CURRICULUM OVERVIEW

Academic year	2023/24	
Subject group	Science	
Subject discipline	Integrated Science	
Teacher	V.P.Renuka Wijesekara Nafissa	
MYP year	Year 5	

Purpose of the report

- The curriculum overview documents the taught curriculum in the MYP
- The curriculum overview is to be submitted to the Head of School
- The school submits curriculum overview in all MYP subjects to the International Baccalaureate.

Date: 20.08.2023	V P Renuka Wijesekara Nafissa

<table>
<tr><th>UNIT 1 - TITLE</th><th>KEY CONCEPT</th><th>RELATED CONCEPTS</th><th>GLOBAL CONTEXT</th></tr>
<tr><td>Ecosystem Ecology</td><td>Systems</td><td>Interaction, Environment, Balance</td><td>Globalization</td></tr>
<tr><th>STATEMENT OF INQUIRY</th><th colspan="3">OBJECTIVES</th></tr>
<tr><td>The transfer of energy among organisms in ecosystems</td><td colspan="3">A i,ii,iii – Test the understanding and knowledge on components, interactions and energy flow in ecosystems. (Summative)
$C_{i,ii,iii,iv,v}$ – Collect enough quantity of raw data using the line transect technique in the field survey and conduct appropriate analysis to recognize food chains of organisms. Present data as a poster to explain the food web complexity in the study location in the sognsvann ecosystem (Formative).

D i,ii,iii,iv – Write structured short answers on Carbon cycle, Global warming, Oceanic acidification, and ecosystem sustainability (Summative)</td></tr>
<tr><th colspan="4">ATL SKILLS</th></tr>
<tr><td colspan="4">Thinking: Creative thinking – Draw a poster using the data collected from Sognsvann. Students must think about trophic levels that different organisms belong to.

Social and communication: Working in groups on simulations online to construct food chains. Exchange ideas in the group when creating the poster.

Research skills: Collect information and analyse it to make decisions</td></tr>
<tr><th colspan="4">CONTENT</th></tr>
<tr><td colspan="4">• Scientific definition of Species, Populations, Communities and Ecosystems.
• Food chains and food webs in ecosystems and energy flow through trophic levels.
• Interactions of species and maintenance of ecosystem balance.
• Observe videos and work on simulations to get better understanding of food chains and food webs in different ecosystems.
• Field excursion to Sognsvann-ecosystem
• Carbon cycle
• Greenhouse effect and global warming
• Oceanic acidification
• Deforestation and ecosystem sustainability</td></tr>
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<table>
<tr><th>UNIT 2 - TITLE</th><th>KEY CONCEPT</th><th>RELATED CONCEPTS</th><th>GLOBAL CONTEXT</th></tr>
<tr><td>Elements of the Universe</td><td>System</td><td>Models, Patterns</td><td>Orientation in time and space</td></tr>
<tr><th>STATEMENT OF INQUIRY</th><th colspan="3">OBJECTIVES</th></tr>
<tr><td>Matters in the universe are made up of elements, and the Periodic table organises elements based on their properties.</td><td colspan="3">A_i, A_{ii}, and A_{iii} – Test on unit to assess the knowledge and understanding of the atomic structure, periodic arrangement of elements, joining of atoms to form molecules of compounds, bonding patterns and shapes of molecules</td></tr>
<tr><th colspan="4">ATL SKILLS</th></tr>
</table>

Communication: Negotiate ideas and knowledge with peers and teacher on their existing knowledge about elements and atoms. Social: Manage and resolve conflict and work collaboratively in teams (construction of molecular models to observe different shapes of molecules)
CONTENT
• Atomic structure – Atomic structure and emission spectrums of different elements. Work on simulation online to construct atomic models to get better understanding of atomic structure. • Periodical table –The placement of elements in relevance to electron configuration. • Lewis structures – Simulation models to draw Lewis structures of atoms and molecules. • Chemical bonding and shapes of molecules – construction of molecular models

UNIT 3 - TITLE	KEY CONCEPT	RELATED CONCEPTS	GLOBAL CONTEXT
Organic Chemistry	Change	Form (Structure) and Energy	Identities and relationships
STATEMENT OF INQUIRY	OBJECTIVES		
The properties and reactions of organic substances depend on molecular structure.	A i,ii,iii – Test the understanding and knowledge on structure, naming and reactions of organic molecules. Construct molecular models, draw the structures, compare and state the shape of molecules. Write reactions of different organic compounds (Oral exam on naming compounds and write balance equations on combustion reactions). Explain and compare the changing of properties of organic substances in relevance to molecular structure.		
ATL SKILLS			
Critical thinking of structural changes in organic molecules in relevance to length of C chain and functional groups Self-management - Practice question sets to work at home and self-evaluation of answers based on the marking scheme. (Discuss answers in the class) Social: collaboration in group work (construction of organic molecular models)			
CONTENT			
• Identification and naming of alkanes, alkenes, alkynes. • Identification and naming of organic compounds with functional groups (alcohol, aldehyde, ketone, and carboxylic acids). • Nomenclature for straight-chain organic molecules			

UNIT 4 - TITLE	KEY CONCEPT	RELATED CONCEPTS	GLOBAL CONTEXT

Properties of waves	Cause	Movement Consequesnces Evidence	Orientation in time and space
STATEMENT OF INQUIRY	How does the properties of waves change in space and time according to the medium and origin?		

