Immaculate Heart of Mary College
Plan on Use of One-off Grant to Secondary Schools for the Promotion of STEM Education 2017-2019

Major Area(s) of Concern	To enhance teachers' knowledge in STEM education.
Strategies / Tasks	• Introduce the STEM-related facilities in school to all teachers. • Invite sharing of STEM education activities from other schools / EDB. • Provide staff development programme for teachers so that different teams can cultivate the problem solving skills in school.
Benefits Anticipated	• Teachers get familiar with the STEM-related facilities in school which can allow brainstorming for new STEM-related activities in different teams. • Teachers understand more about STEM education. • Teachers gain more ideas in how to implement STEM-related activities
Time Scale	1 September 2017 to 30 September 2018
Total Expenses	$969.70
Success Criteria	• The STEM-related facilities are introduced to all teachers. • At least 1 staff development programme related to STEM is organized for teachers. • At least one sharing of STEM education activities from other schools / EDB is organized. • 75% teachers are satisfied with the sharing / staff development programme related to STEM education.
Evaluation	• A staff development programme related to STEM education was held for all teachers on 21 Mar 2018. • In the programme, the STEM Education Team reported the work on STEM education in recent years. It also introduced the STEM-related facilities in school. Afterwards, a STEM workshop was organized so as to allow all teachers to experience STEM education. Finally, a sharing on STEM education, which was titled as "**STEM education – rationale & practice**", was conducted by Mr. Man Ho Wai (Vice Principal of Lok Sin Tong Yu Kan Hing Secondary School). • A survey was conducted: 66.7% agreed that the programme helped them know more about the STEM education in our school 58.3% agreed that they enjoyed the experience of STEM workshop 62.5% agreed that they have a better understanding in STEM education
People Responsible	Mr. Wong Chi Wai

Major Area(s) of Concern	To nourish students and teachers' knowledge in 3D printing technology
Strategies / Tasks	• Recruit one tutor for one 10-lesson 3D printing class (after school interest class). • Tutor is familiar with 3D drawing software and the use of 3D printer. • The tutor has to prepare teaching materials for the class. • The class size is about 20 students.
Benefits Anticipated	• Students learn how to use 3D drawing software & printer to make products. The printing technology would be used in other projects in the future. • The teaching materials of the 3D printing class can be further used • It makes our teachers more confident in using 3D drawing software.
Time Scale	20 Dec 2017, 9 Mar, 28 Mar, 13 Apr, 27 Apr and 4 May 2018
Total Expenses	To employ 1 tutor: Salary of each lesson (3 hours) = $400; $2,400.00 ($400 / lesson, 6 lessons, total 18 hours)
Success Criteria	• Students learn how to use the 3D drawing software and 3D printer • Teaching materials are prepared
Evaluation	• 20 students learned how to use the 3D drawing software and 3D printer. • Instead of 10 lessons (1.5 hour each), 6 lessons (3 hours each) were organized so that students could spend more time to do practice with the assistance from the tutor. • Some teaching materials for 3D drawing was created by the tutor. • A lunch time STEM workshop "3D printing X Platonic Solids" were organized for all F.1 students. (10 & 11 Oct 2018).
People Responsible	Mr. Wong Chi Wai and Mr. Chan Kim Pong

