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DepED
DEPARTMENT OF EDUCATION

Science Activity
Quarter 2 – MELC 5
Week 5

THE CARBON COMPOUNDS

REGION VI – WESTERN VISAYAS

Science 9Activity Sheet No. 5, **The Carbon Compounds**
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Introductory Message

Welcome to Science Grade 9!

The **Learning Activity Sheet** is a product of the collaborative efforts of the Schools Division of Escalante City and DepEd Regional Office VI - Western Visayas through the Curriculum and Learning Management Division (CLMD). This is developed to guide the learning facilitators (teachers, parents and responsible adults) in helping the learners meet the standards set by the K to 12 Basic Education Curriculum.

The **Learning Activity Sheet** is self-directed instructional materials aimed to guide the learners in accomplishing activities at their own pace and time using the contextualized resources in the community. This will also assist the learners in acquiring the lifelong learning skills, knowledge and attitudes for productivity and employment.

For learning facilitator:

The **Science Activity Sheet** will help you facilitate the leaching-learning activities specified in each Most Essential Learning Competency (MELC) with minimal or no face-to-face encounter between you and learner. This will be made available to the learners with the references/links to ease the independent learning.

For the learner:

The **Science Activity Sheet** is developed to help you continue learning even if you are not in school. This learning material provides you with meaningful and engaging activities for independent learning. Being an active learner, carefully read and understand the instructions then perform the activities and answer the assessments. This will be returned to your facilitator on the agreed schedule.

Name of Learner: _____
Grade and Section: _____ Date:_____

SCIENCE 9 ACTIVITY SHEET No. 5
The Carbon Compounds

I. Learning Competency with Code

Explain how the structure of the carbon atom affects the type of bonds it forms **(S9MT-IIg-17)**

II. Background Information for Learners

A home is where the most convenient place you always go back no matter where you go. Somehow it is a place where love and understanding prevails with your love ones and the relationship you ponder as you celebrate life to the fullest.

The same scenario is link with the elements around you. You need them to complete your needs for survival. They exist everywhere and you embrace its abundance by nature. Carbon is a very common element of matter and many of the products you utilize need carbon atoms.

It can combine with itself and with many other elements to form a great diversity of compounds. It belongs to non-metal consisting of four valence electrons. Meaning, carbon needs four more electrons to fill its outer energy level. Organic compounds contain carbon which is utilized according to uses, structures and the type of bonds it forms. The bonds maybe single, double or triple.

Try to explore the structures and bond types of the common organic compounds.

III. Accompanying DepEd Textbook and Educational Sites

Department of Education. (2014). K to 12 Basic Education Curriculum.
Science 9 Learner's Material p.135. Pasig City, Philippines.

IV. Activity Proper

Activity 1.

Directions: Read pp. 135-136 Science 9 Learner's Material and do the following:

1. Study the table and answer the guide questions number 7 – 12 on page 136. Write your answer on a separate sheet of paper.

a. Activity 3 – Table 1 – Alkanes
Table 2 – Alkenes
Table 3 - Alkynes

V. Reflection

How would you relate the type of bonds as to the relationship you have with your friends/ classmates?

_____
_____
_____

VI. Answer Key

Q7. What are the types of bonds present in the following: alkanes, alkenes and alkynes?

Answer: The types of bonds present in alkanes is single bond, while alkenes is double bond and on alkynes is triple bond.

Q8. Using Tables 1 to 3, what pattern do you observe in terms of the phase, number of carbon atoms, structure and boiling points of the alkanes, alkenes and alkynes? Explain the patterns you observed.

Answer: The physical state of the alkanes from methane to butane is gas, and from pentane to octane it is liquid. The reason for this is related to the structure of the compounds. If the molecule of the compound is small, it interacts less with each other. Just like methane, it is likely to be a gaseous compound. When the molecules become bigger in size or structure, they can closely interact with each other and they will more likely to be liquid like in the case of octane. Octane molecule has a long chain structure that makes it too heavy to be a gaseous compound. The trend in the phase of the compounds is also similar to the alkenes and alkynes. The phase of the alkenes and alkynes is a gas when the molecules are small and become liquid as the molecules become bigger.

The trend in the structures of the compounds in alkanes, alkenes, and alkynes are the same. The size of the structures of the compounds is increasing because the compounds become bigger or longer.

Q9. What do you think will be the boiling point of the next alkane, alkene, and alkyne? Write the boiling point of each hydrocarbon be higher or lower? Explain your answer.

Answer: The trend in the boiling point of the compounds in alkanes, alkenes, and alkynes is also in an increasing pattern. This is because of their structures. As the structures of the compounds become bigger, they also interact more with each other. Bigger molecules that interact with each other more strongly require higher temperature to evaporate. That is why they have a higher boiling point.

Q10.Why do you think some hydrocarbons are gases and others are liquids?

Answer: There are gases and liquid hydrocarbons because of the structure or the size of the molecules of the compounds. When the molecules are small, they tend to interact less among each other. Smaller molecules are usually gases. And when molecules have bigger structures, they interact more with each other. Thus, bigger molecules then tend to settle in liquid state.

Q5. The reason for so many hydrocarbon compounds is the carbon atom. Carbon

Q11. Why do you think there are many hydrocarbon compounds?

Answer: There are many hydrocarbon compounds because Carbon atoms have four valence electrons. This atomic structure of the carbon makes it possible to form different types of bonds with other elements and compounds of carbon atoms. The formation of these bonds results in many different hydrocarbons.

Q12. What hydrocarbon compounds are gases and liquids? What are the uses of gaseous hydrocarbon compounds and liquid hydrocarbon compounds?

Answer: Common examples of gaseous hydrocarbon compounds are methane, butane, propene, and ethyne (acetylene). Methane and butane gas are most common gaseous hydrocarbons used as fuel for cigarette lighters and LPG. It is also used as fuel for vehicles and also mixed with other fuel. Ethyne gas or commonly known as acetylene is used commonly in flame torch that is used in welding of iron, and it is also used for hastening the ripening of fruits.

While the common examples of liquid hydrocarbons are pentene, hexene and pentyne. The most important use of liquid hydrocarbons is for fuel. It also used to make plastics and synthetic fabric such as polyesters.

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