TITLE OF LESSON

Physical Science Unit1 Lesson 30 – Organic & Biochemical Compounds

Nature of Matter: How do tribes gain understanding of compounds and molecules?

TIME ESTIMATE FOR THIS LESSON

One class period

ALIGNMENT WITH STANDARDS

California – Sciences: Chem, Chemical Bonds 2; Investigation and Experimentation 1a

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MATERIALS

Kirinyaga, Chapter 7 pp. 214-228 – Reading (not provided by ESubjects)
Simple Organic – Student Page
Simple Organic Key – Teacher Page
Editing Skills List – Teacher Page
Lab Report Grading Procedure – Teacher Page (one overhead copy and/or copies for each student)
Lab Report Rubric – Teacher Page (one overhead copy)

LESSON OBJECTIVES

- To introduce students to the rules of naming organic compounds
- To introduce students to the functional groups of organic compounds
- To introduce students to the structures of carbohydrates, proteins, and fats
- To have students practice naming
- To edit a lab report

FOCUS AND MOTIVATE STUDENTS

1) Homework Check – Collect **Naming** homework. Remind students you will be collecting their binders at the end of the period for a formal letter grade.
2) Agenda – Have students copy the agenda you posted.
3) Peer Edit – Have students take out the second draft of Lab Report 5. If they have not finished, they should spend this time finishing their second draft and they will simply have to get someone to edit for them outside of class. Have students exchange reports with someone in their group (or assign partners). Post the **Editing Skills List** on the overhead with all of the steps covered. Remind students that editing is the most tedious process of all because they have to pay attention to the smallest details. However, it is the attention to detail that most teachers and employers value highly. So today they are going to practice. Tell students they will be scored on how thoroughly they edit their partner's report. Then walk students through the process step by step just like you did for the peer revision. Spend no more than 20 minutes on peer revision.
4) Grades – Post the **Lab Report Grading Procedure**. Review the grading process for lab reports. Explain to students that this is how they will be graded on their effort for the drafting process. The **Lab Report Rubric** (post that next) is how they will be graded on the quality of the final draft.

ACTIVITIES – INDIVIDUAL AND GROUP

1. Mini Lecture – Remind students to take careful notes in class today. Tell them to title their notes Organic & Biochemical Compounds. Ask what the difference is between something inorganic and organic.

   Possible responses: *Organically grown fruits and vegetables were grown without chemical fertilizers and pesticides.Living organisms are organic. Rocks are inorganic.*

   Ask students if they know what an organic compound is.

2. Mini Lecture – Write on the board: Organic compounds are molecular compounds that contain carbon and hydrogen and sometimes oxygen, nitrogen, phosphorus, and/or sulfur.
Explain that yesterday you learned how to name inorganic compounds. Ask if organic compounds are named the same way. (*Naming is different for organic compounds.*) Can anyone think of an example of an organic compound? (*methane, ethanol, formaldehyde, acetone.*)

3. Mini Lecture: Naming Organic Compounds – Divide the board into three columns. Title the table Naming Simple Organic Compounds. Use the headings ALKANE, ALKENE, ALKYNE. Introduce the students to the rules for writing the formula or word for each. Illustrate each rule with the examples listed.

