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Understanding the demands of G1 and G2 Upper Secondary Science

SCIENCE

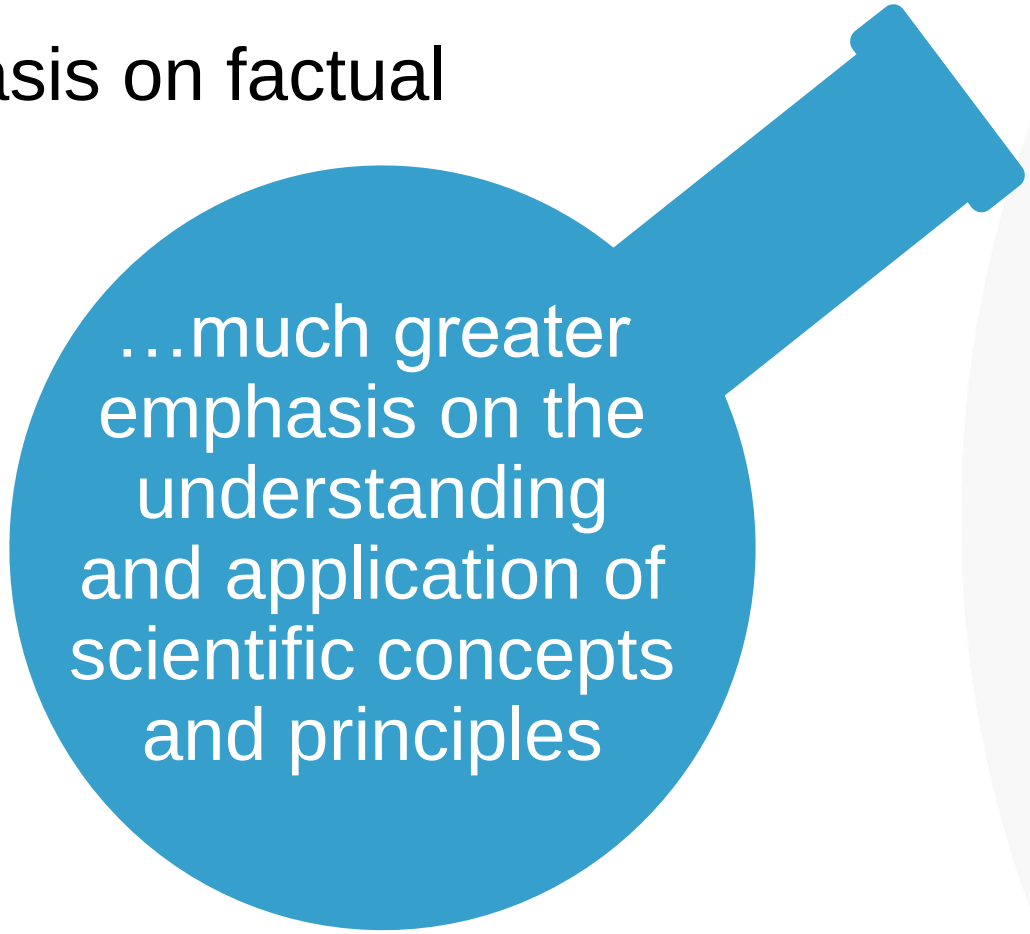
is all around us

Goals of Science Education

- Enthuse and nurture all students to be scientifically literate
- Provide strong fundamentals for students to pursue science related areas in learning and work
- Prepare individuals to navigate an increasingly complex and technologically advanced world, while also fostering a deeper appreciation for the wonders of the natural world.

The Science Syllabus

less emphasis on factual materials…



builds on the foundations of Lower Secondary science

the need to develop skills that will be of long-term value

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	Science
CRITERIA, DESIRED DISPOSITIONS	A Science student should have: • a strong foundation in Science, and possess the spirit of scientific inquiry • the confidence to engage confidently in issues and questions that relate to the roles played by Science in daily life, society and the environment • the ability to discern, weigh alternatives and evaluate claims and ideas critically, based on logical scientific evidence and arguments
SKILLS & COMPETENCIES TO BE DEVELOPED	Science education plays a vital role in developing the 21st-century skills needed to thrive in an increasingly complex, interconnected, and rapidly changing world. Students will learn to: • analyze and evaluate complex problems through **critical thinking**. • **problem solve** issues through experimentation and research. • **communicate** their findings and ideas effectively through reports and presentations. • collaborate and work in teams. • exercise **adaptability and flexibility** during challenges. • exercise **ethical awareness in** responsible conduct of research, ethical considerations in scientific inquiry, and the importance of ethical behavior in the scientific community. • cultivate a sense of **curiosity** and a **passion** for discovery.
POST-SECONDARY OPPORTUNITIES	Science education provides students with a diverse set of skills and competencies that are valuable not only in scientific careers but also in many other fields, including education, healthcare, technology, and environmental conservation.

