO software. Moreover, high performance notebook computer is used to prepare mass number of videos and multimedia teaching materials in the constructed platform and support VR learning. Essential for the completion of student activity

						1.2, 1.4, 1.5, 1.7 and 2.1 and the teachers' training workshops.
High performance desktop computers	with the following specifications or higher: - CPU: Intel i7-9700K or AMD Ryzen 5 3600 or above - RAM: DDR4 16 GB or higher - At least 4GB of video memory for high-res textures - Latest Nvidia drivers: GRD, Studio, Quadro-ODE - Display: 1920x1080 @ 60Hz - Storage SSD preferred, 20+ GB disk space	20,000	1		20,000	The high-performance desktop computers will be used by teachers to teach CLO. This specification is recommended by the company of CLO Virtual Fashion for running the CLO software. Moreover, high performance desktop computer is used to prepare mass number of videos and multimedia teaching materials in the constructed platform and support VR learning. Essential for the completion of student activity 1.2, 1.4, 1.5, 1.7 and 2.1 of session 2.7a and the teachers' training workshops in session 2.7b.
Notebook-charging storage cart		30,000	1		30,000	To safely store the notebooks and charge for before lesson.
Interactive smart board with projector		80,000	1		80,000	For conducting lessons
White boards on wall		1000	2		2,000	For conducting lessons
Laser cutter and	Size: 101cm (Height) x 112.5cm (Length)x 72cm (Width) With Unique Fire Alarm, Air compressor, Aluminum Grib Table	80,000	1		80,000	Essential for the completion of student activity 2.2 and the teachers' training workshop.

Fume extractor for laser cutter						To filter the fumes that are created in the process of laser cutting and filter the toxic chemicals ion.
3D printers		10,000	2		20,000	Essential for the completion of student activity 6 and the teachers' training workshop.
Sub-total on equipment cost :					$472,000	

d. Works cost

Item	Works details	Amount($)	Justification
Preparation	construction Protection	4,000	To change the Multimedia Learning Centre to STEM Room. The proposed work will help well optimize the utilization of space. All junior form students (S1-S3) will make use of the room in the Science, Computer and Technology and Living lessons. S4-6 students taking Science subjects and ICT will use the STEM Room to carry out STEM-related learning activities during regular lessons. S4-S5 students taking Technology and Living will make use of the high performance notebook computers and the CLO software purchased in creating garment visualizations. Student members of the STEM Society
Demolition works	To dismantle and raze the original furniture and floor	35,400	
Relocate light and power sockets	To relocate light and power sockets in order to have spacious area for conducting learning activities	165,160	
Refurbish the floor, the ceiling, and the wall	To keep good conditions of the floor, the ceiling and the wall for conducting learning activities.	132,420	
Install graffiti walls	To install a 340cm x 130m graffiti wall in order to facilitate students' group discussion, designing layout plan and planning for assignment progress. Tempered glass made of magnetic material is convenient for students to use magnets to attach notices or large size paper.	25,200	
Purchase of furniture	One glass door	12,000	
	One 6.5-foot-long teacher bench and one chair	20,700	
	Thirty-six sets of trapezium-shape table and chair for students	62,640	
	Two half-height cabinets (total length: 14 feet)	35,600	
	One 7-foot-long working bench	13,000	
	One 4-foot-long cabinet with tool board	20,900	
	One 9-foot-long display cupboard for storing and showcasing students' work	41,040	
	One 8-foot-long wall cabinet	26,040	
	One 8-foot-long half-height cabinets	20,000	
	Eight sets of curtain (total length: 63 feet)	10,000	
Clean-up	Post-construction clean-up to remove all remaining trash and debris	10,800	

			and Makers' and Robot Club will utilize the room for organizing activities at school. The utilization rate of the proposed STEM learning area are higher than 90% of the total students.
Sub-total on works cost :			**$634,900**

e. General expenses

Item	Amount($)	Justification
Licences of CLO software (HK$80000 for the first 10 licences for 2 years, HK$14000 for additional 7 licences for 1 year)	94,000	For conducting student activity 2.1 and the teacher training of CLO.
Consuming materials including Plastic filaments for 3D printing plastic	3,032	For conducting learning and teaching activities
Audit Fee	15,000	
Sub-total on general expenses :		**$112,032**

f. Contingency

Item	Amount($) (Round down to the nearest integer)
Works contingency	63,490
General contingency	19,878
Sub-total on contingency :	**$83,368**

