Lesson 2-2: Organic Compounds: Naming & Drawing	
Curriculum Expectations	• B2.2 • B2.3 • B3.5
Learning Goals	**Learning Goals:** By the end of this lesson you will: • Know the different classes of organic compounds and their structural characteristics • Describe organic compounds using molecular formulas, structural formulas and line-angle formulas • Be able to name organic compounds according to IUPAC convention by interpreting their structural formula • Be able to draw organic compounds based on their IUPAC names
Success Criteria	I know I have achieved the learning goals when I can name and draw molecules from the different classes of organic compounds.
Teacher Prep	• Printouts for Alkanes handout • Prepare list of organic compounds for Name & Draw That Isomer Game

Minds On

Goal: This activity will help students understand the importance of uniform naming conventions and will help them identify how names can be used to tell us information about an object/person, etc.

1. <u>What's in a Name Game</u>

Instructions:

1. Have the students write their full names out on a piece of paper.
2. Each student will write a brief statement about what each of the parts of their names mean such as do their names have literal meanings, are they named after a family member, do their names describe something about their families such as profession, standing etc.
3. Each student will present the information about their names to the class.

4. The teacher should try to generate a discussion among students with the goal of helping them understand that a name carries more information in it than just what to call someone.

Action

****Refer to the Differentiation Resources link for additional practice worksheets, and to enrich your classroom teaching using different tools throughout the lesson. ****

1. **Student Notes:** Have students create a set of notes for this lesson, with step-by-step instructions for naming and drawing rules for each class of organic compound. Students should create a table that identifies the suffixes of the different organic compounds and by the end of the lesson should be able to identify the classes by sight (structure) as well as by name.

2. **2-2A: Naming Alkanes Worksheet**
    - Have students complete the handout as they work their way through the lesson *or* you can assign the handout as homework to completed after class and taken up in the next session.

3. **2-2A: Naming Alkanes Powerpoint Presentation**
    - Use the powerpoint as a guide and give a step by step lecture on how to name alkanes.
    - Begin with the simple alkanes table and stop after Section A.

4. **2-2A.1: Naming Mnemonic Forum**
    - Either individually, or in groups of 2-3, have students create their own mnemonic to help them memorize the names of the first 10 alkanes.
    - Have each group present their mnemonic to the whole class
    - One member of each group must post their mnemonic in the forum (2-2A.1) and identify the other members of the group.

5. **2-2A: Naming Simple Alkanes**
    - Use the powerpoint as a guide to give a lecture on naming branched alkanes and have students read sections B and C.
    - Ask if there are any questions or confusion.
    - Emphasize that this section is extremely important to be comfortable with as these techniques will apply for the more complex naming and drawing activities.
    - Play the video in section C for the whole class.

- Go through step-by-step with the students demonstrating how to name **4-ethyl-2,3-dimethylheptane**
- Make sure students are comfortable naming complex, branched alkanes before moving forward.
- Have students answer questions 2-1B-1 on their own.
- Take up the answers as a class.

6. 2-2A: Drawing Simple Alkanes

- Use the powerpoint as a guide to give a lecture on naming drawing alkanes based on IUPAC convention.
- Following that, watch the video "Name to structure" as a group.
- Ask if there are any questions or confusion.
- As a class, go step-by-step through drawing **2,3-dimethylhexane.**
- Emphasize that this section is extremely important to be comfortable with as these techniques will apply for the more complex naming and drawing activities.
- Make sure students are comfortable drawing complex, branched alkanes before moving forward.
- Have students answer questions 2-1B-3 on their own.
- Take up the answers as a class.

7. 2-2A: Naming Cyclic Alkanes

- Use the powerpoint as a guide to give a lecture on naming and drawing cyclic alkanes.
- Have students read through section E
- Make sure students are comfortable naming and drawing cyclic alkanes before moving on.