ALKANE	**ALKENE**	**ALKYNE**
A compound containing only carbon and hydrogen atoms containing only single bonds **From formula to words:** 1. Determine the prefix by the number of carbons. 2. prefix + ane *ex:* CH_4 1=meth methane C_2H_6 2=eth ethane **From words to formula:** 1. Determine the number of carbons from prefix. 2. Determine the number of hydrogens by using the formula $C_nH_{2n+2.}$ *ex*: propane pro=3 (2*3 + 2 = 8) C_3H_8 butane but=4 (2*4+2 = 10) C_4H_{10}	A compound containing only carbon and hydrogen atoms containing at least one double bond **From formula to words:** 1. Determine the prefix by the number of carbons. 2. Determine the location of the double bond by counting from the closest end (this the #). 3. #- + prefix + ene *ex:* C_2H_4 2=eth ethene $CH_2CHCH_2CH_3$ 4=but #=1 1-butene $CH_3CHCHCH_3$ 4=but #=2 2-butene **From words to formula** 1. Determine the number of carbons from prefix. 2. Determine the location of double bond from the #. 3. Determine the number of hydrogens by using the formula $C_nH_{2n.}$ *ex:* propene pro=3 (2*3 = 6) C_3H_6 2-pentane pent=5 (2*5 = 10) C_5H_{10} $CH_3CHCHCH_2CH_3$	A compound containing only carbon and hydrogen atoms containing at least one triple bond **From formula to words:** 1. Determine the prefix by the number of carbons. 2. Determine the location of the double bond by counting from the closest end (this the #). 3. #- + prefix + yne *ex:* C_2H_e 2=eth ethyne $CHCCH_2CH_3$ 4=but #=1 1-butyne CH_3CCCH_3 4=but #=2 2-butyne **From words to formula** 1. Determine the number of carbons from prefix. 2. Determine the location of double bond from the #. 3. Determine the number of hydrogens by using the formula $C_nH_{2n-2.}$ *ex:* propyne pro=3 (2*3 - 2 = 4) C_3H_4 2-pentane pent=5 (2*5 - 2 = 8 C_5H_8 $CH_3CCCH_2CH_3$

3. Simple Organic – Have students break into groups, assign roles (see *Group Roles* below), and work on the Student Page, **Simple Organic**. Give them 15 minutes to work on it. Tell them that the group with the most correct answers will get extra points. Remind them to follow the rules for naming alkanes, alkenes and alkynes you put on the board. Call time. Have a member of the group write the group's answers on the board (preferably not where you have written the naming rules). Make corrections if necessary, field any questions and clarify any points of confusion. The group with the greatest number of answers correct receives 2 extra points.

4. Flash Cards – Have students, individually or in groups, make flash cards for the following: alkane – from formula to words; alkane – from words to formula; alkene – from formula to words; alkene – from words to formula; alkyne - from formula to words; alkyne – from words to formula. Again, students may make more than six cards and divide up some of the information if they feel that will help them understand the topic better.

5. Flash Cards – Give the students 5 minutes to study the flash cards they just created and those they made yesterday. While they are studying their flash cards, note in your grade book those who have completed the assignment. Then have them pair up. Assign each partner a letter (partner A and B). Tell them that first all the A's will be flashing the B's. The

correct answers will be put in one pile and the incorrect in another. Since students may find this topic more challenging than others, tell students they can create a third pile for partial credit, ie the students answered more than half correctly. Tell them they have 5 minutes. Go. At the end of five minutes call time. Record the number of correct answers in the grade book when finished. Then have the B's flash the A's. Give them five minutes. At the end of five minutes, call time and record the number of correct answers for each student. The goal is to increase the number correct each time they flash. Remind students that flash cards are a great studying strategy that many college students have to use in order to remember all of the information they are expected to learn.

6. Individual Work - If time permits, allow students to continue working on **Simple Organic**.

7. Homework Review – Tell students to read *Kirinyaga*, Chapter 7 pp. 214-228 beginning with "Our daily business is always conducted in late afternoon when the heat of the day has passed, at the *boma* of Koinnage, the paramount chief" and ending with the end of the chapter. Have students write Dialectical Journal 17 with three entries. Collect binders to grade tonight.

HOMEWORK

1) Finish **Simple Organic**.handout.
2) Write final draft of Lab Report 5 with no errors. Due tomorrow. They must include their first draft with revisions, the second draft with edits, and an error free final version to get complete credit.
3) Read *Kirinyaga pp. 214-228.*
4) Write Dialectical Journal 17 with three entries,
5) Remind students that their Kirinyaga Journals #7 is due at the beginning of the next class.

GROUP ROLES

Recorder – All students will be records today and record agreed upon answers.
Facilitator – You will be to keep your group focused and ensure that they complete the work.
Manager – You will be in charge of getting all materials for the group and reporting back to class.

DOCUMENTATION FOR PORTFOLIO

Lab Report 2
Test 1: Matter
Lab Report 3
Class Periodic Table
Lab Report 4
Test 2: Atoms and Periodicity
Lab Report 5