

香港資優教育學苑
The Hong Kong Academy for Gifted Education

Topic : Biological world (P6 Trans-disciplinary inquiry unit: English Language + General Studies)

Number of lessons: 22 lessons

Enduring understanding: Treasure and love the environment through understanding the importance of the balance of nature

Central inquiry question: Is the balance of nature well kept?

Inquiry questions :

1. What is environment (nature)?
2. How are living things classified?
3. How do animals interact with environment?
4. How do they reproduce?
5. How do plants interact with environment?
6. How do they reproduce?
7. How do living things interact?
8. Why does Nature lose balance? What are the evidences for this?
9. How can human restore the balance?

Remarks : () Stands for the number of lesson, but it would be amended by teachers if necessary

WS stands for worksheet ; TB stands for textbook; Ex stands for extended task; Diff stands for tasks for differentiation

Enrichment Corner: reference books (prepared jointly amongst teachers, parents and students), VCD, a computer

Word list/ Glossary for all students: To help student learning General Studies in English; To help the students with lower English competence

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Objectives			Learning activities		Assessment
Concepts	Skills	Values and attitude	Classroom (core curricular) activities	Ex / Diff activities	
1.The four major Environments: -Tropical Rainforest (TRF) - Desert - Grassland - Polar Region	- Critical thinking - Communication - Collaborative	- Appreciate the beauty of different environments	(1) Lesson at Computer Lab / with 1-1 laptop - Introduce 4 major environments (TB P.2-3) TRF, desert, grassland, polar region - Students go to the Computer Lab to make use of Geographic Information System (GIS) for finding out different biomes. - Group activity for assessing prior knowledge: discuss the climatic characteristics, number of species, population, examples of plants and animals in different environments.	- Ex: WS 3.1 Understand our world	Formative assessment (WS3.1): understanding of the earth
2. Abiotic and biotic characteristics of different environments	Critical thinking	- Appreciate the beauty of biodiversity in our planet	(1) Lesson at Computer Lab / with 1-1 laptop: - TB 2-3 - Group discussion: Browse www.blueplanetbiomes.org discuss the abiotic and biotic elements within each of the 4 environment.	- WS 3.2 animals & plants in different landscapes Diff: (tiered task) A big chart comparing 2 environments in terms of climatic, population, biodiversity, examples of plants and animals	Formative assessment (WS3.2): understanding of different environments

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3. Adaptation of animals to the environment	<ul style="list-style-type: none"> - Study - Critical thinking 	<ul style="list-style-type: none"> - Appreciate the harmony between animals and environment - Appreciate the life of different animals in terms of their adaptation abilities 	(2) Lessons: - TB P.4-7 How animals adapt to the environment: - skin cover (P.4) - skin colour (P.5) - beak (P.6) - feet (P.6) - living style (P.7) - For each item, discuss different forms, functions and examples of animals' adaptation to the environments	Ex: - WS 3.3 - WS 3.4 - WS 3.5 Diff: (tiered task) Create a big poster showing skin cover, colour, beak, feet and living style in terms of forms, functions and examples	Formative assessment WS 3.3-3.5 OR Big Chart (Study skills: synthesis)
4. Classification of living things	<ul style="list-style-type: none"> - Critical thinking 	<ul style="list-style-type: none"> - Appreciate different forms of animals 	(1) Lesson a. Prior knowledge assessment: Classify animals on P.15 b. Common classification TBP.16-17 insects, fish, birds, mammals, reptiles (1) Lesson a. Case studies: TB P.17-20 b. Classification of plants TB P.19-20 Gifted students presentation	Fill in the blanks of TB P.16-17 Diff: (Anchor activity) The gifted students are asked to choose 1-2 categories and identify examples. Discuss how they adapt to their environment (reinforce Concept 3)	Formative assessment: 1-minute summary: spider maps of animals & plants classification

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<p>5. Life cycle of animals</p> <p>Reproduction of animals: by hutching and by birth</p>	<ul style="list-style-type: none"> - Study - Collaborative 	<p>Appreciate the continuation of animals</p>	<p>(1) Lesson TB P.24-25 Life cycle: birth, growth, illness, death Students are grouped to search for information about animals' reproduction (Appendix 1: Task sheet)</p> <p>(2) lessons (a) TB P.27, 29 reproduction by hatching and by birth (b) Poster making</p>	<p>Students are grouped to create poster showing the life cycle (with time frame) and reproduction of a particular species</p> <ul style="list-style-type: none"> - Some groups by hutching, some groups by birth <p>Diff: (tiered task) The gifted group is working on asexual reproduction</p>	<p>Summative assessment: Poster (concepts of life cycle)</p>
<p>6. Structure of plants</p> <p>Plants have lives: - plant cell, photosynthesis, respiration</p>	<ul style="list-style-type: none"> - Study - Critical thinking - Collaborative 	<p>Plants are worth treasuring because of their lives</p>	<p>(1) lesson Structure of plants (refer to the word list) Brief the propose and preparation of the lab work in next lesson. Study WS 3.6 and make hypothesis</p> <p>(2) lessons Lab work for plan respiration, cell, growth <Details refer to WS 3.6></p>	<p>WS 3.6 Experiments for plants' lives</p> <p>Ex: WS 3.7 Instructions of constructing a green corner</p> <p>Students are grouped to construct a green corner at the classroom</p> <p>Diff: Open-ended response</p>	<p>Formative assessment: WS 3.6 Study skills WS 3.7 values & action Peer assessment WS3.8</p>

