

**Connecting the English Language curriculum to Maker education
to motivate students to learn and use English
Lok Sin Tong Yu Kan Hing Secondary School**

(A) Purpose of implementing STEM education in school:

- To promote STEM education to unleash students' potential and enhance their creativity

(B) Why integrating STEM Education into the English curriculum?

To provide students with more chances to:

- communicate facts, ideas & hypotheses
- orally present information, findings & supporting evidence
- advance scientific inquiry through reading & writing activities

(DeBoer, G, Carman, E, & Lazzaro, C. (2010.) The Role of Language Arts in a Successful STEM Education Program, College Board.)

(C) English teachers' positive contributions to promoting STEM education in school

- Identifying possible entry points to integrate STEM education into the school-based English Language curriculum
 - ➔ curriculum mapping
 - ➔ encouraging students to join STEM competitions and exhibitions and use English to introduce the inventions to the audience
- Introducing relevant English reading materials to support students in critically discussing the issues related to Mathematics, Integrated Science and technology
- Designing tasks, activities and projects to encourage students to work out innovative solutions to problems or create new ideas or things to enhance their creative capacity

(D) Strengthen the collaboration with Maker lessons

- Providing opportunities for students to present their Maker Class products in English
- Helping students develop their language skills through the STEM projects and promoting Reading across the Curriculum (RaC)
- Developing students' presentation skills in English

(E) What is Maker education?

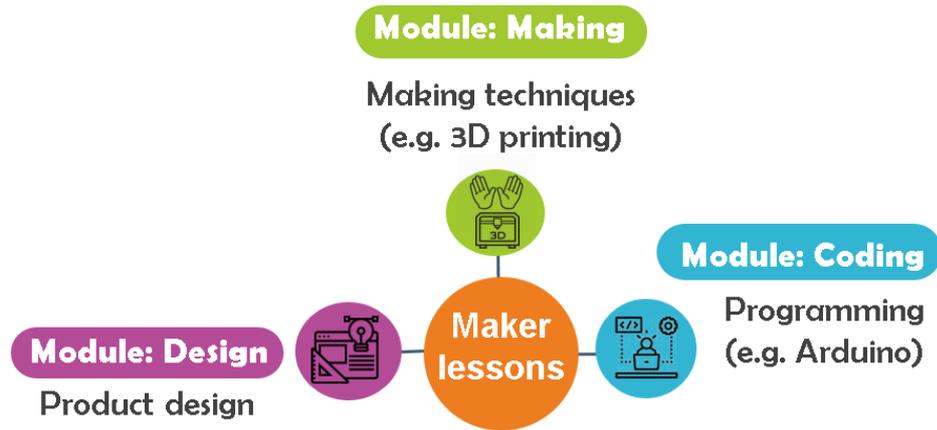
- In maker-centred learning environments, students imagine, design, and create projects that align the content of learning with hands-on application.
- Maker education isn't about the stuff we can make. It is about the connections, community and the meaning we can make, and who holds the power to decide what our futures hold.

(~ The Maker Education Initiative ~ <https://makered.org/about/what-is-maker-education/>)