Total amount of Funding: $1,723,500

3. Expected Project Outcomes

3.1 Deliverables/positive impact on the school's development

Item: Enhanced learning atmosphere

This project will help the school to plan and develop school-based STEM education systematically and nurture students to be learners in the 21st century through the establishment of the STEM Room, curriculum development, organizing activities, the connection with primary schools and teachers' development programmes.

Item: Deliverables / outcomes

☑Learning and teaching materials ☑ Resource package

☐ e-deliverables*(please specify) _____

☑ Others (please specify) _____

- STEM Room
- STEM activities
- Teachers' training
- Refined school-based STEM curriculum
- Students' CLO products

*For e-deliverables to be hosted on HKEdCity, please liaise with HKEdCity at 2624 1000.

3.2 Evaluation

Evaluation Method: Assessment for learning

Success criteria:

- Formative assignments, such as worksheets will be given to students to allow them to demonstrate their competence and skills which allow teachers to monitor their learning progress in each level during the activities. Teachers can gain an understanding of their students' knowledge and skills in order to provide positive feedback and guide instruction that will further improve their learning. Moreover, teachers can highlight students' strengths and weaknesses acting as indicators for the future planning of STEM education

Evaluation Method: Assessment of learning

Success criteria:

- Summative assignments, such as questionnaire, survey or quiz, will be given to students at the end of the lessons and activities which allow teachers to monitor their learning outcome. It provides information about the students' achievement and the effectiveness of the learning tasks.

Evaluation Method: Assessment as learning

Success criteria:

- Formative assessment will be given to focus on teaching students' metacognitive processes to evaluate their own learning and make adjustments. Students will be provided with opportunities to present, peer-evaluate and self-evaluate. Through questioning and use of peer feedback, teachers prompt students to think and offer suggestions for improvement on other students' work, thus developing their critical thinking skills. More than that, students looking at their learning and

reflecting on their own abilities act not only as a contributor to the assessment and learning process, but also as the critical connector between them.

- The evaluation items are listed below:
- - The effectiveness of the school-based STEM education programme (success criteria: 80% of the teachers agree that the project helps the school promote STEM education)
- - To help students to learn cross-curricular knowledge and strengthen their problem-solving skills (success criteria: 80% of students are able to solve the questions in post-content assessments by applying cross-disciplinary knowledge)
- - To arouse students' learning interest (success criteria: 80% students agree that the project helps arouse their learning interest in STEM-related subjects)
- - To enhance teachers' professional capacity (80% of the teachers agree that the project can help enhance their confidence in implementing STEM education)

3.3 Sustainability of the project (only applicable to applications with total funding sought exceeding $200,000)

- Activities: By organizing inter-school competitions for primary schools, network and linkage with primary schools are formed. This allows sustainable sharing between local schools in order to further promote the development of STEM education.
- Evaluation and Professional development: By the end of the project, an evaluation meeting will be held for the committee members and the teachers involved. They will discuss how to further develop the school-based STEM education and design learning and teaching activities of different themes. Teachers who are involved in the teaching training could have better foundation knowledge for STEM project development, thus they can carry out professional sharing in regular panel meetings.
- Promotion of STEM education to the society: Our school will celebrate the Emerald Jubilee in 2023/24 and several anniversary programmes will be held. The students' learning outcome can be showcased and the experience in the development of school-based STEM education can be shared with the public on the Open day.
- Usage of the assets: The maintenance fee and the purchase of new equipment of the STEM Room in future will be borne by the school. The school will continue to make good use of the facilities and equipment to conduct learning and teaching activities in order to enrich students' learning experience after the completion of the project.

