Review the Concepts

Work through the following exercises to review the concepts in this chapter. For additional review, check out the activities at www.mybiology.com. The website offers a pre-test that will help you plan your studies.

**Exercise 1  (Module 3.1)**

The great variety of organic compounds results from the ability of carbon atoms to form four bonds, creating branching chains of different lengths. Several hydrocarbon molecules, consisting only of carbon and hydrogen, are shown in Module 3.1. Practice seeing the versatility of carbon by sketching some hydrocarbon molecules of your own, as suggested below.

1. Sketch a hydrocarbon molecule that is a straight chain, containing 5 carbon atoms and 12 hydrogen atoms, molecular formula \( \text{C}_5\text{H}_{12} \):

   Question: Why does each carbon bond to 4 other atoms?

2. Now sketch a shorter hydrocarbon chain, with only four carbon atoms:

   Question: What is the molecular formula \((\text{C}_7\text{H}_7)\) of the above molecule?
3. Sketch another five-carbon hydrocarbon, but this time include one double bond:

Question: What is the molecular formula of this molecule?

4. Sketch a five-carbon hydrocarbon molecule that is branched (and contains no double bonds):

Question: What is the molecular formula of this molecule? What is the term for its relationship to molecule 1 (in this exercise)?

5. Sketch two five-carbon hydrocarbon molecules in the form of rings, one without double bonds and one with one double bond.

Question: How many hydrogen atoms are in each of these molecules?