

Printed Textbook Writing Guidelines for Science Education Key Learning Area

1. Introduction

- 1.1 The purpose of this set of guidelines is to familiarise interested textbook publishers with the curriculum aims and objectives, guiding principles for writing textbooks, etc. of the Science Education KLA in a bid to ensure that the textbooks are written in accordance with the specific requirements of the curriculum and “The Seven Learning Goals of Secondary Education” (www.edb.gov.hk/en/curriculum-development/7-learning-goals/secondary/index.html). (For details, please refer to *Secondary Education Curriculum Guide* (2017) and its Supplementary Notes (2021).)
- 1.2 *Values Education Curriculum Framework (Pilot Version)* has been released in 2021. Upon the addition of “Law-abidingness” and “Empathy” in 2020, the Education Bureau (EDB) has listed “Diligence” as the tenth priority value and attitude. Publishers are suggested to reinforce the learning elements for values education in the textbooks where appropriate, especially for the above-mentioned three newly added priority values and attitudes. (For details, please refer to *Values Education Curriculum Framework (Pilot Version)*(2021) (Chinese version only) (www.edb.gov.hk/tc/curriculum-development/4-key-tasks/moral-civic/ve_curriculum_framework2021.html).
- 1.3 For the general principles and requirements for writing textbooks and the requirements for submission of printed textbooks for review, publishers should refer to the latest edition of the *Guiding Principles for Quality Textbooks* and *Guidelines on Submission of Printed Textbooks for Review* available on the EDB’s Textbook Information website (www.edb.gov.hk/textbook).

2. Curriculum Aims and Objectives

Publishers should refer to the latest Science Education KLA Curriculum Guide, as well as the Curriculum and Assessment Guide, curriculum documents and supplementary documents of the respective subjects.

Remarks: Publishers should submit at least three Elective topics, in addition to the Compulsory Part, of Physics (S4-6) for review.

3. Guiding Principles

3.1 Content

- Publishers should refer to the latest Science Education KLA Curriculum Guide, as well as the Curriculum and Assessment Guide, curriculum documents and supplementary documents of the respective subjects.

- Both the Compulsory and Elective Parts or the Core and Extension Parts of each subject should be covered by the textbooks.

3.2 Learning and Teaching

- Curriculum, pedagogy and assessment form a trio. Textbooks prepared for the Science curricula should reflect this trio and support student-centred learning, help our students to construct knowledge and promote understanding of important scientific models and theories.
- Textbooks should be designed to be comprehensible and self-contained, and should:
 - provide a sense of purpose and direction for learning;
 - address students' prior knowledge;
 - provide students with a variety of phenomena and help them understand how the phenomena are related to scientific ideas;
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 - provide resource materials such as extracts from articles (with sources provided), flow-charts, photos, diagrams, statistical tables or graphs, etc. for students' reference;
 - guide students' interpretation and reasoning;
 - provide practice in applying scientific ideas;
 - provide assessment tasks to facilitate assessment for learning and assessment as learning; and
 - encourage students to explore science beyond the classroom.
- Practical work, activities and exercises
 - Practical work, either integrated with the main text or compiled as a separate workbook, should be included to facilitate the development of scientific concepts and understanding, as well as science process skills. Involving students in the planning of investigations would enable them to better understand how variables are controlled, what data have to be collected, how frequent measurements have to be taken, etc. The use of data loggers (or suitable devices such as single-board computers or smartphone devices) and suitable sensors for experiments should be included, as alternatives or in parallel, wherever appropriate.
 - The instruction, diagrams or photos, etc. in relation to practical / field work should meet with the necessary safety requirements.

- Advice on potential hazards, risk assessment and appropriate control measures for open-ended investigative study, scientific investigations or practical-based projects, etc. should also be provided.
- In the study of science, practical work is important, but it is not the only type of learning and teaching activity. A range of activities, such as discussion, information search, “reading to learn”, writing learning journals, role-play, debate, design and make, project learning, etc. should also be included for the attainment of the objectives outlined in the Curriculum and Assessment Guides.
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- Suitable exercises should be provided to help students assess their attainments of learning objectives of different parts of the curriculum and check their own learning progress.
- Learning tasks of different types and demands could be included to embrace learner diversity. Student-centred and interactive approaches are recommended, as they are useful in providing suitable learning experience for stimulating and developing higher order thinking.
- Application of IT tools could be introduced to enhance the effectiveness and efficiency of doing practical work, and facilitate students to conduct scientific investigation.
- STEM activities could be introduced to provide opportunities for students to integrate and apply STEM-related knowledge and skills to solve daily life problems.