3.4 Dissemination (only applicable to applications with total funding sought exceeding $200,000)

Item: Learning circle

Curriculum

- Through the school-based whole-class approach for the implementation of STEM curriculum, the school can identify talented and gifted students and offer to them different pull-out enrichment programmes, such as "Scientific Training and Mentoring for STEM Talents" and "Enrichment Programme for Young Mathematics Talents" organized by the Chinese University of Hong Kong to further unleash their potentials in the field of STEM.

- Implementing the teaching of 3D fashion design software, CLO in Technology and Living panel is a curriculum highlight. We serve as the pioneer of the infusion of new element in the existing curriculum. Teachers of Technology and Living departments will initiate to join or hold seminar to share their

experience, the learning outcome of students and evaluation of the project to other schools to help the academia to develop STEM teaching and learning. Moreover, 3D fashion design is the new trend in the fashion industry. Students equipped with the skills in using CLO gain the competitive advantage in their future career pathway of fashion design.
Item: Activity -Through participating in the student helpers' and teachers' training workshops, the AI knowledge is introduced and taught. These workshops consolidate students' and teachers' foundation knowledge of AI. The technical and generic skills can be further applied in the off-site programme: "Design-led STEM (D-STEM) with interdisciplinary practice of Artificial Intelligence and Design" organized by the Institute of Textiles & Clothing and the Hong Kong Polytechnic University which allows students to gain new insight in intelligent textiles and AI applications in design, strengthen their communication skill and innovative techniques.
Item: Seminar/sharing session - The school plans to organize learning workshops and sharing sessions for the teachers and students by the end of the project period so as to showcase students' learning outcomes, share the project experience and tips for implementing STEM learning activities.

When writing this proposal, did the school refer to the sample proposal/project(s) approved with funding support at the Quality Education Fund (QEF) website?

Yes Relevant sample proposal number: S05 Approved project number:

4. <u>Declaration</u>

a. The school will bear all possible consequences resulted from the related school premises alteration/improvement works, including but not limited to the provision of relevant grants, repair works, etc.
b. The school understands that the expenditure items funded by the QEF is one-off. The applicant school is required to bear the recurrent expenditure incurred, including maintenance costs, daily operating costs, etc. and the possible consequences that may arise.
c. The school will ensure that all procurement of goods and services is conducted on an open, fair and competitive basis with measures taken to avoid conflict of interests in the procurement process.
d. The school will provide measures to ensure the safety of the participants of the project activities.

5. Asset Usage Plan

Item/Description	Description and No. of Units	Total cost	Proposed plan for deployment
High performance notebook computers	16	$240,000	The equipment will continue to be used for facilitating learning and teaching of the school after the completion of the project.
High performance desktop computers	1	$20,000	
Notebook-charging storage cart	1	$30,000	
Interactive smart board with projector	1	$80,000	
White boards on wall	2	$2,000	
Laser cutter and fume extractor for laser cutter	1	$80,000	
3D printer	1	$20,000	

6. Report Submission Schedule

The school commits to submit proper reports in strict accordance with the following schedule:

Project Management (Should be submitted via the "Electronic Project Management System" (EPMS))		**Financial Management** (Hard copy together with supporting documents should be submitted to the QEF Secretariat by mail or in person)	
Type of report and reporting period	**Report due on**	**Type of report and reporting period**	**Report due on**
Progress Report 01/08/2021 - 31/01/2022	28/02/2022	Interim Financial Report 01/08/2021 - 31/01/2022	28/02/2022
Progress Report 01/02/2022 - 31/07/2022	31/08/2022	Interim Financial Report 01/02/2022 - 31/07/2022	31/08/2022
Progress Report 01/08/2022 - 31/01/2023	28/02/2023	Interim Financial Report 01/08/2022 - 31/01/2023	28/02/2023
Progress Report 01/02/2023 - 31/07/2023	31/08/2023	Interim Financial Report 01/02/2023 - 31/07/2023	31/08/2023
Final Report 01/08/2021 - 31/08/2023	30/11/2023	Final Financial Report 01/08/2023 - 31/08/2023	30/11/2023