(F) Benefits of Maker Education

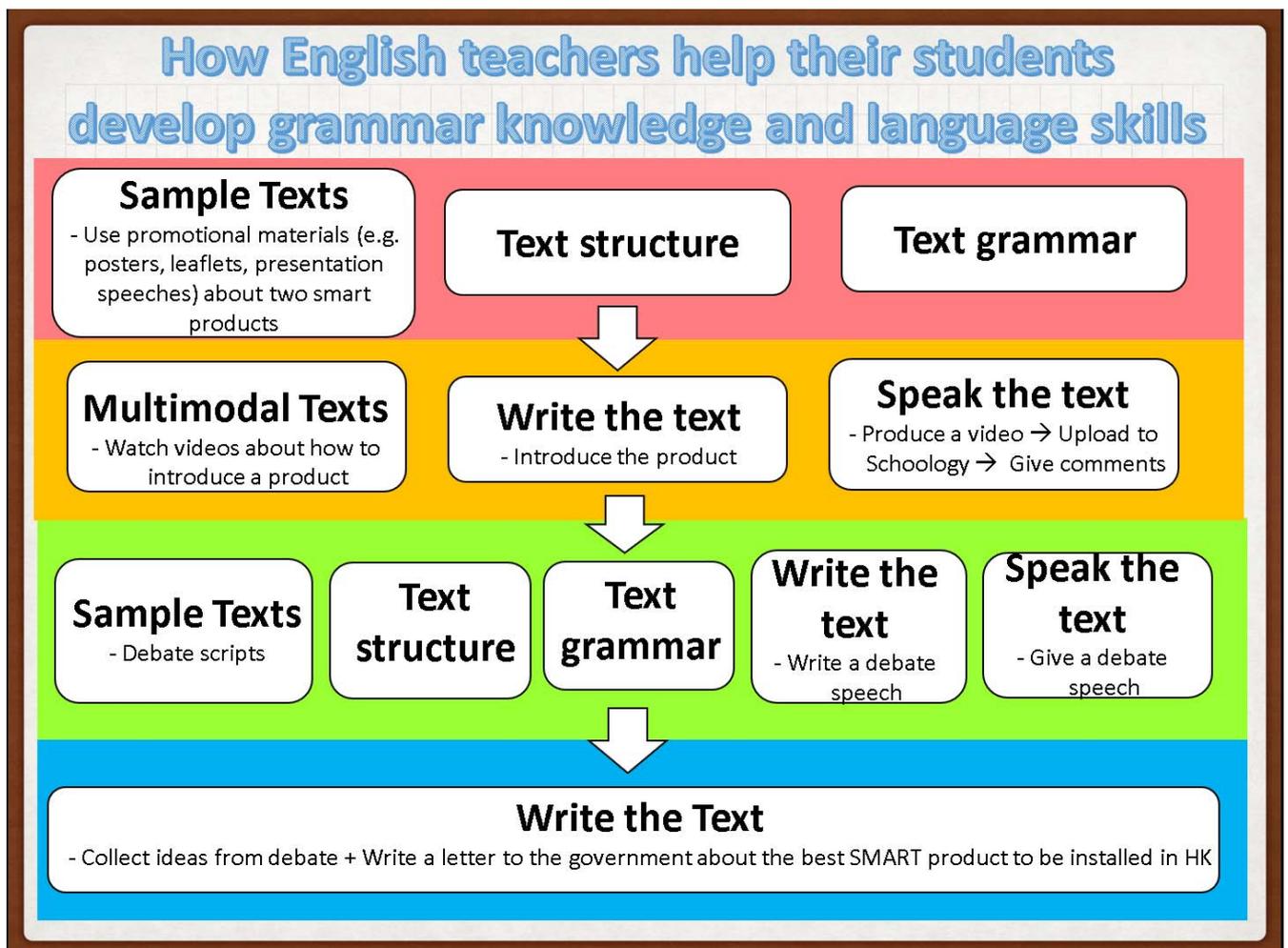
- Maker Education ignites a passion for learning
 - ➔ When kids make something that matters to them, it gives them a context for understanding their academic learning
- "Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results." ~ John Dewey

