

Science (S1 – S3) Curriculum Framework of National Security Education**1. General teaching foci**

- 1.1. Through studying issues related to the ecological environment, students should understand the importance of maintaining the sustainable development of the natural environment and pay more attention to ecological issues in Hong Kong, our country and the world, so as to recognise the necessity of safeguarding ecological security. In addition, through studying issues such as water resources and petroleum resources, students should understand the importance of resource security to the social and economic development of our country.
- 1.2. The Science curriculum includes topics that help students understand the ecological environment and the relationship between biodiversity and humans, such as “water conservation and pollution”, “biodiversity”, “energy sources”, “balance of carbon dioxide and oxygen in Nature”, “corrosive nature of acids” and “materials of the modern world”. Through the above topics, students should learn to pay more attention to ecological issues in Hong Kong, our country and the world, and understand the importance of maintaining the sustainability of the natural environment and natural resources.
- 1.3. The Science curriculum also includes topics related to new security domains (e.g. biosecurity), such as “health and diseases”. For related topics, the teacher can introduce examples of our country’s efforts in infectious diseases prevention and control, as well as in biotechnology, so as to enhance students’ awareness of our country’s development in these areas.
- 1.4. Through studying topics such as conservation, environmental protection and the use of resources, students should learn to cherish and make good use of natural resources. They should understand that it is everyone’s responsibility to care for Nature and maintain ecological balance and that they are expected to become responsible citizens.

2. Learning foci

Science (S1 - S3)		Curriculum Framework of National Security Education in Hong Kong	
Chapter / Topic	Learning Elements	Strand	Learning Elements
2.5 Water conservation and pollution	<ul style="list-style-type: none"> • Understand that water is a precious natural resource • Recognise the importance of water conservation and the ways to conserve water • Recognise some causes of water pollution and its impact on humans and the ecological environment • Be aware of our responsibility to minimise water pollution <p>➤ When teaching this topic, teachers can arrange discussion activities for students, so that students can recognise the sources of drinking water in Hong Kong, as well as the importance and ways to conserve water. Students can also discuss the negative impact of water shortage on society, economy and the environment, and understand the importance of maintaining water resources to the sustainable development of Hong Kong and our country.</p>	1	<ul style="list-style-type: none"> • Understand the definition of national security and the 13 domains of national security (e.g. resource security)
		7	<ul style="list-style-type: none"> • Explore topics related to ecological security and new security domains (e.g. biodiversity, conservation, and exploration and protection of deep seas and polar regions), understand the impact of human activities on the ecology and environment, and the necessity of safeguarding ecological security and new security domains • Understand the importance of homeland security, resource security and nuclear security to the social-economic development of the country

Science (S1 - S3)		Curriculum Framework of National Security Education in Hong Kong	
Chapter / Topic	Learning Elements	Strand	Learning Elements
3.3 Biodiversity	<ul style="list-style-type: none"> • Recognise the importance of biodiversity to the sustainable development of the natural environment, and its benefits to humans (e.g. provision of resources such as food, medicine, raw materials) 	1	<ul style="list-style-type: none"> • Understand the definition of national security and the 13 domains of national security (e.g. ecological security)
	<ul style="list-style-type: none"> • Be aware of the importance of environmental conservation and the protection of wild life • Understand that some human activities (e.g. hunting, destruction of habitat) may threaten the survival of some species • Give examples of some endangered species and human activities leading to the reduction in biodiversity <ul style="list-style-type: none"> ➤ When teaching this topic, teachers can ask students to search for information about how Hong Kong and our country conserve the ecological environment and species, so that students will understand the importance attached by our country to the ecological environment and recognise the necessity of safeguarding ecological security. 	7	<ul style="list-style-type: none"> • Explore topics related to ecological security and new security domains (e.g. biodiversity, conservation, and exploration and protection of deep seas and polar regions), understand the impact of human activities on the ecology and environment, and the necessity of safeguarding ecological security and new security domains
	<ul style="list-style-type: none"> • Recognise that fossil fuels are non-renewable energy sources 	1	<ul style="list-style-type: none"> • Understand the definition of national security and the 13 domains of national

Science (S1 - S3)		Curriculum Framework of National Security Education in Hong Kong	
Chapter / Topic	Learning Elements	Strand	Learning Elements
5.3 Energy sources	<ul style="list-style-type: none"> • Be aware of the concerns about using fossil fuels (e.g. limited supply and pollution problem) • Recognise the need for developing alternative energy sources (e.g. solar energy, biomass energy, nuclear power, wind power and hydroelectric power) • Be aware of the concerns arising from the use of different energy sources (e.g. nuclear power and wind power) <p>➤ When teaching this topic, teachers can arrange for students to watch video clips about our country's current development of other energy sources, so that they will be aware of the benefits and potential risks of nuclear energy, and understand the importance of safeguarding resource security and nuclear security to the social and economic development of our country.</p>		security (e.g. resource security and nuclear security)
		7	<ul style="list-style-type: none"> • Explore topics related to ecological security and new security domains (e.g. biodiversity, conservation, and exploration and protection of deep seas and polar regions), understand the impact of human activities on the ecology and environment, and the necessity of safeguarding ecological security and new security domains • Understand the importance of homeland security, resource security and nuclear security to the social and economic development of our country
7.5 Balance of carbon dioxide	<ul style="list-style-type: none"> • Understand that there is a natural balance of carbon dioxide and oxygen in the atmosphere 	1	<ul style="list-style-type: none"> • Understand the definition of national security and the 13 domains of national security (e.g. ecological security)

