

**Hong Kong Diploma of Secondary Education Examination 2021
DESIGN AND APPLIED TECHNOLOGY**

SBA Project – Suggested Titles

Candidates are required to choose ONE contextual challenge from the following and complete the SBA project:

Contextual Challenges

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| 1 | An automated ping pong ball launcher to improve training efficiency | Returning balls is a basic training exercise for table tennis players. Design an automated device that can launch ping pong balls continuously to help players improve their ability to return balls. The ball launcher should be able to launch ping pong balls to hit designated targets and provide various types of projectiles for players with different abilities to self-practice. |
| 2 | A transformable workbench equipped with treadle-driven scroll saw and drill press | Craftsmen often need to go to outdoor places where there is no power supply and teach the public how to make alphabet cut-outs from wood boards. Design a workbench that is equipped with a scroll saw and a drill press which are both treadle-driven so that the user can free both hands to hold work pieces. The design should allow the workbench to be assembled and disassembled easily and quickly and transformed into a portable toolbox that can store the two machines together with some hand tools. |
| 3 | An intelligent aluminium can recycling bin with automatic sorting and crushing functions | An environmental group found that other disposed materials are often mixed up with the recyclables inside the aluminium can recycling bins. Design an intelligent recycling bin that can automatically recognise and sort aluminium cans. The recycling bin should be able to collect one or more types of commonly found aluminium stay-tab cans on the market, and automatically crush the empty cans to increase the amount of collection. |

Notes for submission:

- Candidates should submit the following two items:
 - a working physical model/prototype, or a virtual 3D model plus a working partial physical model;
 - an A4 or A3 size portfolio.
- ‘Prototype’ refers to all working solutions including products, models and systems that are sufficiently developed to be tested and evaluated. A final prototype could be a highly finished product, made as ‘proof of concept’ prior to manufacture, a scaled working model or a functioning system where a full-sized product would be impractical.

- The physical model/prototype produced by the candidates as the final solution for the project should be able to perform proper testing and evaluation in the environment it is intended for. The main body of the final physical model/prototype should be made from raw materials and not be directly built using commercially available kits. However, commercially available mechanical components, control components and programming devices are permitted. Solely using computer modelling and simulation in lieu of physical model/prototype are not considered as appropriate alternatives in this regard.
- For details of the requirements and assessment criteria of this subject applicable to the SBA projects starting from 2021 HKDSE, please refer to:
http://www.hkeaa.edu.hk/DocLibrary/SBA/HKDSE/DAT-2021-Draft_Assess_Criteria-0318-E.pdf

Remarks:

The HKDSE Examination Regulations stipulate that a candidate may be liable to disqualification from part or the whole of the Examination or suffer a mark or grade penalty for breaching the regulations. For details, please refer to the SBA Teachers' Handbook for Design and Applied Technology:

http://www.hkeaa.edu.hk/en/sba/sub_info_sba/dse_subject.html?10