Part 1

1. Click on **RUN NOW!**.
2. When the program opens up, begin by making a water molecule.
3. Click and drag the atoms to bond them on the blue screen. When you’ve created the water molecule, drag it to the black rectangle on the right.
4. Now click the yellow arrow in the bottom white box to go to the next kit and use those atoms to make an oxygen molecule. Drag it to the rectangle on the right.
5. Use the same kit to make a hydrogen molecule.
6. Now click the yellow arrow in the bottom white box to go to Kit 3 and use those atoms to make carbon dioxide. Drag it to the rectangle on the right.
7. Use the same kit to make a nitrogen molecule.

Part 2

1. Now click the tab at the top of the program named “Large Molecules”.
2. Use one of the kits to make the macromolecules below. For each macromolecule, draw its structural formula. Then circle and label the functional groups on it.
   a. C₂H₆O – Ethanol
   b. C₃H₆O – Acetone (hint: it’s a ketone)
   c. C₂H₄O₂ – Acetic Acid
   d. C₂H₅NO₂ – Glycine (2-Aminoacetic Acid)
   e. CH₅N – Methylamine

   *If you need to reset the molecule to try again, click “Refill Kit”*

   *If you need to remove an atom/ break a bond, position your cursor over the bond and use the “scissors” option.*

Analysis:

1. Why can’t we use the program to model sulphydryl or phosphate groups?
2. Search the internet for the structural formula of Cysteine & Glycerol Phosphate and draw them. Circle and label their functional groups.
3. Which important energy-storing molecule made by the process of cellular respiration contains a phosphate group? Draw the structural formula of this molecule.
4. Search the internet for Pentane & 2-methylbutane. What is the molecular formula for each? Draw their structural formulas. What kind of isomers are these two molecules?
5. Search the internet for 2 butene. What is the molecular formula? Draw the structural formulas for both isomers. What kind of isomers are these two molecules?
6. Why is it important to learn the structure of macromolecules?