# FIRST SEMESTER SYLLABUS IN EARTH AND LIFE SCIENCE
## First Quarter

<table>
<thead>
<tr>
<th>CORE SUBJECT DESCRIPTION</th>
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<tbody>
<tr>
<td>This learning area is designed to provide a general background for the understanding of Earth Science and Biology. It presents the history of the Earth through geologic time. It discusses the Earth’s structure, composition, and processes. Issues, concerns, and problems pertaining to natural hazards are also included. It also deals with the basic principles and processes in the study of biology. It covers life processes and interactions at the cellular, organism, population, and ecosystem levels.</td>
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<thead>
<tr>
<th>CONTENT STANDARD</th>
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<tbody>
<tr>
<td>The learner demonstrates understanding of key concepts and principles of Earth Science.</td>
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<thead>
<tr>
<th>PERFORMANCE STANDARD</th>
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<tbody>
<tr>
<td>The learner is able to create a research to identify the rocks and minerals that is widely present in different regions of the Philippines, identify the present geological problems as well as to assess the possible hydrological hazards.</td>
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<thead>
<tr>
<th>TIME FRAME</th>
<th>TOPICS</th>
<th>LEARNING COMPETENCIES</th>
<th>ASSESSMENT</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Unit I - Universe, Solar System, and Earth Systems</td>
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<tr>
<td></td>
<td>• <em>Universe and Solar System</em></td>
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<tr>
<td></td>
<td>o Origin of the Universe</td>
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<td>Creation Myths</td>
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<td>o The Big bang and other Theories</td>
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<td></td>
<td>o Origin of the Solar System: Early Theories</td>
<td>The learners:</td>
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<tr>
<td></td>
<td>• (S11/12ES-la-e-1) State the different hypotheses explaining the origin of the universe.</td>
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<td>• (S11/12ES-la-e-2) Describe the different hypotheses explaining the origin of the solar system.</td>
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<td></td>
<td>• (S11/12ES-la-e-3) Recognize the uniqueness of Earth, being the only planet in the solar system with properties necessary to support life.</td>
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<td></td>
<td>• (S11/12ES-la-e-5)</td>
<td>• Formative</td>
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<tr>
<td></td>
<td>➢ Sample Questions, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 20;</td>
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<tr>
<td></td>
<td>➢ Summative</td>
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<tr>
<td></td>
<td>➢ LAS – (Design and Make, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 21)</td>
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</tr>
</tbody>
</table>
| Week 2 | Value:  
- Respect for cultural diversity. |  
- Explain the current advancements/information on the solar system. |  
- Space Technology in the New Millennium;  
  *Performance Task*  
  ➢ LAS – Quiz |
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</tbody>
</table>
- *Earth: History and Geologic Time*  
  o Earth’s History  
  o Geologic Time Scale  
  o A Brief Description of Earth’s History  
- Values:  
  - Conservation and preservation of Earth’s natural resources  
- (S11/12ES-Ia-e-4) Explain that the Earth consists of four subsystems, across whose boundaries matter and energy flow.  
- (S11/12ES-Ia-e-6) Show the contributions of personalities/people on the understanding of the earth systems.  
- (S11/12ES-Ia-e-7) Identify the layers of the Earth (crust, mantle, core).  
- (S11/12ES-Ia-e-8) Differentiate the layers of the Earth. |  
- (S11/12ES-Ia-e-25) Describe the different methods (relative and absolute dating) to determine the age of stratified rocks.  
- (S11/12ES-Ia-e-27) Explain how relative and absolute dating were used to determine the subdivisions of geologic time.  
- (S11/12ES-Ia-e-28) Describe how marker fossils (also known as guide fossils) are used to define and identify subdivisions of the geologic time scale.  
- (S11/12ES-Ia-e-29) Describe how the Earth’s history can be interpreted from the geologic time scale. |  
- Formative  
  ➢ Sample Questions, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 32  
- Summative  
  ➢ LAS – (Design and Make, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso pp. 34-35) making a Geological Timeline;  
  *Performance Task*  
  ➢ LAS – Quiz |
| Week 3 | Value:  
- Stewardship  
- Earth: Structure and Subsystems  
  o Earth’s Formation and layers  
  o Earth’s Subsystem  |  
- (S11/12ES-la-e-4) Explain that the Earth consists of four subsystems, across whose boundaries matter and energy flow.  
- (S11/12ES-la-e-6) Show the contributions of personalities/people on the understanding of the earth systems.  
- (S11/12ES-la-e-7) Identify the layers of the Earth (crust, mantle, core).  
- (S11/12ES-la-e-8) Differentiate the layers of the Earth. |  
- Formative  
  ➢ Sample Questions, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 61  
- Summative  
  ➢ LAS - (Design and Make, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 62) Making a Terrarium; |
| Week 4 | Unit II – Earth Materials and Processes  
- *Earth’s Materials: Rocks and Minerals*  
  - 4.1 Rock  
  - 4.2 Minerals  
| Value:  
- Nurturing of Talents (Matthew 25:14-30-The Parable of the Talents). |
| Week 4 | Performance Task  
- (S11/12ES-la-9) Identify common rock-forming minerals using their physical and chemical properties.  
- (S11/12ES-Ib-10 ) Classify rocks into igneous, sedimentary, and metamorphic.  
- (S11/12ES-Ic-18 ) Compare and contrast the different types of igneous rocks.  
- (S11/12ES-Le-25 ) Describe how layers of rocks (stratified rocks) are formed.  
- (S11/12ES-Ic-17) Describe the change in mineral components and texture of rocks due to changes in pressure and temperature (metamorphism). |
| Week 5 | FIRST MID - QUARTER EXAM |
| Week 6 | - *Exogenic Processes*  
  - 5.1 Weathering  
  - 5.2 Mass Wasting  
  - 5.3 Erosion and Transportation  
  - 5.4 Deposition and Depositional Landforms  
| Value:  
- Stewardship |
| Week 6 | Performance Task  
- (S11/12ES-Ib-11) Describe how rocks undergo weathering.  
- (S11/12ES-Ib-12) Explain how the products of weathering are carried away by erosion and deposited elsewhere.  
- (S11/12ES-Ib-13) Make a report on how rocks and soil move downslope due to the direct action of gravity |
| Week 7 | - *Endogenic Processes*  
  - Tectonic Processes:  
| Value:  
- Formative  
- Sample Questions, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 79 |
| Week 7 | Performance Task  
- (S11/12ES-Ib-14) Describe where the Earth’s internal heat comes from.  
- (S11/12ES-Ic-15) Describe how |

