SCIENCE

Structuring Competencies in a Definitive Budget of Work

Grade	**EIGHT**
Science Discipline/Component	**Matter**
Grade Level Standard	At the end of Grade 8, learners can describe the factors that affect the motion of an object based on the Laws of Motion. They can differentiate the concept of work as used in science and in layman's language. They know the factors that affect the transfer of energy, such as temperature difference, and the type (solid, liquid, or gas) of the medium. Learners can explain how active faults generate earthquakes and how tropical cyclones originate from warm ocean waters. They recognize other members of the solar system. ***Learners can explain the behaviour of matter in terms of the particles it is made of. They recognize that ingredients in food and medical products are made up of these particles and are absorbed by the body in the form of ions.*** Learners recognize reproduction as a process of cell division resulting in growth of organisms. They have delved deeper into the process of digestion as studied in the lower grades, giving emphasis on proper nutrition for overall wellness. They can participate in activities that protect and conserve economically important species used for food.
Domain	**PROPERTIES AND STRUCTURE OF MATTER.** Using models, learners learn that matter is made up of particles, the smallest of which is the atom. These particles are too small to be seen through a microscope. The properties of materials that they have observed in earlier grades can now be explained by the type of particles involved and the attraction between these particles. **CHANGES THAT MATTER UNDERGO.** Learners learn that particles are always in motion. They can now explain that the changes from solid to liquid, solid to gas, liquid to solid, and liquid to gas, involve changes in the motion of and relative distances between the particles, as well as the attraction between them. They also recognize that the same particles are involved when these changes occur. In effect, no new substances are formed.

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Performance Standard	The learners shall be able to: 1. present how water behaves in its different states within the water cycle;
Content Standard	The learners demonstrate understanding of… 1. the particle nature of matter as basis for explaining properties, physical changes, and structure of substances and mixtures; 2. the identity of a substance according to its atomic structure; 3. the identity of a substance according to its atomic structure; 4. the periodic table of elements as an organizing tool to determine the chemical properties of elements
Performance Task	The learners shall be able to: 1. present how water behaves in its different states within the water cycle 2. Illustrate how the sub-atomic particles are distributed in an atom 3. Show the historical development of the PT in the form of song, poem,

CONTENT	LEARNING COMPETENCIES	CODE	NO. OF DAY/S TAUGHT	REMARKS
1. The Particle Nature of Matter	**1. Explain the properties of solids, liquids, and gases based on the particle**	**S8MT-IIIa-b-8**		
1.1 Elements, Compounds, and Mixtures	1.1 Identify and describe the classification of matter based on its physical state (solids, liquids, and gases)	S8MT-IIIa-b-8.1.1	1	
1.2 Atoms and Molecules	1.2 Differentiate the structure of solids, liquids, and gases based on its:	S8MT-IIIa-b-8.1.2		
	a. Shape and molecular arrangement (through illustration, etc.)	S8MT-IIIa-b-8.1.2.a	1	
	b. Mass and volume	S8MT-IIIa-b-8.1.2.b	1	

	c. Movement of molecules (through role playing, etc.)	S8MT-IIIa-b-8.1.2.c	1	
	d. Boiling Point, Melting Point, Density and Specific Gravity	S8MT-IIIa-b-8.1.2.d	1	
	1.3 Identify and describe the classification of matter based on its composition (element, compound, and mixture)	S8MT-IIIa-b-8.1.3	2	
	2. Explain physical changes in terms of the arrangement and motion of atoms and molecules.	S8MT-IIIc-d-9		
	2.1 Differentiate physical from chemical change	S8MT-IIIc-d-9.1	1	
	2.2 Enumerate and discuss the different physical/phase changes in matter (Evaporation, Condensation, Sublimation, etc.)	S8MT-IIIc-d-9.2	1	
	2.3 Show how phase changes in matter is affected by change in temperature at molecular level (video clips, role-playing, etc.)	S8MT-IIIc-d-9.3	1	
	2.4 Present a how water behaves in different states in a water cycle (through song, poem, illustration, video clips, etc.)	S8MT-IIIc-d-9.4	1	
	2.5 Define chemical change operationally and cite the different evidences of chemical change	S8MT-IIIc-d-9.5	1	

	2.6 Explain how chemical change affects the chemical composition of a material (molecular level)	S8MT-IIIc-d-9.6	1	
	SUMMATIVE TEST		1	
2. Atomic Structure 2.1 Protons 2.2 Neutrons 2.3 Electrons	**3. Determine the number of protons, neutrons, and electrons in a particular atom** 3.1 Differentiate atoms from molecules (through KWL, Venn Diagram, etc.) 3.2 Discuss the historical background of the atom and its sub-atomic particles 3.3 Describe atom and its sub-atomic particles 3.4 Determine the number of electrons, protons, and neutrons in an atom 3.5 Determine the number of electron. proton and neutron in a positive and negative ions 3.6 Illustrate how the sub-atomic particles are distributed in an atom/anion/cation	**S8MT-IIIe-f-10** S8MT-IIIe-f-10.1 S8MT-IIIe-f-10.2 S8MT-IIIe-f-10.3 S8MT-IIIe-f-10.4 S8MT-IIIe-f-10.5 S8MT-IIIe-f-10.6	 1 2 1 1 2 1	
	SUMMATIVE TEST		1	
3. Periodic Table (PT) of Elements	**4. Trace the development of the periodic table from observations based on similarities in properties of elements;**	**S8MT-IIIg-h-11**		

3.1 Development of the PT 3.2 Arrangement of elements 3.3 Reactive and nonreactive metals	4.1 Discuss briefly the historical development of the PT 4.2 Show the historical development of the PT in the form of song, poem, drawing/ illustration, etc. 4.3 Differentiate periods/series from groups/families in the PT and identify each given elements' periods/series or groups/families 4.4 Enumerate and describe the periodic trends/properties of the PT (Metallic property, Nonmetallic property, electronegativity, ionization energy, electron affinity, etc.) 4.5 Plot the following atomic number of elements versus atomic size/ electronegativity/ionization energy/etc. 4.6 Arrange given set of elements in increasing/decreasing order of periodic properties 4.7 Determine which metallic elements will be reactive or nonreactive **5. Use the periodic table to predict the chemical behaviour of an element.**	S8MT-IIIg-h-11.1 S8MT-IIIg-h-11.2 S8MT-IIIg-h-11.3 S8MT-IIIg-h-11.4 S8MT-IIIg-h-11.5 S8MT-IIIg-h-11.6 S8MT-IIIg-h-11.7 **S8MT-IIIi-j-12**	1 2 1 2 2 2 1	

	5.1 Write the electron configuration of elements in a given group and relate it to their classification in the PT (metals, nonmetals. metalloids)	S8MT-IIIi-j-12.1	1	
	5.2 Describe and predict the elements' trend in the PT with respect to its:			
	a. density and melting point;	S8MT-IIIi-j-12.2.a	1	
	b. ability to react with oxygen;	S8MT-IIIi-j-12.2.b	2	
	c. reaction with water;	S8MT-IIIi-j-12.2.c	2	
	d. reaction of metals with nonmetals and vise versa.	S8MT-IIIi-j-12.2.c	2	
	SUMMATIVE TEST		1	
	TOTAL NUMBER OF DAYS		43	
	PERIODICAL TEST		2	
	OVERALL TOTAL NUMBER OF DAYS		45	