

GEOGRAPHY

TEACHING AND LEARNING SYLLABUS

Upper Secondary

Express and Normal (Academic)

Implementation starting with
2023 Secondary Three Cohort



Ministry of Education
SINGAPORE

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CONTENTS

	Page
1. INTRODUCTION	
• Geography Curriculum Concept	<u>3</u>
• Aims of Upper Secondary Geography	<u>5</u>
• Desired Outcomes of Education and 21st Century Competencies	<u>6</u>
• Learning Progression and Continuity in Geography	<u>7</u>
• Design of the Syllabus	<u>9</u>
2. CONTENT	
• Geography in Everyday Life Cluster	<u>10</u>
• Tourism Cluster	<u>15</u>
• Climate Cluster	<u>20</u>
• Tectonics Cluster	<u>24</u>
• Singapore Cluster	<u>28</u>
3. PEDAGOGY	
• Learning Through Geographical Inquiry	<u>34</u>
4. ASSESSMENT	
• Assessment Objectives	<u>36</u>
• Scheme of Assessments	<u>37</u>

1. INTRODUCTION

Geography Curriculum Concept

The Geography Curriculum Concept (Figure 1) articulates the aspirations of Geography education in Singapore, from Secondary to Pre-University. It signals a shared belief regarding the nature, purpose and structure of Geography for all levels of study so that all stakeholders can better support students' growth as they progress from one level of study to the next.

The Geography Curriculum Concept, as illustrated in Figure 1, highlights the following:

- Selection of sustainability-themed **content** for all levels of study.
The overarching theme of **sustainable development** in the Geography syllabuses aims to deepen students' understanding of the impact of human activity on environmental sustainability and vice versa. Defined as "that (development) which meets the needs of the present without compromising the ability of future generations to meet their own needs", sustainable development has become a part of everyday lexicon since its articulation in the report of the World Commission on Environment and Development, *Our Common Future* (1987).¹ Countries have committed towards building sustainable and resilient futures, through the United Nations 2030 Agenda for Sustainable Development.² The study of Geography provides opportunities for students to understand sustainability-related challenges around the world including Singapore in an integrated way, providing students with the kind of synthesis and holistic thinking needed to inspire them to take action to achieve a more sustainable world. A holistic and continued coverage of ideas and knowledge through the context of sustainable development is planned into the curriculum across all levels of study, which explores sustainability challenges through different topics on human-environment relationships.
- Disciplinary approach to strengthening **learning progression** and **continuity** from Lower Secondary to Pre-University.
Learning progression in Geography refers to students acquiring more sophisticated understanding of disciplinary or geographical concepts and being able to undertake more rigorous fieldwork methods over time. **Continuity** is strengthened through the same set of disciplinary or geographical concepts adopted for all levels of study – Space, Place, Environment and Scale. See Learning Progression and Continuity in Geography on [page 7](#) to understand how it is featured in the Upper Secondary Geography syllabuses.
- Unique features of Geography's **pedagogy** and **assessment**, integrating education research with geographical practices.
Teaching with **inquiry** is a signature pedagogy in Geography. Geography educators are adept in developing and enacting inquiry lessons that take place in classrooms, field sites and online environments. Using **real-world contexts** to assess students' understanding help simulate a variety of field conditions for questions testing students' fieldwork

¹ World Commission on Environment and Development (1987). *Our Common Future*. Oxford University Press.

² United Nations (2021). *Sustainable Development Goals*. Retrieved from: <https://www.un.org/sustainabledevelopment/>

competencies. Importantly, featuring real-world contexts in assessment aligns with Geography’s signature pedagogy of teaching with inquiry, resulting in coherence between students’ learning experience and how they are tested.

- Attributes of **The Singapore Geography Student**.

The Singapore Geography Student contributes to Singapore’s and the world’s sustainable development by exercising **ingenuity** and **innovation** in generating sustainable solutions for future growth. They will be able to consider **connections** between people, places, events and environments, combining this knowledge with their understanding of the spatial arrangement of phenomena, and deliberate on human’s reciprocal relationship with nature. Additionally, students will understand how our local **context** interacts with the driving forces behind globalisation, and be able to strike a balance between being open to innovations and ideas, and recognising our unique local context and culture. Through Geography education, they will develop an **intrinsic wonder and appreciation for nature**.

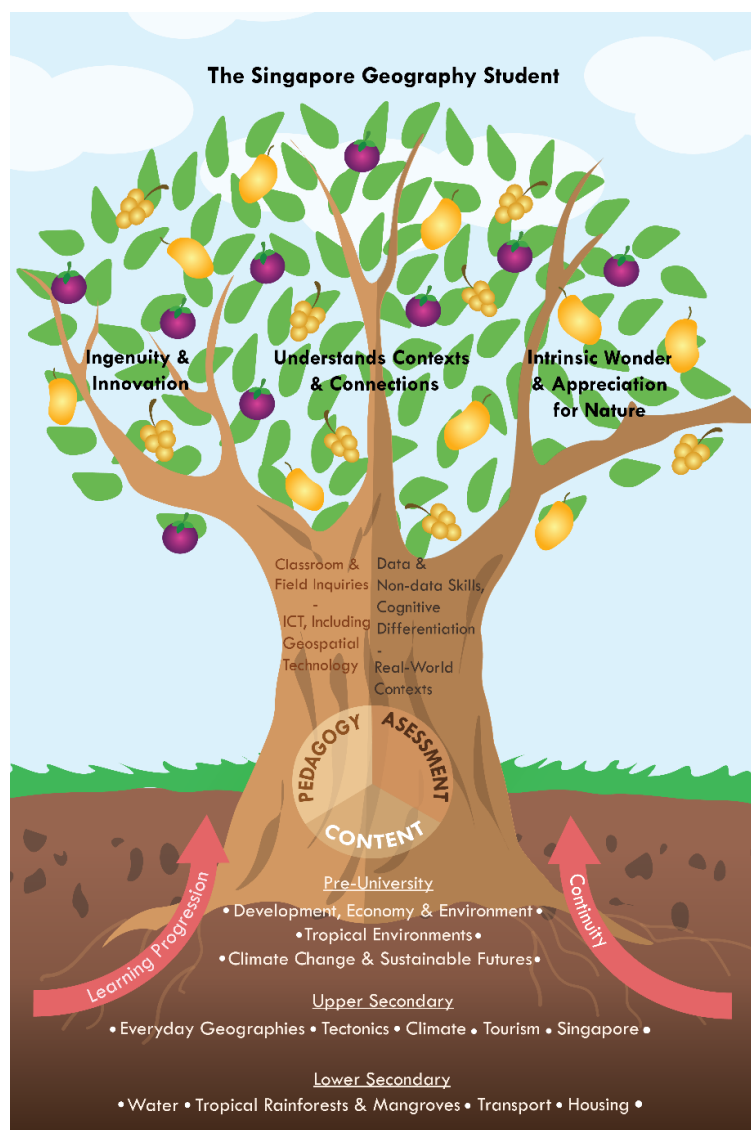


Figure 1: The Geography Curriculum Concept

Aims of Upper Secondary Geography

The syllabuses enable students to:

- acquire knowledge and skills to describe, explain and analyse geographical phenomena and processes that occur in Singapore and beyond;
- examine selected geographical phenomena and processes by analysing data;
- be aware of different value orientations towards the environment, which influence people's actions;
- be imbued with a sense of responsibility towards the environment; and
- be provided with opportunities to discuss solutions and take actions to achieve a more sustainable world.

Knowledge and Understanding

The syllabuses develop students' knowledge and understanding of:

- geographical phenomena and processes that occur in Singapore and beyond;
- geographical concepts associated with selected natural and human phenomena;
- geographical methods of inquiry to investigate selected natural and human phenomena and processes; and
- sustainable development and approaches that enhance the sustainability of our world at various scales.

Skills

The syllabuses seek to equip students with skills to:

- analyse geographical data;
- interpret geographical data to recognise patterns and trends, and suggest relationships;
- pose relevant geographical questions to learn about natural and human phenomena and processes;
- apply selected geographical concepts and methods to investigate natural and human phenomena and processes; and
- evaluate geographical information to make reasoned decisions.

Values and Attitudes

The syllabuses seek to nurture in students:

- an awareness of different value orientations towards the environment, which influence people's actions; and
- a sense of responsibility towards the environment, and a desire to contribute towards building a sustainable future.

Desired Outcomes of Education and 21st Century Competencies

The Desired Outcomes of Education (DOE) are attributes that educators aspire for our learners upon the completion of their formal education. These outcomes establish a common purpose for Geography educators, drive our school-based programmes, and serve as a

compass to guide curriculum and instruction.

The Singapore Geography student embodies the DOE, and exercises ingenuity and innovation in contributing to Singapore’s and the world’s sustainable development. He/she understands contexts and connections, and possesses an intrinsic wonder and concern for nature. In sum, he/she is:

- a **confident person** who has a strong sense of right and wrong, is adaptable and resilient, knows himself or herself, is discerning in judgment, thinks independently and critically, and communicates effectively;
- a **self-directed learner** who questions, reflects, perseveres and takes responsibility for his or her own learning;
- an **active contributor** who is able to work effectively in teams, is innovative, exercises initiative, takes calculated risks and strives for excellence; and
- a **concerned citizen** who is rooted to Singapore, has a strong sense of civic consciousness, is informed about Singapore and the world, and takes an active part in bettering the lives of others around them.

The Upper Secondary Geography syllabus is aligned to the Framework for 21st Century Competencies (21CC) and Student Outcomes (Figure 2), and it enables students to develop competencies necessary for them to thrive in a globalised and fast-changing world. Learning Geography supports the acquisition of the 21CC through inquiries, developing well-constructed explanations and responses to phenomena or issues affecting their everyday lives. Geography also introduces investigative and communication tools including maps, fieldwork and Geographic Information Systems (GIS), which offer unique opportunities to make sense of the modern world.

