LESSON PLAN TEMPLATE

Lesson Title	Chronicles of the Elements: The Evolution of the Periodic Table
Learning Area/s	Science
Name of Teacher/s	DepED Tambayan
Grade Level and Section	Grade 8
No. of Sessions	4 Sessions
References	None specified
Declaration of AI use	This lesson plan was co-created using Gemini AI to assist with unpacking competencies into a 4-session learning design, structuring activities, and assessment formulation.

Intentions.

Meaningful learning experiences are anchored in how we frame them. Start by deciding what you want learners to master by the end of the lesson – keep it clear and simple.

Learning Competency and Curriculum Standards:	**Learning Competency:** ● Discuss the significant contributions of early scientists in the development of the periodic table. **Content Standards:** ● 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 Standards:** 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.			
	Session 1	**Session 2**	**Session 3**	**Session 4**
Learning Objectives:	1. Describe Johann Wolfgang Dobereiner's Law of Triads. 2. Explain John Newlands' Law of Octaves. 3. Identify the limitations of early element classification systems.	1. Discuss Dmitri Mendeleev's contribution to the periodic table. 2. Analyze how Mendeleev predicted the properties of undiscovered elements. 3. Value the importance of scientific foresight and persistence.	1. Explain Henry Moseley's contribution to the modern periodic table. 2. Differentiate between Mendeleev's atomic mass arrangement and Moseley's atomic number arrangement. 3. State the Modern Periodic Law.	1. Construct a chronological timeline of the significant contributions of scientists to the periodic table. 2. Summarize the evolution of the periodic table through a creative presentation. 3. Reflect on the collaborative nature of scientific advancements.
Learner Context:	Learners in this Grade 8 class show high engagement when lessons are linked to daily organizational tasks but struggle with abstract chemical symbols. A significant number of students prefer visual representations and hands-on sorting activities. While they can identify patterns, some encounter language barriers when interpreting complex scientific texts, requiring simplified instructions and bilingual support (English and Filipino) during discussions.	The class exhibits strong curiosity about historical 'mysteries' and enjoys problem-solving games. However, their readiness levels vary regarding the concept of atomic mass. Some learners require more time to process why a scientist would leave 'blank spaces' in a table, as they are accustomed to 'complete' answers.	Learners have a growing interest in technology and modern inventions. They are starting to grasp the internal structure of the atom (protons/electrons) but often confuse 'mass' with 'number'. Visual aids showing the nucleus are highly effective for this group.	This session leverages the learners' strength in collaborative group work and creative expression. Since they enjoy hands-on projects, they are likely to perform well in creating a tangible product. The main barrier is time management during group activities.

Learning Experience. **A learning experience is like a thoughtfully designed journey. Each activity and interaction builds towards meaningful understanding and growth. Identify activities and interactions to help learners gain knowledge, skills, or understanding in a purposeful way.**				
Pre-Lesson:	**Sorting the Sari-Sari Store:** Learners are given a mixed set of images representing items found in a local sari-sari store (canned goods, sachets, snacks). They must group them into three categories based on shared characteristics and explain their reasoning.	**The Missing Puzzle Piece:** Learners are given a puzzle with three pieces missing. They are asked to describe what the missing pieces might look like based on the surrounding patterns and colors.	**Line Up!** Ask 5 learners to line up by height (representing atomic mass). Then, ask them to re-line up by their birth months (representing atomic number). Discuss which order is more 'fixed' and less likely to change.	**Memory Recall:** A quick 'Relay Race' where groups write the names of the four scientists discussed so far on the board in chronological order.
Flow:	**1. Introduction to Classification:** Connect the sari-sari store activity to how scientists needed to organize elements. (Scaffolding) **2. Dobereiner's Triads:** Present images of the 'Triads' (e.g., Li, Na, K). Guide learners to calculate the average atomic mass of the first and third elements to see if it matches the middle one. (Active Retrieval/Check for Understanding) **3. Newlands' Law**	**1. Mendeleev's Solitaire:** Tell the story of Mendeleev using cards for elements. Explain how he arranged them by atomic mass and properties. (Scaffolding) **2. Predicting the Future:** Show Mendeleev's 1869 table with gaps (Eka-aluminum). Present the actual properties discovered later (Gallium) and let learners compare the accuracy. (Check for Understanding/Active Retrieval) **3. Group**	**1. The Anomaly Problem:** Show elements like Argon and Potassium. Show how Mendeleev's mass-based order caused 'property mismatches'. (Scaffolding) **2. Moseley's X-Ray Discovery:** Briefly explain how Moseley used X-rays to count protons (atomic number). Use a diagram of an atom to highlight the nucleus. (Visual Learning) **3. The Modern Law:** Lead a choral reading of the Modern Periodic	**1. Timeline Workshop:** Groups are provided with art materials (recycled cardboard, markers, string). They must create a 'Clothesline Timeline' of the periodic table's history. (Social Learning/Scaffolding) **2. Gallery Walk:** Groups display their timelines. One 'curator' stays to explain while others rotate to learn from other groups. (Social Learning/Check for Understanding) **3. Synthesis**

