Biology Assessment #10 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 <u>own</u> 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 two examples of mutations that are more complex than point mutations
  - What causes a frameshift mutation?
  - When would a gene translocation occur?

- 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)