SCIENCE

Grade 8

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

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For Learning Competencies

First Term	
Content Standard	• Organ systems work together for the growth and survival of the organism. • Inherited traits passed from parents to offspring are governed by the rules on the patterns of inheritance. • Classification of living things shows life's diversity. • Photosynthesis and respiration are processes that show how living things • obtain energy and nutrients from the environment. • The use of timeline and charts can illustrate scientific knowledge of the structure of the atom has evolved over time. • The current structure of the atom includes subatomic particles, their symbol, mass, charge, and location.
Performance Standard	By the end of the Term, learners demonstrate the use of models, flow charts, and diagrams to illustrate how body systems work together for the growth and survival of an organism. They represent patterns of inheritance and predict simple ratios of offspring. They explain that the classification of living things shows the diversity and unity of living things. They describe the processes of respiration and photosynthesis and plan and record a scientific investigation to verify the raw materials needed. They use flow charts and diagrams to explain cycles in nature. They demonstrate an understanding of the structure of the atom and how our understandings have changed over time. They draw models of the atom and use tables to represent the properties of subatomic particles.
Week	**Learning Competency**
1 to 2	**Organ Systems Working Together**

	• Using a labeled diagram, trace how food travels through the digestive tract and explain how different digestive processes work, including mechanical processing, secretion, digestion, absorption, and elimination. • Use models, flow charts, diagrams, and simulations to explain how body systems work together, such as digestion and excretion. • Describe how plant organs (leaf, stem, roots) work together as the transport system.
3	**Heredity** • Represent patterns of inheritance of a simple dominant/ recessive characteristic through generations of a family. • Predict simple ratios of offspring genotypes and phenotypes in crosses involving dominant/recessive gene pairs.
4 to 5	**Taxonomic Classification** • Describe the importance of the six-kingdom system and the three-domain system of classification of living things. • Explain why humans are classified under Class Mammalia and the Order Primates.
6 to 9	**Use of Timelines and Charts, Photosynthesis, Respiration and Cycles in Nature** • Using flow charts and labeled diagrams explain the role of plants and animals in the cycles of nature, such as the carbon, oxygen, and water cycles. • Describe the process of photosynthesis and respiration, and identify its raw materials needed and products. • Using information from secondary sources identify the different parts of the cell where photosynthesis and respiration occur. • Plan a scientific investigation to verify the raw materials needed for photosynthesis.
10	**Use of Timelines and Charts on the Atomic Model** • Develop a timeline for the historical background of the development of the current Atomic Model that identifies tiny particles as atoms. • Draw the structure of an atom in terms of the nucleus and electron shells.

11	**Subatomic Particles** ● Differentiate the subatomic particles protons, neutrons, and electrons in terms of their symbol, mass, charge, and location within an atom.
Suggested Activities	● Learners trace the movement of food through the digestive tract using a labeled diagram. They must: ○ Label each organ (mouth to anus) ○ Explain mechanical processing, secretion, digestion, absorption, elimination ● Learners create a comparison table of protons, neutrons, and electrons. They must: ○ Include symbol, charge, mass, and location
Suggested Performance Tasks	● Conduct a scientific investigation to verify the raw materials needed for photosynthesis. ● Design an illustrated timeline or create a documentary that describes and discusses the development of the models of atomic structure contributed by Dalton, Thomson, Rutherford, and Bohr.

Second Term	
Content Standard	• Elements and compounds are identified as pure substances. • The periodic table is a useful tool to determine the chemical properties of elements. • The distribution of continents and oceans on Earth is related to the presence of the oceanic crust and continental crust. • Volcanic terrain is built by the slow accumulation of erupted lava. • The earth's surface is made of separate and movable plates.
Performance Standard	By the end of the Term, learners demonstrate their knowledge and understanding of the periodic table by identifying the elements, their symbols, their valence electrons, and their positions within the groups and periods. They design and/or create timelines or documentaries as interesting learning tools. They demonstrate an appreciation of the large-scale features of the 'blue planet' Earth and relate those features to the geological characteristics of the upper crustal layers of the Earth. They identify and describe the nature and impact of volcanic activity in building new crust and identify that these crust forming processes account for patterns and changes in the distribution of volcanoes, earthquakes, and mountain chains that have occurred over time.

Week	Learning Competency
1	**Elements and Compounds** • Describe the properties of pure substances as: a. having fixed chemical composition, examples of which are elements and compounds b. that all the atoms of an element have a unique number of protons
2 to 5	**The Periodic Table** • Discuss the significant contributions of early scientists in the development of the periodic table. • Identify the names and symbols of the first 20 or several common elements of the periodic table. • Explain that the arrangement of elements in the periodic table as 7 periods and 18 groups is based

