Test 4 study Guide Key

Review for Chapter 8 -9 Quest

1. Describe the structure of DNA Double Helix; backbone made of deoxyribose + phosphate held together by covalent bonds; nitrogen bases (A, T, C, G) held together by Hydrogen bonds
2. How does the structure of DNA enable replication to occur? Hydrogen bonds are weak bonds, so they break easily by DNA polymerase to create 2 new equal strands.
3. Compare replication, transcription, and translation:

	Replication	Transcription	Translation
Purpose	duplicate DNA	make RNA	make proteins
Location	nucleus	nucleus	ribosome
Enzymes involved	DNA polymerase	RNA Polymerase	
Summarize what happens	DNA polymerase unwinds DNA and breaks hydro. bond. DNA polymerase then attaches new nucleotides to create 2 new identical strands	RNA Polymerase unwinds a portion of DNA and breaks hydro. bonds. RNA Polymerase then adds RNA nucleotides to create mRNA	mRNA goes to ribosome. tRNA attaches to mRNA and brings amino acids, which bond together to create protiens

Transcription

4. Compare and contrast DNA and RNA:
   a. Similarities: Adenine, Cytosine, Guanine; DNA + mRNA in nucleus
   b. Differences: Double Helix, single helix; Thymine + Uracil; 1 type of DNA; 3 types RNA

DNA

RNA Polymerase

mRNA

5. A. What is a codon? B. Where is it located? C. What is an anticodon? D. Where is it located?
   a. 3 nucleotides on mRNA that code for an amino acid
   b. mRNA
   c. 3 nucleotides on tRNA that carries amino acid to ribosomes during translation
   d. tRNA
6. What is the complementary mRNA sequence for a DNA sequence of TACGGTCATTTAGGGACT? What is the complementary amino acid sequence for this same strand? (amino acids on page 244)
   a. AUGCCAGUAAAUCCCUGA
   b. methionine - Proline - Valine - Asparagine - Proline - stop
7. What are the different types of mutations?

Gene Mutations

1. Point mutation: change in a single nitrogenbase that changes one amino acid
2. Frame shift mutation: addition or deletion of a nitrogen base to DNA, causing the DNA to shift

Chromosomal Mutations

1. nondisjunction: homologous chromosomes do not seperate during meiosis causing trisomy (3 copies of a chromosome) or monosomy (1 copy)
2. Deletion: a segment of a chromosome is left out during replication of DNA
3. Translocation: a portion of a chromosome attaches to a different chromosome
4. Insertion: a portion of a chromosome is inserted into a different chromosome
5. Duplication: a segment of a chromosome is repeated
6. Inversion: a portion of chromosome attaches backwards

8. What is Genetic Engineering?

making changes in DNA code of living organisms

What are the 3 types of Genetic Engineering?

a. Selective Breeding: 1) hybridization = mating dissimilar organisms 2) Inbreeding = mating similar organisms

b. Induce mutations with Chemicals and radiation

c. Removing DNA, cutting it into fragments w/ restriction enzymes, or seperating it into fragments with gel electrophoresis, and then combining that DNA w/ other DNA

* All notes are posted to the website. Please look over those as well.