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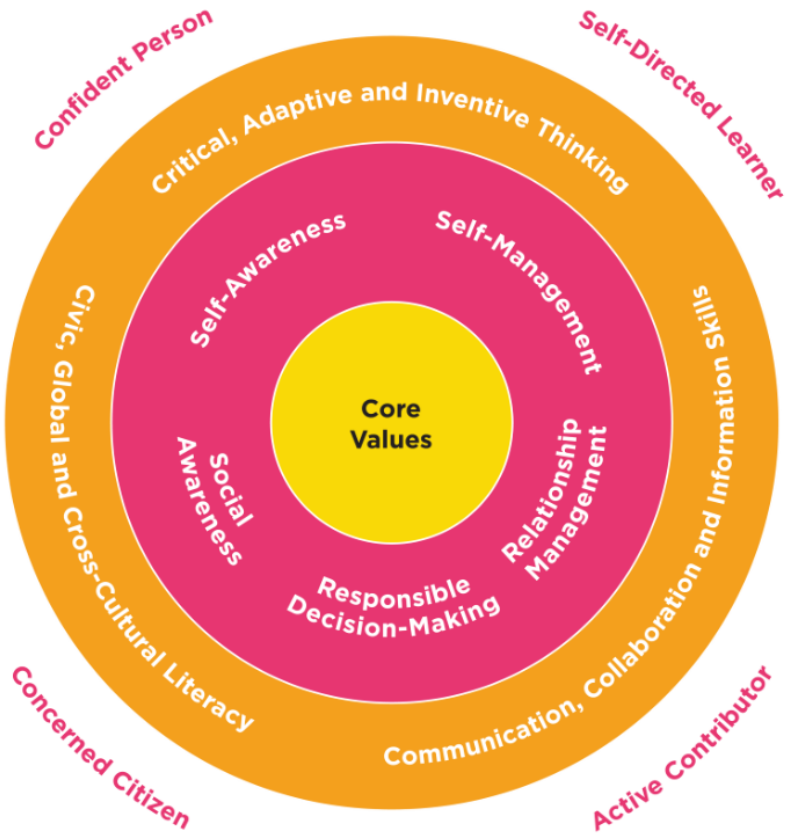
Skills, 21st Century Competencies and Student Outcomes



Skills, Values & Attitudes in Science

- Integrity
  Curiosity
  Objectivity
  Perseverance
- Data driven practice
  Communicate and Convince
- Observing, Predicting, Comparing, Classifying, Inferring, Analysing Evaluating, Verifying
- Develop sound arguments
  Hypothesise
  Reason

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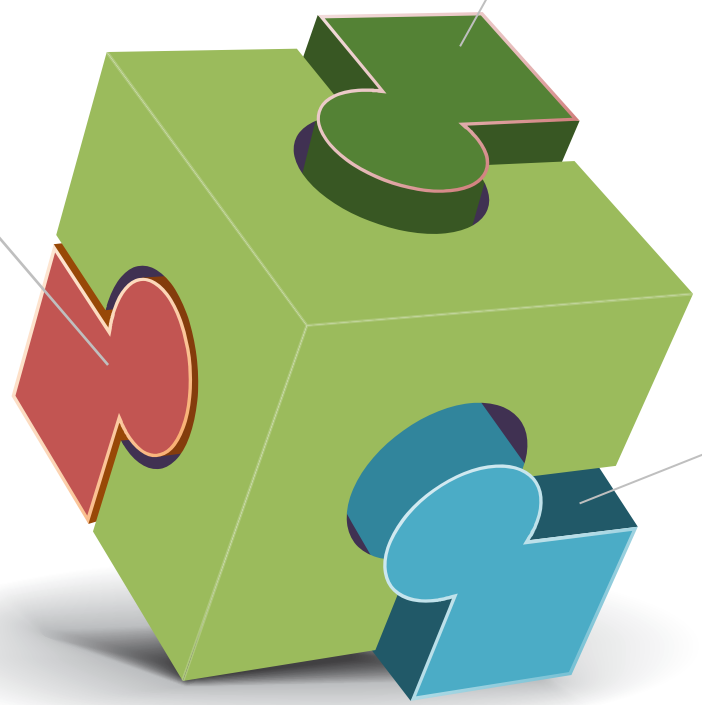
Differences between the Sciences

Biology

The study of life and living organisms… including their physical structure, function, growth and evolution

Chemistry

The study of the composition, structure, properties and change of matter… known as the 'central science' that bridges physics and biology



