Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Mendelian Genetics**

**Short Answer. Write out the response that best answers the question.**

1. Using the following sequence of DNA, write out the complementary DNA strand; Then write out the RNA message strand.

DNA gene template: ATG TTT CCT TCG CAA CAG TAA

DNA complementary strand: TAC AAA GGA AGC GTT GTC ATT

RNA message: AUG UUU CCU UCG CAA CAG UAA

1. What are the three components of a nucleotide?

Base, sugar, phosphate

1. Name two functions of nucleic acids

Storing genetic information

Transmitting genetic information

Encoding protein products

Preventing damage to genetic information

1. What is the central dogma of genetics?

DNA replicates to DNA or transcribes to RNA; RNA translates to protein

1. What are the two Laws of Mendelian Genetics?

Law of Segregation

Law of Independent Assortment

1. What is the importance of meiosis to sexual reproduction?

Meiosis increases variation in offspring by homologous recombination, independent assortment and segregation of chromosomes; haploid gametes from meiosis are used in fertilization to create multiple phenotypes in offspring.

**Multiple choice. Circle the choice that best answers the question.**

1. Which of these is not a method of gene regulation?
   1. Feedback inhibition
   2. Copy number
   3. Repressor molecules
   4. All of the above are methods of gene regulation
2. Which is an example of sex linkage?
   1. Calico coat color on X chromosome
   2. XY genotype of males
   3. Blonde hair and blue eyes linked
   4. None of the above
3. Which mutation causes no change to the codon?
   1. Nonsense mutation
   2. Missense mutation
   3. Silent mutation
   4. Frameshift mutation
4. What is the correct order of mitosis:
   1. Prophase, Anaphase, Metaphase, Telophase
   2. Anaphase, Metaphase, Prophase, Telophase
   3. Metaphase, Prophase, Anaphase, Telophase
   4. Prophase, Metaphase, Anaphase, Telophase

**True or False. Click T if the statement is true and F is the statement is False.**

T F Genotype is the physical attributes of a trait

T F Dominant allele only requires one copy to be expressed

T F Gametes are the diploid sex cells

T F Asexual reproduction can only produce identical copies of the organism

T F Uracil is only used in RNA

T F RNA is single stranded

T F Transcription uses ribosomes to make RNA

T F Translation uses ribosomes to make proteins

T F Mitosis is the cellular division into two identical cells

T F Karyotyping is determining if a sample is the same, related or a different organism