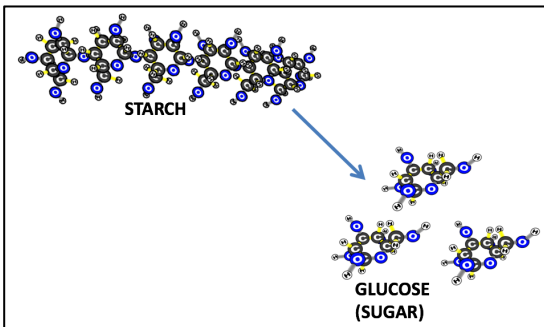
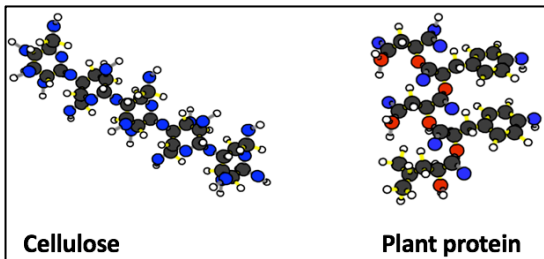


# 5.1: Tracing the Processes of Fungi Growing: Digestion and Biosynthesis Directions

## Materials:

- 1 Decomposer poster (11 x 17)
- 2 nickels
- 10 pennies

## Procedure:

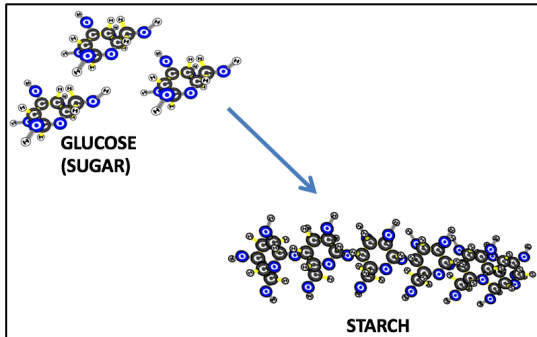


1. Place one nickel in the circle in the tree trunk's roots and one nickel in the circle in the soil (close to but outside the hyphae). You do not need your pennies yet. Your nickels represent large organic molecules in the dead tree and in the soil from dead organisms. These large molecules cannot enter cells. However, cells need the matter and energy in these large molecules to grow and function. You can trace how large organic molecules provide matter and energy for all of the fungus' cells.
2. Digestion starts when decomposers release enzymes. The enzymes break down the large organic molecules in the tree trunk and soil into small organic molecules. This happens outside of the fungus' body. **Exchange each of your nickels for five pennies.** The pennies represent small organic molecules.

**Stop and think:** Remember that large organic molecules have chemical energy, because they have C-C and C-H bonds. When large organic molecules are digested into small organic molecules the C-C and C-H bonds remain. *Based on this, what form of energy is present after digestion? Has the energy changed? Watch the animation of digestion in the PowerPoint.*

3. The small organic molecules (pennies) are taken up by the fungal hyphae. **Move your pennies into the hyphae.**
4. The small organic molecules move through the hyphae to all parts of the fungus' body. **Move your pennies through the hyphae to the mushroom.** *Watch the animation of this movement in the PowerPoint.*

5. The small molecules enter the cells, but don't come out. The cells combine some of the small organic molecules with oxygen to release energy. *What is this process called? What happens to the carbon atoms in those molecules?*



6. But cells use food in two ways. In addition to providing energy, the small organic molecules provide materials that cells use to grow and divide. In the cells, the small organic molecules are built into large organic molecules. For example, in a series of steps, glucose molecules can be combined into starch. This process is called biosynthesis and results in growth. **Exchange your ten pennies for 2 nickels to represent biosynthesis.**

**Stop and think:** The small organic molecules with C-C and C-H bonds are combined into large organic molecules. *Based on this, what type of energy is present in the large organic molecules after biosynthesis? Has the energy changed? Watch the animation of biosynthesis in the PowerPoint.*