

LIFE 1010-01

- 1) View the chromosomes below and determine the relative age of each person. The shaded regions are telomeres.



1



2



3

- 2) List the three molecules in order involved in the central dogma of biology.
- 3) List the three phases of transcription and describe what happens in each of them.
- 4) In the diagram below fill in the promoter, RNA polymerase, synthesized RNA, and terminator sequence along with directionality.

- 5) What reaction is involved in elongating nucleotide sequences?
- 6) Use the strand of DNA below to synthesize the complementary strand of DNA

5' ATGGTATAGTTTCCGGCA 3'

7) Use the newly synthesized strand of DNA as the template strand to create a strand of RNA.

8) Use the RNA from the question above (and a codon table) to determine the amino acid sequence that results from translation.

9) Use the Immature RNA Molecule below to create a strand of mRNA. (3 additions)



10) Where does this modification process take place and where does the mRNA end up after modification is complete?

11) Discuss with your group what the wobble effect is and how it might be beneficial to the translation process.

12) Draw what happens in the process of initiation of translation below.

13) Draw what happens in the process of elongation of translation below.

14) Draw what Happens in the process of termination of translation below.

15) True or False: The anticodon encodes of the amino acid. If this is false, state what the correct statement would be.

16) What replication enzymes have proofreading capabilities?

17) Determine the type of mutation based on the prompts.

- a. 5' AUGGCCCGAGGGCCC 3' Underlined C is changed to U.
- b. 5' AUGGCCCCGAGGGGCCC 3' Underlined G is changed to A.
- c. 5' AUGGCCCCGAGGGCCC 3' Underlined C is changed to A.
- d. 5' AUGGCCCCGAGGGGCCC 3' Underlined G is deleted.

Medical Matters

When we consume foods, glucose is absorbed into our bloodstream which raises our blood glucose levels. Insulin is then produced by the beta cells within the Islets of Langerhans (within the pancreas) which allows for glucose to enter cells and be used. Follow the central dogma of biology to explain the mechanisms of insulin production.