

DNA REPLICATION

- ◆ **Genes** (the chemicals of heredity) are composed of DNA. Whenever new cells are made in either meiosis or _____, then new genes made of DNA are produced for the new cells.
- ◆ **DNA Replication** means the duplication of DNA that is identical to the original double-stranded DNA.
- ◆ This replication of DNA must be _____, or a **mutation** of an incorrect sequence of nucleotides will occur.
- ◆ **DNA Replication occurs in 3 steps**
 1. The 2 bases forming each rung of the 'ladder' snap apart. This is caused by an enzyme that passes along the strands, 'unzipping' it.
 2. Spare nucleotides (in the nucleus of the cell) attach themselves to the 'broken rungs' to repair the break. Each repairing nucleotide is identical to the one broken.
 3. As each 'broken rung' is repaired, two 'ladders' form, that is 2 identical strands of DNA. The 'repairing' is really the process of replication.

PROTEIN SYNTHESIS

- ◆ There are 2 processes in protein synthesis:
 1. Transcription (DNA makes all 3 forms of _____ in the nucleus)
 2. Translation (DNA plus all 3 forms of RNA together make proteins at the _____ in the cytoplasm)

Transcription

- ◆ One strand of the DNA double helix is used to make _____ (which travels to the 'ribosome workbench'), tRNA (which collects its specific _____ acid for the protein), and rRNA (which forms much of each ribosome where _____ are made).

Translation

- ◆ mRNA has many _____ sequences consisting of 3 nucleotides, each of which codes for a particular amino acid to build up the _____
- ◆ mRNA which is a long single strand lies _____ a ribosome.
- ◆ Meanwhile, tRNA has an 'opposite' or complementary **anticodon** sequence, and searches the cytoplasm for the specific amino acid which is specifically coded for by each tRNA's _____
- ◆ Each tRNA brings each of the many amino acids to the mRNA at the ribosome.
- ◆ After each amino acid is linked in turn to the growing protein, the tRNA dissociates itself from the amino acid and the mRNA.
- ◆ There are both start codons and _____ codons. Start codons initiate the making of a protein. Stop codons _____ the making of a protein and release it into the cytoplasm.