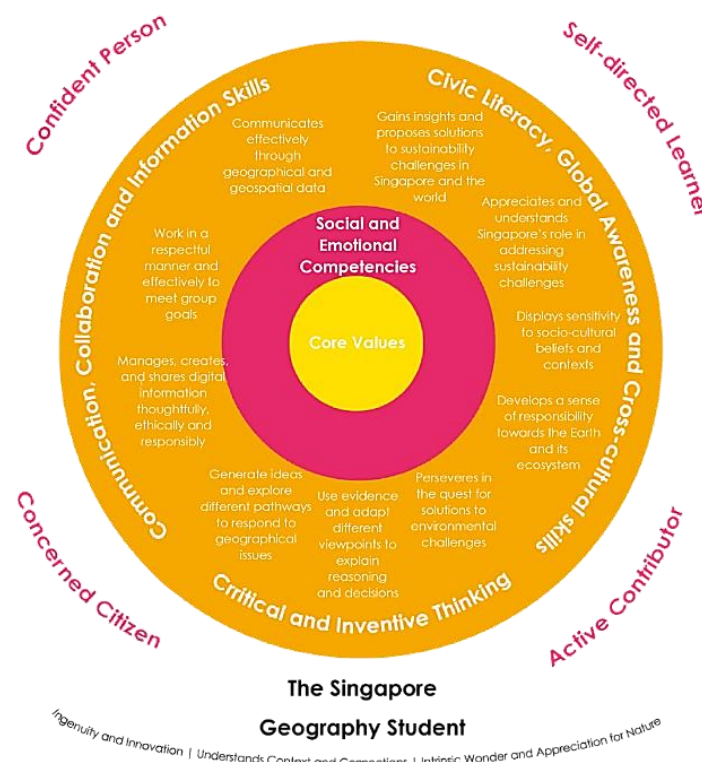


Figure 2: 21CC and Student Outcomes

Learning Progression and Continuity in Geography

The Learning Progression and Continuity in Geography (Table 1) is developed and featured in the Geography Curriculum Concept (Figure 1); with students acquiring more sophisticated understanding of geographical concepts and undertaking more rigorous fieldwork methods from Secondary to Pre-University.

Planning for progression in the Geography curriculum (Table 1) is featured as follows:

- **Breadth of geographical knowledge:** Breadth refers to the gradual extension of students' geographical knowledge, which is a cumulative process as they move through each level of study. Previously acquired knowledge is reinforced when students perceive it to be relevant to new learning, and long-term recall is usually facilitated by periodic revisiting.
- **Depth of geographical understanding:** Progression in students' geographical understanding is closely associated with the development of their ability to describe and explain geographical ideas and being able to apply them to new situations. Hence this is evidenced by students' ability to comprehend and undertake cognitively more demanding tasks, including interpretation, analysis, synthesis and evaluation of information.
- **Use of geographical skills:** Geographical skills are varied and can be categorised as specific techniques associated with fieldwork, skills associated with cognitive tasks, and skills associated with inquiry strategies.
- **Attitudes and values:** While explicitly articulated in the Geography Curriculum Concept (Figure 1), its specific progressions are implicitly embedded in all syllabuses through the sustainability-themed topics and concepts such as contestation over land use, responses to hazards, sustainable development and stewardship. The curriculum has planned increasing opportunity for students to examine social, economic, environmental and political issues at each higher level of study.

Planning for continuity in the Geography curriculum (Table 1) is seen in these aspects across all levels of study:

- **Overarching theme of sustainable development:** Sustainability-themed content is first introduced in the 2021 Lower Secondary Geography through sustainable resource use and management and will be explored further in the 2023 Upper Secondary and Pre-University Geography Syllabuses under sustainability challenges through different topics on human-environment relationships.
- **Disciplinary concepts of Space, Place, Environment and Scale:** The same set of disciplinary concepts are adopted across all levels of study. This allows students to deepen their use of disciplinary lenses in analysing phenomena and issues as they learn Geography at a higher level of study.
- **Teaching with inquiry as a signature pedagogy:** Teaching with inquiry is emphasised across all levels of study through the Geography Inquiry Process. Geographical inquiry encourages questioning, investigation and critical thinking about issues affecting the environment and people's lives, now and in the future.

Fieldwork as the cornerstone of Geography education: Across all levels of study, students are given the opportunity to understand geographical phenomena and issues through investigative fieldwork. At each higher level of study, they are exposed to more rigorous quantitative and qualitative fieldwork methods.

Table 1: Learning progression and continuity in Geography from Lower Sec Geography to Pre-U Geography

	Lower Secondary Geography	Upper Secondary Geography	Pre-University Geography
Progression in Key Geographical Concepts			
Space	<ul style="list-style-type: none"> Basic spatial concepts; <i>location, distance, direction, scale, and movement.</i> Spatial patterns and processes; <i>distribution of tropical equatorial climate and global process of the hydrological cycle.</i> 	<ul style="list-style-type: none"> Spatial concepts; <i>region, volume and interdependence to show the connections in physical and human phenomena.</i> Spatial patterns, processes and associations of physical and human phenomena; <i>climate risks variation and its influence on physical and human systems in surrounding regions.</i> 	<ul style="list-style-type: none"> Complex spatial concepts; <i>connectivity, networks and hierarchies to show the spatial organisation of the global economy and trans-national corporations.</i> Spatial and temporal relations; <i>fluvial processes change over time and shape patterns in the distribution of human and physical phenomena.</i>
Place	<ul style="list-style-type: none"> Places as locations with distinctive characteristics; <i>Singapore occupying a particular point on the Earth's surface.</i> Places as locales with physical and human characteristics; <i>deforestation of tropical rainforests in Brazil.</i> 	<ul style="list-style-type: none"> Places as locales with physical and human characteristics that change with time; <i>the development of tourist destination over time.</i> Places as socially constructed with personal meaning; <i>people develop a sense of place through personal, community and national identity rooted in places.</i> 	<ul style="list-style-type: none"> Places as socially constructed with place-based identities; <i>sustainable urban development and liveability, urban reimagining.</i> Places as socially constructed are interacting continuously; <i>places are sites of contestation as local and global processes socially construct and reconstruct places (all the time).</i>
Environment	<ul style="list-style-type: none"> Physical and human environments; <i>natural landscape versus built-up urban areas.</i> Simple interrelationships in the environment; <i>humans through building homes can change the physical environment (into an urbanised city).</i> 	<ul style="list-style-type: none"> Nature-human interrelationships in the environment; <i>tourism activity depends on the natural environment, and also impacts the environment as a result.</i> Environment as ecosystems; <i>natural and human systems are connected within and across systems.</i> 	<ul style="list-style-type: none"> Environment as dynamic and complex; <i>changes in one part may affect others.</i> Synoptic links between development, economy & environment; <i>environmental integrity in dimensions of sustainable urban development.</i>
Scale	<ul style="list-style-type: none"> Scale concepts by fundamental levels of organisation; <i>local (eg. Bishan Park), national (eg. Singapore), regional (eg. Southeast Asia), global (eg. world).</i> Scale of imagery; <i>satellite and aerial to ground photographs.</i> 	<ul style="list-style-type: none"> Scale concept by duration; <i>temporal scale of daily occurrences of land and sea breezes vs. seasonal monsoon winds.</i> Scale concept by size of the space; <i>spatial scale & spatial hierarchies of residential units, neighbourhoods and town centres in Singapore.</i> 	<ul style="list-style-type: none"> Scale concept by length; <i>synoptic scale of wind circulations.</i> Scale concept by duration; <i>geological time scale in warming and cooling of the earth.</i> Scale as socially constructed; <i>politics of scale in human geography where issues manifest at different and multiple scales are also interconnected.</i>
Progression in Geographical Methods			
Geography Inquiry Process	<ul style="list-style-type: none"> Geography inquiry process; <i>focus on entire inquiry process to aid understanding of prescribed geographical phenomenon.</i> 	<ul style="list-style-type: none"> Geography inquiry process; <i>focus on the depth and different parts of the entire process to understand a selected geographical phenomenon.</i> 	<ul style="list-style-type: none"> Geography inquiry process; <i>as a framework to plan and design a student-directed research on a selected geographical phenomenon.</i>
Sampling Methods	<ul style="list-style-type: none"> Exposure to sampling methods; <i>convenience, (simple) random and systematic random sampling.</i> 	<ul style="list-style-type: none"> Basic non-probable and probable sampling methods; <i>convenience and quota sampling, and (simple) random and stratified random sampling.</i> 	<ul style="list-style-type: none"> Range of non-probable and probable sampling methods; <i>selection guided by research questions/ hypotheses and topic under investigation.</i>
Data Collection Methods	<ul style="list-style-type: none"> Exposure to generic methods; <i>use of interviews and field sketches.</i> 	<ul style="list-style-type: none"> Basic qualitative and quantitative methods; <i>mental maps and semi-structured interviews, and closed-ended questionnaire survey</i> 	<ul style="list-style-type: none"> Range of qualitative and quantitative methods; <i>selection guided by research questions/ hypotheses and topic under investigation.</i>

Design of the Syllabus

Aligned with the Geography Curriculum Concept (Figure 1), the Upper Secondary Geography syllabuses have adopted an integrated design approach to prepare students for interdisciplinary learning. Integrating physical and human geography knowledge help them understand real-world issues and facilitate transfer of learning. Figure 3 shows how the different clusters are integrated to develop students' understanding of geographical phenomena, associated impacts and responses, grounded in the theme of *Sustainable Development*.

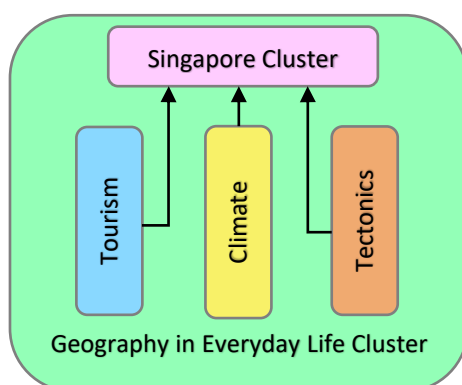


Figure 3: An integrated design approach

In this syllabus, the *Geography in Everyday Life Cluster* is integrated and sets the foundation for understanding key ideas in other clusters. *Tourism, Climate and Tectonics Clusters* each represent a sub-field in Geography. The *Singapore Cluster* provides opportunity for learners to apply knowledge and understanding from all clusters in a holistic manner when considering Singapore's probable response to future challenges.

Four key geographical concepts – *Space, Place, Environment* and *Scale* underpin the syllabuses. They are featured in the *Geography in Everyday Life Cluster* and the concepts are made concrete in the context of urban neighbourhoods. Students develop and deepen their use of disciplinary lens when examining phenomena and issues in the different clusters and fieldwork. Table 2 shows the overview of the content in the Upper Secondary Geography syllabuses, which are organised using *Sustainable Development* as a conceptual lens to understand phenomenon around urban neighbourhoods, in the region and the world.

