SCIENCE

Grade 6

Three-Term Budget Of Work (BOW) for Learning Competencies

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Three-Term Budget Of Work
For Learning Competencies

First Term	
Content Standard	• Diagrams and flowcharts demonstrate processes involving heat energy and changes of state. • Changes in materials can be either reversible or irreversible. • Mixtures and the products of their separation techniques are very useful in our daily lives. • Scientific investigations need to satisfy the features of a fair test and use accurate and reliable measurements. • Animals have systems that help them grow, respond, and reproduce. • There are several modes of reproduction in plants. • To be valid and reliable, scientific investigations need to include fair tests and multiple trials. • Animals can be grouped as vertebrates or invertebrates based on their characteristics.
Performance Standard	By the end of the term, learners demonstrate an understanding of the benefits of various separation techniques. They use diagrams and flowcharts to describe changes of state. They use the words reversible and irreversible to describe changes to materials. They demonstrate skills in the use of equipment. They recognize and apply their understanding of the features of a fair test. They demonstrate an understanding of the different ways that plants reproduce. Plan a simple scientific investigation to determine which method works best in a given habitat. They describe and provide examples of vertebrates as animals with a backbone and invertebrates as animals that do not have a backbone.
Week	**Learning Competency**

1 to 2	**Diagrams and Flowcharts, Processes of Changes of State** • Describe changes of state for solids, liquids, and gases as melting, evaporation, freezing, condensation using diagrams and flowcharts. • Explain the role of heat energy in change of state processes.
3	**Physical and Chemical Change** • Explain why physical changes are reversible, and chemical changes are irreversible.
4 to 6	**Mixtures and Separation Techniques** • Describe useful everyday examples of uniform and non-uniform mixtures, such as solutions and suspensions. • Describe air as a mixture of oxygen, carbon dioxide, nitrogen, and water vapor. • Demonstrate various techniques in separating mixtures, such as decantation, winnowing, scooping, picking, evaporation, filtering, sieving, and using magnets. • Explain the benefits of each mixture separation technique in preparing useful products.
7 to 8	**Fair Test** • Apply the features of a fair test: a. change one factor, b. measure one factor, and c. keep all other factors the same. • Recognize the features of a fair test and that scientific investigations also involve a) doing at least three trials, or use replication, and b) observing, measuring, and recording accurately.
9	**The Circulatory System** • Identify from pictures and diagrams the parts of the circulatory system as heart, blood, and blood vessels, and describe how they work.
10	**Reproduction in Plants** • Describe the different ways that plants reproduce, such as pollination, seed production, and plant propagation. • Plan a simple scientific investigation that includes the features of a fair test, replication, and accurate measurement to determine which type of plant propagation, such as cutting, budding,

	layering, grafting, works best for garden plants.
11	**Vertebrates and Invertebrates** • Describe the differences between animals with a backbone (vertebrates) and animals without backbones (invertebrates) by using common local examples of each group.
Suggested Activities	• **Change of State Flowchart Task** – Learners complete and interpret diagrams/flowcharts showing melting, freezing, evaporation, and condensation. • **Heat Energy Cause-and-Effect Investigation** – Learners observe how adding or removing heat changes state and record evidence linking heat energy to the process. • **Physical vs Chemical Change Sorting Lab** – Learners classify examples as reversible physical changes or irreversible chemical changes and justify their answers using observable evidence. • **Mixture Type Identification Activity** – Learners examine everyday mixtures and classify them as uniform (solutions) or non-uniform (suspensions) using a table of observations. • **Air as a Mixture Concept Map** – Learners build a simple concept map showing air components (oxygen, nitrogen, carbon dioxide, water vapor) and their importance. • **Mixture Separation Stations** – Learners rotate through stations demonstrating decantation, sieving, filtering, evaporation, magnets, and hand-picking, then record results. • **Fair Test Planning and Replication Checklist** – Learners design a simple investigation plan using one changed factor, one measured factor, controlled variables, and at least three trials with accurate recording.
Suggested Performance Tasks	• Apply an appropriate separation technique to solve a local or household problem. • Plan and conduct a simple scientific investigation involving a physical change, such as "Does sugar dissolve faster in hot or cold water?" Use your understanding of a fair test to answer the question. • Design and present a "Plant Reproduction Guide" demonstrating pollination, seed production, and propagation using drawings, models, or simple classroom examples.

