**Review Guide**

**Protein Synthesis & Mutations**

**Proteins**

* Identify the three categories that proteins fall in to
  + What is an example of a protein for each of these categories?
* Identify what enzymes do
* Identify the building blocks of proteins
  + How many types of these building blocks are there?
  + Where do they come from? (How do we or other living things get them?)
  + What do we call a chain of these building blocks?
  + What types of bonds hold them together in a chain?

**Transcription (Protein Synthesis)**

* Identify the three processes that make up the Central Dogma
* Explain the result of the process of transcription
* Identify three structural differences between DNA and RNA
* Identify and describe the jobs of the three different types of RNA
* Describe the steps of transcription
  + Where does this process take place?
  + What molecules are involved in this process?
  + What does RNA polymerase do?
* Identify the sequence of mRNA that would result from a template strand of DNA
  + Example: What would the mRNA sequence be for a strand of DNA that reads AATGCTATAGCC
* Compare and contrast between DNA Replication and Transcription
  + How are they different in terms of how much and how often these process happen?

**Translation (Protein Synthesis)**

* Explain the result of the process of translation
* Identify what a codon is, where it is located, and what it codes for
  + Which type of RNA contains codons? Which type contains anticodons?
  + What is THE start codon? What amino acid does it code for?
  + What are stop codons for? Which codons are stop codons?
  + Explain why this phrase makes sense: Each codon codes for an amino acid, but not every amino acid has its own amino acid.
* Explain the basic structure of the ribosome
  + Which subunit binds to which type of RNA?
* Describe the steps involved in translation
  + How does the tRNA molecule “know” which amino acid to bring next? How does base-pairing rules play a part in this?
  + How does the ribosome help in this process?
  + What signals for translation to begin? To end?
* Identify what happens to the polypeptide chain once translation is complete

**Mutations**

* Define mutation
* Identify different causes of mutations
  + Why do you think it’s more common for induced mutations to happen compared to naturally occurring ones?
* Define point mutation
* Identify and describe the three types of point mutations
  + Which type of point mutation would most likely cause the biggest problem for protein synthesis?
* Identify what causes cancer
  + How is this related to mitosis?
* Identify and explain two examples of mutations that are more complex than point mutations
* Explain the difference between a somatic cell mutation and a sex cell mutation
  + In what type of cell would we be able to pass on a mutation?
* Identify the ways that mutations would or would not affect the phenotype of an individual (trait that is expressed)