Table 2: Overview of 2023 Upper Secondary Geography syllabus content

<i>Content Clusters</i>	<i>Topic 1 Phenomena, Concepts</i>	<i>Topic 2 Implications, Impacts</i>	<i>Topic 3 Responses, Sustainable Development</i>
Geography in Everyday Life Cluster Thinking Geographically Sustainable Development Geographical Methods			
Tourism Cluster	Tourism Activity	Tourism Development	Sustainable Tourism Development
Climate Cluster	Weather and Climate	Climate Change	Climate Action
Tectonics Cluster	Plate Tectonics	Earthquakes and Volcanoes	Disaster Risk Management
Singapore Cluster	Small Island City-State	Opportunities and Challenges	Sustainable and Resilient Singapore

2. CONTENT

Geography in Everyday Life Cluster

Geography is more than a world knowledge. Geographers make sense of their everyday lives and the world around them by viewing it through a ‘geographical lens’ or concept. Concepts introduce the diversity of ways to think geographically and investigate using geographical methods, the connections and relationships between places and spaces. Learning Geography is to engage mentally with questions about people, society, environment and the planet. Geographers studying sustainable development explore how people attach values to the environment and consider people’s varied responses to sustainability challenges in context.

Topic 1 | Thinking Geographically

Notwithstanding the diversity of practices among geographers worldwide, disciplinary concepts are commonly used by geography teachers to support students in classifying and establishing their understanding of concepts and phenomena. These disciplinary concepts exemplify how geographers conduct research, providing a meaningful structure that helps students to organise conceptual and factual knowledge. Equipped with the ability to think geographically would make students’ knowledge powerful, enriching their civic participation and enabling them to contribute productively in cross-disciplinary teams.

Key Questions	Students should know and understand
1. What is the relationship between people and nature in their neighbourhoods ?	<ol style="list-style-type: none"> 1. Relationship between people and nature <ol style="list-style-type: none"> a) local communities and nearby nature areas are dependent upon each other b) local communities and nearby nature areas mutually affect each other 2. Benefits enjoyed by people and nature <ol style="list-style-type: none"> a) nature areas lower air temperatures, remove pollutants and provide space for recreation b) community activities promote the importance of environmental protection 3. Disadvantages to people and nature <ol style="list-style-type: none"> a) wildlife from nearby nature areas may harm people and environmental protection limits development b) visitors to nature areas cause soil erosion, damage vegetation, worsen pollution and disturb wildlife
2. How do people acquire a sense of place in their neighbourhoods ?	<ol style="list-style-type: none"> 1. Sense of place <ol style="list-style-type: none"> a) people associate importance, meanings and memories with specific locations in their neighbourhoods b) people’s experiences with natural and built environments, and interaction with others at these locations 2. Acquiring a sense of place <ol style="list-style-type: none"> a) individuals repeatedly encounter people and objects along familiar paths or roads during regular travel b) individuals experience significant or memorable events at local landmarks and gathering places 3. Representing a sense of place <ol style="list-style-type: none"> a) individuals and organisations use different forms and types of media to express people’s sense of place

	<ul style="list-style-type: none"> b) individuals' sense of place could be enhanced or contradicted by these different representations
<p>3. What is the relationship between locations in a neighbourhood?</p>	<ol style="list-style-type: none"> 1. Regions <ul style="list-style-type: none"> a) areas with similar physical and/or human characteristics or are known for something b) spheres of influence of services, events and objects on other locations in the area 2. Spatial patterns <ul style="list-style-type: none"> a) non-random arrangement of services, events and objects in an area b) services, events and objects arranged in recognisable shapes, geometry, clusters or at regular intervals 3. Spatial associations <ul style="list-style-type: none"> a) tendency of a pair of services, events and objects to locate near each other b) tendency suggests a connection between a service, event or object and another service, event or object
<p>4. How are neighbourhoods organised in Singapore?</p>	<ol style="list-style-type: none"> 1. Spatial scales in Singapore <ul style="list-style-type: none"> a) more than 20 towns spread across the country, catering to different lifestyles b) each town has a town centre, serving as commercial and social hubs for residents living in its neighbourhoods 2. Spatial hierarchies in Singapore <ul style="list-style-type: none"> a) nested areas of different sizes beginning with a single residential unit b) clusters of residential units form a precinct, which in turn forms neighbourhoods that combine into a town 3. Town planning in Singapore <ul style="list-style-type: none"> a) serve residents and provide for nature at distinct levels of the precinct, neighbourhood and town b) create connections and synergies across precincts, neighbourhoods and towns

Topic 2 | Sustainable Development

The key to sustainable development is to achieve a balance between the exploitation of natural resources for economic and social development, and conserving ecosystem services that are critical to people's livelihoods and well-being. Disasters destroy lives, undoing many years of effort in protecting natural environments, and improving economic and social conditions. Therefore, putting emphasis on disaster risk reduction is central to sustainable development.

Key Questions	Students should know and understand
<p>1. What are sustainable urban</p>	<ol style="list-style-type: none"> 1. Sustainable development <ul style="list-style-type: none"> a) meet the needs of the present population by achieving high standards of living for all

<p>neighbourhoods ?</p>	<ul style="list-style-type: none"> b) ensure the ability of future generations to meet their own needs 2. Economic and social sustainability in urban neighbourhoods <ul style="list-style-type: none"> a) high enough population density to support local businesses, and keep transport and infrastructure costs low b) small population size to enable regular interaction among residents and to discuss decisions affecting the neighbourhood 3. Environmental sustainability in urban neighbourhoods <ul style="list-style-type: none"> a) ample protection for nature and facilities that support waste minimisation and recycling b) adopts energy and water efficient design approaches for buildings and landscapes
<p>2. What ecosystem services are found in urban neighbourhoods ?</p>	<ul style="list-style-type: none"> 1. Urban neighbourhoods as ecosystems <ul style="list-style-type: none"> a) ecosystems consist of living communities and the non-living environment interacting with one another b) aquatic and terrestrial ecosystems in neighbourhoods including ponds, lakes, parks and forests 2. Provisioning and regulating services <ul style="list-style-type: none"> a) provisioning services available in neighbourhoods include fresh water and food b) regulating services in neighbourhoods include microclimate regulation, flood mitigation, air and water quality control 3. Cultural and supporting services <ul style="list-style-type: none"> a) cultural services in neighbourhoods include aesthetics, education and recreation b) supporting services in neighbourhoods include soil formation, pollination and photosynthesis
<p>3. What are common hazards in urban neighbourhoods ?</p>	<ul style="list-style-type: none"> 1. Fire hazards <ul style="list-style-type: none"> a) fires in neighbourhoods are commonly caused by faulty electrical appliances and wiring, and unattended cooking fires b) negative consequences of fires include burn injuries, smoke inhalation and property damage 2. Air pollution hazards <ul style="list-style-type: none"> a) air pollution in neighbourhoods is commonly caused by burning vegetation and industrial and motor vehicle emissions b) negative consequences of air pollution include respiratory infections, heart disease and lung cancer 3. Traffic hazards <ul style="list-style-type: none"> a) traffic accidents in neighbourhoods are commonly caused by speeding, red-light running and drunk driving b) negative consequences of traffic accidents include serious injury and loss of life

<p>4. How to build sustainable urban neighbourhoods ?</p>	<ol style="list-style-type: none"> 1. Environmental stewardship <ol style="list-style-type: none"> a) promote volunteerism among neighbourhood residents to share knowledge with others about the importance of healthy ecosystems b) partner public and private stakeholders in environmental stewardship efforts 2. Disaster risk management <ol style="list-style-type: none"> a) reduce neighbourhoods' exposure to hazards and the vulnerability of people and properties to hazards b) improve residents' preparedness in responding to hazards and implement monitoring and warning systems 3. Community resilience <ol style="list-style-type: none"> a) strengthen relationships among residents and raise their awareness of potential hazards b) develop residents' ability to organise themselves and equip themselves with resources to resist, adapt and recover from a disaster
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Topic 3 | Geographical Methods

Geographical inquiry is integral to school geography and provides the closest proximate to the practice of geographers. It is learning that takes place outside the classroom and occurs in a real-world context. It is a systematic approach to investigating geographical phenomena and their related issues, by applying relevant geographical concepts and skills. At the end of their inquiry, students should reflect on the learning process by evaluating the reliability of the data collected, and the validity of their conclusion or findings.

Key Questions	Students should know and understand
<p>1. How to design fieldwork?</p>	<ol style="list-style-type: none"> 1. Research questions and hypotheses <ol style="list-style-type: none"> a) identify a topic or thesis from textbooks, news articles, websites b) craft a question that outlines a specific scope and a measurable hypothesis about one or two variables 2. Data collection sequence through primary and/or secondary sources <ol style="list-style-type: none"> a) collect quantitative data, then design qualitative data collection to examine patterns and trends b) collect qualitative data, then design quantitative data collection to verify observations 3. Limitations and risks <ol style="list-style-type: none"> a) adjust research aim, study area, sample size and timeframe according to available resources b) implement measures to avoid harming oneself, other people and nature
<p>2. How to collect primary data?</p>	<ol style="list-style-type: none"> 1. Sampling <ol style="list-style-type: none"> a) use non-probability sampling methods including convenience and quota sampling

	<ul style="list-style-type: none"> b) use probability sampling methods including simple random sampling and stratified random sampling <ol style="list-style-type: none"> 2. Closed-ended questionnaire surveys <ul style="list-style-type: none"> a) create pre-defined responses to questions that are limited to short phrases, single words or numbers b) use rating scales to guide responses including the Likert scale, frequency scale and ranking scale 3. Mental maps <ul style="list-style-type: none"> a) visualise experiences by drawing features and adding labels onto the base map of a study area b) conduct semi-structured interviews with open-ended questions exploring features and labels added to the map
<ol style="list-style-type: none"> 3. How to process and analyse data? 	<ol style="list-style-type: none"> 1. Closed-ended questionnaire surveys <ul style="list-style-type: none"> a) interpret responses using measures of frequency including counts and percentages b) interpret responses using measures of central tendency including mean, mode and median 2. Mental maps <ul style="list-style-type: none"> a) analyse how well maps represent reality, and how features and labels are drawn or added b) examine how memories of experiences are represented on maps and described during semi-structured interviews 3. Relationships and patterns <ul style="list-style-type: none"> a) visualise positive and negative correlations using scatter plots and best-fit lines b) identify recognisable geometric shapes, clusters and repetitions
<ol style="list-style-type: none"> 4. How to present findings? 	<ol style="list-style-type: none"> 1. Maps <ul style="list-style-type: none"> a) represent spatial information using dots, lines and polygons b) provide title, date, orientation, scale, legend, author and source(s) on maps 2. Graphs <ul style="list-style-type: none"> a) use bar graphs and pie charts to show distributions b) use line graphs to show trends and relationships between two variables 3. Photographs and texts <ul style="list-style-type: none"> a) use satellite and aerial images to display spatial information b) use colour-coded quotations and word clouds to represent qualitative analyses

Tourism Cluster

Tourism is a complex, multi-dimensional phenomenon that is best understood as a system. Tourism activity consists of flows of people and goods and services between places. These flows are interdependent, existing within a wider system. Tourism benefits and harms people and nature across different scales. As places are unique, sustainable tourism development cannot be achieved using a one-size-fits-all approach. Strategies to benefit from tourism and solutions to address problems caused by tourism would need to be adapted to suit different contexts.