Second Term	
Content Standard	• Producers, consumers, scavengers, and decomposers have important roles in food webs. • Interactions within an ecosystem can have important impacts on the living things within it. • Simple machines allow people to change the direction and size of forces. • Science processes and concepts help solve everyday problems.
Performance Standard	By the end of the term, learners design an example of a food web showing the role of consumers, producers, scavengers, and decomposers. They identify the technical terms biotic and abiotic as referring to living and non-living things. They investigate and explain how simple machines (inclined planes, wedges, levers, and pulleys) help people do work by changing the magnitude and direction of forces, using fair tests and evidence from guided activities and real-life examples. They also demonstrate understanding of waves by describing how waves carry energy, investigating water waves and their features and behaviors.

Week	Learning Competency
1	**Food Webs** • Describe the roles of producers, consumers, scavengers, and decomposers in a food web.
2	**Processes of Interactions between Living Things** • Use information from secondary sources to describe that living things interact with each other in the natural environment, such as through competition, or predation.
3 to 4	**Biotic and Abiotic Factors in an Ecosystem** • Describe living things, such as animals and plants, as biotic factors and light, water, temperature, and soil type, as abiotic factors of an ecosystem.

	• Explain how interaction between living things and interactions between living and non-living things may bring good or harm to the living things involved.
5 to 7	**Simple Machines** • Observe and describe examples and uses of simple machines found at home, at school, and in the community. • Demonstrate through guided investigation the advantages and limitations of simple machines such as inclined planes, wedges, levers, and pulleys. • Carry out fair tests to show how levers can be used to change the magnitude and direction of a force.
8 to 10	**Properties of Water and Sound Waves** • Identify that waves carry energy from a source to a receiver. • Carry out investigations with water waves in a ripple tank, a big tub of water or improvised ripple tank and observe and describe the features of the waves including their: a. shape, such as crests and troughs b. size, such as width and height c. patterns of movement, such as how they bend, or reflect off walls • Research using secondary sources to identify how the properties of waves are described using scientific terms such as amplitude, frequency, wavelength, and velocity.
Suggested Activities	• **Food Web Role Card Sort** – Learners classify organisms as producers, consumers, scavengers, or decomposers and explain each role in a food web. • **Interaction Scenario Analysis** – Learners read short ecosystem scenarios and identify interactions such as competition and predation, including effects on survival. • **Biotic–Abiotic Factor Mapping** – Learners complete an ecosystem map labeling biotic factors and abiotic factors (light, water, temperature, soil type). • **Good or Harm Interaction T-Chart** – Learners organize examples of living–living and living–nonliving interactions into "helpful" or "harmful" with brief explanations. • **Simple Machines Community Inventory** – Learners identify and document simple machines at home/school/community and describe their uses.

	• **Simple Machine Advantage-Limitation Stations** – Learners rotate through stations (inclined plane, wedge, lever, pulley) and record how each makes work easier and its limitations. • **Ripple Tank Wave Investigation and Wave-Type Comparison** – Learners investigate water waves (crests/troughs, height/width, reflection/bending), then use research to define amplitude/frequency/wavelength/velocity and compare longitudinal vs transverse waves with examples.
Suggested Performance Tasks	• Apply the features of a fair test to investigate how much water is needed to grow a common garden plant from a seed. • Select an appropriate medium to design an example of a food web in a local ecosystem. • Conduct a community simple machine photo survey and create a labeled poster explaining each machine's use, advantage, and limitation. • Build and investigate an improvised ripple tank to observe wave features and behaviors, then produce a concept map comparing transverse and longitudinal waves using key terms (amplitude, frequency, wavelength, velocity). • Develop an information poster that aims at showing learners who are interested in music-related subjects to consider the benefits of studying science. The poster should use words, pictures or drawings and labelled diagrams to explain how musical instruments utilize the properties of sound waves. The poster may suggest ways that learners could use scientific processes to develop their musical techniques. • Design and propose or improve the design of a simple machine that can be used at home, in school, or in the community. Include the following details: 1. Name and purpose of the simple machine 2. Description of how the simple machine works and its intended function 3. Materials needed for constructing the simple machine 4. Sketch or diagram illustrating the design and functionality of the proposed simple machine 5. Explain how the proposed simple machine can be useful in the chosen setting (home, school, or community) and its potential benefits.

	• Utilize the concept of motion and gravity to write a creative story, poem, or any written art.

