



Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

GENERAL SCIENCE

Grade 11

*This curriculum guide contains inputs from the Technical Panel for General Education
of the Commission on Higher Education (CHED)*

Course Description:

This course uses a multidisciplinary approach to equip learners with the essential scientific knowledge, skills, and capabilities to meet the challenges of living and working in a rapidly changing and advancing Philippine society. The course aims to provide learners with the fundamental scientific competencies to help shape a sustainable future for themselves, their communities, and the planet. The course focuses on understanding and applying the scientific models, theories, and laws that relate to everyday life and work, as well as how these impact the Philippines as a significant contributor to the world. The curriculum uses a transdisciplinary approach to understand how the study of *Physics*, *Chemistry*, *Biology*, and *Earth and Space Science* interact to explain natural phenomena and how they can be utilized to advance the Philippines' economy. The course builds on learners' experiences and understandings of scientific phenomena to support them to be scientific and technological thinkers who can propose and solve problems through scientific observation, data gathering, meaning-making, and effectively communicating evidence-based conclusions. Learners will develop practical, scientific, and critical thinking skills through individual and collaborative scientific investigations and research, preparing them to pursue further education and careers in various fields or contribute meaningfully to a science-driven workforce.

Prerequisite: None

Time Allotment: 160 hours for one year, 4 hours per week

Quarter 1: Physics

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Physics in daily life	1. physics principles apply to numerous aspects of everyday living;	1. identify various ways physics enhances our quality of life across different areas, including household activities, health and safety, work productivity, and leisure;
2. Applications of translational and rotational motion	2. understanding linear and angular quantities to describe motion helps in the design of efficient machines;	2. compare and contrast translational and rotational motion in terms of their respective linear and angular quantities; 3. demonstrate through simple activities the relationship between linear and angular quantities; a. human movement (e.g., exercises, dance, and gymnastics), and b. ergonomic designs (e.g., buildings, vehicles, furniture, and toys);

3. Simple and compound machines	3. the efficiency of simple and compound machines can be improved by applying basic physics principles;	4. apply concepts of translational and rotational motion to design and build prototypes of efficient simple and compound machines; 5. explain the characteristics of efficient simple and compound machines;
4. The physics of fluids	4. hydraulic systems exploit the relationship between pressure, force, and area to multiply forces and perform tasks;	6. explain how simple hydraulic systems use fluid principles to enhance simple and compound machines; 7. identify applications of Archimedes' principle and Pascal's principle in various contexts, such as home, community, businesses, and transportation; 8. design simple practical activities or models to determine how variations in physical properties, such as shape, mass, and volume, affect an object's ability to float in a fluid;
5. Utilization of electricity	5. analysis of electricity generation, consumption patterns, and energy-efficiency practices can lead to better energy supply and management; and	9. discuss safety practices in dealing with electrical hazards, such as overloading, damaged insulation, damp electrical conditions, faulty wiring, and electrocution; 10. propose ways to minimize energy loss and energy wastage in homes, schools, local businesses, and other parts of society;
6. Understanding and using light and sound	6. an understanding of the properties of light and sound leads to their safe and productive application.	11. discuss properties of light and sound waves related to communications technology, navigation, medicine, and entertainment; and 12. identify innovations related to sound and light, such as soundproofing, sound amplifiers, LEDs, holograms, and lasers.

Performance Standards

By the end of the quarter, learners identify general physics principles and their applications in daily life. They use scientific principles to solve problems, make informed decisions, and illustrate the applications of physics for self, society, and the environment. They design simple and compound machines and hydraulic systems to demonstrate applications of force, torque, center of mass, and hydraulic-related principles. They evaluate energy-efficient practices in electricity supply and consumption at home and local businesses and explore the advantages and drawbacks of light and sound in medical imaging, security, communication, and entertainment.