	on their atomic structure and chemical properties, such as reactivity. • Explain that the electron structure of an atom determines its position on the periodic table. • Calculate the number of protons, neutrons, and electrons in the atom of several elements, such as aluminum. • Explain that the elements within a group in the periodic table have the same number of valence electrons.
6	**Distribution of the Continents** • Identify what proportion of the Earth's surface is covered with water as opposed to land.
7 to 11	**Crustal Features and Interactions** • Gather information from secondary sources to name and describe the upper crustal layers of the solid earth. • Describe the different types of volcanoes found around the world according to their: a. activity b. type of eruption c. location in the crust • Relate the shape of a volcano's cone to its composition. • Relate the location and distribution of active volcanoes, earthquake epicenters, and major mountain belts to the distribution of oceanic crust and continental crust. • Identify how oceanic crust and continental crust is associated with the Earth's lithospheric plates.
Suggested Activities	• Learners create a timeline showing the major scientists who contributed to the periodic table (Dobereiner, Newlands, Mendeleev, Moseley). They must: ○ Summarize each scientist's contribution • Learners practice identifying the names and symbols of the first 20 elements using flash cards or memory puzzles. They must: ○ Match element symbols to names • Learners plot active volcanoes, earthquake epicenters, and mountain ranges on a

	world map to compare their distribution. They must: ○ Explain patterns in relation to oceanic and continental crust
Suggested Performance Tasks	● Create a volcano comparison chart showing: ○ Activity (active, dormant, extinct) ○ Eruption type ○ Crust location ○ Cone shape, magma composition

Third Term	
Content Standard	• Bodies of water and landforms affect typhoons. • The interaction between the Sun, Earth, and Moon causes tides. • Forces cause objects to accelerate. • An object is accelerating if the magnitude and/or direction of its velocity changes. • Kinetic energy is the energy of movement, and potential energy is stored energy. • As an object falls from a height its energy is conserved because its potential energy is transformed to kinetic energy. • The resources of the Philippines provide many benefits to its people and their activities.
Performance Standard	By the end of the Term, learners draw on their understanding of the relationships between landforms and oceans to explain the formation and impacts of typhoons. They also identify that predictable interactions of the Sun-Earth-Moon system result in tidal effects. They demonstrate understanding of the technical meaning of acceleration and apply their understanding to everyday situations involving motion. They represent and interpret acceleration in distance-time and velocity-time graphs to make predictions about the movement of objects. Learners link motion to kinetic energy and potential energy and explain transformations between them using everyday examples. Learners relate understanding of kinetic energy and potential energy to an appreciation of the hydro-electric resources of the Philippines for the generation of electricity for use in homes, communities,
Week	**Learning Competency**
1 to 2	**Typhoons** • Gather information from secondary sources to explain: a. how typhoons develop b. why the Philippines is prone to typhoons

	• Use a map and a record of tracking data to trace the path of typhoons that enter the Philippine Area of Responsibility (PAR). • Discuss how bodies of water and landforms affect typhoons. • Father information from the Department of Science and Technology (DOST) and other reliable websites to identify how authorities support communities affected by typhoons.
3	**Tides** • Relate the relative movements of the Earth, Moon, and Sun with the occurrence of tides. • Draw on information from secondary sources to identify situations where tidal differences could be exploited to generate renewable energy.
4 to 5	**Acceleration and Distance-time and Velocity-time Graphs** • Identify that forces cause objects to accelerate, and that acceleration of an object is its rate of change of velocity. • Observe and describe examples of accelerating objects at school and in the local community, including objects that show uniform circular motion. • Construct and annotate distance-time graphs and velocity-time graphs to represent uniform and non-uniform acceleration.
6 to 7	**Kinetic Energy and Potential Energy** • Describe kinetic energy as the movement of objects or particles, and potential energy as energy stored due to the position of objects or particles. • Identify examples of everyday situations that demonstrate: a. kinetic energy being transformed to potential energy a. potential energy being transformed to kinetic energy
8 to 9	**Work and Energy** • Recognize that work is done when a force causes the displacement of an object. • Recognize that power is the rate of doing work. • Explain that the mechanical energy of an object is the sum of the kinetic energy and the potential energy available to do work.

10	**Renewable Energy** • Describe conservation of energy in everyday situations involving gravity, such as when objects fall. • Gather information from secondary sources to explain how potential energy stored in lakes and dams in the Philippines is used to produce kinetic energy to generate electricity for use in homes, communities, and industry.
11	**Properties of Light** • Carry out guided investigations to describe and illustrate the reflection of light using plane and curved mirrors and the refraction of light using transparent blocks, lenses, and prisms with examples from everyday applications.
Suggested Activities	• Learners use a map and historical tracking data to trace the path of 3 typhoons that entered the PAR. They must: ○ Plot coordinates ○ Label direction and intensity changes • Learners compare two typhoon paths—one passing over water, one over land—and describe how landforms and water bodies affected their strength. They must: ○ Identify weakening/strengthening points • Learners research real-world examples of tidal energy plants and explain how tidal differences are used to generate electricity. They must: ○ Identify locations and mechanisms
Suggested Performance Tasks	• Design and construct a model house to withstand a simulation of wind speed in a typhoon, test the model, and redesign if needed. • Make a working model of a party light that uses batteries as the power source. Describe the scientific ideas that you have utilized to change the properties of light.