**Unit 3 Test - Review**

**Section 3.1 - The Disease**

**3.1.1 -** [**Blood Detectives**](https://docs.google.com/presentation/d/1RwsFdglwxeekRSt3HnncBtbMlwiKawxJDXZg8Dxl23Y/edit?usp=sharing) **(notes linked)**

**3.1.2 - Sickle Cell Diaries**

* Know the definitions of the following terms:
  + Anemia
  + Blood Plasma
  + Erythrocytes (RBC's)
  + Leukocytes (WBC's)
  + Sickle Cell Disease
  + Platelets.
* Describe the nature of sickle cell disease.
  + What is its defining feature?
  + Why is this a problem?
  + What are some of the most common health problems associated with sickle cell disease.
* What is the purpose of hemoglobin?
* Know why sickling of red blood cells causes health problems.
* How how sickle cell disease is diagnosed.
  + What is a hematocrit.
    - How is it calculated?
  + Why is it a good indicator of sickle cell disease?
* How does sickle cell disease affect daily life?

**Section 3.2 - It's In the Genes**

**3.2.1 -** [**Protein Synthesis**](https://docs.google.com/presentation/d/1dwOuLV-5_ZARYCAt6eV937xlgAyGwnjnkJl43xRSqhA/edit?usp=sharing) **(Notes Linked)**

**3.2.2 - The Genetic Code**

**3.2.3 -** [**Does Changing one Nucleotide Make a Big Difference**](https://docs.google.com/presentation/d/1rrxDZfFqtuSKGJ7raHonVT-d2EDPPAoV0O1dxf6FMiU/edit?usp=sharing) **(Notes Linked)**

* Know the definitions of the following terms:
  + Amino Acid
  + Anticodon
  + Codon
  + Hydrophilic
  + Hydrophobic
  + mutation
  + nucleotide
  + protein
  + protein synthesis
  + RNA
    - mRNA
    - tRNA
  + Ribosome
  + Transcription
  + Translation
  + Hydrophilic
  + Hydrophobic
  + Chromosome
  + Gene
    - Initiator Sequence
    - Coding sequence
    - Termination sequence
* Describe the purpose of the DNA code.
* Explain how genes and proteins are related.
* Describe the steps involved in protein synthesis, be able to use the following words in the description.
  + Codon
  + Transcription
  + Protein
  + Nucleus
  + tRNA
  + Chromosome
  + DNA
  + mRNA
  + Gene
  + mRNA
  + Cytoplasm
  + ribosome
  + Anti-codon
  + amino-acid
  + Peptide bond
  + Translation
* Explain what a mutation is. How can it affect the shape of a protein?
* Are all mutations created equal? Do some mutations have a greater effect than others? Which? Do simple mutations always cause simple problems?
* Can changing just one nucleotide change the shape of a protein? Is this a serious problem?
* Describe the specific mutation responsible for sickle cell disease and it's cause in terms of DNA, RNA, Genes, and the protein is created. Why specifically does this mutation cause a problem in red blood cells?

**Section 3.3 - Chromosomes**

**3.3.1 - How is DNA Passed Through the Generations**

**3.3.2 - What are Chromosomes?**

* Know the definitions of the following terms:
  + Allele
  + Chromosome
  + Dominant trait
  + Gene
  + Genetic Material
  + Genotype
  + Heredity
  + Homologous Chromosome
  + Sister chromatids
  + Karyotype
  + Meiosis
  + Mitosis
  + Mutation
  + Pedigree
  + Phenotype
  + Recessive Trait
  + Sex Chromosome
  + Diploid
  + Haploid
  + Gamete
* [Mitosis](https://docs.google.com/presentation/d/1O3h3GOfkHXYKp7Mc9sBHlxx57PAhWsP5DCnozmlNKA4/edit?usp=sharing) (Notes Linked)
  + Why do cells undergo mitosis?
  + What are the "starting materials" for mitosis?
  + What are the steps of mitosis? In 10 words or less, describe each step in mitosis.
  + What are the ending materials for mitosis?
  + Why is it important that daughter cells are diploid?
* [Meiosis](https://docs.google.com/presentation/d/1FV8VCQxZnFHNxGYA52rsdsjU_SniA3iha7N6YTvCPNM/edit?usp=sharing) (Notes Linked)
  + Why do cells undergo meiosis?
  + What are the "starting materials" for meiosis?
  + What are the steps of meiosis? In 10 words or less describe each step.
  + Describe the term 'crossing over' why is it vital for sexual reproduction?
  + Describe the idea of "independent assortment" why is this vital for sexual reproduction?
  + What is the end result of meiosis? Why is it important that sperm and egg are haploid?
* Why do mutations like sickle cell disease get passed from generation to generation?

**Section 3.4 - Inheritance**

**3.4.1 - Family Inheritance**

**3.4.2 - What is the Probability**

* [Define the following terms:](https://docs.google.com/document/d/1kk5Rx1TYS3ruz7TW2pSFev_DaStvT2W5mBX_EOBlF00/edit?usp=sharing) (Notes linked.)
  + Gene
  + Genotype
  + Heredity
  + Pedigree
  + Phenotype
  + Punnett square
  + Recessive trait
* Explain how pedigrees can be used to track diseases.
* Know the pedigree symbol for the following.
  + A male
  + A female
  + An affected male
  + An affected female
  + An unaffected male
  + An unaffected female
  + A carrier female
  + A carrier male.
* Understand how the following are illustrated in a pedigree.
  + A marriage
  + Siblings
  + Offspring
* Why does sickle cell disease run in families, yet is not present in every generation?
* How can doctors and genetic counselors calculate the probability of a child inheriting a disease?