Structural Formulas (Section 1-10)
1. Full Structural Formulas
2. Condensed Formulas
3. Line-Angle Formulas
Since organic structures are large and complex, full Lewis structures are often a hassle. You’ll need to be proficient in both condensed and line-angle formulas.

<table>
<thead>
<tr>
<th>Full, Condensed, and Line-Angle Structures for Hexane, C₆H₁₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: H–C–C–C–C–C–C–H</td>
</tr>
<tr>
<td>B: CH₃CH₂CH₂CH₂CH₂CH₃</td>
</tr>
<tr>
<td>C: CH₃(CH₂)₄CH₃</td>
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<tr>
<td>D: Line-Angle</td>
</tr>
</tbody>
</table>

Condensed Formulas: Central atoms are shown with attached atoms, essentially in sequence
- Challenges:
  1. Handling parentheses
  2. Handling double and triple bonds
  3. Handling branches
  4. Handling ketones/aldehydes/esters/amides/carboxylic acids
  5. In general, recognizing when an oxygen is double-bonded off a carbon, and when it is single bonded both to carbon and to something else.

Line-Angle Formulas:
1. Each vertex represents a carbon
2. C-H bonds are often omitted: assume enough H’s to give four bonds or the appropriate formal charge
3. Oxygen and Nitrogen atoms must be specified, and O-H and N-H bonds are not omitted
- Line-angle formulas are routinely the fastest and cleanest to draw.
- Line-angle is essential and optimal for showing 3-dimensional organic shape.

Formula Practice (Section 1-10)
3. Time race: Draw as many copies of C₆H₁₄ hexane as you can in 20 seconds:

Full:

Condensed:

Line-Angle:
4. Draw the full structure, given the condensed structure. (Note:

\[ \text{CH}_3\text{CH}_2\text{OH} \]

\[ (\text{CH}_3)_2\text{CH}_2\text{NH}_2 \]

\[ \text{CH}_2\text{CHCl} \]

\[ \text{CH}_3\text{CHO} \]

\[ \text{CH}_3\text{CO}_2\text{H} \]

5. Fill in the full structure, including attached hydrogens and attached lone pairs, for the following line-angle structures. If given a condensed structure, convert it to a line-angle.

\[ \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3 \]

\[ \text{CH}_3\text{CO}_2\text{H} \]