NORTHBROOKS SECONDARY SCHOOL
SOARING YET ROOTED

Sec 2 Subject Information:

Science

(NA)

Science subjects for NA stream:

- Science (Physics/Chemistry)
- Science (Biology/Chemistry)
- *O Level Science (Physics/Chemistry)
- *O Level Science (Biology/Chemistry)

*for students eligible for SBB at Upper Secondary

Science (Physics)

Overview

- provides students with a coherent understanding of energy, matter, and their interrelationships

- develops in students investigative and problem-solving skills, effective communication of theoretical concepts and appreciation of the contribution physics makes to our understanding of the physical world

Section
I. Measurement
I. Newtonian Mechanics
III. Thermal Physics
IV. Waves
V. Electricity & Magnetism
VI. Radioactivity

O & N(A) Science (Physics)

Syllabuses and Topics

Section	O-Level Science(Physics)	N(A)-Level Science(Physics)
I. Measurement	1) Physical Quantities, Units and Measurements	1) Physical Quantities, Units and Measurements
II. Newtonian Mechanics	2) Kinematics	2) Kinematics
	3) Forces and Pressure	3) Forces and Pressure
	4) Dynamics	4) Dynamics
	5) Turning Effects of Forces	5) Energy
	6) Energy	
III. Thermal Physics	7) Kinetic Particle Model of Matter	6) Kinetic Particle Model of Matter
	8) Thermal Processes	7) Thermal Processes
IV. Waves	9) General Wave Properties	8) General Wave Properties (I)
	10) Electromagnetic Spectrum	9) Electromagnetic Spectrum
	11) Light	
V. Electricity & Magnetism	12) Electric Charge and Current of Electricity	10) Electric Charge and Current of Electricity
	13) D.C. Circuits	11) D.C. Circuits
	14) Practical Electricity	12) Practical Electricity
	15) Magnetism and Electromagnetism	
VI. Radioactivity	16) Radioactivity	13) Radioactivity

Science (Biology)

Overview

- enables students to deepen their interest in biology for future learning and work

- develops a way of thinking to understand how living organisms work to sustain life and use the disciplinary ideas in biology to approach, analyse and solve problems in biological systems

Section
I. Cells and Chemistry of Life
II. The Human Body – Maintaining Life
III. Living Together – Plants, Animals and Ecosystems

O & N(A) Science (Biology)

Syllabuses and Topics

Section	O-Level Science(Biology)	N(A)-Level Science(Biology)
I. Cells and the Chemistry of Life	1) Cell Structure and Organisation	1) Cell Structure and Organisation
	2) Movement of Substances	2) Movement of Substances
	3) Biological Molecules	3) Biological Molecules
II. The Human Body – Maintaining Life	4) Nutrition in Humans	4) Nutrition in Humans
	5) Transport in Humans	5) Transport in Humans
	6) Respiration in Humans	6) Respiration in Humans
	7) Infectious Diseases in Humans	7) Infectious Diseases in Humans
III. Living Together – Plants and Animals	8) Nutrition and Transport in Flowering Plants	8) Nutrition and Transport in Flowering Plants
	9) Organisms and their Environment	
IV. Continuity of Life	10) Molecular Genetics	
	11) Reproduction in Humans	
	12) Inheritance	

Science (Chemistry)

Overview

- enables students to appreciate practical applications of chemistry in the real world

- develops in students a way of thinking to approach, analyse and solve problems by explaining macroscopic characteristics and changes in chemical systems

Section
I. Matter – Structures and Properties
II. Chemical Reactions
III. Chemistry in a Sustainable World

O & N(A) Science (Chemistry)

Syllabuses and Topics

Section	O-Level Science(Chemistry)	N(A)-Level Science(Chemistry)
I. Matter – Structure and Properties	1) Experimental Chemistry	1) Experimental Chemistry
	2) The Particulate Nature of Matter	2) The Particulate Nature of Matter
	3) Chemical Bonding and Structure	3) Chemical Bonding and Structure
II. Chemical Reactions	4) Chemical Calculations	4) Chemical Calculations
	5) Acid-Base Chemistry	5) Acid-Base Chemistry
	6) Qualitative Chemistry	6) Qualitative Chemistry
	7) Redox Chemistry	7) Patterns in the Periodic Table
	8) Patterns in the Periodic Table	
	9) Chemical Energetics	
	10) Rate of Reactions	
III. Chemistry in a Sustainable World	11) Organic Chemistry	8) Organic Chemistry
	12) Maintaining Air Quality	9) Maintaining Air Quality

N(A) Level Combined Science
Assessment Objectives

Papers 1, 2, 3, 4, 5 and 6

A Knowledge with Understanding, approximately 45% of the marks with approximately 20% allocated to recall.

B Handling Information and Solving Problems, approximately 45% of the marks

C Experimental Skills and Investigations, approximately 10% of the marks*

*new – students should be able to select and use techniques, apparatus and materials, take readings and record observations, interpret and evaluate experimental data and observations, and evaluate methods and suggest possible improvements

N(A) Level Combined Science
Scheme of Assessment

The pair of Papers 1 and 2, 3 and 4, 5 and 6 will be taken in one session of 1 hour 15 minutes.

