Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

EARTH AND SPACE SCIENCE 1

Grade 11

Course Description:

This course explores the origin of the universe and how the features of the Earth were influenced by its position in the solar system. Learners then investigate Earth's materials and resources, including minerals, rocks, soil, and energy sources, focusing on their formation, classification, and importance. They examine how these resources support industry and technology and compare renewable and non-renewable energy sources, highlighting their impact on the environment and the need for sustainable practices. Through hands-on activities, research, and creative projects, learners classify earth materials, analyze their uses, and design campaigns promoting resource conservation and sustainability.

Elective: Academic
Prerequisite: None
Time Allotment: 80 hours for one semester, 4 hours per week
Schedule: First Semester

Quarter 1: Origin and Structure of the Earth

Content	**Content Standards** *The learners learn that*	**Learning Competencies** *The learners*
1. Composition of the Universe	1. the objects making up the universe have distinct characteristics; 2. the interactions of the Sun, planets, and moon produce dynamic physical influences;	1. describe the historical development of theories that explain the origin of the universe; 2. distinguish the characteristics of celestial objects present in the solar system, including moons, asteroids, meteoroids, and comets;
2. Earth's position within the Solar System	3. the Earth is the only planet in the solar system that supports life; 4. the Earth's position in the solar system contributes to its structure and dynamic nature;	3. describe the features of the Earth that classifies it as a habitable and able to support life and relate its special features to its position in the solar system 4. describe the connection between the Philippines' position on earth and its tectonic activities using suitable sources, including images, maps, and cross-sections;

3. The historical development of the Earth	5. historical and contemporary models and theories provide the scientific bases for explaining the Earth's origin, its plates, and boundaries;	5. use information from secondary sources to outline the historical development of the Earth's origin based on the nebular hypothesis and planetesimal formation;
4. The structure and composition of the Earth	6. seismic waves and their effects help to explain and understand the nature and composition of the Earth.	6. describe how scientists use the study of rocks, minerals, meteorites, seismology, and volcanology to infer the composition of the Earth; 7. determine the structure and composition of Earth's crust and interior, layers based on insights gained from seismic studies, focusing on their unique properties and boundaries; and 8. describe the structure and composition of Earth's layers in the Southeast Asian region surrounding the Philippines.
Performance Standards *By the end of the quarter, learners* describe the origin of the solar system and Earth's historical evolution. They relate Earth's unique position in the solar system to its composition, structure, and the dynamic nature of its outer layers. Learners explain how scientists determine the nature of Earth's interior. They also collaboratively create detailed models and scientific analyses and use evidence-based findings to illustrate the nature and composition of the Earth.		
Suggested Performance Tasks ● Develop a timeline for the formation of the Earth using the Nebular Hypothesis and explain how other theories of planetesimal formation might help explain Earth's formation. ● Create a multimedia presentation explaining how Earth's position in the solar system contributes to its composition, structure, and tectonic processes, and how this compares to the other planets.		

Quarter 2: Earth's Materials and Resources

Content	**Content Standards** *The learners learn that*	**Learning Competencies** *The learners*
1. Mineral resources	1. minerals are essential for industrial development, economic growth, and technological advancement, but should be managed sustainably;	1. identify minerals based on their properties, including hardness, luster, color, streak, cleavage, and composition, using available methods and technologies; 2. explain the uses of key mineral resources of the Philippines, highlighting their economic significance; 3. identify strategies to prevent and mitigate the environmental impacts associated with the exploitation, over extraction, and misuse of mineral resources;
2. Rocks and soils	2. the rock cycle is a dynamic system that forms, alters, and reforms rocks over geological time; 3. various environmental factors influence the characteristics of soil;	4. explain the rock cycle and its significance in the formation and transformation of rocks, particularly those found in the Philippine archipelago; 5. classify rocks into igneous, sedimentary, and metamorphic based on their characteristics and formation, and identify the dominant type of rock in the locality; 6. describe the characteristics, formation, and profile of the types of soil in the Philippines, in particular, what is found in the locality; 7. identify human activities that affect the soil; 8. provide sustainable ways to conserve and protect soil resources;
3. Energy sources	4. the differences between renewable and non-renewable energy sources are key to making sustainable energy choices and reducing environmental impacts; and 5. conserving energy sources and promoting sustainable practices are key to economic and environmental sustainability.	9. distinguish between renewable and non-renewable energy sources based on their characteristics, availability, use, and environmental impact; and 10. use secondary sources to make a proposal for conserving energy sources to promote economic and environmental sustainability.

Performance Standards

By the end of the quarter, learners identify, describe, and classify a range of minerals, rocks, and soils using appropriate scientific techniques. They explain the formation and economic significance of the Philippines' earth materials and energy sources, emphasizing the importance of sustainable mineral resource management. Learners differentiate renewable and non-renewable energy sources and develop campaigns focused on energy conservation and sustainability.

Suggested Performance Tasks

- Investigate mineral resources in the community (local or regional) and create infographics showing examples of the uses and contributions of minerals in community development, industrial development, economic growth, and/or technological innovation. Learners may be directed to consult or request materials and information from the Bureau of Mines and Geosciences (https://www.mgb.gov.ph/) or the University of the Philippines – National Institute of Geological Sciences (https://www.nigs.upd.edu.ph/).
- Develop a campaign to promote sustainable practices in the exploration, mining, and use of resources.
- Do fieldwork in a quarry site or an outcrop and create a detailed soil profile to explain the physical and chemical characteristics, formation processes, and classification.
- Compare and contrast renewable and non-renewable energy sources by developing an infographic illustrating the importance of sustainable energy choices and their environmental implications. Learners may be directed to consult or request materials and information from the Department of Energy (https://www.doe.gov.ph/).
- Make a proposal for conserving energy sources to promote economic and environmental sustainability.