



Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

EARTH AND SPACE SCIENCE 2

Grade 11

Course Description:

Building on Earth and Space Science 1, this course explores Earth's interconnected systems—the geosphere, atmosphere, biosphere, and hydrosphere—and their role in sustaining life. Learners use models to explain the dynamic nature of the Earth's lithosphere. Learners examine biogeochemical cycles, the distribution and movement of surface water and groundwater, and their impact on ecosystems and human activities, particularly in the Philippines. They analyze how human actions affect water resources and propose sustainable conservation strategies. Through scientific modeling, research, and data analysis, learners gain a deeper understanding of Earth's dynamic systems and their importance in environmental sustainability.

Elective: Academic

Prerequisite: Earth and Space Science 1

Time Allotment: 80 hours for one semester, 4 hours per week

Schedule: Second Semester

Quarter 3: Plate Tectonics and Earth's Processes

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Evolution of Earth's landmasses and ocean basins	1. a range of theories have contributed to modern understanding of the dynamic nature of Earth's lithosphere;	1. use secondary sources to assess the continental drift and seafloor spreading theories in providing evidence for plate movement, including continental jigsaw patterns, fossil correlations across continents, similarities in rock types and other geological features, and patterns of ancient climate;
2. Plate tectonics and the Philippine archipelago	2. tectonic plates and their movements are responsible for the current shape of the Earth's lithosphere, and cause geologic phenomena including earthquakes and volcanic activities along the plate boundaries; 3. geologic phenomena due to plate tectonics cause sudden movement of rock	2. identify Earth's major tectonic plates on a map showing relative movements at the three types of plate boundaries: <ol style="list-style-type: none"> divergent plate boundaries (oceanic ridges) convergent plate boundaries (mountain ranges and the process of subduction) transform plate boundaries 3. construct models to explain how plate movements drive the formation of geological features such as folds, faults, trenches, volcanoes, rift valleys, and mountain ranges; 4. describe how the movement of tectonic plates is generally what provides the stress that causes rocks beneath the Earth's surface

	<p>materials below the Earth's surface;</p> <p>4. geologic phenomena due to plate tectonics—volcanism is a natural process; and</p>	<p>to shift and break, resulting in faults, and the sudden movement of rock materials below the Earth's surface causes earthquakes;</p> <p>5. describe how seismic waves travel in the Earth's interior and surface;</p> <p>6. identify earthquake generators in the Philippines</p> <p>7. describe earthquake hazards and mitigation of their impacts;</p> <p>8. explain the properties of magma and volcanic gases and the process of volcanic eruption, and how these properties and processes contribute to the different types of volcanic eruptions in the Philippines;</p>
<p>3. Weathering, erosion, and sedimentation</p>	<p>5. weathering, erosion, and sedimentation are processes that continually reshape Earth's surface.</p>	<p>9. explain weathering, erosion, and sedimentation in shaping the Earth's surface;</p> <p>10. describe the coastal and riverine processes, highlighting landscapes through erosion, deposition, and transportation of materials; and</p> <p>11. develop a summary of events that have influenced the current shape of the Philippine Archipelago.</p>

Performance Standards

By the end of the quarter, learners simulate Earth's geological processes using concrete and conceptual models. They use practical examples to illustrate and explain Earth processes and their impacts on local, national, regional, and global landforms over time.

Suggested Performance Tasks

- Create a map analysis that identifies the Earth's major tectonic plates with the three types of plate boundaries. Learners may be directed to consult or request materials and information from the Philippine Institute of Volcanology and Seismology. (<https://www.phivolcs.dost.gov.ph/>)
- Make physical models to describe and explain the movement at plate boundaries and demonstrate the impact the movements have in changing the lithosphere.
- Design an interactive simulation showing how weathering, erosion, and sedimentation contribute to shaping a significant local or regional feature of the Philippines.
- Create a summary of events that have influenced the current shape of the Philippine Archipelago.

Quarter 4: Earth's Surface Systems

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Earth's Systems	1. the Earth is a complex system where energy and matter flow across interconnected subsystems, shaping the environment and sustaining life;	1. describe the flow of matter and energy between and among the Earth's subsystems in sustaining and supporting the ecological balance on the planet;
2. Biogeochemical cycles	2. the biogeochemical cycle are processes that regulate Earth's subsystems;	2. analyze the importance of the biogeochemical (carbon-oxygen and water) cycles in regulating energy flow and maintaining Earth's systems that are necessary to support life;
3. Surface Water and Groundwater Systems	3. water resources are unevenly distributed across the Earth, affecting regional climate, ecosystems, and human activities; 4. water in different forms plays a vital role in forming landscapes, supporting ecosystems, and sustaining human needs; 5. human activities have a profound impact on water quality and availability;	3. describe the distribution of Earth's water resources and their varying availability across different regions of the Philippines; 4. characterize running water, groundwater, and subsurface water, highlighting their roles in the water cycle using local examples; 5. explain the importance of surface water and groundwater systems in supporting ecosystems; 6. construct models to explain the movement and distribution of groundwater within aquifers, including the processes that affect its flow, recharge, shortage, and storage; 7. describe and evaluate how Philippine water and other resources are being monitored through various government agencies; and 8. propose sustainable ways of conserving and protecting water resources caused by human activities.

Performance Standards

By the end of the quarter, learners relate the Earth's interconnected subsystems and describe how these impact sustaining and supporting life and ecological balance within the Philippines and on the planet. Learners describe and explain the implications of these processes for the Philippines. Learners apply scientific models and concepts, data analysis, and scientific reports to describe local and global water systems and their sustainability for the Philippines.

Suggested Performance Tasks

- Create a visual model that demonstrates the relationships and energy flow between the Earth's geosphere, atmosphere, biosphere, and hydrosphere by applying it to a familiar local environment or one you can directly observe.
- Produce a written analysis that describes the distribution and availability of water resources within the local community, focusing on the challenges faced by community members in accessing clean and safe water.
- Investigate how human activities (such as pollution, overconsumption, and deforestation) affect the quality and availability of local water resources and propose sustainable ways to conserve and protect these resources.