**Unit 7 Review**

**DNA Structure and History**

1. Describe the structure of DNA including nucleotide structure
2. Understand how each of the following people contributed to the understanding of DNA

* Griffith’s experiment (1928)
* Avery, MacLeod, McCarty (1944)
* Hershey-Chase (1952)
* Chargaff (early 1950s)
* Maurice Wilkins & Rosalind Franklin (early 1950s)
* Watson and Crick (1953)
* Matthew Meselson & Franklin Stahl (late 1950s)

1. Describe differences between prokaryotic and eukaryotic DNA and chromosomes

**DNA Replication**

1. Describe (or draw) the process of DNA replication using the following terms:

* Semiconservative replication
* Leading strand, lagging strand, Okazaki fragments
* 3’ and 5’ end
* DNA polymerase (1 and 3), helicase, ligase, primase,
* (topoisomerase, single stranded binding proteins, RNA primer)

**DNA Electrophoresis**

1. Describe the process of DNA electrophoresis.
2. What are restriction enzymes? How can they create sticky ends?
3. What information can you gain by looking at a gel?
4. Review you electrophoresis lab.

**pGLO lab**

1. What is bacterial transformation?
2. Describe how the pGLO lab was designed to show that transformation occurred.
3. What was the purpose of each of the following in the lab?

* The plasmid, GFP gene, arabinose, ampicillin, LB agar, UV light?

1. Explain the arabinose operon.
2. Review the lab.

**Transcription and Translation**

1. What are the differences in structure and function of DNA and RNA
2. Explain transcription in 1 sentence.
3. How do each of the following relate to transcription?

* RNA polymerase
* Promoter
* Eukaryotic transcription – promoter, TATA box, transcription factors
* 5’ to 3’ end
* 3’ to 5’ end

1. Explain 3 ways that mRNA is post-transcriptionally edited in eukaryotes.
2. Explain translation in 1 sentence
3. Describe the structure of a ribosome. Where are they made? How are they different in prokaryotes and eukaryotes?
4. Use the following to describe translation

* Ribosome (free and bound), cytoplasm, rough ER
* mRNA, tRNA, rRNA
* codon, anticodon, amino acid
* E, P, and A site
* Imitation, elongation, termination

1. How is translation different in prokaryotes and eukaryotes?
2. What is the location of transcription? Translation?
3. Describe how point mutations and frameshift mutations can impact an organism.

**Operons**

1. What is an operon?
2. Describe the lac and trp operons. How are they similar? How are they different?