AP Biology Summer Assignment

AP Biology will be a fast-paced class with a certain degree of previous knowledge expected. The more prepared you are in advance, the easier the concepts will be throughout the course. Below is a list of concepts (video resources provided) you are expected to know before starting AP Bio in August. If the resources provided are not enough, look for additional videos, or research the questions on the web. You will have a test within the first week back from summer break on the concepts below. Your grade on this summer assignment will come from the test. This handout is to help guide you in your studies.

**Structure of Water and Hydrogen Bonding**

**Watch this video 🡪 https://bit.ly/3FSnvor**

* What is the chemical formula of water?
* The oxygen in a water molecule has a more \_\_\_\_\_\_\_\_ charge and the hydrogens in water have a more \_\_\_\_\_\_\_\_\_\_ charge.
* If multiple water molecules were bonding together, explain how they would be attracted to each other (consider the charges in the above question).
* What is a polar molecule?

**Biomolecule Structure and Function**

**Watch this video 🡪 https://bit.ly/3NgqQQv**

* List the four biomolecules (also called macromolecules).
* What is a monomer?
* List the monomers of the biomolecules.
* List the function of each biomolecule.

**Introduction to Cells**

**Watch this video 🡪** [**https://bit.ly/3sFa99w**](https://bit.ly/3sFa99w) **and** [**https://bit.ly/3FSWBMZ**](https://bit.ly/3FSWBMZ)

* Explain the difference between prokaryotes and eukaryotes.
* Identify images of the following cell structures: cell (plasma) membrane, cytoplasm, cytoskeleton, ribosomes, nucleus, rough endoplasmic reticulum, smooth endoplasmic reticulum, mitochondria, chloroplast, vacuoles, Golgi apparatus, lysosome
* State the function of each of the above cell structures.

**Cell Division**

**Watch this video 🡪 https://bit.ly/37YJeys**

* What happens when cells uncontrollably divide?
* Cells spend most of their time in which phase?
* What is happening during mitosis?
* What is happening during each stage of mitosis: prophase, metaphase, anaphase, and telophase?
* What is happening during cytokinesis?
* How many chromosomes are found in the human body?

**Meiosis**

**Watch this video 🡪 https://bit.ly/3FVyXiV**

* What is the difference between mitosis and meiosis?
* What kind of cells undergo meiosis?
* How many chromosomes are found in human sex cells?
* How many times do cells undergo meiosis?
* What happens during prophase 1 that contributes to genetic variety?
* What happens when chromosomes do not separate correctly in meiosis?

**Punnett Squares**

**Watch this video 🡪 https://bit.ly/3MErXK5**

* Define an allele.
* What is the difference between a dominant and recessive allele?
* What is the difference between homozygous and heterozygous?
* What is the difference between genotype and phenotype?
* Cross Bb x Bb. What are the chances the offspring will be BB?
* If B = brown eyes, what are the chances the offspring in the above Punnett square would be brown?

**Replication**

**Watch this video 🡪 https://bit.ly/3a1B2xT**

* The process of DNA replication occurs in the \_\_\_\_\_\_\_\_\_\_\_, where the DNA is stored.
* Which enzyme unwinds the DNA double helix so it can be replicated?
* Which enzyme copies the DNA nucleotides to make a complimentary strand of DNA?
* When DNA is copied, A pairs with \_\_\_\_\_\_ and C pairs with \_\_\_\_\_\_.
* What would the compliment be to the following section of a DNA strand: AATCGGGTA?

**Protein Synthesis**

**Watch this video 🡪 https://bit.ly/3LmCSGD**

* The two steps of protein synthesis are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Transcription occurs in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a cell and produces \_\_\_\_\_\_\_\_ from DNA.
* In transcription, A pairs with \_\_\_\_\_\_\_ instead of T, but C always pairs with \_\_\_\_\_\_\_.
* What would the complimentary mRNA strand be for the following section of DNA: AATCGGGTA?
* List the 3 types of RNA and their function.
* Translation occurs in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and makes a \_\_\_\_\_\_\_\_\_\_\_\_ from mRNA.
* Three mRNA molecules, known as a codon, code for \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_.
* Using the amino acid chart on the video, what would be the sequence of amino acids for the following codons: AUG GGG CAA ACT