LESSON 29 ACTIVITY

Molecules in Two Dimensions
Structural Formulas

Name _____

Date _____ Period _____

Purpose

To compare the structures of molecules.

Materials

- vials F–H

Part 1: Test Your Predictions

Write your predictions in the table. Then carefully smell vials F, G, and H.

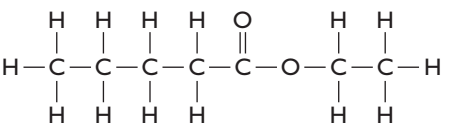
Vial	Chemical name	Molecular formula	Predicted smell	Actual smell
F	ethyl pentanoate	$C_7H_{14}O_2$		
G	butyric acid	$C_4H_8O_2$		
H	ethyl acetate	$C_4H_8O_2$		

1. What name would you give to the smell category that vial G might belong in?

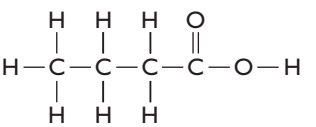
2. What could account for two molecules with the same molecular formula having different smells?

Part 2: Examine the Structures

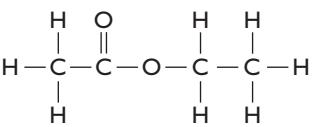
Below are structural formulas of each of the three substances. They show how the atoms in each molecule are connected.



Molecule F



Molecule G



Molecule H

Questions

1. List three similarities between molecules G and H.

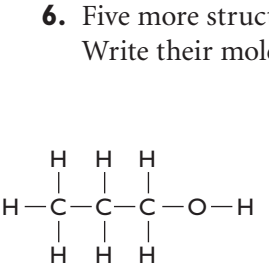
2. List two differences between molecules G and H.

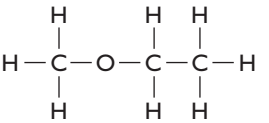
3. List three similarities between the two sweet-smelling molecules.

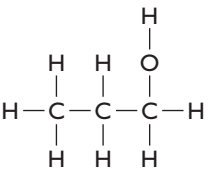
4. What do you suppose the lines in these drawings represent?

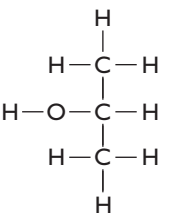
5. From the evidence you have seen so far, how would you explain the differences in smell between molecules G and H?

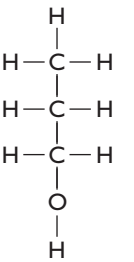
6. Five more structural formulas are shown here. Write their molecular formulas.


Molecule 1


Molecule 2


Molecule 3


Molecule 4


Molecule 5

7. Molecules 1, 3, and 5 smell exactly the same. They represent the same molecule. Explain why.

8. Molecules 1, 2, and 4 have different smells. Explain why.

9. Making Sense What evidence is there that the structure of a molecule is related to how it smells?

10. If You Finish Early Draw molecule 4 so that it looks different on paper but still represents the same molecule.