LEARNING AS ONE NATION

Expanded Project

GC1 Q1_14

SHS LEARNING ACTIVITY

Name: _____ **Score/Mark:** _____

Grade and Section: _____ **Date:** _____

Strand: ☑ STEM ☐ ABM ☐ HUMSS ☐ ICT (*TVL Track*)

Subject: *General Chemistry 1*

Type of Activity: ☑ Concept Notes ☐ Skills: Exercise/Drill ☐ Illustration ☐ Performance Task ☐ Essay/Report ☐ Others: _____

Activity Title: **B-02. Significant Figures in Calculations**

Learning Target: To determine the number of significant figures after performing a specific mathematical operation

To round off numbers according to specifications

References: *(Author, Title, Pages)*

Brown et al., Chemistry 12th edition, pp. 23-24.

J.A. Sadudaquil, M.D.A.D. Cadeliña, CVIF-DLP Learning Activities

When performing calculations, there are rules to follow for handling significant figures (SF). In this activity, we will only focus on the four fundamental mathematical operations.

1. **Addition and subtraction**. The answer should contain the least number of digits after the decimal point contained by a number in the operation.

   Example:
   ```
      3.4211  ←  four digits after the decimal point
    - 2.10    ←  two digits after the decimal point
      1.32    ←  two digits after the decimal point
   ```

2. **Multiplication and division**. The answer should have the least number of significant figures contained by a number in the operation.

   Example:
   ```
      9.000  ←  four significant figures
    ÷   1.7  ←  two significant figures
      5.3    ←  two significant figures
   ```

In performing mathematical operations, we must round off numbers properly. We should determine first how many digits need to be retained. Then, we look at the leftmost digit to be dropped:

- If the digit to be dropped is less than 5, the number preceding it should remain the same. In the first example, we round off 1.3211 to 1.32 if asked to round off to hundredths (two decimal places).
- If the digit to be dropped is greater than 5, the number preceding it is increased by 1. For example, if we wish to retain two SF, the number 5.2941 is rounded off to 5.3 which has two SF.
- If the digit to be dropped is 5 with no digits or only zeros following, an even number preceding it is retained, while an odd number is increased by 1. For example, if we wish to retain three SF, 5.84500 will be rounded off to 5.84 and 9.15500 to 9.16.

Exercise: Carry out the indicated operation for each item below. Remember to only round off the final answer and not the answer in-between operations. Show your step-by-step solutions.

a) $$\frac{3.47 \times 10^{-6}\ \mathrm{m}^2 + 8.4 \times 10^{-7}\ \mathrm{m}^2}{3.0 \times 10^{5}\ \mathrm{m}}$$

b) $$(7.25 \times 10^{2}\ \mathrm{N}) \times (2.0 \times 10^{-5}\ \mathrm{m})$$