Science (S1 - S3)		Curriculum Framework of National Security Education in Hong Kong	
Chapter / Topic	Learning Elements	Strand	Learning Elements
and oxygen in Nature	<ul style="list-style-type: none"> • Recognise that some human activities are disrupting the balance of carbon dioxide in Nature • Describe the effects of the increasing amount of carbon dioxide in the atmosphere on the environment <ul style="list-style-type: none"> ➤ When teaching this topic, teachers can arrange for students to watch video clips about the impact of climate change on the polar regions and the ecological environment, so that they will understand the necessity of protecting the polar regions and safeguarding ecological security. 	7	<ul style="list-style-type: none"> • Explore topics related to ecological security and new security domains (e.g. biodiversity, conservation, and exploration and protection of deep seas and polar regions), understand the impact of human activities on the ecology and environment, and the necessity of safeguarding ecological security and new security domains
9.4 Corrosive nature of acids	<ul style="list-style-type: none"> • Understand the causes of acid rain and its effects on the environment and living things <ul style="list-style-type: none"> ➤ When teaching this topic, teachers can arrange students to conduct scientific investigation to study the effect of acid rain on the growth of seedlings, so that they will understand the importance of safeguarding ecological security. 	1	<ul style="list-style-type: none"> • Understand the definition of national security and the 13 domains of national security (e.g. ecological security)
		7	<ul style="list-style-type: none"> • Explore topics related to ecological security and new security domains (e.g. biodiversity, conservation, and exploration and protection of deep seas and polar regions), understand the impact of human activities on the

Science (S1 - S3)		Curriculum Framework of National Security Education in Hong Kong	
Chapter / Topic	Learning Elements	Strand	Learning Elements
			ecology and environment, and the necessity of safeguarding ecological security and new security domains
12.3 Health and diseases	<ul style="list-style-type: none"> • Recognise that most infectious diseases are caused by infection of microorganisms • Recognise some ways for preventing infectious diseases <ul style="list-style-type: none"> ➤ When teaching this topic, teachers can ask students to search for information from reliable online sources (e.g. websites of the Centre for Health Protection of the Department of Health, the Chinese Center for Disease Control and Prevention, and the World Health Organisation) about the policies and measures of Hong Kong and our country on infectious disease prevention and control, so that they will understand the importance attached by our country to people's health and recognise the necessity of safeguarding biosecurity. • Be aware of the health-related applications of biotechnology (e.g. manufacturing of drugs, genetic testing for diseases, identification of infectious virus and microorganisms) 	1	<ul style="list-style-type: none"> • Understand the definition of national security and the 13 domains of national security (e.g. new security domains)
		7	<ul style="list-style-type: none"> • Explore topics related to ecological security and new security domains (e.g. biodiversity, conservation, and exploration and protection of deep seas and polar regions), understand the impact of human activities on the ecology and environment, and the necessity of safeguarding ecological security and new security domains

Science (S1 - S3)		Curriculum Framework of National Security Education in Hong Kong	
Chapter / Topic	Learning Elements	Strand	Learning Elements
	<ul style="list-style-type: none"> ➤ Teachers can ask students to search for information about the development of biotechnology in our country, so that they will recognise our country's work in safeguarding new security domains (e.g. biosecurity) and recognise the necessity of the related development. 		
13.5 Materials of the modern world	<ul style="list-style-type: none"> • Recognise some environmental problems associated with the use of materials (e.g. plastics, metals), and the solutions to these problems ➤ When teaching this topic, teachers can ask students to search for information about waste reduction policies and solid waste treatment in Hong Kong and our country, so that they will understand the importance of ecological security. 	1	<ul style="list-style-type: none"> • Understand the definition of national security and the 13 domains of national security (e.g. ecological security)
		7	<ul style="list-style-type: none"> • Explore topics related to ecological security and new security domains (e.g. biodiversity, conservation, and exploration and protection of deep seas and polar regions), understand the impact of human activities on the ecology and environment, and the necessity of safeguarding ecological security and new security domains

3. Suggested learning and teaching activities (examples)

✧ **Project learning**

- ◆ **【Biodiversity】** Conduct projects and search for information on approaches to ecological and species conservation in Hong Kong and our country.
- ◆ Design appropriate self-learning activities in line with the curriculum aims and objectives, so that students will learn about the attention and importance attached by other countries to ecological issues and environmental protection.

✧ **Exchanges activities with the Mainland**

- ◆ **【Materials of the modern world】** Arrange for students to visit the Guangdong-Hong Kong-Macao Greater Bay Area, so that they can learn about our country's waste reduction policies and the latest development in solid waste treatment.

✧ **Cross-curricular collaboration**

- ◆ **【Water conservation and pollution】** Collaborate with the panel of Design and Technology to design and make water-saving devices with 3D printing technology, so that students can learn about the ways to conserve water.

✧ **Visits**

- ◆ **【Water conservation and pollution】** Arrange for students to visit H2OPE Centre, so that they can learn about the sources of drinking water in Hong Kong (water gathering grounds within country parks and Dongjiang water), and understand the importance of water conservation and the ways to conserve water.
- ◆ **【Energy sources, balance of carbon dioxide and oxygen in Nature, and corrosive nature of acids】** Arrange for students to visit the “CLP Power Low Carbon Energy Education Centre”, so as to deepen their understanding on the use of low-carbon energy to combat climate change and reduce air pollution, as well as enhance students' understanding on our country's nuclear energy development.

