Science Education Key Learning Area: Science (Secondary 1 to 3)
Curriculum Framework of National Security Education (2025)

Introduction

This Curriculum Framework[1] illustrates in tabular form how learning in Science (Secondary 1 to 3) can be connected to related learning elements of national security education, facilitating schools in planning the learning content of national security education. Schools should integrate national security education into the curriculum planning and learning and teaching of this subject through "organic integration", "natural connection", "diversified strategies", "mutual coordination", "learning within and beyond the classroom" and "whole-school participation". In addition to this Curriculum Framework, schools should also refer to the *Curriculum Framework of National Security Education in Hong Kong (2025)* and other relevant curriculum documents to implement national security education more effectively.

1. Overall Teaching Foci

1.1 The junior secondary Science curriculum covers topics that help students understand the relationship between biodiversity and humans, such as "Water conservation and water pollution", "Biodiversity and conservation", "Energy saving", "Climate change", "Acid rain and ocean acidification" and "Environmental problems associated with the use of materials". These topics raise students' awareness of ecological issues in our country, Hong Kong and the worldwide, help them understand the importance of maintaining the sustainability of the natural environment and natural resources, as well as their close connection to safeguarding ecological security and related fields of security.

[1] The content of this framework is set out in the form of examples. Schools should adopt or adapt the relevant suggestions based on students' learning needs and abilities.

1.2 By studying topics such as water resources, fossil fuels and alternative energy sources, students can understand the importance of resource security to the socio-economic development of our country. Besides, through studying ecological conservation, environmental protection, and resource utilisation, students can learn to cherish and make good use of natural resources, as well as understand that it is everyone's responsibility to care for nature and maintain the ecological balance. This will nurture them to become responsible citizens.

1.3 The junior secondary Science curriculum also includes topics related to biosecurity, such as "Health and diseases". When studying these topics, teachers can share successful examples of our country in areas such as prevention and control infectious disease, and biotechnology to deepen students' understanding of our country's development in these areas.

2. Learning Foci

Science Education Key Learning Area: Science (Secondary 1 to 3) [Key Stage 3 (Junior Secondary)]		Curriculum Framework of National Security Education in Hong Kong (2025)
Learning Areas (Examples)	**Learning Elements (Examples)**	**Related Learning Elements / Major Fields of National Security (Examples)**
• Applications of science, innovation and technology	• Recognise the daily applications of science, innovation and technology ➢ Through discussing the practical applications of science, and innovation and technology in various fields (e.g. agriculture, healthcare, extreme environments and robotics) in our country, students can recognise and take the ethical responsibilities of science, the benefits of sustainable development, and the importance of safeguarding national security	• 3.6 Have a further understanding of the importance of national security in ensuring people's security, major national interests and sustainable development • 3.9 Learn about the role of science and innovation and technology industries in safeguarding national security in our country and Hong Kong • 3.19 Further understand that one must observe the corresponding moral responsibilities and behave responsibly in the application of

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		science and innovation and technology • Related major field of national security: Science and Technology Security
• Water conservation • Water pollution	• Recognise that fresh water is a precious natural resource and the importance of water conservation • Be aware of our responsibility to minimise water pollution ➢ Through discussing the water sources of Hong Kong, the importance and ways of water conservation, and the negative impacts of water shortages on the society, economy and environmental sustainability, students can recognise the importance of protecting water resources for the	• 3.5 Learn about our country's development and achievements in areas such as the economy, national defence, society, culture, science and technology, healthcare, transportation infrastructure, ecological conservation, bioengineering,

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• Biodiversity and conservation	sustainable development of our country and Hong Kong, and safeguarding resource security together • Recognise the importance of biodiversity to the stability of an ecosystem and the sustainable development of the natural environment • Recognise the importance of environmental conservation and the protection of wildlife • Recognise that some human activities (e.g. hunting, destruction of habitat) may threaten the survival of particular species and lead to biodiversity loss. ➢ Through searching information on environment and species conservation methods of our country and Hong Kong, as well as information on setting up of	aerospace, thereby enhancing our national pride • 3.6 Have a further understanding of the importance of national security in ensuring people's security, major national interests and sustainable development • 3.9 Learn about the role of science and innovation and technology industries in safeguarding national security in our country and Hong Kong • Related major fields of national security: Resource Security,

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	research stations in Antarctica, students can recognise the emphasis on the environment by our country and appreciate the necessity of safeguarding ecological security and polar security	Ecological Security, Nuclear Security
• Fossil fuels and alternative energy sources • Energy saving	• Be aware of the concerns about using fossil fuels (e.g. limited supply and pollution problem) and nuclear power • Recognise the needs and considerations for developing renewable energy sources (e.g. solar energy, biomass energy, wind power and hydroelectric power) and nuclear power ➢ Through watching video clips to learn about the latest development of alternative energy sources in our country, students can recognise the benefits and the	

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• Climate change	potential risks of using nuclear power, as well as the importance of safeguarding resource security and nuclear security to national, social and economic development • Recognise the natural balance of carbon dioxide and oxygen in Nature • Recognise that some human activities can disrupt the balance of carbon dioxide in Nature • Understand the potential impact of increasing carbon dioxide emissions on the environment and human health (e.g. the greenhouse effect) ➢ Through watching video clips learning about the impacts of climate change on the environment, and	

