## Representations for Elements & Compounds

<table>
<thead>
<tr>
<th>Representations</th>
<th>Example</th>
<th>Details</th>
</tr>
</thead>
</table>
| **empirical formula**    | HO        | • simplest type of formula  
                          • indicates *relative* number of atoms of each element present using atomic symbols and subscripts |
| **molecular formula**    | H$_2$O$_2$| • indicates actual number of atoms of each element present using atomic symbols and subscripts |
| **structural formula**   | ![Structural Formula](image) | • indicates actual number of atoms of each element present using atomic symbols  
                          • indicates how the atoms are connected (bonded) using sticks  
                          • may or may not indicate actual shape of molecule |
| **ball & stick model**   | ![Ball & Stick Model](image) | • indicates actual number of atoms of each element present using (colored) spheres  
                          • indicates how the atoms are connected (bonded) using cylinders  
                          • usually indicates actual shape of molecule  
                          • usually indicates relative sizes of the atoms but distances between atoms exaggerated |
| **space-filling model**  | ![Space-Filling Model](image) | • indicates actual number of atoms of each element present using (colored) overlapping spheres  
                          • does not show chemical bonds explicitly  
                          • usually indicates actual shape of molecule  
                          • indicates relative sizes of the atoms and accurately represents distances between atoms |