Physics

The study of matter & its motion through space & time… the concepts of energy & forces… how the universe behaves…

Topics covered in Lower Secondary Science

Chemistry

2. Physical Properties
3. Chemical Composition
4. Separation Techniques
7. Particulate Nature of Matter
8. Atoms and Molecules
11. Chemical changes

Biology

6. Cells
12. Ecosystems
14. Human Digestive System
15. Transport Systems in Living Things
16. Human Sexual Reproduction System

Physics

5. Ray Model of Light
9. Forces, Pressure, Moments, Energy
10. Transfer of Heat Energy and its Effects
13. Electrical Systems

Science combinations offered

- Science [G1]
- Combined Sciences (Phy, Chem) [G2 / G3]
- Combined Sciences (Chem, Bio) [G2 / G3]

Dispositions for the Sciences

Biology

- Curious about and interested in the human body and the natural world
- Ability to apply concepts of living organisms to address the broader question of how living organisms work to sustain life
- Strong and confident in expressing concepts and explanations (at most 15% calculation questions)
- Able to draw diagrams of plants or animals

Physics

- Curious about and interested in the interactions of the physical world of energy and matter
- Strong foundation in Mathematics (20 to 40% calculation questions)
- Keen to investigate natural phenomena and apply patterns, models, laws and theories

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Sec 2 Science Subject Level	G3	G2	G1
SUBJECTS OFFERED	*Science (Phy, Chem) (G3) *Science (Chem, Bio) (G3)	*Science (Phy, Chem) (G2) *Science (Chem, Bio) (G2)	Science (G1)
ASSESSMENT FORMAT	1. Multiple Choice 2. Structured 3. Practical	1. Multiple Choice 2. Structured	1. E-Examination (Multiple choice, selected response, short-answer and structured 2. Short-answer and structured

Subject requirements:
*Students to be offered Science at the same subject level unless they meet the criteria for these subjects to be offered at a More Demanding Level (MDL).

e.g. A student who is currently taking Science G1 and meets the criteria to be offered Science at G2 can choose between Science (Phy/ Chem) or Science (Chem/ Bio).

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G3 Combined Science – Scheme of Assessment

Paper	Combined Sciences	Time	Marks	Weighting
1	Multiple Choice	1h	40	30%
2	Structured & Free Response (Physics)	1h 15m	65	32.5%
3	Structured & Free Response (Chemistry)	1h 15m	65	32.5%
4	Structured & Free Response (Biology)	1h 15m	65	32.5%
5	Practical Test	1h 30m	30	15%

G2 Science – Scheme of Assessment

Paper	Combined Sciences	Time	Marks	Weighting
1	Multiple Choice (Physics)	1h 15m	20	20%
2	Structured (Physics)		30	30%
3	Multiple Choice (Chemistry)	1h 15m	20	20%
4	Structured (Chemistry)		30	30%
5	Multiple Choice (Biology)	1h 15m	20	20%
6	Structured (Biology)		30	30%

G1 Science – Scheme of Assessment

Paper	Type of Paper	Duration	Marks	Weighting
1	E-Examination Multiple choice, selected response, short-answer and structured	1h 15 min	50	50%
2	Short Answer and Structured	1h	50	50%

Science Assessment Weightage

Level	Subject Title	Subject Code	SEAB website links
G3	Science (Physics, Chemistry)	5086	https://www.seab.gov.sg/files/O%20Lvl%20Syllabus%20Sch%20Cddts/2026/5086_y26_sy.pdf
G3	Science (Chemistry, Biology)	5088	https://www.seab.gov.sg/files/O%20Lvl%20Syllabus%20Sch%20Cddts/2026/5088_y26_sy.pdf
G2	Science (Physics, Chemistry)	5105	https://www.seab.gov.sg/files/NA%20Level%20Syllabus%20Sch%20Cddts/2026/5105_y26_sy.pdf
G2	Science (Chemistry, Biology)	5107	https://www.seab.gov.sg/files/NA%20Level%20Syllabus%20Sch%20Cddts/2026/5107_y26_sy.pdf
G1	Science	5148	https://www.seab.gov.sg/files/NT%20Lvl%20Syllabus%20Sch%20Cddts/2026/5148_y26_sy.pdf

