

Plan to Utilise One-off Grant to Secondary Schools for the Promotion of STEM Education
(EDB Circular Memorandum No. 68/2017)
for the Nurturing of STEM Education at LTPSS
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1. Main Objective & Situation

Our objective is to nurture a learning initiative through STEM (*Science, Technology, Engineering & Mathematics*) Education at LTPSS, where students will have exciting opportunities to engage in meaningful real-world, problem-based and subject-integrated learning activities. The continual nurturing of STEM Education at LTPSS (*since 2016*) will not only engage our learners, but it will also provide a strong catalyst for their future ambitions.

Recently, the EDB have been providing HK\$200,000 grants to help Secondary Schools enhance STEM Education (*Circular Memorandum No. 68/2017*) as a means of nurturing student creativity, collaboration, innovativeness, problem-solving skills and overall learning interest with student career prospects in mind.

With the One-off Grant, we would like to pool such resources into STEM activities through the purchasing of materials, equipment, competition applications and external services. Subsequently for the future, we would also like to explore the possibility of redeveloping our current ICT Room 207 into a STEM Room, where customised learning can take place within the realm of STEM and a host of other subjects and applications.

2. Benefits of our Request

- a. Students will have increased opportunity and scope for STEM-based learning; lunchtime activities, CCAs, school-based curriculum and subject weeks
- b. In-house materials to help students train and prepare for external activities and competitions
- c. A growth in synergy of subject panels working together
- d. Good school publicity and selling-point for school; STEM-based products and achievements can be showcased to parents, school community and prospective consumers (including LTPSS Information Days)

3. Grant-based Activities

The table(s) below are an outline of activities we plan on having with respect to the EDB One-off Grant:

Item No.	Item Name and Content of the Activity	Intended Objective(s)	Evaluation	Expenses
1.	STEM Subject Week Activities, CCAs & Competitions for Students	a. Acquire raw materials and produce literature (<i>posters, souvenirs etc</i>) for STEM DAY 2019 activities	Grant was used accordingly to purchase materials for STEM bottle boat project (% DM) as well as for Science (% DWY & LCK). 3D printer warranty (for 207) was extended and extra plastic filament was purchased for the creation of souvenirs (mini bottle boats + rockets) for STEM DAY 2019. Parent visitors really warmed to the idea of 3D printer products and were happy with the souvenirs and products on show.	HK\$4,854.30
		b. Purchase of Makeblock, Arduino, BBC micro:bit and other STEM-based peripheral kits	A set of BBC micro:bit kits were purchased for S1 ICT classes this year, allowing classes of 25 students with their own individual micro:bit. This year has seen the introduction of Arduino in full-force with a heavy purchase of components (via. Taobao), which have been compulsory for S3 ICT and a 'taster' for S1-2 ICT. Arduino was also used as part of CCA (fronted by PCM) to teach a Smart Home Automation unit to students. All-in-all, our students are very warming to the use of Arduino and it is clearly an ecosystem we should continue using in future owing to its versatility and learning potential. A Makeblock Airblock Drone was purchased for ICT project use. Furthermore, the governing body of Tai Po Inno Expo (2/2019) graciously donated \$5,000 to our school for the purchase of Makeblock kits (Ultimate 2.0 and Ranger; MegaPi boards). for the event, thus saving grant money.	HK\$14,807.97
		c. Students participate in external competitions; Grant subsidises student entry	Selected students from S1-4 took part in 2 STEM/Robotics events this year, notably STEM DSS Expo (9/2018) and Tai Po Inno Expo (2/2019) where robotic products of Makeblock and Arduino variants were showcased. There will be another Robotic Exhibit event scheduled for 7/2019 at HKSTP. Since there were no entry fees for student entry, no money was spent in this regard.	HK\$0
		d. Hiring of external companies or individuals to provide STEM-based student workshops for CCA and other activities	The STEM CCA was outsourced this year to J-Magic Ltd for a designated number of Fridays across the 2018-19 school year. As documented (separate cover), contractual agreement disputes arose between J-Magic Ltd and LTPSS, and the contract was ended around 3/2019; unused tuition fees refunded back to parents. Both PCM and DWY stepped up to provide 4 contingency STEM CCA sessions on Arduino Home Automation (3/2019) and Special Physics Experiments (4/2019) respectively as a result. Coach transportation was booked for students for STEM DSS Expo (9/2018) as well as transportation of equipment for Tai Po Inno Expo (2/2019).	HK\$19,495.10

2.	Convert Room 207 into a STEM Room (Curtains, Projection & Equipment)	a. Removal of deprecated smartboard and conventional whiteboard in favour of a new whiteboard projection wall; affix new audio speakers on wall.	Whiteboard wall was successfully installed in Room 207 on 4/2019 (during ELW) by Roxy (Xyro) Ltd. Smartboard, conventional whiteboard and red paint were removed; wall was replastered and reformed due to bumps and cracks, imposing an extra fee for the job also via Roxy (Xyro) Ltd. Wall has been extremely useful and versatile for a number of lessons and events since 4/2019 including GLS and ICT lessons. Existing projection unit needed to be re-orientated to align with the contours and angle of the wall. Special care is needed for the whiteboard wall since certain whiteboard pens have issues with the wall, and at times when ink won't erase fully from the wall, a sponge with water helps with removal. Audio speakers were not purchased since a PA speaker was used in its place as well as those of a 4K TV on the adjacent wall; plan for quadraphonic speaker system to be installed in 207 in future (even if an alternative budget is required).	HK\$24,000
		b. Removal of old, broken curtains in favour of new curtains / blinds.	The old damaged curtains in Room 207 (covering windows facing greenery) were replaced with black roll-down curtains back in 8/2018.	N/A (Already covered in 2017-18 expense)
		c. Additional shelving, storage units and furniture to store more equipment and allow for better seating / working arrangements.	A number of plastic drawers were purchased for Room 207 for storage of Arduino components and special robotic/electronic tools. The drawers have been very useful in organisation of equipment.	HK\$842.50
		d. Improvement of learning environment	A quadraphonic (4-speaker) sound system was installed and three air-conditioners were replaced which have been used for over 20+ years, two of the ACs were broken down before the summer and the remained one was not functioning well.	HK\$30,060
			Total Expense in 2018-19:	HK\$94,059.87

4. Financial Summary:

Grant received	\$0
Actual Expenditure	(\$94,059.87)
(Deficit) for the year	(\$94,059.87)
Surplus brought forward from previous year	\$97,930.00
Surplus to be clawed back	\$3,870.13