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Objectives			Learning activities		Assessment
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7. Adaptation of plants to the environment	- Critical thinking - Communication	Appreciate the life of different plants Construct and take care of the green corner	(1) lessons TB P.9-13 How plants adapt to the environment - roots (P.10) - stems (P.11) – study a plot of aloe vera - leaves (P.12) – an experiment showing respiration	Ex: WS 3.9 Adaptation of plants in TRF and TD Diff: (tiered task) WS3.9b Diff: 20 gifted/ high ability students → Field trip to Bride's Pool Trail about TRF vegetation inquiry on Saturday → share with the whole class	Formative assessment: observation (critical thinking skills)
8. Reproduction of plants (brief introduction only)	- Study	Appreciate the continuation of plants	(2) lessons revisit the sexual reproduction of animals + WS 3.7 Green corner construction Introduce the reproduction of plants TB P.31-33, 35-36 Gifted students share asexual reproduction	Diff: (anchor activity) Single-lined paper: How does human being affect the reproduction of plants (spread of seed)? (writing skills incorporated)	

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<p>9. Ecosystem</p> <ul style="list-style-type: none"> - food chain - nutrient cycle - gas exchange 	<ul style="list-style-type: none"> - Study - Critical thinking 	<p>Treasure the interdependence of living things</p>	<p>(1) Lesson at Computer Lab / with 1-1 laptop TB P.40-41 Follow WS 3.10</p> <p>Food chain and interdependence of living organism: Website 1: food chain game and reading (WS 3.10 P.1-2):</p> <p>Food web Website 2: food web game and reading (WS 3.10 P.3)</p> <p>(1) Lesson a. debrief food chain & food web as energy flow b. nutrient cycle (TB P.41) c. gas exchange (TB P.42)</p>	<p>Ex: WS 3.10</p> <p>Diff: (tiered task) WS 3.10 P.4 (extra challenge for the gifted students)</p> <p>Outstanding works for classroom decoration</p>	<p>Formative assessment: WS3.10 ecosystem concepts and study skills</p>
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Objectives			Learning activities		Assessment
Concepts	Skills	Values and attitude	Classroom activities	Ex / Diff activities	
10. Deforestation - how is ecosystem affected	- Communication - Writing	Love the nature	(1) lessons Group discussion TB P.43 Why is forest cleared? How is ecosystem (Concept 9) be affected?	Ex: WS 3.11	Summative assessment for Concepts 1-10

Summative assessment <Concepts 1-10>

Details refer to the summative assessment paper and answer key

Time allocated: 50 minutes

Multiple choice (24%), diagram annotation (12%), sequencing (8%), short questions (41%), long questions (15%)

Item/ Concept 11. Endangered animals --- next page

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Objectives			Learning activities		Assessment
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11. Animal extinction	<ul style="list-style-type: none"> - Critical thinking - Communication - Collaborative 	Treasure endangered animals	(1) TB P.44 The concept of animal extinction Go through 2 examples <ul style="list-style-type: none"> - explain “climate change / global warming” Group discuss “Chinese White Dolphin” and explain threats to its survival by using mind map Finish the note P.44 and explain “over-_____”	Diff: (<i>Anchor Activity</i>) After finishing the core activities, go to Resource Corner to read books/ search info about prevention of animal extinction as enrichment.	Make a proposal of saving the endangered animals
			(1) Group activity <ul style="list-style-type: none"> ■ Jigsaw reading and find more information (refer to the resource pack, Appendix 2) 7 groups: Am. crocodile, bear, blackfaced spoonbill, Chinese white dolphin, blue whale, giant panda, black rhino -- their current situation -- the reason(s) for extinction ■ envoy exchange/ presentation → generalise the reasons 	Ex: Find reading materials about an endangered animals For the proposal (action) later Diff: (Choice) Diff: (anchor activity) Resource corner for websites of extended reading for each endangered animal	

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11. Animal extinction (continued)			(1) Lesson: Case study: Asian elephant Video: Series 12, Safari (VCD) Current situation, threats, government policies, evaluation of policies	Ex: WS 3.12 Diff: Level 2 Enrichment group: a 5-month international collaboration project	1. Summative assessment: Proposal: assess values and action 2. Self-assessment 3. peer assessment
			(1) Lesson: Group work: drafting proposal of saving an endangered species Follow the format of WS 3.13 and create a new one on their own	Ex: Proposal of saving the endangered animals	

Level 2 enrichment group: 20 gifted students → *pullout GE programme for international collaboration project*

Level 3 enrichment: 6 exceptionally gifted students are awarded a full sponsorship for a gifted programme in the University of Toronto