

## Activity 15: Representing Molecules on Paper

### *Learning Objectives*

*Gain familiarity with Lewis, condensed, ball-and-stick, and skeletal representations of organic molecules*

*Draw structures in one representation if given in another*

*Develop the definition of structural isomer*

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**Estimated Completion Time**      45 Minutes

### **Instructor Information**

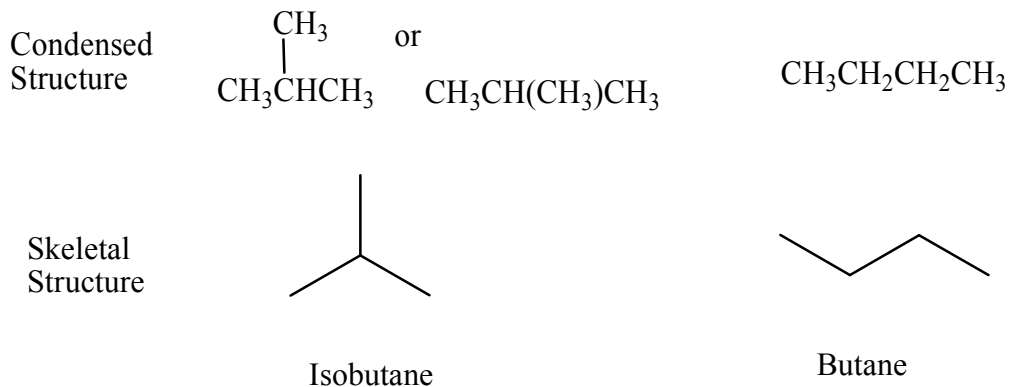
Students will struggle at first conceptualizing skeletal (line) structures; collaboration on this concept helps many students.

### **ANSWERS TO QUESTIONS**

1. Propyl alcohol and isopropyl alcohol have the same molecular formula and both contain the functional group alcohol, but the atoms are connected to each other differently.
2. The molecular formula only lists the type and number of atoms; the condensed structure gives some information about the atom arrangement.
3. A Lewis structure shows all the atoms, bonds, and electrons present in a molecule, whereas a condensed structure gives some information about the arrangement of the atoms but shows no bonds or electrons.
4. a. Carbon      b. The red is oxygen and the gray is hydrogen.
5. A carbon atom

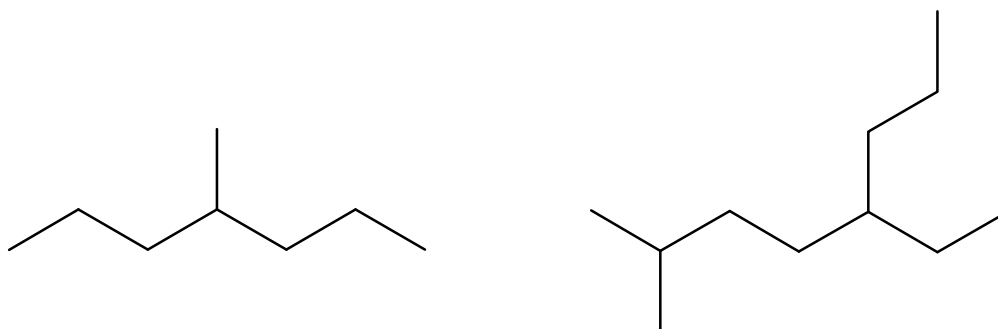
6. Structural isomers have the same molecular formula, but the atoms have different connectivity.

7.



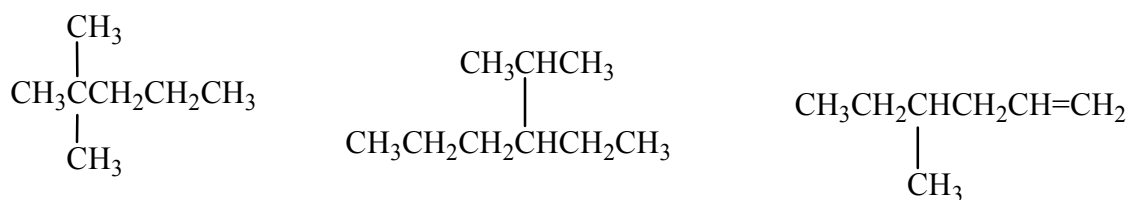
8. Yes. The two molecules have the same molecular formula but have the carbons bonded differently.

9.



10. Each carbon is assumed to have four bonds to it. Bonds not to carbon or other atoms are made to hydrogens. The total number of bonds sums to four.

11.



### Activity 15: Skill Development

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1.