Third Term	
Content Standard	• Waves transfer energy between source and receiver. • Volcanoes are vents from which molten rock from Earth's crust erupts onto the surface releasing pressure and gases. • The Philippine volcanoes can violently and unpredictably erupt lava, ash, and ballistic projectiles. • Weather and climate have predictable patterns throughout the year, which affect human activities. • The revolution and the rotation of the Earth demonstrate observable patterns. • Constellations are patterns of stars in the sky.
Performance Standard	By the end of the term, learners demonstrate comparing and identifying examples of longitudinal and transverse waves. Learners appreciate that volcanoes can have unexpected and severe impacts on communities and that the uncertainty and impacts of unpredicted eruptions can be offset by understanding and following alerts from authorities. Learners appreciate weather patterns that produce seasons that are largely predictable, and they use models to scientifically understand and describe natural processes and timing that can be relied upon, such as the changes of season. Learners identify that scientific models are valuable in explaining other observations of patterns in nature, such as the apparent movement of celestial objects across the sky. They exhibit respect for cultures and interpretations of natural phenomena by indigenous people over generations and balance that with respect for explaining phenomena using scientific inquiry and objectivity.
Week	**Learning Competency**
1 to 2	**Longitudinal and Transverse Waves** • Demonstrate using simple models how longitudinal waves and transverse waves carry energy. • Describe and explain how sound changes when the source or the receiver are moving.

3 to 8	**Volcanic Activity and Safety** • Explain what volcanoes are and how they are formed. • Use local information or other reliable sources to identify where the nearest active and inactive volcanoes are located and assess the risk of impacts from eruptions to their local community. • Discuss the patterns of volcanic eruptions in the Philippines over the last 100 years with family and community members to assess and describe how predictable patterns of eruptions are. • Identify and describe some of the materials formed during volcanic eruptions in the Philippines. • Interpret PHIVOLCS Volcano Monitoring (Alert Levels) to demonstrate what to do before, during, and after a volcanic eruption.
9	**Seasons in the Philippines** • Describe the different seasons in the Philippines and suggest activities that are appropriate for each season.
10	**Motions of the Earth** • Demonstrate the rotation of the Earth on its axis using a globe to explain day and night. • Make a Sun-Earth-Moon system model to demonstrate and explain the observable effects of predictable patterns and events including: a. changes in seasons b. changes observed in the patterns of visible star over a year c. solar and lunar eclipses
11	**Constellations** • Explain why ancient human cultures relied on constellations to indicate directions and verify seasons. • Gather information from local indigenous community members or from reliable secondary sources to investigate ways that indigenous people of the Philippines represented and communicated understandings of: a. the predictability of solar and lunar eclipses b. patterns /interpretations in the night sky and their use for tracking time

Suggested Activities	• **Wave Model Demonstration** – Learners use a rope/slinky to model transverse and longitudinal waves and explain how energy is transferred. • **Moving Sound Source Simulation** – Learners simulate the Doppler effect (moving buzzer/phone sound) and describe how sound changes when the source or receiver moves. • **Volcano Formation Concept Sketch** – Learners create a labeled diagram explaining what volcanoes are and how they form (magma, vents, eruption). • **Local Volcano Risk Mapping** – Learners use maps and reliable sources to locate nearby active/inactive volcanoes and identify possible community risks. • **Eruption Pattern Timeline Interview** – Learners gather information from family/community and secondary sources to create a 100-year eruption timeline and discuss predictability. • **PHIVOLCS Alert Level Action Plan** – Learners interpret PHIVOLCS alert levels and complete a before–during–after preparedness plan for a volcano eruption. • **Sun–Earth–Moon and Indigenous Sky Knowledge Inquiry** – Learners build a Sun–Earth–Moon model to explain seasons, star patterns, and eclipses, then document Indigenous interpretations of the night sky and eclipse predictability using interviews or reliable sources.
Suggested Performance Tasks	• Design and describe an evacuation plan for a house or school in the event of a nearby and intensifying volcanic eruption. Indicate planned actions to reach a safe place and outline the reasoning behind the planned actions. • Select a constellation that can be seen from the Philippines and describe its features. Explain its practical and cultural significance for Filipino people in the past and present. • Construct a Sun–Earth–Moon system model to show seasons, changing star patterns, and eclipses, and include a brief report explaining how ancient cultures used constellations for direction and seasonal tracking.