OBJECTIVES

Criteria B - Inquiring and designing (Summative assessment)

i. Design an experiment to investigate the selected property of a wave.

ii. Formulate a research question and testable hypothesis on effect of a selected factor on change of a selected property of a wave and explain it using scientific reasoning.

iii. Explain the way of manipulating variables and collection of data.

iv. Plan a procedure to record qualitative data and enough quantity of reliable data.

Criteria C – Data collection, Processing and evaluating (i, ii, iii iv and v)

How does the selected property of a wave change due to the effect of selected factor.

(Summative assessment) (i, ii, iii iv and v)

ATL SKILLS

Communication: Negotiate ideas and knowledge with peers and teacher on their existing knowledge.

Use and interpret a range of discipline-specific terms and symbols – Use of different images and videos to explain properties of waves.

Social: Work collaboratively in teams.

Thinking Skills: critical thinking of wave properties in relevance to type of material and origin of wave.

Self-management: Improve time management skills. Set goals that are challenging and realistic with time management.

Reflection Skills: Develop new skills, techniques and strategies for effective learning.

Research Skills: processing and evaluating observations to make conclusions

CONTENT

- Read necessary background, conduct one of the following experiments and write a lab report
- Central concepts related to experiments: Validity, reliability, accuracy, precision.
- Choose independent variable, control other variables that could affect the dependent variable
- Measure the variables with suitable uncertainty an adequate number of times.
- Lab report on different subject:
  - Confirm Hooks Law
  - Finding the speed of light
  - mass of water in a glass affects the "singing frequency"
  - how does the angle of incidence affect the angle of reflection
  - how does the angle of incidence affect the angle of refraction
  - how does the frequency of a vibrating ruler affect the produced wavelength of surface water
  - How does the mass of water in a glass affect the frequency
  - Find the speed of a wave on a guitar string
  - How does the length of a plucked guitar string affect the frequency of the produced sound wave
  - How does length of a cantilever affect the frequency
  - How does the length of a simple a pendulum affect the period
  - How does the weight of a mass affect the period

UNIT 5 - TITLE	KEY CONCEPT	RELATED CONCEPTS	GLOBAL CONTEXT

Energy in Life	Change	Environment, Energy, Transformation, Forms Function	Globalization and sustainability
STATEMENT OF INQUIRY – Different variables that affect to the processes of energy change (Photosynthesis & Respiration) in life forms determine the efficiency of energy change.			

OBJECTIVES

Criteria B - Inquiring and designing (Summative assessment)

i. Design an investigation to assess the effect of selected factor on rate of photosynthesis or respiration.
ii. Formulate a research question and testable hypothesis on effect of a selected factor on rate of photosynthesis or respiration.
iii. Explain the way of manipulating variables and collection of data.
iv. Plan a procedure to record qualitative data and enough quantity of reliable data.

Criteria C – Data collection, Processing and evaluating (i, ii, iii iv and v)

How does the change of selected factor effect on rate of photosynthesis? (Summative assessment) (i, ii, iii iv and v)

ATL SKILLS

- Critical thinking – Effect of factors on energy conversions and productivity.
- Research – Design an experiment to measure the effect of selected factor on conversion of solar energy to chemical energy (Photosynthesis) or chemical energy to heat or mechanical energy (Respiration)

CONTENT

- Solar energy to chemical energy (Photosynthesis) (Experimental design to assess rate of Photosynthesis)
- Cellular respiration to convert chemical energy to ATP.
- Productivity and factors affect photosynthesis.
- Cellular respiration of living organisms.

UNIT 6 - TITLE	KEY CONCEPT	RELATED CONCEPTS	GLOBAL CONTEXT
Energy & transformation	Change	Form (Structure) Energy Transformation	Globalization / sustainability Scientific /technical innovation

STATEMENT OF INQUIRY	OBJECTIVES
Environment and humankind are affected by transformation of energy	D i,ii,iii,iv (all strands)

ATL SKILLS

Communication skill: Negotiate ideas and knowledge with peers and teacher on their existing knowledge about energy sources how effective they are and how they affect the environment.

Use and interpret a range of discipline-specific terms and symbols – Use of different images and videos to describe consequenses.

Social: Work collaboratively in teams.

Thinking Skills: critical thinking of wave properties in relevance to type of material and origin of wave.

Self-management: Improve time management skills. Set goals that are challenging and realistic with time management.

Reflection Skills: Develop new skills, techniques and strategies for effective learning

CONTENT

- Work and energy concept.
- Conservation of energy.
- Energy change to different forms
- Renewable (Solar Energy , Wind Energy, Hydropower (Hydroelectric Energy-Tidal Energy - Energy of Waves and Currents), Geothermal Energy , Biomass)
- Non-Renewable Energy Resources (Fossil Fuel (Oil-Coal-Gas), Nuclear Energy)