Topic 1 | Tourism Activity

The components of the tourism system span the globe, connecting communities and economies from different parts of the world. Its efficient functioning depends on the maintenance of the relationship between tourist generating and tourist destination regions. Tourist arrivals was about 25 million in 1950. About 60 years later, it exceeded 1 billion as the motivation and ability of individuals to travel increased. The tourism boom resulted in the transformation of many places, as they evolve as tourist destination regions, attracting tourists with different personality characteristics at different stages of their life cycle.

Key Questions	Students should know and understand
1. What is a tourism system?	<ol style="list-style-type: none"> 1. Components of the tourism system <ol style="list-style-type: none"> a) key components include tourist generating regions, tourist destination regions and transit routes b) volume and direction of travel between regions are influenced by transit routes 2. Relationship between tourist generating and destination regions <ol style="list-style-type: none"> a) push factors at tourist generating regions and pull factors at tourist destination regions b) interdependence of tourists, businesses and organisations at tourist generating and destination regions 3. Interactions between tourism and the environment <ol style="list-style-type: none"> a) tourism activity interacts with nature, communities and economies in their local environment and beyond b) changes to one part of the tourism system affects the local and wider environment, and vice versa
2. What led to the growth of tourism?	<ol style="list-style-type: none"> 1. Motivation to travel <ol style="list-style-type: none"> a) individuals seeking relaxation, self-fulfilment and unique travel experiences b) made possible by growth in individuals' incomes 2. Ability to travel <ol style="list-style-type: none"> a) growth in disposable incomes and increased leisure time due to paid vacation. b) facilitated by business innovations, lower transport costs and accommodation costs 3. Mobility in travel <ol style="list-style-type: none"> a) expansion of public transport services and infrastructure, and new modes of air, land and sea travel b) increased private car ownership improving travel convenience to nearby locations

Key Questions	Students should know and understand
3. How do tourist destination regions develop over time?	<ol style="list-style-type: none"> 1. Exploration and involvement stages <ol style="list-style-type: none"> a) small number of tourists undertaking individual and irregular travel to visit the destination's primary attractions b) locals offer tourist services, advertising the destination, requesting for more public tourist amenities and facilities 2. Development and consolidation stages <ol style="list-style-type: none"> a) increase in tourist numbers with destinations having more man-made attractions, advertisements and foreign labour b) growth in tourist numbers slow and tourists outnumber locals resulting in a tourism dependent economy 3. Stagnation and decline or rejuvenation stages <ol style="list-style-type: none"> a) tourist numbers peak as a destination's carrying capacity is reached, resulting in negative impacts b) tourist numbers decline as a destination loses its tourist appeal or is rejuvenated with new cultural or man-made attractions
4. How do different personality characteristics of tourists affect tourist destination regions?	<ol style="list-style-type: none"> 1. Spectrum of personality characteristics <ol style="list-style-type: none"> a) Dependables and Venturers, with a small proportion of tourists on both extreme ends b) majority of tourists in the middle of the spectrum with a mixture of both extremes 2. Features of personality characteristics <ol style="list-style-type: none"> a) Dependables spend cautiously, guided by authoritative figures, prefer structure in daily living and the company of friends and family b) Venturers spend readily, guided by personal judgement, prefer different activities and being alone 3. Personality characteristics influence travel patterns <ol style="list-style-type: none"> a) different types of tourist destination regions appeal to tourists with different personality characteristics b) tourists who are more Venturer types influence travel decisions of those who are more Dependable types

Topic 2 | Tourism Development

Tourism is expected to continue growing, characterised by more diverse travel experiences offered by a larger variety of tourism operators. Thus, the potential of tourism contributing to environmental protection, economic and social development is widely recognised. It is equally important to recognise that this potential cannot be fulfilled without paying close attention to the negative, and in some cases irreversible, impacts of tourism. Left unattended, the negative impacts of tourism could negate all the benefits that it has brought to tourism destination regions.

Key Questions	Students should know and understand
<p>1. What are the trends in tourism?</p>	<ol style="list-style-type: none"> 1. Globalisation and tourism <ol style="list-style-type: none"> a) continued expansion in international tourist arrivals b) tourism becomes increasingly diverse in tourist generating and destination regions 2. Diversity in tourism demand <ol style="list-style-type: none"> a) growing popularity of lesser-known destinations that were not previously as popular or were less accessible b) emergence of new experiences including adventure, heritage, sports and health tourism 3. Diversity in tourism supply <ol style="list-style-type: none"> a) small specialist operators adding to services of mass market tour operators b) tourism marketing changing from traditional print and broadcast media to new online media
<p>2. How does tourism affect the economies of places?</p>	<ol style="list-style-type: none"> 1. Economic impact in the tourism system <ol style="list-style-type: none"> a) tourist generating and destination regions operate interdependently in the tourism system b) tourism's impact on the economy is experienced more significantly at tourist destination regions 2. Positive economic impact <ol style="list-style-type: none"> a) increased employment in the formal and informal tourism sectors at tourist generating and destination regions b) higher income generated from tourists' spending on consumer goods and services at tourist destination regions 3. Negative economic impact <ol style="list-style-type: none"> a) economic leakages resulting in less tourism revenue b) overdependence on tourism increasing tourist destination regions' vulnerability to a sudden fall in tourist numbers
<p>3. How does tourism affect the society of places?</p>	<ol style="list-style-type: none"> 1. Social impact in the tourism system <ol style="list-style-type: none"> a) tourists and local communities at tourist destination regions mutually affect each other b) outcomes are shaped by the nature of interaction between tourists and local communities 2. Positive social impact <ol style="list-style-type: none"> a) increased interest among tourists and local communities in preserving traditional cultural practices and art forms b) environmental protection at tourist destination regions enhances cultural ecosystem services 3. Negative social impact <ol style="list-style-type: none"> a) commodification of traditional cultural practices and art forms resulting in loss of values and conflict among locals b) negative attitudes of local communities towards tourists including cultural clashes and tourists as victims of crimes

<p>4. How does tourism affect the environment of places?</p>	<ol style="list-style-type: none"> 1. Environmental impact in the tourism system <ol style="list-style-type: none"> a) natural environments provide important provisioning and regulating ecosystem services b) environmental degradation due to tourism impacts tourist destination regions significantly 2. Positive environmental impact <ol style="list-style-type: none"> a) conservation of natural environments and preservation of biodiversity to maintain natural attractions b) restoration of degraded aquatic and terrestrial ecosystems to create new natural attractions 3. Negative environmental impact <ol style="list-style-type: none"> a) pollution caused by greenhouse gas emissions, inadequate sewage facilities and improper waste disposal b) construction of facilities and attractions encroaches on nature, depletes natural resources and threatens wildlife habitats
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Topic 3 | Sustainable Tourism Development

Sustainable tourism development is necessary for economies, communities and natural environments to continually benefit from tourism. However, it is challenging to balance the different dimensions of sustainable development given the numerous stakeholders who are involved in tourism. The values, attitudes and needs of these stakeholders could differ or be in conflict. There are many approaches to achieving sustainable tourism development, which strive for sustainable tourism production and consumption, ensuring the equitable distribution of tourism benefits.

Key Questions	Students should know and understand
<p>1. How does tourism development help achieve sustainable development?</p>	<ol style="list-style-type: none"> 1. Economic sustainability <ol style="list-style-type: none"> a) tourism development should continually provide employment opportunities and income growth b) tourism development should result in more social services that raise local standards of living 2. Social and environmental sustainability <ol style="list-style-type: none"> a) tourism development should respect authenticity of local communities, practices and art forms; and contribute to intercultural understanding and tolerance b) tourism development should maintain essential ecological processes and conserve natural heritage and protect biodiversity 3. Sustainable tourism development <ol style="list-style-type: none"> a) achieved when sustainability principles are applied to the economic, social and environmental aspects of tourism development b) all three dimensions are balanced to guarantee tourism’s long-term sustainability
<p>2. How effective are</p>	<ol style="list-style-type: none"> 1. Governments and international organisations

<p>stakeholders in influencing sustainable tourism development?</p>	<ul style="list-style-type: none"> a) governments establish policies, create plans and enforce regulations to manage tourism development b) international organisations offer consultancy, financial assistance and raise public awareness <p>2. Businesses, local communities and tourists</p> <ul style="list-style-type: none"> a) businesses and local communities could seek advice from others and participate in decision-making b) tourists could develop genuine interest in tourist destination regions and interact responsibly <p>3. Challenges faced by stakeholders</p> <ul style="list-style-type: none"> a) stakeholders may have conflicting priorities and needs b) stakeholders have differing amounts of control over resources and may view how sustainability is measured differently from other stakeholders
<p>3. How effective are the different approaches in achieving sustainable tourism development?</p>	<p>1. Ecotourism</p> <ul style="list-style-type: none"> a) comprises diverse approaches that lie on a spectrum from hard to soft ecotourism b) limitations include uncertainty over continuity of efforts in conserving nature and involving local communities <p>2. Community-based tourism</p> <ul style="list-style-type: none"> a) innovative small-scale tourism managed by local communities including homestays and agricultural tourism b) limitations include the potential loss of local culture and competition from larger-scale tourism operators <p>3. Pro-poor tourism</p> <ul style="list-style-type: none"> a) focused on improving livelihoods of the poor through training and access to micro-finance b) limitations include the inability to significantly reduce poverty as compared to direct investment in social services
<p>4. How might tourism continue to develop sustainably?</p>	<p>1. Sustainable tourism production</p> <ul style="list-style-type: none"> a) when demands on ecosystem services do not exceed the supply of resources b) when different stakeholders adopt a long-term, responsible and coordinated approach instead of short-term profit <p>2. Sustainable tourism consumption</p> <ul style="list-style-type: none"> a) when destination regions manage demand and tourism is consumed responsibly by tourists b) when policies give local communities primary attention while considering needs of tourists <p>3. Equitable distribution of tourism benefits</p> <ul style="list-style-type: none"> a) effective tourism management to ensure benefits are enjoyed by all b) minimising negative trade-offs within or between economic, social and environmental dimensions

Climate Cluster

Climate change is not new. Earth's climate has changed in response to the varying amounts of energy from the Sun and the evolving atmospheric composition. This has occurred over timescales ranging from millions to hundreds of years. Today, changes in climate have been exacerbated due to anthropogenic activities. The Earth's weather and climate system is part of the natural system that is interconnected with the human system. Hence changes in one part of the system affects another, impacting people and nature. Climate action could build our resilience to the effects of climate change, but it requires active participation from many stakeholders.

