Disaster Prevention Educatic.. at Schools in Singapore

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Disaster prevention education at schools in Singapore : Outline

1. Singapore: Natural and Anthropogenic Hazards and Disasters
2. Climate Change and new vulnerabilities in Singapore
3. SG Green Plan 2030
4. Geography Curriculum, Pedagogy & Assessment
5. Enablers and Challenges

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1. Singapore: Natural and Anthropogenic Hazards

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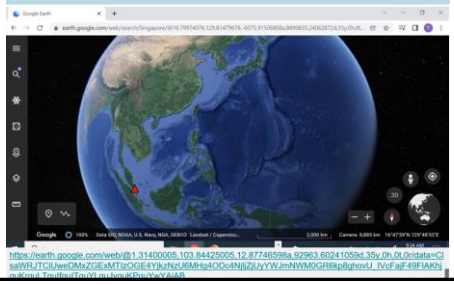
Singapore: 1.3°N, 103.8°E

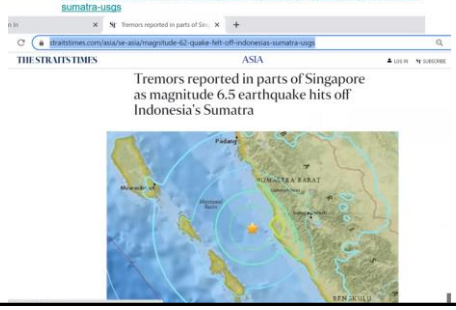


Singapore: Extremely Low Level Exposal to Natural Hazards

- Lies outside the Pacific Rim of Fire - Not affected by natural disaster (earthquake, volcanos, tsunami)

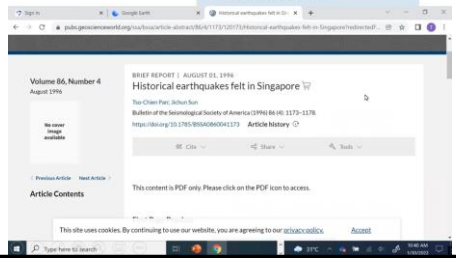
Located 1°N – Not affected by typhoons and cyclones

- https://www.straitstimes.com/asia/se-asia/magnitude-62-quake-felt-off-indonesias-sumatra-usgs



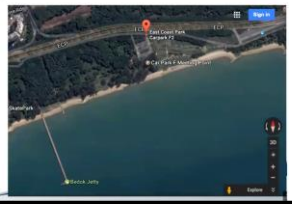
Historical Earthquakes felt in Singapore

https://pubs.geoscienceworld.org/ssa/bssa/article-abstract/86/4/1173/120173/Historical-earthquakes-felt-in-Singapore?redirectedFrom=PDF



