

TxCETP Course Component: Introduction of Valence and Covalent Bonds

This material is based on work supported by the National Science Foundation under Grant No. DUE 9987332.

Inquiry C: *The Linkage*

Objective: Students demonstrate the linkage of biological monomers.

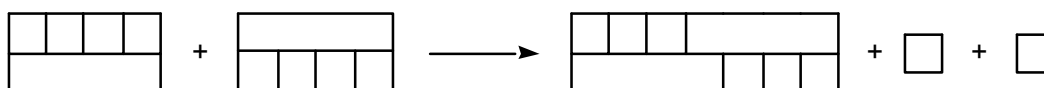
Time Frame for Activity: 10-15 minute

Materials:

Assorted Legos® (See Inquiry A Materials)

Procedure:

1. Instruct the students to make two models using one of the 1X4, one model with the 1X4 on the top and one model with the 1X4 on the bottom.
2. Once the students have made their models, instruct them to combine the two models so that the combined models contain two layers. If students say that it cannot be done, inform them that they may remove a 1X1 or 1X2 from each of the models to accomplish the combining of the original models.



3. Observe students progress and assist the groups that are having difficulties.
4. Ask the students how they combined their models and draw a few examples on the board.
5. Give the students some example molecules and ask them to combine these models in a similar fashion.
6. Relate these models to similar reactive groups (amino, carboxyl, hydroxyl,...).
7. Introduce the concept of linkage of reactive groups and relate back to linkage of 1X4 Legos®.
8. Give the students four models using the 1X4 and ask the students to combine these models into one, two level structure.
9. Introduce the concept of polymerization to form macromolecules such as carbohydrates and proteins.

Formative Assessment:

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1. Can you combine molecules without removing elements?
2. In the following reaction, does the disaccharide have exactly twice the number of atoms that you find in each monosaccharide?
3. What single molecule is used to form the following macromolecule?