	of Octaves: Use a musical scale (Do-Re-Mi-Fa-So-La-Ti-Do) as an analogy to show how properties repeated every 8th element. (Social Learning/Contextualization) **4. Analysis:** In pairs, learners discuss why these methods failed as more elements were discovered. (Critical Thinking)	**Discussion:** Why is Mendeleev called the 'Father of the Periodic Table' instead of earlier scientists? (Social Learning)	Law. (Social Learning) **4. Sorting Challenge:** Learners re-order a small set of 'mismatched' element cards based on atomic number instead of mass. (Active Retrieval/Check for Understanding)	**Discussion:** How did each scientist build upon the work of the previous one? (Active Retrieval) **4. Final Reflection:** Individual writing on 'The importance of teamwork in science'.
Learning Resources:	● Images of common household items ● Calculation worksheets for Triads ● Period Table history posters	● Mendeleev's 1869 table replica ● Blank element cards ● Comparison chart (Predicted vs. Discovered)	● Diagrams of Argon and Potassium atomic structures ● X-ray experiment simplified illustrations ● Modern Periodic Law posters	● Recycled materials (cardboard, twine) ● Art supplies ● Rubric for the timeline project
Opportunities for integration:	**Mathematics:** Averaging and numerical patterns. **Music:** Understanding octaves and repeating scales.	**History:** Impact of Russian scientific contributions in the 19th century. **English:** Developing descriptive adjectives for element properties.	**Physics:** Basic introduction to X-rays and energy. **Ethics:** Brief mention of Moseley's life and the impact of war on scientific progress.	**Arts:** Visual design and layout of historical timelines. **Social Studies:** Understanding how global collaboration drives progress.
Assessment. **Assessments reveal what learners have gained and what they still need help with. These are helpful in providing you with information to guide your future instruction throughout the entire session.**				
Formative	**Triad Check:** A	**Prediction**	**Venn Diagram:**	**The Timeline**

Assessment:	short worksheet where learners find the 'missing' atomic mass in a hypothetical triad. **Exit Ticket:** 'Why was Newlands' system compared to music?'	**Activity:** Provide a set of properties for elements A and C in a group; ask learners to predict the properties of element B. Observe group discussions to check for logic.	Learners compare Mendeleev and Moseley's tables. **Quick Poll:** 'Which is the fundamental property used in the modern table?'	**Rubric:** Assessment of the group project based on accuracy, chronology, and presentation quality. **Summary Quiz:** A 10-item matching type quiz covering all scientists and their contributions.
Ways Forward. **Meaningful learning can also happen beyond the classroom – for both the learners and the teacher. Pause and reflect on what happened today.**				
Extended learning opportunities:	Ask learners to interview a local market vendor on how they organize their products and compare it to the scientists' early efforts.	Learners write a 'thank you' letter to Mendeleev explaining why his 'gaps' were actually a great idea for future scientists.	Create a digital 'trading card' for Henry Moseley highlighting his 'superpower' (Atomic Number).	Learners are encouraged to look up 'Glenn Seaborg' and how the periodic table continues to change even today.
Reflections:	Assess if learners were able to perform the mathematical calculations for triads and if the musical analogy helped or confused those without a music background.	Reflect on whether the puzzle analogy effectively communicated the concept of scientific prediction to the lower-readiness group.	Check if learners still confuse atomic mass and atomic number. If confusion persists, plan a remediation session using physical counters for protons.	Reflect on the effectiveness of the gallery walk. Did it allow for peer-to-peer teaching? Were the timelines accurate representations of the weekly competency?