Extremely Susceptible to Effects of Climate Change

Climate Change and Sea Level Rise

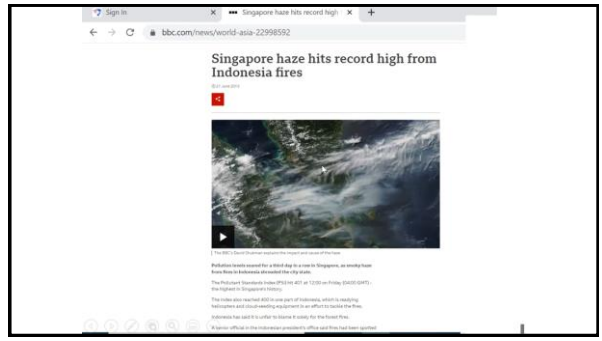


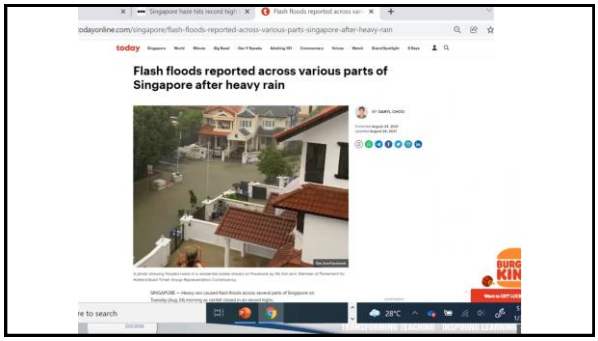
Anthropogenic Hazards

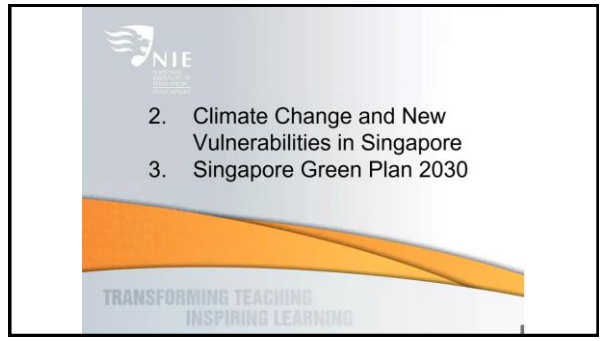
- Industrial accidents
- Water pollution
- Air pollution
- Haze
- Solid waste disposal
- Fires and explosions
- Flooding

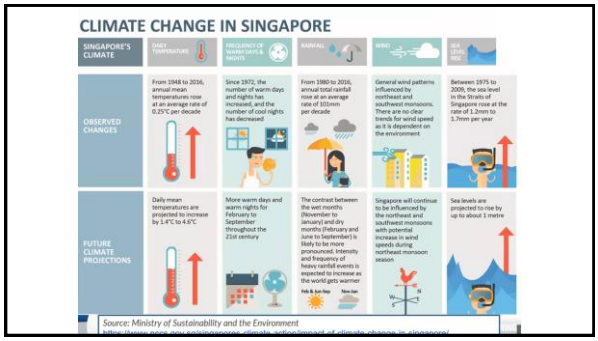
Channel News Asia, 14 Sept 2019: Haze hits unhealthy levels in Singapore as PSI exceeds 100 for the first time in 3 years

https://www.channelnewsasia.com/singapore/haze-psi-singapore-air-quality-unhealthy-sumatra-fires-861031

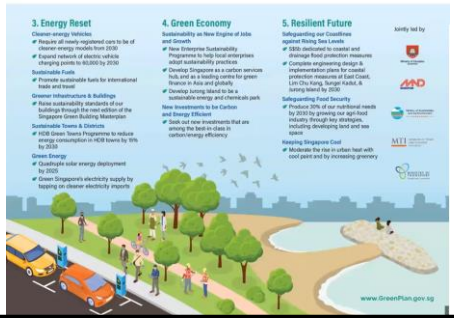


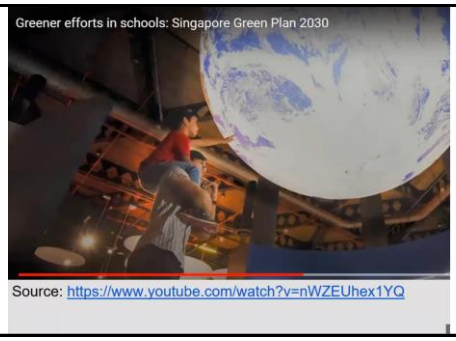






Multi-Ministry Green Plan 2030
Source: https://www.channelnewsasia.com/news/singapore-green-plan-2030-targets-10-years-14161356?cid=h3_referral_inarticlelinks_24082018_cna





Source: https://www.youtube.com/watch?v=nWZEUhex1YQ

Greener efforts in schools (2021): Singapore Green Plan 2030

- Every student to understand, live and practice sustainability
- Eco-stewardship programmes
- Reduce carbon footprint (some schools to be carbon neutral by 2030)
- Make responsible decision
- Create ripple effect on families and friends
- Make sustainability a key part of the curriculum

