**DNA Replication and Mutation Notes**

Replication: The process of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_) \_\_\_\_\_

 This must take place \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cell division.

Why is there DNA replication?

 One copy will power the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cell, the other will be for the \_\_\_\_\_\_\_ cell.

Remember: DNA is made out of \_\_\_\_\_\_\_ strands. They are complementary to each other (bases on one strand determines the sequence on the other)

Base Pairs:

Adenine ( ) – Thymine ( ) Guanine ( ) – Cytosine ( )

Practice Strand: G A C T C G A T C C G G

Examples: #1 –

#2 -

Steps in Replication:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unwinds the DNA (like a zipper unzipping) creating a replication fork, it does this by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds
2. DNA polymerase adds the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bases. The DNA polymerase travels from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ end. This is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ strand.
3. A DNA polymerase also adds the complementary bases to the other side of the ladder, it travels in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It completes the strand in several fragments called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These fragments are bound together by DNA ligase. This is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ strand.

**Mutations**

**Important Vocabulary:**

**Codon:** a series of \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a DNA sequence that codes for a specific \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

**Point Mutations (gene mutations): where single genes are affected**

Frameshift Mutations: The \_\_\_\_\_\_\_\_\_\_\_\_\_ of 1 or 2 nucleotides that causes the affected codon and all of the codons that follow to be misread. This changes the protein product.



Nonsense Mutations: The new codon causes the protein to prematurely \_\_\_\_\_\_\_\_\_\_\_\_\_, produces a shortened product.



Missense Mutations: The new codon causes an \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to be inserted into the protein. The outcome of this depends on what is inserted in place of the normal amino acid.

**Chromosome Mutations: changes in the chromosomal structure**

Example Original Sequence: ABCDEFG

Translocation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a segment from a different chromosome

Inversion: change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a segment

Addition: the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of another fragment

Deletion: the \_\_\_\_\_\_\_\_\_\_\_\_\_ of an inner fragment

**Silent Mutations: where there is a change in the DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ HOWEVER what is expressed (\_\_\_\_\_\_\_\_\_\_\_\_\_) does \_\_\_\_\_\_\_ change, silent mutations are there but are not \_\_\_\_\_\_\_\_\_\_**