**DNA Replication Notes Guide: - General Biology B**

You are responsible not only for the material in this guide but the diagrams and pictures on the notes. The notes can be found on Mr. Walkers website: [www.walkersclass.com](http://www.walkersclass.com).

**Objective 2: Explain the pairing and sequencing of the nitrogenous bases and the process of DNA replication**

# **DNA Replication**

## The process of making a copy of DNA is DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## This process occurs in INTERPHASE of the cell cycle

## The first stage of DNA replication is the separation of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

# **DNA Helicases**

## The double helix unwinds by enzymes called DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

## Helicases break the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds that link the nitrogen bases .

## **DNA Polymerase**

## After the strand separates, DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ move along each DNA strand. DNA Polymerase \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nucleotides to the exposed nitrogenous bases. As DNA polymerases move along, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ new double helixes are formed.

# **Final Step**

## Once the DNA polymerase has finished copying the DNA strand, two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ strands which are identical are created.

# **Errors**

## During DNA replication, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can sometimes occur, and the wrong nucleotide is added to the new strand.

## DNA polymerase III also goes along the strand and “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” the strand and corrects any errors. This reduces the number of errors to about 1 error per 1 billion nucleotides

## **Rate of Replication**

## The DNA strand has an estimated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ billion base pairs (A,C,T,G). The DNA strand is not replicated from start to finish. Rather, it is divided into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sequences about 100,000 bases and DNA replication begins