Writing systems for Lewis structures

A. Lewis dot formulas
   ▪ Each covalent bond is a pair of electrons, designated by dots
   ▪ The dots can be optionally coded per atom

\[
\begin{align*}
\text{H} & \quad \text{H} \\
\text{H} & \quad \text{C} \\
\text{C} & \quad \text{C} \\
\text{O} & \quad \text{O} \\
\text{H} & \quad \text{H}
\end{align*}
\]
B. Lewis line-bond formulas
  ▶ Generally omit lone pairs
  ▶ Each line is a two electron covalent bond
  ▶ Incorporate VSEPR theory at option of the writer
C. Condensed formulas

- Emphasize atoms, not bonds
- Delete the lines of line-bond formulas
- The # of identical groups attached to an atom is designated by a subscript
- ( ) are used if identical assemblies of atoms (``complex groups'') are attached to an atom
- Standard order to write formula: C, then H, then everything else

H\_\_\_H  
H-C-C-O-H
H H

F F H H
F C C C H
H C C H
H H H

CH\textsubscript{3}CH\textsubscript{2}OH  
CF\textsubscript{3}C(CH\textsubscript{3})\textsubscript{2}CH\textsubscript{2}Cl
D. Skeletal formulas (Klein’s “bond-line structures”)

- Emphasize bonds and electrons, not atoms
- Every line is a covalent bond
- Every intersection of 2 or more lines is a C
- Every terminus of a line is a C
- H's are implicit--add enough of them to fill octets of C's in a formula
- Heteroatoms replace C's
- Lone pairs are added at option of the writer

\[
\begin{align*}
\text{OH} & \\
\text{HH} & \\
\text{C} & \text{O} \\
\text{H} & \text{H} & \text{H} \\
\text{CH}_3\text{CH}_2\text{OH} & \\
\text{H} & \text{C} & \text{C} \\
\text{H} & \text{H} & \text{H} \\
\end{align*}
\]