8. 2-2B: Alkenes & Alkynes

- Discuss the introduction with the class, emphasizing the differences between alkanes, alkenes and alkynes.
- Watch the video "Naming Unstaturated Hydrocarbons"
- Pause throughout the video to make sure everyone understands.
- Have students write out the step-by-step instructions to keep for their notes.
- As a class, go step by step to name the organic compound pictured under the video.
- Emphasize the importance of identifying the correct end of the chain to label as Carbon #1.
- Ask if there are any questions.
- Have students answer 2-1C-1 on their own.
- Take up the answers as a class.

9. 2-2B: Cyclic Alkynes & Alkenes

- Using the image in the lesson, discuss the technique for naming cyclic alkenes and alkynes.
- Emphasize the importance of identifying the correct end of the chain to label as Carbon #1.
- Ask if there are any questions.
- Have students answer 2-1C-2 on their own.
- Take up the answers as a class.

10. 2-2B: Drawing Alkynes & Alkenes

- Watch the video "Drawing Alkenes & Alkynes" as a group.
- Pause throughout the video to make sure everyone understands.
- Have students write out the step-by-step instructions to keep for their notes.
- As a class, go step by step to name the organic compound pictured under the video.
- Emphasize the importance of identifying the correct end of the chain to label as Carbon #1.
- Ask if there are any questions.
- Have students answer 2-1C-3 on their own.
- Take up the answers as a class.

11. 2-2C: Naming Alcohols

- Discuss the introduction with the class, emphasizing that the suffix –ol identifies an alcohol.
- Watch the video "Naming Alcohols"
- Pause throughout the video to make sure everyone understands.
- Have students write out the step-by-step instructions to keep for their notes.
- As a class, go step by step to name the alcohol pictured under the video.
- Emphasize the importance of identifying the correct end of the chain to label as Carbon #1.
- Ask if there are any questions.
- Have students answer the check your understanding question.
- Take up the answers as a class.

12. 2-2C: Drawing Alcohols

- Watch the video "Drawing Alcohols" as a group.
- Pause throughout the video to make sure everyone understands.
- Have students write out the step-by-step instructions to keep for their notes.
- As a class, go step by step to name the organic compound pictured under the video.
- Emphasize the importance of identifying the correct end of the chain to label as Carbon #1.
- Ask if there are any questions.

- Have students answer the check your understanding question on their own.
- Take up the answers as a class.

****Follow these same instructions for the rest of the learning activities in this lesson. Emphasize the different suffixes identify different classes of compounds.****

13. Name/Draw That Isomer Game (Group Activity)

In this group activity students will be able to practice their knowledge and skills related to isomers, naming and drawing organic compounds. You will have to create a list of general formulae of organic compounds from which the students will draw their isomers. You may need to briefly review isomers and the difference between structural and stereo isomers.

1. Split the class into 2 groups or into groups of 2-4 students.
2. The goal for each team is to name and draw as many isomers of organic compounds in a given amount of time when given a general formula.
3. Write the general formula of an organic compound on the board (e.g. C_6H_{12} , $C_{10}H_{18}OH$, etc).
4. Give each group 3 minutes to accurately draw and name as many isomers with the same general formula.
5. After the time is up each group will present their structures and names. 1 point per correct name and drawing is given.
6. The team with the most points after a round wins that round.

Consolidation

1. **2-2G, 2-2H –** Naming and drawing Organic Structures Practice. Have students complete these in class or at home. Take up the answers as a class, identify any areas of weakness or misconceptions and review any content as necessary.

2. **2-2I–** Organic Molecules Quizzes – these activities will test the students understanding of naming and drawing organic compounds. Have students complete these individually or in groups and take up answers as a class when completed.

3. **2-2J: Organic Molecules Game:**

- This activity can be done individually or together as a class. It is another resource that allows students to practice their understanding of naming and drawing organic compounds.

4. **2-2K: Naming & Drawing Organic Compounds Assignment –** review the instructions for the assignment as a class. Make sure to emphasize how marks are allocated and that students will only receive full marks for answers that are written legibly and

absolutely correctly. Make sure students are aware of proper file formatting when submitting. Students must complete this assignment individually.

****Refer to Differentiation Resources for additional practice worksheets, and to enrich your classroom teaching using different tools. ****