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	searching information on the achievement of mangrove conservation and restoration in our country, students can recognise the necessity of safeguarding ecological security	
• Acid rain and ocean acidification	• Recognise the causes of acid rain and ocean acidification, and its effects on the environment and living things ➢ Through watching video clips learning about the contribution to conservation of marine ecosystem by our country, and arranging students to conduct scientific investigation on the impacts of acid rain on seedling growth, students can recognise the importance of safeguarding ecological security	• 3.5 Learn about our country's development and achievements in areas such as the economy, national defence, society, culture, science and technology, healthcare, transportation infrastructure, ecological conservation, bioengineering, aerospace, thereby enhancing our national pride

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• Health and diseases	• Recognise that most infectious diseases are caused by infection of microorganisms • Recognise some ways for reducing the risk of infectious diseases (e.g. maintaining personal hygiene, vaccination and herd immunity) ➢ Through searching information on policies and measures related to prevention and control of infectious disease in our country and Hong Kong from reliable websites (e.g. the Centre for Health Protection of the Department of Health, the Chinese Center for Disease Control and Prevention, the World Health Organization), students can appreciate the commitments to public health by our country and understand the necessity of safeguarding biosecurity	• 3.9 Learn about the role of science and innovation and technology industries in safeguarding national security in our country and Hong Kong • Related major fields of national security: Ecological Security and Biosecurity

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	• Be aware of the medical applications of biotechnology ➢ Through searching information on the development of biotechnology of our country (e.g. manufacturing of drugs, testing for genetic diseases, identification of infectious viruses and microorganisms), students can recognise our country's efforts in safeguarding biosecurity, and to understand its importance	
• Environmental problems associated with the use of materials	• Describe some environmental problems associated with the use of materials (e.g. plastics, metals) • State some solutions to the environmental problems of using materials (e.g. plastics, metals) ➢ Through searching information on waste reduction policies and solid waste treatments in our country and	• 3.5 Learn about our country's development and achievements in areas such as the economy, national defence, society, culture, science and technology, healthcare, transportation infrastructure, ecological

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	Hong Kong, students can recognise the importance of ecological security	conservation, bioengineering, aerospace, thereby enhancing our national pride • 3.6 Have a further understanding of the importance of national security in ensuring people's security, major national interests and sustainable development • Related major field of national security: Ecological Security

3. Suggested Learning and Teaching Activities (Examples) (Junior Secondary)

The following are examples for reference. Teachers can design appropriate activities based on their school context and subject characteristics to promote national security education.

✧ **Project learning**

- [Biodiversity] Conduct project learning on ways of conservation of environment and species in our country and Hong Kong
- In line with the curriculum aims and objectives, design appropriate self-learning activities for students to recognise the concerns and emphases of our country and Hong Kong on ecological and environmental protection related issues

✧ **Exchanges with the Mainland**

- [Environmental problems associated with the use of materials] Arrange for students to visit the Guangdong-Hong Kong-Macao Greater Bay Area to recognise our country's the waste reduction policies and the latest technological developments in solid waste treatment
- [Fossil fuels and alternative energy sources] In collaboration with relevant organisations, arrange for students to visit the Daya Bay Nuclear Power Plant to learn about the power generation principle by the nuclear power plant and its adopted safety designs

✧ **Cross-curricular collaboration**

- [Water conservation and water pollution] Design and make water-saving devices using 3D printing technology to learn

about ways to conserve water in collaboration with subject "Design and Technology"

✧ **Visits**

- [Water conservation and water pollution] Arrange for students to visit the "H_2OPE Centre" to learn about sources of fresh water in Hong Kong (country park catchment areas and Dongjiang water) and recognise the importance of water conservation and ways to conserve water
- [Energy saving, Climate change] Arrange for students to visit the "CLP Power Low Carbon Energy Education Centre" to deepen their understanding on the use of low-carbon energy to address climate change and air pollution, and ways to reduce carbon emissions in daily life. This will also enhance students' understanding about our country's development of nuclear power
- [Environmental problems associated with the use of materials] Arrange for students to visit the "O·PARK1 Organic Resource Recovery Centre" and "T·PARK Sludge Treatment Facility" to learn about the solid waste management strategies of Hong Kong and foster the habit of reducing waste at the source

✧ **Educational seminars, guided tours or field trips**

- [Biodiversity] Participate in educational activities organised by marine parks, including educational seminars for schools, guided eco-tours and coastal field trips, to deepen students' understanding of the environment of marine parks
- [Biodiversity] Participate in guided tours or workshops organised by the Hong Kong Wetland Park to recognise the ecosystem of wetland and the relationship between wetland and human
- [Biodiversity] Use "Science (S1-3) Hong Kong Wetland Park Outdoor Self-directed Learning" resource package

(https://cd1.edb.hkedcity.net/cd/science/HKWP_SDL/index-en.html) to arrange structured outdoor science learning activities for students at the Hong Kong Wetland Park

Disclaimer:

- *In case of any discrepancy in the meaning of wording between the English text and the Chinese text, the Chinese text shall prevail.*