**BIOL 150 Principles of Biology I**

**Metabolism: Cellular Respiration**

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| **Stage 1 – Desired Results** | |
| **Established Goals:**   Describe the metabolic process of cellular respiration.   Describe the basic principles of chemistry that are important to biology.   Identify the structure and functions of macromolecules important to life.   Locate, identify, collect, organize, analyze, and interpret data. | |
| **Understandings:**  **Students will understand that…**   Cellular respiration is connected or interacts with other metabolic pathways that involve many types of biomolecules other than just glucose or other carbohydrates.   Protein composition and conformation is critical for normal functions, is responsible for some diseases, and appears to have  evolved over time from precursors. | **Essential Questions:**   What is cellular respiration?   Where does it happen?   What enzymes/proteins are involved?   How does cellular respiration differ between cell types?   How can I find data addressing these questions?   How can I analyze or compare data from different source. |
| **Student objectives (outcomes):**  **Students will be able to…**   Ask questions and develop hypotheses about metabolism.   Develop search strategies and conduct literature survey to answer their question or revise their hypotheses.   Locate, retrieve, and use relevant biological information about metabolic pathways, related enzymes, metabolites, and genes.   Summarize their results in written report and present to class. | |
| **Stage 2 – Assessment Evidence** | |
| **Performance Task(s):**   Bioinformatics/Omics Project  o Enzyme report.  o Metabolic pathway report.  o Protein sequence and  homologue report.  o Final report & Presentation | **Other Evidence:**   Peer-review of papers   Peer-evaluation of group participation   Peer-evaluation of presentations |
| **Stage 3 – Learning Plan** | |
| **Learning Activities:**   Begin with an entry question (What does your metabolism have in common with your intestinal microbial flora, a plant, a worm, or a fly?).   Lectures will introduce key terms and concepts regarding protein structure/function/synthesis and metabolic pathways involved in cellular  respiration.   Students will express interests in diseases and/or organisms. Instructor will assign groups based on common interests and diversity of backgrounds.   Groups will meet and generate questions/hypotheses about disease/organisms- related metabolism. | |

 Students will individually conduct literature survey, select 3 sources, and prepare reference information and short annotation to be brought to class or shared online.

 Groups compile annotated bibliography on their research topic.

 Groups discuss their gathered information and revise their question/hypothesis and develop strategy for finding relevant information. Teams divide tasks among

members.

 Teams compile information; consider what additional information or types of analysis are needed.

 Analyze data, prepare figures, and summarize results.

 Prepare draft of report.

 Groups will peer-review other groups report, then self-evaluate their report considering peer-review, and revise report.

 Groups will prepare presentation.

 Groups will turn in their report and draft presentation for instructor preview/feedback.

 Instructor will provide feedback and preliminary grade.

 Groups will revise their report and conduct group-peer evaluations.

 Groups will make final presentation of results and peer-evaluate presentations.