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DepED
DEPARTMENT OF EDUCATION

Learning Activity Sheets for Science

Quarter 2

Lesson

2

Learning Activity Sheet for Science Grade 8
Quarter 2: Lesson 2 of 6 (Week 3)
SY 2025-2026

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LEARNING ACTIVITY SHEET

Learning Area:	Science (Chemistry)	**Quarter:**	2nd Quarter
Lesson No.:	Lesson 2 Subtopic 3	**Date:**	
Lesson Title/ Topic:	Isotopes and Atomic Mass		
Name:		**Grade & Section:**	

I. Activity No.: Activity #1: Understanding Isotopes (20 minutes)
II. Objective(s): *At the end of the activity, the learners are expected to:*
1. Define isotopes and explain their significance in atomic structure

III. Materials Needed: Diagram of isotopes, colored pencils or markers
IV. Instructions:

1. Isotopes are atoms of the same element with different numbers of neutrons, leading to different mass numbers. For example: Carbon-12, Carbon-13, and Carbon-14 are isotopes of carbon.

2. Draw the isotopes of Strontium and label the number of protons, neutrons, and electrons for each isotope.

3. Guide Questions
   - What is the difference between these isotopes?

   - Why do isotopes have different mass numbers but the same chemical properties?

LEARNING ACTIVITY SHEET

Learning Area:	Science (Chemistry)	**Quarter:**	2nd Quarter
Lesson No.:	Lesson 2 Subtopic 4	**Date:**	
Lesson Title/ Topic:	Isotopes and Atomic Mass		
Name:		**Grade & Section:**	

I. Activity No.: Activity #2: Calculating Atomic Mass (25 minutes)
II. Objective(s): *At the end of the activity, the learners are expected to:*

1. calculate the atomic mass using the relative abundance of isotopes

III. Materials Needed: calculator, worksheet (provided below)
IV. Instructions: Answer the following questions:

1. Cesium is a soft, silvery-gold metal with two common isotopes, ^{133}Cs and ^{135}Cs. If the abundance of ^{133}Cs is 69.5% and the abundance of ^{135}Cs is 30.5%, what is the average atomic mass of cesium?

2. Thorium is used in some nuclear reactors and is a rare element on earth. Thorium has three common isotopes. If the abundance of ^{230}Th is 0.02%, the abundance of ^{231}Th is 0.98%, and the abundance of ^{232}Th is 99.0%, what is the average atomic mass of thorium?

3. Zirconium has five common isotopes: ^{90}Zr (51.4%), ^{91}Zr (11.2%), ^{92}Zr (17.2%), ^{94}Zr (17.4%), ^{96}Zr (2.8%). What is the average atomic mass of zirconium?

4. Why is the mass in amu of a neon-20 atom reported as 20.180 in the periodic table of the elements?

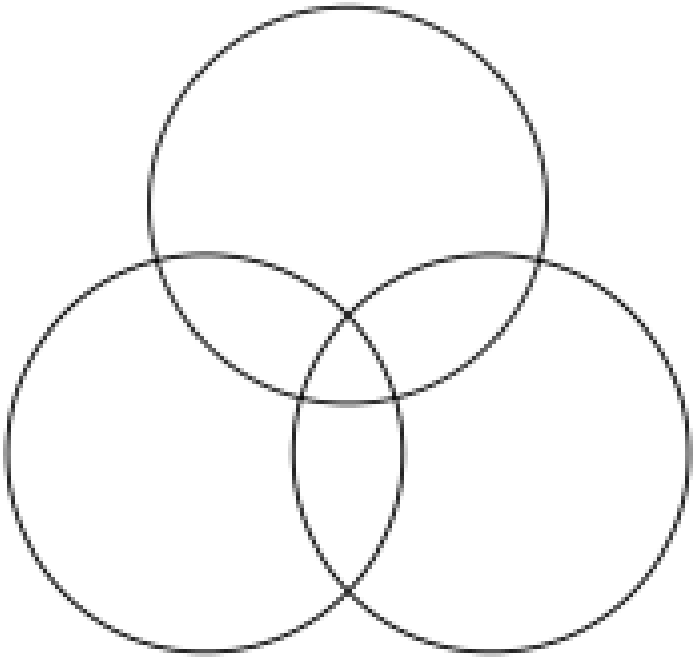
Guide Questions:
1. Why is it important to know the relative abundance of each isotope when calculating the average atomic mass?

2. What might be the implications of having one isotope with a significantly higher abundance compared to the others?

LEARNING ACTIVITY SHEET

Learning Area:	Science (Chemistry)	**Quarter:**	2nd Quarter
Lesson No.:	Lesson 2 Subtopic 3 & 4	**Date:**	
Lesson Title/ Topic:	Isotopes and Atomic Mass		
Name:		**Grade & Section:**	

I. Activity No.: Activity #3: Isotope Comparison and their real-world applications (30 minutes)
II. Objective(s): *At the end of the activity, the learners are expected to compare isotopes of an element in terms of the number of neutrons and mass number and discuss how isotopes influence the average atomic mass of an element and their applications.*
III. Materials Needed: Venn Diagram template, reference materials or internet access
IV. Instructions: Isotopes of the same element have the same number of protons but different numbers of neutrons. Use a Venn diagram to compare isotopes of nitrogen: Nitrogen-14 (N-14), Nitrogen-15 (N-15), and Nitrogen-16 (N-16). Label the subatomic particles and tell where each isotope is used.



4. Research Assignment
   - Choose a real-world application of isotopes (e.g., carbon dating, medical imaging, nuclear energy).
   - Research and summarize below the application, including the isotope used, its properties, and its significance.

LEARNING ACTIVITY SHEET

Learning Area:	Science (Chemistry)	**Quarter:**	2nd Quarter
Lesson No.:	Lesson 2 Subtopic 3 & 4	**Date:**	
Lesson Title/ Topic:	Isotopes and Atomic Mass		
Name:		**Grade & Section:**	

I. Activity No.: Activity #4: Investigatory Case Study – Isotopes in Environmental Science (40 minutes)
II. Objective(s): *At the end of the activity, the learners are expected to analyze a case study involving isotopes in environmental science.*
III. Materials Needed: case study worksheet (provided below), internet access for research
IV. Instructions:

1. Read the provided case study about using oxygen isotopes (O-16, O-17, O-18) in climate science to track historical climate changes.
2. Analyze the Case Study: Identify the isotopes involved and their specific roles in the study. Then, discuss the methods used to measure isotope ratios and their significance in interpreting climate data.
3. *Case Study Worksheet*
   - List the isotopes of oxygen discussed in the case study and their mass numbers.
   - Explain the significance of each isotope in climate science.
   - Describe the methods for measuring isotope ratios in ice cores or sediment samples.
   - Discuss how these measurements help scientists reconstruct past climate conditions.
4. Analysis
   - What conclusions can be drawn about historical climate changes based on the isotope data presented?
   - How can this information be used to predict future climate trends?
5. Discussion
   - Discuss the potential limitations and challenges of using isotopes in climate science.
   - Reflect on the broader implications of this research for understanding climate change.
6. Guide Questions:
   - Why are oxygen isotopes useful in climate science?
   - What methods are commonly used to measure isotope ratios, and what challenges do scientists face in this research?