

# Glenbard District 87

**Course Title:** Biology

**Unit:** Cellular Respiration/Photosynthesis

## Stage 1 – Desired Results

**Established Goal(s):** *What relevant goals (e.g. Content standards, course or program objectives, learning outcomes, etc.) will this address?*

**HS-LS1-5**

**Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.**

**HS-LS2-5**

**Develop a model to illustrate the roll of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.**

**HLSLS1-7**

**Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in the net transfer of energy.**

**HLSLS2-3**

**Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.**

**Understanding(s):** *Students will understand that...*

- Photosynthesis and cellular respiration are interconnected
- The mitochondria and chloroplasts play a role in energy transformation
- Different factors affect photosynthetic rates
- That photosynthesis and cellular respiration are important components of the carbon cycle
- Energy can be transferred from one system to another

**Essential Question(s):** *What provocative questions will foster inquiry, understanding, and transfer of learning?*

- How do photosynthesis and cellular respiration assist in the cycling of matter in the biosphere?
- How does energy and matter flow into, out of, and within a system (specifically within photosynthesis and cellular respiration)?

**Knowledge:** *Students will know...*

1. how photosynthesis and respiration are interconnected
2. which organelles are responsible for photosynthesis, cell respiration
3. the reactants and products for photosynthesis
4. the reactants and products for cellular respiration
5. the role of aerobic and anaerobic respiration in different environments
6. what the biosphere, atmosphere, hydrosphere, and geosphere are.

**Skills:** *Students will be able to ...*

1. Use models and diagrams depicting the process of photosynthesis or cellular respiration to make interpretations and draw logical conclusions
2. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
3. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
4. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
5. Predict the outcome of energy production in aerobic or anaerobic production.