*First Semester: Syllabus in Earth and Life Science*
<table>
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<tr>
<th>Week 8</th>
<th>Unit III – Natural Hazard, Mitigation, and Adaptation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Geological Processes and Hazards</td>
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<tr>
<td></td>
<td>7.1 Republic Act 10121, 124</td>
</tr>
<tr>
<td></td>
<td>7.2 Geologic Processes and Hazards</td>
</tr>
<tr>
<td></td>
<td>7.3 Prevention and Mitigation, Preparedness, Response and Rehabilitation</td>
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<tr>
<td>Value:</td>
<td>Social awareness</td>
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</tbody>
</table>

### Values:
- Open-mindedness
- Logical thinking

### Summative

#### LAS – (Design and Make, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 119)
- I Was There: A Volcanic Eruption Experience; Performance Task

#### LAS 16 - Quiz

### Formative

#### Sample Questions, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 138

#### Summative

#### Role Playing: Precautionary Measures: Before, During and After the Earthquake; Performance Task

#### LAS – Quiz
| Week 9 | Hydrometeorological and Coastal Processes and Hazards  
> o Hydrometeorological Phenomena and Hazards  
> o Coastal processes and Hazards  
> Value:  
> • Alertness | (S11/12ES-Ig-35) Describe the various hazards that may happen in the wake of tropical cyclones, monsoons, floods, or ipo-ipo.  
> (S11/12ES-Ig-36) Using hazard maps identify areas prone to hazards brought about by tropical cyclones, monsoons, floods, or ipo-ipo.  
> (S11/12ES-Ih-37) Give practical ways of coping with hydrometeorological hazards caused by tropical cyclones, monsoons, floods, or ipo-ipo.  
> (S11/12ES-Ih-38) Describe how coastal processes result in coastal erosion, submersion, and saltwater intrusion.  
> (S11/12ES-li-39) Identify areas in your community prone to coastal erosion, submersion, and saltwater intrusion.  
> (S11/12ES-li-40) Give practical ways of coping with coastal erosion, submersion, and saltwater intrusion.  
> (S11/12ES-li-41) Cite ways to prevent or mitigate the impact of land development, waste disposal, and construction of structures on control coastal processes. |
| Week 10 | FIRST QUARTER EXAMINATION |