3.3 Structure and Organisation

- Publishers should refer to the latest Science Education KLA Curriculum Guide, and Curriculum and Assessment Guides of the respective subjects.

3.4 Language

- The language used should be appropriate to students’ language ability. For the Chinese translation of English terms commonly used in the teaching of science, publishers should refer to the [*English-Chinese Glossaries of Terms Commonly Used in the teaching of Science Subjects in Secondary Schools*](#) compiled by the Education Bureau.
- The International System of Units (SI) should be used. For detailed guidance on units and symbols, please refer to *Signs, Symbols & Systematics: The ASE Companion To 5-16 Science* published by the Association for Science Education (1995), UK: ASE, 《高等學校教學參考書——物理量與單位》杜荷聰、王啟堯、袁楠(1986)著，中國計

量出版社出版, or the latest information announced by the General Conference on Weights and Measures (CGPM) ◦

3.5 Textbook Layout

- The layout should be logical and consistent. The materials should be well-organised, with appropriate use of space and margin for ease of reading, but avoiding unnecessary use of blank space.
- Illustrations such as photos, pictures and graphs should be accurate, appropriate, effective and suitably annotated to stimulate and facilitate learning. They should serve to direct students to the instructional focus rather than to distract them from it.
- If necessary, the translation of English/Chinese terms should be placed at the bottom of the page as footnote.
- Publisher may refer to the latest edition of EDB's [*Guiding Principles for Printing of Textbooks*](#) for use of paper, colouring, use of inks, etc.

4. Others

- 4.1 When writing textbooks, publishers have to ensure that the content and information provided in the materials should be correct, complete, up-to-date, objective and impartial. The source and the date of the information should be provided as appropriate. The information in the illustrations and images should avoid showing brand-names of commercial items unless it is necessary.
- 4.2 Except for a single URL of the publisher's website, no other URLs or QR codes (including those linking to the listening practices' audio files of language subjects) should be included in the textbooks. Publishers are required to clearly declare in the "Preface" or "Editor's Notes" that the learning and teaching resources on the publisher's website have not been reviewed by the EDB. When textbooks of reprint with minor amendments are submitted for review, they should contain no URLs and hyperlinks, except for one single URL of the publisher's website.
- 4.3 Publishers may provide self-developed supplementary learning materials or the web links of the learning and teaching resources developed by the third party on publishers' websites. Publishers may also provide their websites' URLs in the Teacher's Book for teachers' reference in preparing lessons or designing learning and teaching activities. Publishers should be accountable for the quality of the learning and teaching resources provided.
- 4.4 It is incumbent on the publishers to ensure that all proof-reading work, including the language, information, punctuation, illustration, pagination, etc., is complete and accurate before submitting the textbooks for review.

- 4.5 Publishers should review the textbook content from time to time. When necessary, publishers can make amendments to the textbook content in the form of corrigenda with the EDB’s prior consent. The EDB may also require publishers to make amendments if deemed necessary.
- 4.6 Publishers should clear all copyright issues of the textbooks as appropriate.
- 4.7 Publishers should not use expiration of copyright on the textbook materials as a reason to apply for textbook “revision” or “reprint with minor amendments”.
- 4.8 Publishers should pay attention to the curriculum time allocation suggested in the curriculum documents of this subject to ensure that the learning content are designed with an appropriate quantity and level.
- 4.9 If publishers submit other versions (such as Chinese version or electronic version) of the same textbook title for review at the same time, they should duly check the consistency of the content among all the versions. If another version will be submitted at a later stage, the suggestions in the Textbook Review Reports for the previous submitted version should be thoroughly followed before submission.
- 4.10 Safety precautions for laboratory work and outdoor activities should be concise and precise and should be included wherever appropriate. In particular, helping teachers and students to exercise care and good judgement in safeguarding against laboratory accidents is of paramount importance. Students should always be alerted of potential hazards in laboratory work and activities so that accidents might be avoided. Hazards of chemicals / substances involved in practical activities should be clearly stated. For the information of chemical hazards, publishers should refer to the Materials Safety Data Sheets (MSDS) / Safety Data Sheets (SDS) provided by the Education Bureau, professional organisations (such as CLEAPSS) or chemical manufacturers. More information on laboratory safety can be found in *Safety in Science Laboratories* (EDB, 2013), and in *Safety Guidelines on Microbiology and Biotechnology Experiments in School Laboratories* (EDB, 2021).
- 4.11 Publishers are required to provide relevant information to show the feasibility of the practical activities, including the detailed design, implementation details for facilitating student learning as well as necessary measures for enhancing safety, in the form of guidelines, teachers’ handbook/guide, sample results, etc. wherever appropriate, for the EDB’s reference in reviewing the textbooks.