Singapore

3 primary schools in Punggol start tapping on solar power as part of carbon-neutral push

Source: https://www.channelnewsasia.com/news/singapore/solar-panel-power-primary-schools-carbon-neutral-14924410

Horizon Primary School (left), Compassvale Primary School (centre) and Edgefield Primary

Elias Park Primary School has four electric biodigester machines and three manual compost bins that produce fertiliser for the school gardens. (Photo: Elias Park Primary School)

Source: https://www.channelnewsasia.com/news/commentary/climate-change-sustainability-curriculum-schools-geography-14792808

Students walk through a forest habitat at Commonwealth Secondary School. (Photo: Commonwealth Secondary School)

4. Geography Curriculum, Pedagogy & Assessment

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Learning Outcomes of the Ministry of Educatic Singapore

21st Century Competencies and Student Outcomes

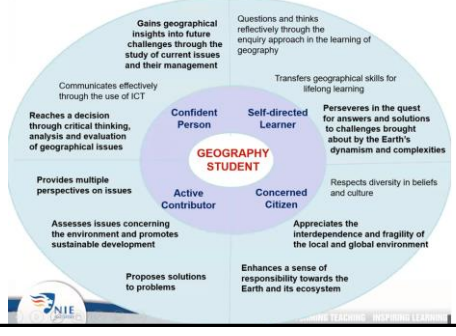
21st Century Skills:

- Global Awareness Skills
- Civic literacy Skills
- Cross-Cultural Skills
- Creativity and Innovation Skills
- Critical Thinking and Problem-Solving Skills
- Communication and Collaboration Skills
- Information Literacy Skills

Core Values:

- Respect, Responsibility,
- Resilience, Integrity, Care,
- Harmony

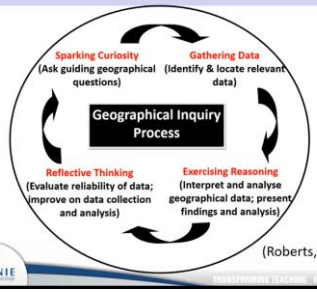
Source: Ministry of Education Singapore,2010



The Pedagogy: The Inquiry Approach

- A paradigm shift to move away from the mere memorisation of information to the comprehension, extraction and application of information from a variety of sources to construct new knowledge and understanding.
- Through the **inquiry process**, students will be challenged to examine their own thinking and become self-reflective thinkers.

Geographical Inquiry Process



(Roberts, 2003)

Geographical Inquiry in Fieldwork

- Geographical Inquiry requires students to participate in an **investigation into an authentic geographical issue (through fieldwork)**.
- It involves the geographical inquiry process of formulating questions, gathering data, exercising reasoning and reflective thinking.

New Lower Sec (13-14yo)Syllabus (202

Theme: Sustainable Resource Use & Managemen..
Overarching concept: Sustainability

SECONDARY 1	SECONDARY 2
Introduction to Geography	
Thematic Question 1: How can we sustainably manage natural resources?	Thematic Question 2: How can we sustainably build cities?
Topic 1.1: Water	Topic 2.1: Housing
Topic 1.2: Tropical Rainforests and Mangroves	Topic 2.2: Transport systems

Skills, Values and Attitudes

Skills:
- to pose geographical questions to initiate and sustain their learning
- to apply methods of the discipline to investigate physical and human phenomena, processes, and associated issues
- to interpret geographical data to recognise patterns and suggest relationships
- to analyse physical and human phenomena, processes, and associated issues.

Values & Attitudes:
- respect, care and concern for the environment and people
- a sense of responsibility and a desire to contribute towards building a sustainable future.

Guiding questions for each Topic (eg Water)

1. What is water and where is water found?
2. Why is water available on the Earth?
3. What relationship does water have with
   (i) the environment and
   (ii) people?
4. How can these relationships be sustainably managed?

