BIOTECHNOLOGY

Overarching Strands

1. Investigation of past, present and future applications of Biotechnology
2. Usage of laboratory safety and equipment
3. Proper implementation of laboratory procedure and industry protocols
4. Utilization of basic chemical principals to prepare lab reagents
5. Description of cell structure and components
6. Identification and maintenance of bacteria and bacteria cultures
7. Comparison of nucleic acid and proteins and genetic information flow in cells
8. Explanation and usage of recombinant DNA techniques in bacteria.

Priority standards within the overarching strands

1. Investigation of past, present and future applications of Biotechnology
    - Applications of present technology and future implications, including careers and history

2. Usage of laboratory safety and equipment
    - Appropriate use of personal protective equipment
    - Maintenance of sanitary and safe lab environment
    - Proper lab behavior to protect others and self
    - Correct and safe usage of lab equipment

3. Proper implementation of laboratory procedure and industry protocols
    - Correct following of lab protocols and chemical safety
    - Correct documentation and record keeping practices

4. Utilization of basic chemical principals to prepare lab reagents
    - Explain basic chemical concepts (atomic and molecular mass, biomolecules, acid base chemistry, pH scale, and buffers)
    - Accurate and correct preparation of solutions
    - Preparation and analysis of dilutions

5. Description of cell structure and components
    - Identification of key cellular components along with their function
    - Identification of components and reproduction methods of prokaryotic and eukaryotic cells

6. Identification and maintenance of bacteria and bacterial cultures
    - Proper preparation of bacterial media
    - Proper inoculation of agar and broth media
    - Identification of common categories of bacteria

7. Comparison of nucleic acid and proteins and genetic information flow in cells
    - Nucleic acid structure and comparison with replication process
    - Structure and function of proteins along with separation techniques and denaturation of proteins

- Protein synthesis according to the central dogma of molecular biology
- Describe the various methods mutations and the consequences of those mutations

8. Explanation and usage of recombinant DNA techniques in bacteria.
    - Describe plasmid usage bacterial transformation and isolation processes of those plamids.