Suggested Performance Task

- Design a model house that showcases how the physics principles behind rotational dynamics, energy efficiency, sound, and light can improve the ambiance and efficiency of Filipino homes.

Quarter 2: Chemistry

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Chemists and how they have made an impact on our lives	1. past research in the field of chemistry provides the foundations for the development of helpful products and processes;	1. use information from secondary resources to report how Louis Pasteur combined research from the fields of chemistry and biology, which has helped scientists to understand the cause of some diseases and prevent infection;
2. Application of chemical substances in household and personal care products	2. household and personal care products contain chemical substances that determine their properties and guide their proper use and disposal;	2. construct a table using product labels that describe the function of the different substances (elements or compounds) present in household products such as those in bleach, detergents, baking powder, and personal care products such as shampoo, soaps, and toothpaste; 3. explain the benefits and potential risks of using and disposing of household and personal care products, by considering their chemical composition, environmental impact, and human health effects, referring to the Department of Trade and Industry (DTI), Food and Drugs Authority (FDA), and the Department of Environment and Natural Resources (DENR);

3. Chemical reactions in everyday lives	3. chemical reactions are part of human activities and present in the environment; and	4. explain some of the common types of chemical reactions and provide examples for the following: decomposition, acid on carbonates, acids on metals, and combustion; 5. identify the type of chemical reactions that occur in our daily activities, including baking, cleaning, and burning; 6. use chemical equations to show biological and environmental processes such as photosynthesis and respiration; 7. describe the chemical reactions that take place in our body cells, which are referred to as metabolism, and explain their significance;
4. Solutions in the environment	4. chemicals should be handled safely, and solutions can have beneficial and harmful environmental effects.	8. explain the characteristics of solutions and their examples in household products, industry, and environmental science; 9. apply best practices in the proper handling, storage, and disposal of chemicals; 10. investigate how much salt dissolved in water will prevent the growth of a simple garden plant; and 11. create a table to show how solutions of saltwater and wastewater can affect local ecosystems and recommend ways to minimize their negative impact on the environment.
Performance Standards <i>By the end of the quarter, learners</i> apply research skills to discover how scientists have impacted our lives. They recognize the significant role of different agencies in the Philippines, such as DOST and DTI, in scientific innovation and development. They show critical thinking in explaining the different substances in household and personal care products, including their benefits and potential risks of using and disposing of them. They demonstrate appropriate and safe handling and use of chemicals. They explain that chemical reactions occur in human activities and the environment, and that several chemical solutions pose a threat to the community.		
Suggested Performance Task <ul style="list-style-type: none"> Look for household or personal care products and identify their active ingredients. Then, research each active ingredient by identifying its brief description, other uses, and potential impact on humans and the environment. 		

Quarter 3: Biology

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Unifying themes of life science	1. all levels of life have systems of related parts; 2. structures and functions are related at all levels of the organization of life;	1. explain using photographs or videos of simple plants or animals as examples how life forms operate as systems of related parts working together; 2. create a diagram to show the relationship between the structural components of a biological system and their functions;
2. The importance of cells in living things	3. cells carry out functions that enable organisms to survive;	3. describe how cells obtain nutrients from food and convert them into energy through cellular processes to sustain life in plants and animals;
3. Organ systems working together	4. organ systems work together to carry out essential functions of an organism;	4. explain how various plant organs interact to facilitate the transport of materials throughout the plant system; 5. describe how a damaged part in a system affects the organism using the case of a torn ACL (skeletal and muscular) and an asthma attack (respiratory and circulatory); 6. explain how the nervous and endocrine systems work together to regulate body temperature in response to stimuli; 7. explain how vaccines work by relating to the functions of the immune system and lymphatic system in protecting an organism against infectious diseases;
4. Philippine ecosystems	5. climate change affects ecosystems and the organisms living in them; and 6. ecosystems are finite and have limited resources.	8. describe what is meant by the term 'climate change'; 9. describe how biological systems respond to climate change and contribute to understanding its effects on living organisms in the Philippines; 10. explain how climate change impacts Philippine ecosystems; 11. propose ways to adapt and mitigate the impacts of climate change on local biodiversity; and 12. analyze information from secondary sources to evaluate the adverse effects of overpopulation locally and globally.

