

1. name the four bases in DNA and describe the structure of DNA using the following terms:

- nucleotide (sugar, phosphate, base)
- complementary base pairing
- double helix
- hydrogen bonding

2. describe DNA replication with reference to three basic steps:

- "unzipping"
- complementary base pairing
- joining of adjacent nucleotides

3. define recombinant DNA

4. compare and contrast the general structural composition of DNA and RNA

5. describe three uses for recombinant DNA

6. use examples to explain how mutations in DNA affect protein synthesis and may lead to genetic disorders

7. demonstrate a knowledge of the basic steps of protein synthesis, identifying the roles of DNA, mRNA, tRNA, and ribosomes in the processes of transcription and translation

Chromosomal mutations		
Type	Description	
Normal	Prior to any structure change	
Translocation	Exchange of chromosome pieces between nonhomologous pairs	
Deletion	Loss of a piece of chromosome	
Duplication	More than one copy of the same gene is present	
Inversion	Portion of chromosome breaks loose and rejoins with the ends reversed	

9.

Gene mutations

Base change		Result
Normal	TAC'GGC'ATG'TCA	
Deletion	ACG'GCA'TGT'CA	Polypeptide completely altered
Addition	ATA'CGG'CAT'GTC'A	Polypeptide completely altered
Substitution	TAG'GGC'ATG'TCA	Change in only one amino acid

10. Environmental Mutagens

11. Somatic Mutations

12. Germinal Mutations