First Semester: Syllabus in Earth and Life Science | 5
References:

- Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso; Copyright 2016; Pheonix Publishing House Inc.
- Conceptual Science and Beyond, Earth and Life Science by Raymond A. Baltazar, Ceazar Ryan U. Cuarto and Jigger P. Leonor Ph. D.; Copyright 2016; Brilliant creations Publishing, Inc.
- Earth and Life Science by Glen R. Mangali, mylene D.G. Olivia, Charity I. Mulig – Cruz and flordeliz R. Estira; Copyright 2016; DIWA Learning System Inc.
FIRST SEMESTER SYLLABUS IN EARTH AND LIFE SCIENCE
Second Quarter

CORE SUBJECT DESCRIPTION
This learning area is designed to provide a general background for the understanding of Earth Science and Biology. It presents the history of the Earth through geologic time. It discusses the Earth’s structure, composition, and processes. Issues, concerns, and problems pertaining to natural hazards are also included. It also deals with the basic principles and processes in the study of biology. It covers life processes and interactions at the cellular, organism, population, and ecosystem levels.

CONTENT STANDARD
The learner demonstrates understanding of key concepts and principles of Life Science

PERFORMANCE STANDARD
The learner is able to value life by taking good care of all beings, humans, plants and animals; make a poster that shows the complementary relationship of photosynthesis and cellular respiration; conduct a survey of products containing substances that can trigger genetic disorders; make a presentation of some diseases that are associated with the various organ systems; design a setup on propagating plants using other methods such as; Design a poster tracing the evolutionary changes in a crop plant (e.g., rice or corn) that occurred through domestication; prepare an action plan containing mitigation measures to address current environmental concerns and challenges in the community.

TIME FRAME

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<th>TOPICS</th>
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<td>Unit IV – Introduction to Life Science</td>
<td>The learners:</td>
<td>Formative</td>
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<td>• How Did Life originate?</td>
<td>(S11/12LT-IIa-1) Explain the evolving concept of life based on emerging pieces of evidence.</td>
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<td>(S11/12LT-IIa-2) Describe classic experiments that model conditions which may have enabled the first forms to evolve.</td>
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</tbody>
</table>
| Values: | • Stewardship  
• Discipline | • (S11/12LT-IIa-3) Describe how unifying themes (e.g., structure and function, evolution, and ecosystems) in the study of life show the connections among living things and how they interact with each other and with their environment. | • Summative  
➢ LAS – (Investigation, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso pp.171-172) What Properties Can Be Observe in Living Things; Performance task  
➢ LAS – Quiz |
| --- | --- | --- | --- |
| Week 12 | • **Cell Energy/Bioenergetics**  
 o How Cells Use Energy  
 o Photosynthesis  
 o Cellular Respiration  
 o Connecting Photosynthesis and Respiration  
 Values:  
• Call for service to the common good and respect for the individual. | • (S11/12LT-IIbd-4) Explain how cells carry out functions required for life.  
• (S11/12LT-IIbd-5) Explain how photosynthetic organisms use light energy to combine carbon dioxide and water to form energy-rich compounds.  
• (S11/12LT-IIbd-6) Trace the energy flow from the environment to the cells.  
• (S11/12LT-IIbd-7) Describe how organisms obtain and utilize energy.  
• (S11/12LT-IIbd-8) Recognize that organisms require energy to carry out functions required for life. | • Formative  
➢ Sample Questions; Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 187  
➢ Summative  
➢ LAS – Make a poster that shows the complementary relationship of photosynthesis and cellular respiration; Performance task  
➢ LAS – Quiz |
| Unit V – Continuity of Life | • **How Do Living Things Reproduce?**  
 o How Do Plants Reproduce?  
 o How Do Animals Reproduce? | • (S11/12LT-Ilej-13) Describe the different ways of how plants reproduce.  
• (S11/12LT-Ilej-14) Illustrate the relationships among structures of flowers, fruits and seeds.  
• (S11/12LT-Ilej-15) Describe the different ways of how representative | • Formative  
➢ Sample Questions; Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p. 203  
➢ Summative |
### Week 14

**Value:**
- Pope Francis said “Every act of cruelty towards any creature is ‘contrary to human dignity.”

**Animals:**
- (S11/12LT-IIej-16) Explain how the information in the DNA allows the transfer of genetic information and synthesis of proteins.