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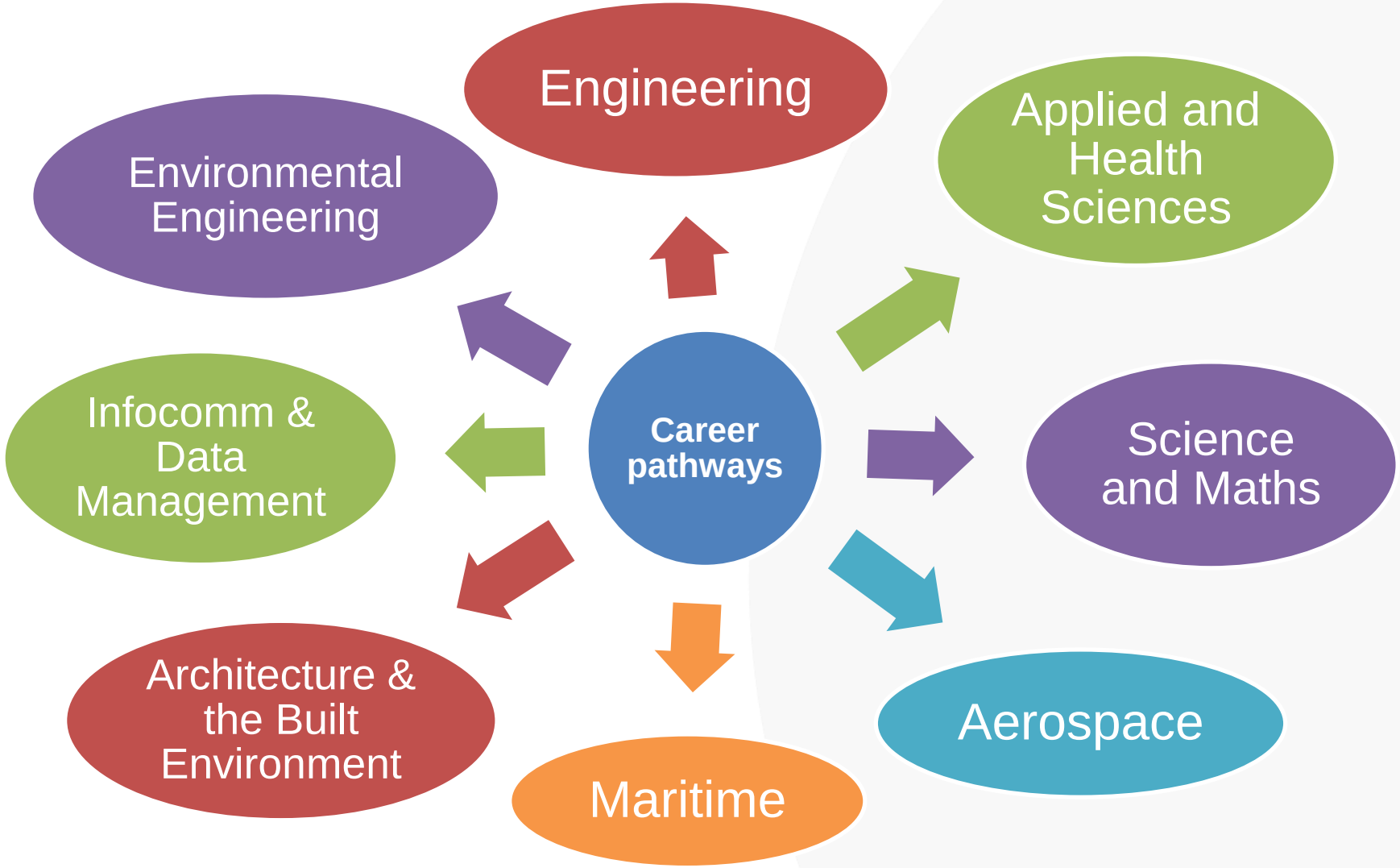
Relevance of Science for Post-Secondary Education



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Course Requirements (Polytechnic)

Course	School	Course Requirements
Biomedical Science	Singapore Polytechnic	Any 1 Science ELR2B2 range: 4-7
Biomedical Science	Ngee Ann Polytechnic	Any 1 Science ELR2B2 range: 3-7
Chemical & Biomolecular Engineering	Ngee Ann Polytechnic	Any 1 Science ELR2B2 range: 4-12
Pharmaceutical Science	Nanyang Polytechnic	Any 1 Science ELR2B2 range: 7-10

*The ELR2B2 range changes by the year

Course Requirements (ITE)

Course	Course Requirements
• Electronics & Info-Comm Technology • Applied & Health Sciences • Design & Media • Engineering	Maths or Science

Key Considerations

What are my child's strengths?

Will my child be able to cope with the rigour?

Is my child eligible for the subject combination?

What are my child's aspirations?

communicate

Making an Informed Decision

- Talk to seniors and/or FTs for clarifications

- Parents and students should discuss and come to an agreement if both parties have different aspirations

- Work towards aspirations and desired subject combinations in Semester 2 (setting up positive routines and developing good habits, the importance of help seeking behaviours, etc)