Major Area(s) of Concern	To organise STEM-related activities such as school-based scientific and technological activities/competitions
Strategies / Tasks	• Procure resources and/or upgrade some existing resources for the implementation of school-based STEM-related activities including projects and competitions. • STEM-related activities such as school-based scientific and technological activities/competitions are organised. • Cross-disciplined STEM-related activities are given a higher priority. • A team of students, STEM team, is set up to assist organising STEM activities in school.
Benefits Anticipated	• Teachers can organise more STEM-related activities (whole form and/or selected students). • Resources related to STEM education are purchased and/or upgraded which facilitate the development of STEM education in school for the long run. • Students have STEM hands-on experiences which allow them to use the new technologies to solve problems. • Through organising STEM activities in school, students are more engaged in learning new technologies.
Time Scale	1 September 2017 to 19 October 2018
Total Expenses	$675.30 STEM project “Egg lander” (All F.4 Physics students) $268.20 STEM project “DIY telescope” (All F.3 Physics students) $69.90 STEM Lunch Time Event: 3D Printing X Platonic Solids (Math) $1375.00 DIY Solar Car (Integrated Science) $ 2200.00 CUHK Campus Visit – Faculties of Science & Engineering $ 1100.00 3D fashion virtual tour (Home Economics) Total = $5688.40
Success Criteria	• At least one whole form STEM-related activity or at least two STEM-related activities for selected students are organised by each team which procure resources / upgrade existing resources using the grant. • 30% students have at least one STEM hands-on experience in the school. • A team of students, STEM team, is set up to assist organising STEM activities in school.
Evaluation	• STEM project “Egg lander” was held for all F.4 Physics students (April 2018). The testing was carried out in the lunch time so that all students in the school also experienced the excitement of the STEM project together. • STEM project “DIY telescope” was held for all F.3 Physics students (May 2018). • A lunch time STEM workshop “3D printing X Platonic Solids” were organized for all F.1 students (10 & 11 Oct 2018). • DIY solar car materials were purchased. The materials will be used in F.1 Integrated Science lessons in the topic of energy conservation. • A Visit to the Science & Engineering Faculties of CUHK was held for 85 F.4 students (22 Oct 2018). • 3D fashion virtual tour at Clothing Industry Training Authority was held by Home Economics Club (22 Oct 2018). Fourteen F.2 - F.5 students joined the event.
People Responsible	Mr. Wong Chi Wai

Major Area(s) of Concern	To support students to participate in various STEM-related local, national and international competitions/exhibitions/programmes.
Strategies / Tasks	• Students are nominated to participate in STEM-related competitions / exhibition / programmes. • Students have to share their experiences in the STEM-related competitions / exhibition / programmes to other students.
Benefits Anticipated	• Students have widened their exposure in new technologies when they participate in STEM-related competitions/exhibition/programmes. • Students have widened their exposure in new technologies through the sharing of STEM-related competitions/exhibition/programmes.
Time Scale	1 September 2017 to 30 September 2018
Total Expenses	$482.90 (Mini-robot competition (英才盃 Preliminary race)) $747.80 (Mini-robot competition (英才盃 Final)) $922.50 (VR Robotic Challenge 2018) $836.00 (PASTA TOWER CHALLENGE) $780.00 (學界科技體育運動-遙控模型車積分賽) $300.00 (2018 ROV Contest - Experience Class) $7357.00 (EIE Robotic Challenge Junior 2018: Flying Robot) $2010.00 (2018 Hong Kong 4D Frame Maths & Science Creativity Competition) $3071.38 (Hong Kong GreenMech Contest 2018) $20.00 (Structural Engineering Competition for the Youth Wooden Tower Challenge) Total = $16,527.58
Success Criteria	• 75% of the participants are satisfied with the STEM-related competitions / exhibitions / programmes. • Students share their experiences in the STEM-related competitions / exhibition / programmes to other students.
Evaluation	• Most participants were satisfied with the STEM-related competitions / exhibitions / programmes. • Photos / videos were taken in the competitions which were shared with other students. • Elements learned in the competitions were modified and shown in the school events (e.g. Information Day). • Students made achievements in several STEM competitions: • Mini-robot competition (英才盃)Preliminary race - Second Class Award) • VR Robotic Challenge 2018 – Merit • 學界科技體育運動-遙控模型車積分賽 - Third Runner-up in “Overall Rank” and Third Runner-up in “Most Active Participation”; 2MK Yau Cho Him won the Third Runner-up in the 2nd Race (Group C) and 2MK Kwok Ho Man won the Second Runner-up in the 2nd Race (Group C) and the First Runner-up in the 3rd Race (Group B) • EIE Robotic Challenge Junior 2018: Flying Robot - First Class Award in Intermediate Level and Expert Level
People Responsible	Mr. Wong Chi Wai