Performance Standards

By the end of the quarter, learners use examples to describe the relationships among living systems and their components and how the structure of a part relates to its function. They explain the role of cells in perpetuating life and how organ systems work together to maintain optimal health. They conduct investigations on the effects of climate change on local ecosystems.

Suggested Performance Task

- Create a presentation using chosen multimodal activities (e.g., forum, infographic, podcast, vlog, etc.) to effectively communicate key concepts about the effects of climate change on the local ecosystem in the learners' community.

Quarter 4: Earth and Space Science

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Uniqueness of the planet Earth	1. planet Earth is currently the only planet in the Solar System that can support life; 2. an appropriate amount of greenhouse gases helps regulate Earth's temperature, making it suitable for life;	1. explain the characteristics of Earth that support life in comparison with the other planets of the Solar System; 2. describe how the greenhouse effect regulates Earth's temperature, making it suitable for life;
2. Uniqueness of the Philippines	3. the Philippines is a unique country in terms of its landforms, bodies of water, climate, and biodiversity;	3. demonstrate how the Philippine archipelago was formed; 4. explain using suitable resources, including images, maps, and cross-sections the unique landforms, climate, and life forms of the Philippines Archipelago that have developed due to its geographical and geological location on Earth;
3. Uses of earth materials by people	4. earth materials are commonly used in human activity and industry;	5. describe the distinctive properties and local availability of earth materials, including rocks, minerals, and soils, and how they are harnessed to support human activities and industries;

4. Geologic processes and hydrometeorological processes that shape the Philippines	5. the Philippines is continuously shaped and reshaped by geologic and hydrometeorological processes;	6. describe geological and hydrometeorological hazards, such as volcanic eruptions, earthquakes, tsunamis, typhoons, floods, and landslides, and slowly acting processes, such as soil erosion and saltwater intrusion;
5. Natural hazards, disasters, prevention and mitigation, preparedness, and adaptation	6. human activities have contributed to the modification of landforms and bodies of water; and 7. impacts of natural hazards need prevention and mitigation strategies and adaptive measures to reduce risks and strengthen resilience.	7. use evidence from secondary resources to describe how human activities have contributed to the modification of landforms and bodies of water of the Philippines since the beginning of the Neolithic Period (~6,000 BCE); 8. assess geological and hydrometeorological hazards (e.g., tropical cyclones, ipo-ipo, thunderstorms, coastal storm surges, and heat waves) in terms of risks and prevention and mitigation strategies; 9. describe how the PAGASA iHEAT (Heat Index) maps provide Filipinos with the knowledge they need to take proactive measures to protect themselves from heat-related illnesses; and 10. develop family preparedness plans and community-based disaster risk reduction and management plans to prepare for, respond to, and recover from geological and hydrometeorological hazards that affect the Philippines.
Performance Standards <i>By the end of the quarter, learners use evidence from secondary sources to explain the uniqueness of planet Earth compared to other planets in the Solar System. They use models to describe and illustrate the distinctiveness of the Philippine Archipelago, showing how islands are formed through geological processes. They investigate the properties of rocks, minerals, and soil and apply their findings to using earth materials in the Philippines. They integrate ideas, experiences, understanding, and skills to explain geological and hydrometeorological hazards affecting the Philippines. They propose sound, viable, and sustainable mechanisms for hazard mitigation and adaptation.</i>		
Suggested Performance Task <ul style="list-style-type: none"> Create a brochure to promote the importance of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the Philippine Institute of Volcanology and Seismology (PHIVOLCS) to the local community in understanding and mitigating geological and hydrometeorological hazards. 		