Topic 1 | Weather and Climate

Weather and climate are closely associated phenomena that affect both natural and human systems. While climate patterns are comparatively more predictable, weather, in contrast, is highly dynamic and varies considerably. Factors affecting three weather variables – air temperature, precipitation and wind can be examined to better understand short-term weather changes and changing climate patterns over a longer term. An insight into the workings of weather and climate would aid in the study of climatic hazards and their impact on natural and human systems.

Key Questions	Students should know and understand
1. What is weather and climate?	<ol style="list-style-type: none">1. Weather<ol style="list-style-type: none">a) state of atmospheric conditions at a particular time and placeb) described using variables including air temperature, cloud cover, precipitation, wind speed and wind direction2. Climate<ol style="list-style-type: none">a) average state of atmospheric conditions over a specified time periodb) climate types include tropical equatorial climate, tropical monsoon climate and cool temperate climate3. Climatic hazards<ol style="list-style-type: none">a) changes in climate and extreme weather including heat waves, droughts, floods, cyclones and wildfiresb) impact natural and human systems significantly
2. Why does air temperature vary across Earth's surface?	<ol style="list-style-type: none">1. Earth's rotation and revolution<ol style="list-style-type: none">a) Earth's rotation on its axis results in variability of air temperature over time in a dayb) Earth's revolution around the sun results in variability of air temperature over time in a year2. Latitude and altitude<ol style="list-style-type: none">a) at the global scale, solar angles are lower at higher latitudes resulting in lower air temperaturesb) at a local scale, air pressure is lower at higher altitudes resulting in lower air temperatures3. Nature of surfaces and distance from sea<ol style="list-style-type: none">a) Earth's surfaces, including snow cover, vegetation and exposed soil, affect site specific air temperaturesb) maritime effect on coastal areas and continental effect on inland areas affect site specific air temperatures

<p>3. Why does precipitation vary across Earth's surface?</p>	<ol style="list-style-type: none"> 1. Water cycle <ol style="list-style-type: none"> a) movement of water between the atmosphere and the Earth's surface through evapotranspiration, condensation and precipitation b) movement of water at different rates in the form of infiltration, surface runoff and groundwater flow 2. Relative humidity <ol style="list-style-type: none"> a) condensation is affected by the amount of water vapour in the atmosphere b) condensation occurs when the amount of water vapour exceeds the amount that can be held by the atmosphere at a given temperature 3. Clouds and precipitation <ol style="list-style-type: none"> a) clouds form due to condensation nuclei and the coalescence of water droplets in the atmosphere b) results in precipitation including convectional and relief rainfall
<p>4. Why do wind direction and wind speed vary across Earth's surface?</p>	<ol style="list-style-type: none"> 1. Unequal distribution of air temperature <ol style="list-style-type: none"> a) results in uneven distribution of pressure gradient b) initiates horizontal motion of air and determines wind direction 2. Wind speed <ol style="list-style-type: none"> a) influenced by strength of pressure gradient between two locations b) and friction due to Earth's topography 3. Local and regional winds <ol style="list-style-type: none"> a) land and sea breezes occur at the local scale b) Northeast and Southwest monsoons occur at the regional scale and are influenced by the Coriolis force

Topic 2 | Climate Change

Evidence has shown that the climates we know today have not always been the same. The Earth's climates have gone through periodic cycles of change over time. However, anthropogenic factors since the dawn of modern industrialisation have affected natural climate variability significantly. The large-scale emission of greenhouse gases from human activities has resulted in the enhanced greenhouse effect, which increases Earth's temperature. This rapid change in global climates would affect both the natural and human systems.

Key Questions	Students should know and understand
<p>1. What is the natural variability of climate?</p>	<ol style="list-style-type: none"> 1. Evidence of past climates <ol style="list-style-type: none"> a) episodes of cooling and warming over geological time b) evidenced by data on seafloor sediment and oxygen isotope 2. Changing climate zones <ol style="list-style-type: none"> a) indicated by temperature

	<ul style="list-style-type: none"> b) evidenced by expansion and contraction of main climatic zones <ol style="list-style-type: none"> 3. Climate variability due to natural processes <ul style="list-style-type: none"> a) changes in Earth's orbit and angle of tilt b) occurrences of sunspots and large-scale volcanic eruptions
2. How do anthropogenic factors contribute to climate change?	<ol style="list-style-type: none"> 1. Growth in population and industrialisation <ul style="list-style-type: none"> a) altered quantity of greenhouse gases in the atmosphere including carbon dioxide, methane and nitrous oxide b) data from the last decade has shown it to have been successively warmer than any of the preceding decades since 1850 2. Causes of the greenhouse effect <ul style="list-style-type: none"> a) a natural process making Earth habitable b) involves absorption and emission of shortwave and longwave radiation, respectively 3. Causes of the enhanced greenhouse effect <ul style="list-style-type: none"> a) burning of fossil fuels b) changing land use
3. How might climate change affect natural systems?	<ol style="list-style-type: none"> 1. Impact of climate change on natural systems <ul style="list-style-type: none"> a) increase in ocean surface temperatures and changes to ocean circulations b) increase in atmospheric temperatures and changes in precipitation on land 2. Impact of climate change on aquatic ecosystems <ul style="list-style-type: none"> a) threatens coral reefs and disruption of marine food webs b) ocean acidification 3. Impact of climate change on terrestrial ecosystems <ul style="list-style-type: none"> a) threatens flora and fauna b) increase in extreme weathers including droughts and excessive rainfall
4. How might climate change affect human systems?	<ol style="list-style-type: none"> 1. Impact of climate change on human systems <ul style="list-style-type: none"> a) geographically uneven due to varying climate variables and localised economic and social factors b) impacts are interconnected and cascaded from natural systems to people 2. Direct impact of climate change on human systems <ul style="list-style-type: none"> a) occurs through extreme weather events b) including heat waves, droughts, floods, cyclones and wildfires 3. Indirect impact of climate change on human systems <ul style="list-style-type: none"> a) affects provisioning ecosystem services including food production, and regulating ecosystem services including disease regulation b) alters cultural ecosystem services including melting of arctic ice and degradation of natural landscapes

Topic 3 | Climate Action

Climate change affects natural and human systems unevenly across the world, and climate risks vary considerably over time and space. Considered one of the most significant threats to sustainable development, climate change complicates the challenges faced by communities, especially those living in developing countries. To be effective, climate action thus needs to be calibrated according to the vulnerability of each different community. Most importantly, mitigating and adapting to climate change requires a holistic approach that combines different strategies to bring about sustained results.

Key Questions	Students should know and understand
1. How does climate action help achieve sustainable development?	<ol style="list-style-type: none"> 1. Climate action <ol style="list-style-type: none"> a) adaptation and mitigation strategies are complementary responses b) may create risks and benefits 2. Climate change is a threat multiplier <ol style="list-style-type: none"> a) exacerbates other threats to natural and human systems b) resulting in uneven climate-related effects 3. Climate change constrains development paths <ol style="list-style-type: none"> a) uneven impacts of climate change globally b) places additional burdens on disadvantaged communities and developing countries
2. Why do climate risks vary across places?	<ol style="list-style-type: none"> 1. Climate risks <ol style="list-style-type: none"> a) interaction between climate-related hazards, and vulnerability and the exposure of natural and human systems to these hazards b) results in potential loss of human lives and damage to properties 2. Affected by climate-related hazards <ol style="list-style-type: none"> a) shorter-term events including cyclones and floods b) longer-term events including sea level rise and droughts 3. Affected by vulnerability and exposure <ol style="list-style-type: none"> a) conditions that increase the susceptibility of a community to suffer from a lack of water, food and health resources due to extreme weather b) exposure to hazard areas including proximity to coastal and dry environments
3. How effective are mitigation strategies in building a community's resilience to climate change?	<ol style="list-style-type: none"> 1. Mitigation strategies <ol style="list-style-type: none"> a) involves changing how societies produce and use energy and land b) effectiveness limited by technological, economic, social and institutional challenges 2. Mitigation strategies that reduce greenhouse gas emissions <ol style="list-style-type: none"> a) international agreements and cooperation, and use of low-carbon technologies b) use of clean energy sources and changes in consumption patterns 3. Mitigation strategies that enhance carbon sinks

	<ul style="list-style-type: none"> a) protection of oceans and forests through land-use change b) protection of forests through forest regeneration
4. How effective are adaptation strategies in building community's resilience to climate change?	<ul style="list-style-type: none"> 1. Adaptation strategies <ul style="list-style-type: none"> a) require actions to lessen harm brought about by climate change b) effectiveness limited by technological, economic, social and institutional challenges 2. Adaptation strategies involving structural and technological approaches <ul style="list-style-type: none"> a) water and flood management b) use of technology to produce food 3. Adaptation strategies involving social and institutional approaches <ul style="list-style-type: none"> a) raising awareness and education b) national and regional policies

Tectonics Cluster

Plate tectonics theory describes and explains the spatial patterns of tectonic phenomena. It unified different explanations of natural phenomena such as earthquakes and volcanoes, synthesising evidence collected by scientists from different parts of the world. The distribution and occurrence of earthquakes and volcanoes is closely associated with tectonic movement. By understanding how disaster risks vary across places, communities living in areas prone to tectonic hazards can better prepare for earthquakes and volcanic eruptions, which is essential for sustainable development.

Topic 1 | Plate Tectonics

Scientists analyse the spatial distribution of natural phenomena, create knowledge based on verifiable observations, and strengthen existing knowledge with new observations. The plate tectonic theory was developed in the 1960s, but its origins has been traced to the ideas of German meteorologist Alfred Wegener who proposed in the 1910s that Earth's seven continents were once a single landmass, which he called Pangea. Scientists then added new observations of the seafloor, earthquake and volcanic activity to develop the plate tectonics theory, which explains how major landforms are created.

