

SAMPLE LESSON PLAN ON CRITICAL THINKING SKILLS

Name of the teacher _____ Date _____

Name of the School _____ Duration of the period :2x40' Subject: Chemistry Topic of the lesson : quantitative aspect of substances
Sub-topic : Atomic mass and the mole concept . Grade : 8

Objectives : By the end of the lesson, the pupils will be able to:

- Reason qualitatively and proportionally the relationship between number of moles, mass and molar mass
- Calculate mass, molar mass and number of moles according to the relationship $n = \frac{m}{M}$
- demonstrate their understanding of molar mass by the ability to convert moles of substances to grams and vice versa.

teaching /learning activities	Teaching - learning materials	Evaluation / Exercise
<p>PRK</p> <p>Atomic mass and relative atomic mass.</p> <ul style="list-style-type: none"> • The mole concept. • Avogadro's number. <p>INTRODUCTION(15 minutes)</p> <p>a. Asking the following questions from the previous lesson</p> <ul style="list-style-type: none"> • Can we use balances to weigh atoms, molecules or ions? Why? • How can we express the quantity of substances? • Why chemists do choose to work in moles? • What are the uses of symbols and formulas in determining moles of substances ? Give examples. • What is the difference between mass of an atom and atomic mass ? <p>The students will try to answer these questions in groups of 5 and the teacher will give corrective feedbacks after the students have presented their answers to the class.</p> <p>TEACHER'S PRESENTATION.(10 minutes)</p> <p>Explains to the students that today's lesson is going to focus on quantitative relationship of moles, molar mass and mass of substances</p> <p>Explains objectives of the lesson.</p> <p>Teacher explains that the amount of substance is not equal to the mass of the substance, although these quantities are proportional.</p> <ul style="list-style-type: none"> • The relation between mole, mass and molar mass is given by the following formula: $n = \frac{m}{M}$	<p>Balance, spoon, salt(NaCl), sulphur, distilled water, sugar, graduated cylinder , calculator</p> <p>Worksheet,</p>	<p>Home work</p> <p>1. oxygen molecules can exist as O₂ and O₃</p> <p>a. is the mass of one mole of each molecules the same? Why?</p> <p>b. is the number of molecules in one mole of each of these molecules the same? Why?</p> <p>c. Is the number of atoms of oxygen in one mole of each molecule the same? Why?</p> <p>2. giving an exercise from the text book</p>

n is the number of moles: SI unit is mole
m is the give/unknown mass: SI unit is gram
M= the molar mass

- The relation between mole, number of particles and Avogadro's number, is given by the formula:

$$n = \frac{\text{number of particles}}{N_A}$$

$N_A = 6,02 \times 10^{23}$ particles.

The teacher will show some examples in explaining the concepts.

ACTIVITIES (40 minutes)

- put pupils in groups of 5 and distributing work sheets and TLMs through group leaders .
- students will create tables and analyze their data to demonstrate their understanding
- The teacher will circulate classroom looking for signs of their understanding and assists pupils to determine moles, molar mass and mass of the given substances
- pupils will write reflections and reflect their findings to the rest of the class and explain their methods
- the teacher will give corrective feedbacks on students reflection and will correcte misconceptions

CONCLUSION (15 minutes)

The teacher will give chances for the students to ask questions

The teacher will summarize the important aspects of the lesson, reinforcing what needs to be remembered and give individual exercises as a home work

Students' work sheet

Activity 1

Procedure

- Take a spoon of salt (NaCl), sulfur powder and sugar separately
- Measure the masses of each substance and create a table to record your data
- Determine the number of moles and the number of particles of each substance.
- Analyze your data

Name of the substance	Molar mass	Measured mass
NaCl		
S (sulfur)		
Sugar(sucrose)		

show your steps for your calculations

Activity 2

1. take 50 ml of distilled water

- a. Calculate the number of moles the water
- b. Determine the number of molecules of the water sample and write your conclusion

Activity 3.

- a. Suppose you drunk 500 gms of water after your launch at your home yesterday, how many moles and molecules of water did you drink at that time?
- b. A pure solid consists of NaCl, Na_2CO_3 , or CuCO_3 . 1.06 g of the solid contains 0.01 mol of a compound. What is the chemical identity of the solid?

Reflection notes