1. Compare and contrast chromosomes and chromatin.

Chromosomes – Bundles of DNA that form during Mitosis

Chromatin – Loose DNA. DNA exists as chromatin during the non-Mitotic stages of a cell cycle

1. In DNA replication, A always pairs with T and C always pairs with G
2. Name four enzymes that participate in DNA synthesis and describe briefly what they do:
3. – Helicase = unzips the DNA in preparation for replication
4. – DNA Polymerase = constructs the complimentary strands of DNA
5. – Primase = attaches RNA primers to the lagging strand
6. - DNA Ligase = connects the Okazaki fragments into one seamless strand
7. Biomolecules that end with “ose” are sugars while those that end with “ase” are enzymes.
8. During transcription RNA is transcribed from DNA in the nucleus of the cell.
9. Which enzymes constructs RNA molecules during transcription?

RNA Polymerase

1. During transcription, A always pairs with U and C always pairs with G.
2. The mRNA leaves the nucleus through the nuclear envelope.
3. The mRNA joins a ribosome in the cytoplasm to begin the process of protein synthesis.
4. The nucleotides on the mRNA correspond to a specific amino acid attached to a tRNA.
5. When several amino acids bind together it is called a polypeptide chain.
6. An enzyme brings two molecules together to help a chemical reaction happen more quickly.
7. Given the following DNA sequence, determine the complementary RNA molecule.

CCT TAA CAA CTC ACG TGT GTT AAT TTG

GGA AUU GUU GAG UGC ACA CAA UUA AAC

1. Using your RNA molecule from #13 and your codon chart, determine the amino acid sequence that would be produced:

Gly – Ile – Val – Glu – Cys – Thr – Gln – Leu – Asn

Fun Fact: These 9 amino acids are the beginning of protein insulin. Your body is using insulin right now to break down sugar molecules!

1. Create a Venn Diagram that compares and contrasts DNA and RNA.

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| --- | --- | --- |
| DNA Only | Both DNA & RNA | RNA Only |
| Contains the sugar “deoxyribose”  Contains the nucleotide T  Double-stranded  Found in the nucleus | Contains the nucleotides A, C, G  Contains information that can code for protein structures | Contains the sugar ribose  Contains the nucleotide U  Single-stranded  3 types: mRNA, tRNA, rRNA  mRNA is constructed in the nucleus. It then travels through the nuclear envelope into the cytoplasm and eventually to a ribosome. |