**Values:**
- Love of Christ and neighbor.

**Week 15**

**Value:**
- Pope Francis said “Every act of cruelty towards any creature is ‘contrary to human dignity.”

**Animals:**
- (S11/12LT-IIej-17) Describe the process of genetic engineering.
- (S11/12LT-IIej-18) Conduct a survey of the current uses of genetically modified organisms.
- (S11/12LT-IIej-19) Evaluate the benefits and risks of using GMO’s.

**Values:**
- How Genes Work
- Genetic Engineering

**Week 16**

**Value:**
- Pope Francis said “Every act of cruelty towards any creature is ‘contrary to human dignity.”

**Second Mid - Quarter Exam**

**Animals:**
- (S11/12LT-IIIaj-20) Explain the different metabolic processes involved in the various organ systems.
- (S11/12LT-IIIaj-21) Describe the general and unique characteristics of the different organ systems in representative animals.
- (S11/12LT-IIIaj-22) Analyze and appreciate the functional relationships of the different organ systems in ensuring animal survival.

**Values:**
- How Animals Survive
  - Metabolic Processes Among Living Things
  - Organ Systems of Some Animals

**Formative**
- Sample Questions; Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p.237

**Summative**
- LAS – Quiz
| Week 17 | **How Plants Survive**  
| o Plant Form and Functions  
| o Plant Growth and Development  
| o Plant Responses to the Environment  
**Value:**  
| Discipline | **Formative**  
| (S11/12LT-IVae-23)Describe the structure and function of the organ system of plants.  
| (S11/12LT-IVae-24)Discuss the tissue system and function of the organ system of plants.  
| (S11/12LT-IVae-25)Explain the different metabolic processes involved in the plant organ systems. | • Sample Questions; Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p.260  
**Summative**  
| LAS – (Investigation, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso pp. 263-264) Plant Structure and Function; Performance task  
| LAS – Quiz |
| Week 18 | **Evolution of Living Things**  
| o Evidences of Evolution  
| o Origin and Extinction of Species  
| o Classification and Evolution  
**Value:**  
| Preservation of life.. | **Formative**  
| (S11/12LT-IVfg-25)Describe evidence of evolution such as homology, DNA/protein sequences, plate tectonics, fossil record, embryology, and artificial selection/ agriculture.  
| (S11/12LT-IVfg-26)Explain how populations of organisms have changed and continue to change over time showing patterns of descent with modification from common ancestors to produce the organismal diversity observed today.  
| (S11/12LT-IVfg-27)Describe how the present system of classification of organisms is based on evolutionary relationships. | • Sample Questions; Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p.280  
**Summative**  
| LAS – (Investigation, Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso pp. 283-284) A Fossil Imprint; Performance task  
| LAS – Quiz |
| Week 19 | **Ecology** | **Formative**  
| (S11/12LT-IVhj-28)Describe the |
| o Principles of the Ecosystem  |
| o Population Growth          |
| o terrestrial and aquatic    |
| Ecosystems                   |
| o Human Affect the           |
| Ecosystems                   |

**Values:**

- Respect all the living creature in this planet.

| principles of ecosystem.     |
| (S11/12LT-IVhj-29)Categorize  |
| the different biotic potential|
| and environmental resistance (e.g., |
| diseases, availability of food, and |
| predators) that affect population |
| explosion.                    |
| (S11/12LT-IVhj-30)Describe    |
| how the different terrestrial|
| and aquatic ecosystems are    |
| interlinked with one another. |

- **Sample Questions; Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso p.301**
- **Summative**
  - **LAS – Quiz**

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**References:**

- Earth and Life Science by Lilia G. Vengco and Teresita F. Religioso; Copyright 2016; Pheonix Publishing House Inc.
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