Key Questions	Students should know and understand
1. What is the plate tectonic theory?	<ul style="list-style-type: none"> 1. Plate tectonic theory <ul style="list-style-type: none"> a) Earth's internal structure consists of core, mantle and crust, including continental and oceanic crusts b) explains how forces within Earth drive global plate movements 2. Convection currents <ul style="list-style-type: none"> a) within the hot softened mantle below the crust b) being the driving force of overlying plates 3. Slab-pull force <ul style="list-style-type: none"> a) gravity-controlled subduction of denser oceanic plate b) drags the rest of the plate along
2. How does seafloor	<ul style="list-style-type: none"> 1. Seafloor spreading <ul style="list-style-type: none"> a) magma rises through mid-ocean ridges

spreading support the plate tectonic theory?	<ul style="list-style-type: none"> b) forms new oceanic crusts <ol style="list-style-type: none"> 2. Evidence from age of rocks <ul style="list-style-type: none"> a) younger rocks are found nearer to the crest of mid-ocean ridges b) rocks get progressively older further away from mid-ocean ridges 3. Evidence from limited sediment accumulation <ul style="list-style-type: none"> a) destruction of older oceanic crusts at trenches b) oceanic crusts younger than continental crusts
3. How does magnetic striping support the plate tectonic theory?	<ol style="list-style-type: none"> 1. Magnetic striping <ul style="list-style-type: none"> a) normal and reversed polarity b) stripes of rock on the seafloor with alternating magnetic properties 2. Evidence from rock composition <ul style="list-style-type: none"> a) basalt is a volcanic rock that forms the oceanic crust b) contains minerals that can be influenced by Earth's magnetic field 3. Evidence from rock patterns <ul style="list-style-type: none"> a) alternating polarity forms a striped pattern b) not random or isolated occurrences
4. What happens at plate boundaries when tectonic plates move?	<ol style="list-style-type: none"> 1. Divergent plate boundaries <ul style="list-style-type: none"> a) plates move away from each other b) results in mid-oceanic ridges, volcanoes including submarine volcanoes and volcanic islands, rift systems and earthquakes 2. Convergent plate boundaries <ul style="list-style-type: none"> a) plates move towards each other b) results in fold mountains, volcanoes including submarine volcanoes, oceanic trenches and earthquakes 3. Transform plate boundaries <ul style="list-style-type: none"> a) plates slide past each other b) results in faults and earthquakes

Topic 2 | Earthquakes and Volcanoes

Plate movements resulting from Earth's internal processes explain why some locations in the world are prone to experiencing earthquakes and volcanic eruptions. Large scale tectonic hazards could pose considerable dangers to people living in hazard-prone areas, causing widespread destruction that results in the loss of lives and massive damage to property. Tectonic hazards can also affect the natural environment, destroying ecosystems, killing plants and animals. However, there are many advantages to living near volcanoes, which resilient communities can benefit from.

Key Questions	Students should know and understand
1. How do tectonic processes affect the magnitude	<ol style="list-style-type: none"> 1. Tectonic processes of earthquakes <ul style="list-style-type: none"> a) stress builds up and exceeds strength of the fault b) sudden release of seismic waves, radiating energy from the focus

<p>of earthquakes?</p>	<ol style="list-style-type: none"> 2. Magnitude of earthquakes <ol style="list-style-type: none"> a) affected by amount of energy released through ground movement b) recorded using seismometers 3. Measuring earthquakes <ol style="list-style-type: none"> a) Richter scale measures local magnitude of earthquakes b) Moment Magnitude scale measures larger earthquakes more reliably
<p>2. How do tectonic processes affect the magnitude of volcanic eruptions?</p>	<ol style="list-style-type: none"> 1. Tectonic processes of volcanic eruptions <ol style="list-style-type: none"> a) magma consisting of dissolved gases is less dense b) forces its way upward and breaks through weak areas in the Earth's crust 2. Magnitude of volcanic eruptions <ol style="list-style-type: none"> a) determined by amount of dissolved gases and magma viscosity b) stratovolcanoes erupt violently and shield volcanoes emit magma gently 3. Measuring volcanic eruptions <ol style="list-style-type: none"> a) Volcanic Explosivity Index measures relative explosivity of historic eruptions b) considers the volume of ejected materials, height of eruption cloud and duration of the eruption
<p>3. How might distribution of earthquakes and volcanoes influence the location of tectonic hazards?</p>	<ol style="list-style-type: none"> 1. Distribution of earthquakes <ol style="list-style-type: none"> a) along all plate boundaries b) largest concentration at the Pacific Ring of Fire 2. Distribution of volcanoes <ol style="list-style-type: none"> a) located near convergent and divergent plate boundaries b) hot spot volcanoes are found away from plate boundaries 3. Distribution of tectonic hazards <ol style="list-style-type: none"> a) most located near plate boundaries, and near earthquakes and volcanoes b) tsunamis and volcanic ash may spread beyond geographic region
<p>4. How might tectonic hazards affect the natural and human systems?</p>	<ol style="list-style-type: none"> 1. Earthquake hazards and their impacts <ol style="list-style-type: none"> a) hazards include ground shaking, soil liquefaction, landslides and tsunamis b) impacts include destroying ecosystems, properties and infrastructure, disrupting services, and causing injury and loss of life 2. Volcanic eruption hazards and their impacts <ol style="list-style-type: none"> a) hazards include tephra, volcanic gases, lava flows, pyroclastic flows, lahars and volcanic landslides

	<ul style="list-style-type: none"> b) impacts include destroying ecosystems, properties and infrastructure, disrupting services, and threatening public health and cause injury and loss of life <p>3. Benefits of volcanic eruptions and living near volcanoes</p> <ul style="list-style-type: none"> a) volcanic eruption provides fertile soil for farming after volcanic materials are broken down and weathered, and makes available valuable minerals and building materials b) living near volcanoes allow harnessing of geothermal energy and tourism activities
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Topic 3 | Disaster Risk Management

Earthquake and volcanic eruption disaster risks vary greatly from place to place depending on both physical and human factors. For countries that are prone to tectonic hazards, sustainable development requires effective disaster risk management involving all stakeholders. Analysing the factors influencing disaster risks is important to reducing disaster risks successfully. Ultimately, it is vital for communities to continually build their resilience, and for governments to sustain their efforts in enhancing disaster response and recovery capabilities.

Key Questions	Students should know and understand
1. How does disaster risk management help achieve sustainable development?	<ul style="list-style-type: none"> 1. Disaster risk management <ul style="list-style-type: none"> a) prevent, reduce and manage disaster risks thus strengthening resilience b) apply plans and actions which are developed into various strategies by communities 2. Disaster risk and loss <ul style="list-style-type: none"> a) brings about serious economic, social and environmental consequences b) costly for individuals and countries, and may hinder development 3. Reducing disaster risks <ul style="list-style-type: none"> a) important for disaster-prone developing countries b) cost-effective investment in preventing future losses, thus contributing to sustainable development
2. Why do disaster risks related to earthquakes and volcanic eruptions vary across places?	<ul style="list-style-type: none"> 1. Tectonic disaster risk <ul style="list-style-type: none"> a) interaction between tectonic hazards, and vulnerability and exposure to earthquakes and volcanic eruptions b) results in potential loss of human lives and damage to properties 2. Factors influencing disaster risks related to earthquakes <ul style="list-style-type: none"> a) nature of hazards including duration and time of shaking b) vulnerable conditions including quality of building design and construction, soil and rock properties, and exposure including population density and distance from epicentre 3. Factors influencing disaster risks related to volcanic eruptions <ul style="list-style-type: none"> a) nature of hazards including chemical composition of magma

	<ul style="list-style-type: none"> b) vulnerable conditions including availability of surface and ground water facilitating the development of lahars, prevailing wind conditions affecting distribution of tephra, and exposure including presence of human settlements
<p>3. How effective are the strategies in building communities' resilience to earthquakes and volcanic eruptions?</p>	<ul style="list-style-type: none"> 1. Strengthening resilience <ul style="list-style-type: none"> a) important for communities living in hazard-prone zones b) to resist, adapt and recover from impacts of disasters in a timely and efficient manner 2. Strategies in building community resilience <ul style="list-style-type: none"> a) reducing exposure including land use planning, reducing vulnerability including hazard-resistant building designs, and monitoring and warning systems b) increasing preparedness for response and recovery 3. Challenges in building community resilience <ul style="list-style-type: none"> a) extent of community's resources b) capability of community to organise itself for disasters
<p>4. How effective are the disaster management strategies after an earthquake or a volcanic eruption?</p>	<ul style="list-style-type: none"> 1. Disaster management <ul style="list-style-type: none"> a) organisation, planning and application of strategies b) responding to and recovering from disasters 2. Disaster management strategies <ul style="list-style-type: none"> a) disaster response includes search and rescue efforts, timely evacuation, and provision of basic social and psychosocial services to affected communities b) disaster recovery includes restoring and improving facilities and living conditions of affected communities 3. Challenges in disaster management <ul style="list-style-type: none"> a) lack of domestic resources, including technological and financial resources b) engaging relevant stakeholders to collaborate and integrate disaster management strategies into their practices

Singapore Cluster

Singapore's natural and human characteristics may present vulnerabilities, yet it continues to be resilient as a small island city-state today. Being interconnected to geographical phenomena occurring regionally and globally, Singapore faces challenges and opportunities because of events that take place locally and beyond, in different sectors and at different scales. Singapore's ability to thrive and progress in the future would depend on its success in building resilience in all sectors and recognising the factors that would affect its desires to achieve sustainable urban development.

Topic 1 | Small Island City-State

Singapore is a unique place. It is small, an island, a city, and a sovereign state. To understand Singapore as a geographical phenomenon, we need to know the natural and human characteristics of the small island, and at the same time recognise that this city-state possesses unique economic, social and political characteristics unlike any other country. Singapore's resilience in the last 50 years enabled the small island city-state to survive, adapt and thrive today. Nonetheless, it is important for Singapore to recognise its vulnerabilities, which could hinder its sustainable development.