Assessments (Lower Sec)

Assessment	Examples
Summative Assessment	- Class test - Examination
Alternative Assessment	- Performance task (Response to a geographical issue in the news) -Geographical Investigation (Process and Product)

Sec 1 Geographical Investigation Water

This GI enables students to:

- Find out the factors contributing to the state of the water quality in a water store;
- Find out about he stakeholders' (e.g., authorities, businesses, the public) roles and their perception of these roles in managing a water store, and the ways they use it.
- Reflect on their past actions, develop solutions, and take actions to maintain or improve water quality to support natural ecosystems and people.

Sec 1: GI on Tropical Rainforest and Mangroves

This GI enables students to:

- Respect the worth of tropical rainforests and mangroves to humans;
- Show care for the people and environment affected by deforestation.
- Suggest sustainable solutions and take actions to protect and grow these two types of natural vegetation.

Sec 2 Geographical Investigation Housing

- This GI enables students to:
- Find out the factors affecting the use of different features (e.g., parks, playground, markets) found in a neighbourhood;
- Find out the impact of different features (e.g., parks, playground, markets) on people and/or the environment.
- Recommend sustainable solutions, and take actions to maintain or improve people's quality of life, and the quality of the environment.

Sec 2 Geographical Investigation: Transport

This GI enables students to:

- Find out the factors affecting the mobility of different groups of people;
- Find out the impact of different mobility options on people and/or the environment;
- Develop solutions and take actions that are sustainable to improve people's quality of life, and the environment.

Upper Sec (15-16yo) Geography Syllabuses

2006 Syllabus	2013 Syllabus (2236)	2023 Syllabus
1. Plate tectonics 2. Weather & climate 3. Natural vegetation 4. Rivers & Coasts 5. Geography of Food 6. The Industrial World 7. Tourism 8. Development	1. Coasts 2. Living with Tectonic Hazards 3. Variable Weather & Climate 4. Global Tourism 5. Food Resources 6. Health and Diseases	S3 & S4: -Sustainable Development Five Clusters 1. Geog in everyday life 2. Tourism 3. Climate 4. Tectonics 5. Singapore

Each Cluster with 3 sub-levels

- Topic 1: Phenomena, concepts
- Topic 2: Implications and impacts
- Topic 3: Responses, sustainable develop'mt

- Example: Climate Cluster:
- 1.Weather and Climate
- 2. Climate Change
- 3. Climate Action

Some Concepts for Upper Sec Geog

- Adaptation
- Air pollution
- Community resilience
- Cultural services
- Disaster risk management
- Economic sustainability
- Environmental stewardship
- Environmental sustainability
- Hazards
- Preparedness
- Provisioning services
- Regulating services
- Social sustainability
- Vulnerability

Reflecting on the Key Enablers

- Continuous and periodic curriculum review
- Pedagogies to promote student engagement
- Relevant and valid assessment
- Collaborative relationship: MOE, universities, schools
- Teacher quality and professionalism

In NIE

Sustainability Learning Lab

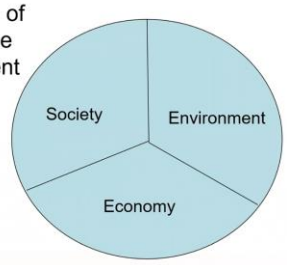
- Research on Sustainability and sustainability education
- Translate such research into curricular and pedagogical resources
- Develop a community of practice to share sustainability research and practice

Challenges

1. Terminologies and Concept on Sustainability
   - Environmental Education (EE)
   - Sustainable Development (SD)
   - Education for Sustainable Development (ESD, EfSD)
   - Decade of Education for Sustainable Development (DESD)
2. Content of School Geography
3. Teachers' & Students' Conception of Sustainability

- **Sustainable Development** (SD) – 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundlandt Commission Report, 1987).
- Education for Sustainable Development (ESD) -

Dimensions of Sustainable Development



Thank you

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