

Heredity  
Unit 1 Test Review

Name: Answer Key Date: \_\_\_\_\_ Class: \_\_\_\_\_ Test #: \_\_\_\_\_

1. Define the following terms:

- a. Anticodon: sequence of 3 bases on tRNA that is complementary to and pairs with a codon on mRNA
  - b. Codon: group of 3 sequential bases on an mRNA strand, each codes for a specific amino acid using tRNA as an intermediary
  - c. Complementary Bases: nitrogenous bases that bond in forming the nucleic acid molecule
  - d. Nucleotide: basic unit of nucleic acids; contains 1 phosphoric acid, 1 sugar, and 1 nitrogenous base
  - e. Nucleic Acid: complex organic molecules containing phosphoric acid, sugar, and nitrogenous bases
  - f. DNA: nucleic acid found in the nucleus that controls the production of proteins in the cell
  - g. Transcription: process through which mRNA is produced from DNA according to the base sequence on DNA
  - h. Translation: Formation of proteins by the ribosomes using information coded on DNA and carried out by RNA
  - i. Purine: nitrogenous bases in nucleic acids that have a double ring of carbon and nitrogen atoms in each molecule
  - j. Pyrimidine: nitrogenous bases in nucleic acids that have a single ring of carbon and nitrogen atoms in each molecule
2. What is the primary function of DNA? store and transmit genetic info
3. Describe the structure of DNA. Sides of DNA ladder: alternating phosphates and sugars, a nitrogenous base is attached to deoxyribose, 4 bases make-up rungs (A-T, G-C), double helix, has a right-hand twist, each twist has 10 base pairs
4. Nucleic Acids are named after what part of a nucleotide? Sugar
5. Which bases are purines? Adenine, Guanine
6. Which bases are pyrimidines? Thymine, Cytosine, uracil (RNA)
- .. Which scientists are credited with discovering the structure of DNA? James Watson & Francis Crick

8. Describe the 3 steps of DNA replication?

- a. DNA unwinds and unzips by Helicase, splitting the center of the molecule causing the bases to break.
- b. Spare nucleotides move in and attach to their proper "old" bases.
- c. Two identical DNA molecules are formed, half is coding strand, half is complementary.

9. Which enzyme is used in DNA replication? Helicase, DNA Polymerase

10. Name the three types of RNA and describe their functions.

- a. messenger RNA (mRNA) - transmits info from DNA into RNA and serves as a template for protein synthesis
- b. transfer RNA (tRNA) - used to transport a specific amino acid to the ribosome during protein synthesis
- c. ribosomal RNA (rRNA) - globular form of RNA, ribosomes are made of rRNA

11. What are the differences between RNA and DNA? RNA is single stranded DNA is double stranded, RNA has ribose and DNA has deoxyribose, RNA has uracil instead of Thymine in DNA.

12. What is the name of the organelle where protein synthesis occurs? Ribosome

13. Describe the beginning step of transcription. RNA Polymerase bonds to DNA molecule and causes the bases to separate

14. What are the complementary bases for the following DNA strand? TGCAAGTC ACGTTCAG

15. Give a summary of the main events in transcription. RNA Polymerase separates DNA molecules, directs the hydrogen bonds b/t bases of one DNA strand and RNA. Establishes sugar to phosphate bonds, releases after termination sequence

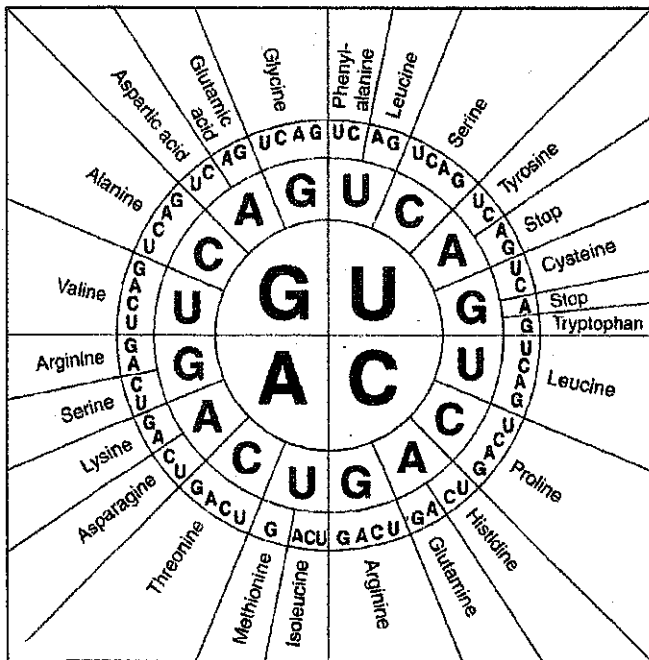
16. Give a summary of the main events in translation. mRNA goes to ribosome, tRNA transports amino acids to mRNA on ribosome. The anticodon on tRNA pairs with codon on mRNA, continues transporting until termination codon

17. What is the function of RNA polymerase? Main enzyme in transcription that separates complementary strands, establishes sugar to phosphate bonds, releases once it reaches a termination sequence.

18. What is the function of DNA polymerase? The enzyme used to add nucleotides to the exposed DNA template bases during DNA replication

Use the mRNA Codon Chart to complete the DNA triplets, mRNA codons, tRNA anticodons, and amino acids in the table below.

DNA Triplet	mRNA codon	tRNA anticodon	Amino Acid
TTC	AAG	UUC	Lysine
GGC	CCG	GGC	Proline
GTC	CAG	GUC	Glutamine
TTA	AAU	UUA	Asparagine
AAA	UUU	AAA	Phenylalanine
GTG	CAC	GUG	Histidine
CTC	GAG	CUC	Glutamic Acid
TGT	ACA	UGU	Threonine
TAT	AUA	UAU	Isoleucine
TCG	AGC	UCG	Serine
ATT	UAA	AUU	Stop
CCA	GGU	CCA	Glycine
GGC	CCG	GGC	Proline



		Second Position					
		U	C	A	G		
First Position (5' end)	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } Ser UCC } UCA } UCG }	UAU } Tyr UAC } UAA } Stop UAG } Stop	UGU } Cys UGC } UGA } Stop UGG } Trp	U C A G	
	C	CUU } Leu CUC } CUA } CUG }	CCU } Pro CCC } CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } Arg CGC } CGA } CGG }	U C A G	
	A	AUU } Ile AUC } AUA } Met AUG }	ACU } Thr ACC } ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G	
	G	GUU } Val GUC } GUA } GUG }	GCU } Ala GCC } GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } Gly GGC } GGA } GGG }	U C A G	
						Third Position (3' end)	