Key Questions	Students should know and understand
1. What are the natural characteristics of Singapore?	<ol style="list-style-type: none"> 1. Size and elevation <ol style="list-style-type: none"> a) small landmass with limited natural resources b) low-lying island 2. Climate <ol style="list-style-type: none"> a) tropical equatorial climate b) experiences Northeast and Southwest monsoons 3. Ecosystems with large biodiversity <ol style="list-style-type: none"> a) land-based ecosystem including tropical rainforests b) coastal ecosystems including inter-tidal areas, mangroves and coral reefs
2. What are the human characteristics of Singapore?	<ol style="list-style-type: none"> 1. Economic characteristics <ol style="list-style-type: none"> a) diversified economy b) wide range of service and manufacturing industries 2. Social characteristics <ol style="list-style-type: none"> a) open and globalised b) densely populated and well-connected internationally 3. Political characteristics <ol style="list-style-type: none"> a) independent sovereign state b) active contributor to global initiatives
3. What are Singapore's vulnerabilities?	<ol style="list-style-type: none"> 1. Limited land and natural resources <ol style="list-style-type: none"> a) difficult to achieve sustainable urban development b) vulnerable to food, water and energy insecurities 2. Changing demographics <ol style="list-style-type: none"> a) decreasing birth rate, ageing population and increasingly diverse society b) vulnerable to labour shortage and economic slowdown 3. External shocks and global uncertainties <ol style="list-style-type: none"> a) economic, social and environmental uncertainties b) vulnerable to climate change, pandemics and financial crises
4. What contributes towards Singapore's resilience?	<ol style="list-style-type: none"> 1. Resilient in terms of survival <ol style="list-style-type: none"> a) Singapore is able to overcome national crises b) effective management of economic recessions and pandemics 2. Resilient in terms of adaptability <ol style="list-style-type: none"> a) Singapore adapts to changing circumstances b) puts in place robust infrastructure and strong systems 3. Resilient in terms of thriving <ol style="list-style-type: none"> a) Singapore thrives as a small island city-state b) focused on building a liveable and sustainable city

Topic 2 | Opportunities and Challenges

The impact of climate change, tectonic hazards and tourism activity in Singapore is influenced by its unique characteristics. For example, being low-lying Singapore needs to be more attentive to the threat of rising sea levels. Although Singapore is located near the Pacific Ring of Fire, it is spared from most tectonic hazards. Nonetheless, it is beneficial for Singapore to invest in disaster risk management. Tourism receipts contribute billions of dollars to Singapore's economy. Much creativity and innovation would be needed to overcome its limitations to maintain its attractiveness as a tourist destination.

Key Questions	Students should know and understand
1. How might climate change affect Singapore?	<ol style="list-style-type: none"> 1. Impacts of climate change <ol style="list-style-type: none"> a) rising sea level b) increased daily mean temperatures and changing weather patterns 2. Challenges due to climate change <ol style="list-style-type: none"> a) floods, urban heat island effect, vector-borne diseases b) threats to biodiversity, food and water insecurities 3. Opportunities created to adapt to climate change <ol style="list-style-type: none"> a) land reclamation, coastal management, increasing health resilience b) high technology farming and development of water technologies
2. How might tectonic hazards affect Singapore?	<ol style="list-style-type: none"> 1. Impacts of tectonic hazards <ol style="list-style-type: none"> a) not susceptible to majority of tectonic disasters b) major tectonic movements close to the Sunda Megathrust may still affect Singapore 2. Challenges due to plausible occurrence of tectonic hazards in the region <ol style="list-style-type: none"> a) destruction of structures built on reclaimed land, and threat of floods from a mega earthquake b) threat of ash clouds from volcanic eruptions affecting health and disrupting the economy 3. Opportunities created to mitigate and adapt to tectonic hazards in the region <ol style="list-style-type: none"> a) national preparedness plans, use of technology to monitor tectonic movements b) partnerships between countries on disaster response and recovery
3. How might tourism activity affect Singapore?	<ol style="list-style-type: none"> 1. Impacts of tourism activity in Singapore <ol style="list-style-type: none"> a) economic and social impacts b) environmental impacts 2. Challenges affecting tourism development in Singapore <ol style="list-style-type: none"> a) intensifying regional competition and increasingly discerning visitors b) ageing population, resource constraints and threats from global uncertainties

	<ol style="list-style-type: none"> 3. Opportunities created to mitigate and adapt to impacts of tourism activity in Singapore <ol style="list-style-type: none"> a) benefits due to growing Asia and develop partnerships with stakeholders to spearhead place-making initiatives b) trial sustainability solutions and develop skilled workers
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Topic 3 | Sustainable and Resilient Singapore

In ensuring the survival, progress and future of Singapore, efforts are made by many stakeholders to work towards sustainable development. Singapore employs various strategies and approaches to build a sustainable and resilient nation, ensuring that efforts are coordinated across government agencies. Singapore has made progress in various resilience efforts and will continue to do so, despite the uncertainties of future stresses and shocks. Its aspiration to continue to develop sustainably will be an on-going concern for the current and future generations of Singaporeans.

Key Questions	Students should know and understand
1. Why is sustainable development important for Singapore?	<ol style="list-style-type: none"> 1. Ensure a competitive economy <ol style="list-style-type: none"> a) attract investments b) provide employment opportunities 2. Ensure sustainable environment <ol style="list-style-type: none"> a) clean and healthy environment b) excellent air and water quality 3. Achieve high quality of life for all <ol style="list-style-type: none"> a) foster community spirit b) facilitate active participation in sustainable development
2. How does Singapore approach sustainable development?	<ol style="list-style-type: none"> 1. Building up resilience crucial to achieving sustainable development <ol style="list-style-type: none"> a) increases Singapore's capacity to survive, adapt and thrive b) ongoing process involving past, present and future actions 2. Integrated master planning key to achieve sustainable development <ol style="list-style-type: none"> a) adopts long-term approach in reviewing land-use plans and demands b) strikes a balance between economic and social development 3. Dynamic urban governance key to achieve sustainable development <ol style="list-style-type: none"> a) political leadership sets clear direction and cooperation among different government agencies to implement and execute policies b) public service and institutions with well-thought out systems and processes
3. What are Singapore's efforts in sustainable development?	<ol style="list-style-type: none"> 1. Environment and climate resilience efforts <ol style="list-style-type: none"> a) cleaning and greening Singapore b) mitigation efforts include green buildings and clean energy, and adaptation efforts include water resilience and food resilience

	<ol style="list-style-type: none"> 2. Economic resilience efforts <ol style="list-style-type: none"> a) deepen and diversify international connections and strengthen business capabilities to innovate b) encourage Singaporeans to acquire and utilise deep skills 3. Social resilience efforts <ol style="list-style-type: none"> a) developing skills throughout life through SkillsFuture national movement and mobilising communities in preparedness measures b) creating shared spaces to bring people together, offer input to government planning and address social concerns
<ol style="list-style-type: none"> 4. How might Singapore continue to develop sustainably? 	<ol style="list-style-type: none"> 1. Environment considerations <ol style="list-style-type: none"> a) life-support systems of the global environment and nature in providing ecosystem services b) limitations of Singapore’s physical environment and possible threats including transboundary haze and climate change 2. Economic and social considerations <ol style="list-style-type: none"> a) ability of Singapore society to advance its economy b) commitment and contribution from all stakeholders in society 3. Political considerations <ol style="list-style-type: none"> a) good governance with strong political willpower b) commitment to develop and improve long term sustainable development plans

Geographical Data Skills and Techniques

Geographical data skills and techniques are essential to the work of geographers. They help geographers gather, analyse, present and interpret information about the characteristics, patterns and processes of the phenomenon/phenomena they are investigating. They also facilitate geographical thinking and decision making. As students learn about a range of geographical data types such as graphs, maps and images through the topics, they will acquire the skills necessary for them to read, construct, analyse and interpret the data in context.

Candidates will be expected to interpret geographical data from the following resources:

- Tabular data
- Text extracts
- Landscape photographs
- Aerial photographs and satellite images
- Scatter graphs and best fit lines
- Simple and comparative line graphs
- Simple and comparative bar graphs
- Pie charts
- Sketch maps
- Dot maps
- Choropleth maps

- Flow line maps
- Proportional symbol maps
- Isoline maps
- Cartoons
- Wind roses
- Diagrams (schematics, block)

Candidates should be able to:

- Calculate mean, median and mode
- Describe patterns, trends and relationships
- Describe natural and human characteristics shown in photographs
- Draw simple sketches of photographs and annotate them to illustrate the features
- Identify locations on map using compass direction, longitude and latitude
- Read map scales and symbols
- Plot scatter, line and bar graphs

3. PEDAGOGY

Learning Through Geographical Inquiry

Learning through inquiry³ stimulates students' interest in Geography and empowers them to take responsibility for their learning. The inquiry-based pedagogical approach seeks to shift students from a reliance on memorising information to actively construct new knowledge and understanding through comprehension, extraction and application of information from varied sources. The use of geographical inquiry is thus at the heart of Geography instruction and learning, and students should be provided with the opportunities to learn the skills required through practice and engagement in geographical inquiry.

The Geographical Inquiry Process (Figure 4) comprises four stages of inquiry. During the *sparkling curiosity* stage, stimulus materials are provided to challenge students' assumptions and habitual responses to situations. Students are invited to be inquisitive and pose questions about phenomena introduced by their teacher or by other students. This is followed by the *gathering data* stage where students use data as evidence to address the inquiry question. By identifying relevant sources of information, data can be provided by teachers or collected first-hand by students through fieldwork. The *exercising reasoning* stage, which is making sense of the information gathered, is the heart of learning. Students need to analyse the data, relate it to what they know already, see relationships between different information, make all kinds of connections and develop their own understanding of what they are studying. Inquiry is not simply about finding information to answer questions, it is about developing understanding. During the final stage of *reflective thinking*, students recollect what has been learnt and revisit how learning has taken place. Reflecting on what students have achieved and whether they would have taken a different approach are crucial in formulating conclusions to the inquiry, evaluating evidence critically and suggesting improvements to the inquiry process.