Paper	Type of Paper	Duration	Marks	Weighting
1	Multiple Choice (Physics)	1 h 15 min	20	20.0 %
2	Structured (Physics)		30	30.0 %
3	Multiple Choice (Chemistry)	1 h 15 min	20	20.0 %
4	Structured (Chemistry)		30	30.0 %
5	Multiple Choice (Biology)	1 h 15 min	20	20.0 %
6	Structured (Biology)		30	30.0 %

O Level Combined Science
Assessment Objectives

Theory Papers (Papers 1, 2, 3 and 4)

A Knowledge with Understanding, approximately 50% of the marks with approximately 20% allocated to recall.

B Handling Information and Solving Problems, approximately 50% of the marks.

Practical Assessment (Paper 5)

Paper 5 is designed to test appropriate skills in **C**, Experimental Skills and Investigations.

In one or more of the questions in Paper 5, candidates will be expected to suggest a modification or an extension, which does not need to be executed. Depending on the context in which the modification / extension element is set, the number of marks associated with this element will be in the range of 10% to 20% of the total marks available for the practical test.

O Level Combined Science
Scheme of Assessment

Candidates are required to enter for Paper 1, Paper 5 and two of Papers 2, 3 and 4, depending on the combination of Science offered.

Paper	Type of Paper	Duration	Marks	Weighting
1	Multiple Choice	1 h	40	20.0%
2	Structured and Free Response (Physics)	1 h 15 min	65	32.5%
3	Structured and Free Response (Chemistry)	1 h 15 min	65	32.5%
4	Structured and Free Response (Biology)	1 h 15 min	65	32.5%
5	Practical Test	1 h 30 min	30	15.0%

Frequently Asked Questions

Q1: Which combination should my child choose?

Q2: Can my child continue to take SBB Science at Upper Secondary?
[for N(A) students offered O Level Science]

Q3: Can my child convert back to N(A) Science if he/she is not able to cope with the demand of the O Level Science?
[for N(A) students offered O Level Science]

Q1: Which combination should my child choose?

A1:

- Your child should choose the combination based on his/her
  > **interest** towards the Sciences disciplines (Physics / Biology)
  > **preferences** of post-secondary courses or future pathways

Notes

- As Chemistry is a subject pre-requisite for most Science courses, the school offers it as a compulsory discipline for Combined Science.
- Across the three Science disciplines, Physics would require more application of formulae to solve problems, while Biology would require more memory work in order to write quality descriptions and explanations.
- Kindly refer to Slide 3, 5 and 7 (overview) for the nature of the Sciences.

Q2: Can my child continue to take Subject-Based Banding (SBB) Science at Upper Secondary?

A2:

- Your child will be offered to consider taking Science at a higher level, if he/she meets the eligibility criteria:
  - > **Attained at least 50%** for Science
    AND
  - > **Passed promotion criteria**

- Students who are eligible for SBB Science at a higher level should also consider their
  - > **manageability** of Science, as well as other subjects
  - > **interest** towards the Sciences disciplines
  - > **preferences** of post-secondary courses or future pathways

Q2: Can my child continue to take Subject-Based Banding (SBB) Science at Upper Secondary?

- Your child may choose from O Level Combined Science (Physics/Chemistry) or (Biology/Chemistry) if he/she decides to accept the SBB Offer.

- With Combined Science, your child can still choose from a wide range of Polytechnic/ITE courses via Polytechnic Foundation Programme/Joint Intake Exercise/after Secondary 5 O Levels as long as he/she **meets the eligibility criteria** for the individual courses or if he/she receives the **conditional Early Admission Exercise (ITE) and meet the Minimum Entry Requirements** of the course.

Q2: Can my child continue to take Subject-Based Banding (SBB) Science at Upper Secondary?

- Different categories of NITEC courses come with **different entry requirements**.

- GCE 'N' Level holders applying for admission to full-time NITEC courses must first **satisfy the entry requirements including passes in the pre-requisite subjects** for the courses applied. Admission is **merit-based**, and posting to a course is based on **aggregate of best 4 GCE 'N' Level subjects**, including pre-requisite subjects and bonus points where applicable and is subjected to availability of vacancies.

- For N(T) students who are interested to apply for NITEC Science courses via **Early Admission Exercise (EAE)**, taking N(A) Combined Science may help to build their portfolio.

Q3: Can my child convert back to N(A) Science if he/she is not able to cope with the demand of the O Level Science?

A3:

- Your child is **strongly encouraged** to complete the two years curriculum of the more demanding course, if he/she **meets the criteria and chooses** to be offered the subject.

- The syllabuses covered at Secondary 3 may **differ slightly** for O Level and N(A) Combined Sciences. Hence, your child is required to make up for the syllabus missed, if he/she converts back to N(A) Combined Science.

- Your child may only convert to N(A) Combined Science (at the end of Secondary 3) on a **case by case basis**, with special considerations.

Examination Syllabus of O Level and N(A) Sciences

O Level
Combined Science

Science: Physics, Chemistry
(Syllabus 5086)

Science: Chemistry, Biology
(Syllabus 5088)

https://go.gov.sg/2024syllabus5086

N(A)
Combined Science

Science: Physics, Chemistry
(Syllabus 5105)

Science: Chemistry, Biology
(Syllabus 5107)

https://go.gov.sg/2024syllabus5107

Thank you.

You may email or contact us at **6752 4311**, if you have other queries.

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