(G) The Maker lessons

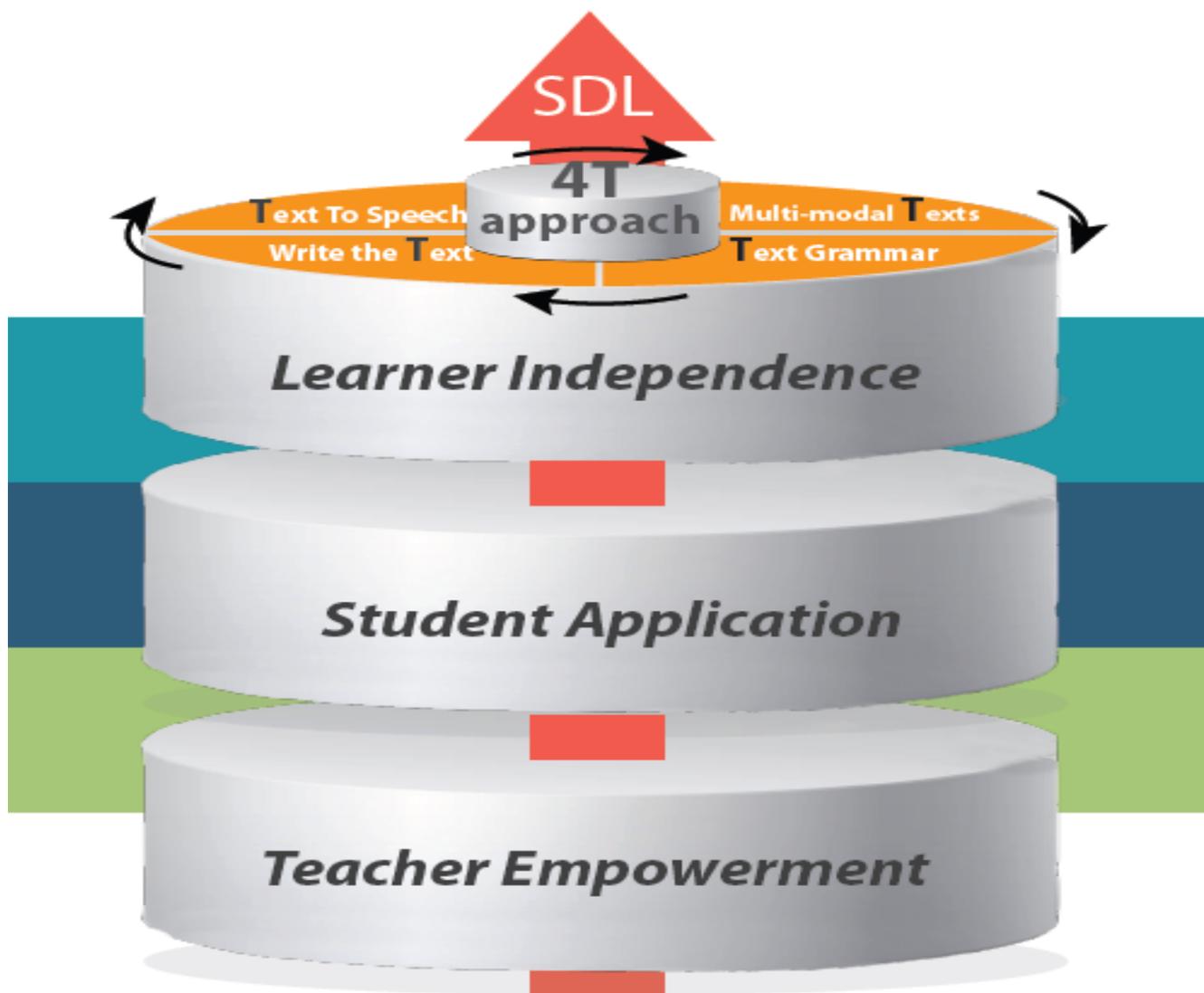


- for S.1 & S.2
- 4 lessons/week
- projects related to IoT (Internet of Things) Smart City: solving urban problems using technology

(H) How English teachers help their students develop language skills



(I) A three-tier progressive development of SDL through the 4T approach



(J) An example

Task:

You work for one of the three technology companies. Being the marketing team of the company, your responsibility is to convince the officers from different government departments to support installing your product in Hong Kong

Step 1: Learning from a sample promotional text

Step 2: Exploring the text structure

Step 3: Deducing language features/text grammar

Step 4: Writing the promotional text

Step 5: Producing multimodal promotional texts (video/posters)

Step 6: Learning how to write a debate speech

Step 7: Showcasing the SMART products

Step 8: Convincing the government officers to support installing the SMART products in Hong Kong

Step 9: Writing to persuade the government to adopt students' new products with 'refinements'

“Enlivening students' learning experiences through infusing life planning and STEM elements into the school-based English Language curriculum” – Connecting the English Language curriculum to Maker education to motivate students to learn and use English

Language Learning Support Section

4 December 2020

(K) Impact of the project

Curriculum level	<ul style="list-style-type: none">• The collaborative problem-solving tasks facilitated the integration of knowledge and skills across disciplines and made the curriculum vibrant, practical and motivating.• The use of technology (e-tools) made learning more student-centred and created an environment conducive to self-directed learning. Students were able to learn at their own pace.• The project allowed learner autonomy. Students created different products and used different ways to present their products.
Teacher level	<ul style="list-style-type: none">• Teachers' expertise in organising and implementing STEM-related English Language learning activities was enhanced through collaboration.<ul style="list-style-type: none">→ Maker class teachers focused on guiding the students through the making of STEM products.→ English Language teachers focused on developing students' language skills through reading or watching videos about technological products and promoting the products through writing, speaking and creating multimodal texts.• The professional capacity of teachers and collaboration within and across schools was strengthened.
Student level	<ul style="list-style-type: none">• Students' ability to integrate and apply knowledge and skills across disciplines to complete the tasks was strengthened through STEM-related learning activities.• Their creativity, collaboration and problem-solving skills were enhanced while potential in innovation was unleashed.• Students could see the authentic reasons and importance of using the English Language to introduce the products they produced and were more motivated to learn and use English.• Students achieved self-improvements with the use of e-tools. They practised their presentations over and over again until they were satisfied with the outcome.