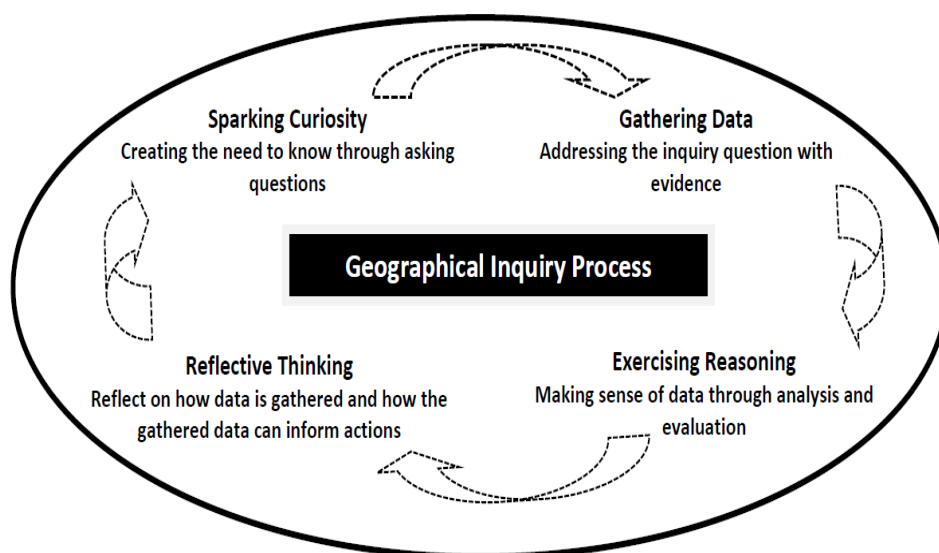


Figure 4: Geographical Inquiry Process

³ Roberts, M. (2013). *Geography Through Enquiry*. Sheffield: Geographical Association.

Bite-sized and Extended Fieldwork

The Upper Secondary Geography has introduced Bite-sized and Extended Fieldwork into the different syllabuses to allow fieldwork skills to be taught within curriculum time. Fieldwork is integral to Geography learning, putting theories into context and energising students to investigate surroundings beyond their classroom walls. For Humanities (Geography) syllabuses, students will do Bite-sized Fieldwork. For Geography syllabuses, 10 weeks are allocated for students to carry out Extended Fieldwork. Table 3 highlights the differences between the two types of fieldwork.

Table 3: Bite-sized and Extended Fieldwork

Bite-sized Fieldwork	Extended Fieldwork
Designed to be accessible through day-to-day classroom instruction.	Designed as an engaging learning experience for students to acquire a deep understanding of geographical phenomena or issues that they are passionate to investigate.
Fieldwork skills can be integrated into the teaching of each topic or cluster.	Geography in Everyday Life Cluster will be applied by students to carry out in-depth study of any content area featured in the neighbourhood contexts and/or the prescribed clusters.
Not necessary for teachers to create a full-length fieldwork experience for students.	Teachers can consider differentiating content, process and product according to their student's interests, readiness and learning profile when designing a school-based fieldwork.

Use of Geospatial Technology in Geographical Inquiry

The advancement of computer hardware and software has made geospatial data and technologies more accessible to teachers and students. Geospatial technologies, for example remote sensing, geographic information systems, Internet mapping and global positioning systems, are used to collect and process data about specific locations on Earth. Geospatial data and technologies can be readily incorporated into web-based learning activities to enhance students' learning. When appropriately applied, teaching with geospatial technology would contribute towards the development of 21CC among students.

4. ASSESSMENT

Assessment Objectives

The Assessment Objectives (AO) are designed based on the cognitive processes and knowledge dimensions of the Revised Bloom's Taxonomy. The AOs are arranged in order of cognitive demands to show the progression of skills expected of candidates.

AO 1 | Knowledge with Understanding

Candidates should be able to construct responses based on understanding of theories, generalisations, models and concepts. This will be demonstrated by the ability to:

- a) identify, describe or explain theories, generalisations, models, concepts and methods
- b) classify environments, events, methods, objects, people, processes and places into categories according to their common features
- c) explain how events, objects and processes cause changes to environments, people and places.

AO 2 | Skills and Analysis

Candidates should be able to apply their understanding to break down information into its component parts or to carry out an investigation. This will be demonstrated by the ability to:

- a) support conclusions using relevant material from information provided
- b) identify, describe or compare characteristics, relationships, patterns and trends shown in graphs, maps, photographs, diagrams, tables and texts
- c) compare similarities and differences between environments, events, methods, objects, people, processes and places
- d) describe or explain how to collect, process, interpret and present quantitative and qualitative data
- e) adapt methods to manage risks, limitations and achieve investigation objectives.

AO 3 | Judgement and Decision-Making

Candidates should be able to use defined criteria and standards to evaluate methods, outcomes and proposals. This will be demonstrated by the ability to:

- a) arrive at an overall evaluation by considering constraints and opportunities in the environment, people's varying needs, attitudes and beliefs, or the importance of sustainable development
- b) evaluate the reliability and validity of investigation findings.

Syllabus 2279: Geography Ordinary Level

Assessment Objectives	Weightings for Paper 1 and Paper 2 each
AO1: Knowledge with Understanding	15%
AO2: Skills and Analysis	20%
AO3: Judgement and Decision-making	15%
Total	50%

Scheme of Assessment

2279 Geography O-Level	
<p>Paper 1</p> <p>1h 45min</p> <p>50 marks</p> <p>50%</p>	<p>Candidates answer <u>three</u> compulsory structured questions.</p> <ul style="list-style-type: none"> • Question 1*: Cluster 1 - Geography in Everyday Life (<i>Topic 1.3</i>) (20 marks) • Question 2: Cluster 2 - Tourism (15 marks) • Question 3: Cluster 3 - Climate (15 marks) <p>Each structured question will consist of no more than 9 sub-parts.</p> <p>Candidates will be required to answer <u>one</u> 9-mark question testing AO3 in <i>either</i> Question 2 <i>or</i> Question 3. This question will be marked using generic level descriptors. All other questions in this paper will be point-marked.</p> <p><i>* Question 1 is on fieldwork. The fieldwork context may or may not be based on any of the clusters in the syllabus.</i></p>
<p>Paper 2</p> <p>1h 45min</p> <p>50 marks</p> <p>50%</p>	<p>Candidates answer <u>three</u> compulsory structured questions.</p> <ul style="list-style-type: none"> • Question 1: Cluster 1 - Geography in Everyday Life (<i>Topics 1.1 and 1.2</i>) (15 marks) • Question 2: Cluster 4 - Tectonics (15 marks) • Question 3: Cluster 5 - Singapore (20 marks) <p>Each structured question will consist of no more than 9 sub-parts.</p> <p>Candidates will be required to answer <u>one</u> 9-mark question testing AO3 in <i>either</i> Question 2 <i>or</i> Question 3. This question will be marked using generic level descriptors. All other questions in this paper will be point-marked.</p>

Syllabus 2246: Geography Normal (Academic) Level

Assessment Objectives	Weightings for Paper 1 and Paper 2 each
AO1: Knowledge with Understanding	20%
AO2: Skills and Analysis	20%
AO3: Judgement and Decision-making	10%
Total	50%

Scheme of Assessment

2246 Geography N(A)-Level	
<p>Paper 1</p> <p>1h 45min</p> <p>50 marks</p> <p>50%</p>	<p>Candidates answer <u>two</u> compulsory structured questions.</p> <ul style="list-style-type: none"> • Question 1*: Cluster 1 - Geography in Everyday Life (<i>Topic 1.3</i>) (25 marks) • Question 2: Cluster 2 - Tourism (25 marks) <p>Each structured question will consist of no more than 12 sub-parts.</p> <p>Candidates will be required to answer <u>one</u> 6-mark question testing AO3 in Question 2. This question will be marked using generic level descriptors. All other questions in this paper will be point-marked.</p> <p><i>* Question 1 is on fieldwork. The fieldwork context may or may not be based on any of the clusters in the syllabus.</i></p>
<p>Paper 2</p> <p>1h 45min</p> <p>50 marks</p> <p>50%</p>	<p>Candidates answer <u>two</u> compulsory structured questions.</p> <ul style="list-style-type: none"> • Question 1: Cluster 1 - Geography in Everyday Life (<i>Topics 1.1 and 1.2</i>) (25 marks) • Question 2: Cluster 3 - Climate (25 marks) <p>Each structured question will consist of no more than 12 sub-parts.</p> <p>Candidates will be required to answer <u>one</u> 6-mark question testing on AO3 in Question 2. This question will be marked using generic level descriptors. All other questions in this paper will be point-marked.</p>

Syllabus 2260: Humanities (Geography) Ordinary Level

Assessment Objectives	Weighting for Paper 2
AO1: Knowledge with Understanding	15%
AO2: Skills and Analysis	20%
AO3: Judgement and Decision-making	15%
Total	50%

Scheme of Assessment

2260 Humanities (Geography) O-Level	
<p>1h 45 min</p> <p>50 marks</p> <p>50%</p>	<p>Candidates answer Questions 1 and 2 in Section A, and <i>either</i> Question 3 <i>or</i> 4 in Section B.</p> <p><u>Section A</u></p> <ul style="list-style-type: none"> • Question 1: Cluster 1 - Geography in Everyday Life (14m) • Question 2: Cluster 2 - Tourism (18m) <p><u>Section B</u></p> <p><i>Either</i></p> <ul style="list-style-type: none"> • Question 3: Cluster 3 - Climate (18m) <p><i>Or</i></p> <ul style="list-style-type: none"> • Question 4: Cluster 4 - Tectonics (18m) <p>Each structured question will consist of no more than 8 sub-parts.</p> <p>Candidates will be required to answer <u>one</u> 9-mark question testing AO3 in <i>either</i> Question 2 <i>or</i> Question 3/ Question 4. This question will be marked using generic level descriptors. All other questions in this paper will be point-marked.</p>

Syllabus 2125: Humanities (Geography) Normal (Academic) Level

Assessment Objectives	Weighting for Paper 2
AO1: Knowledge with Understanding	20%
AO2: Skills and Analysis	20%
AO3: Judgement and Decision-making	10%
Total	50%

Scheme of Assessment

2125 Humanities (Geography) N(A)-Level	
<p>1h 45min</p> <p>50 marks</p> <p>50%</p>	<p>Candidates answer Question 1 in Section A, and <u>either</u> Question 2 <u>or</u> 3 in Section B.</p> <p><u>Section A</u></p> <ul style="list-style-type: none"> Question 1: Cluster 1 - Geography in Everyday Life (25m) <p><u>Section B</u></p> <p><i>Either</i></p> <ul style="list-style-type: none"> Question 2: Cluster 2 - Climate (25m) <p><i>Or</i></p> <ul style="list-style-type: none"> Question 3: Cluster 3 - Tectonics (25m) <p>Each structured question will consist of no more than 12 sub-parts.</p> <p>Candidates will be required to answer <u>one</u> 6-mark question testing AO3 in Question 2/ Question 3. This question will be marked using generic level descriptors. All other questions in this paper will be point-marked.</p>