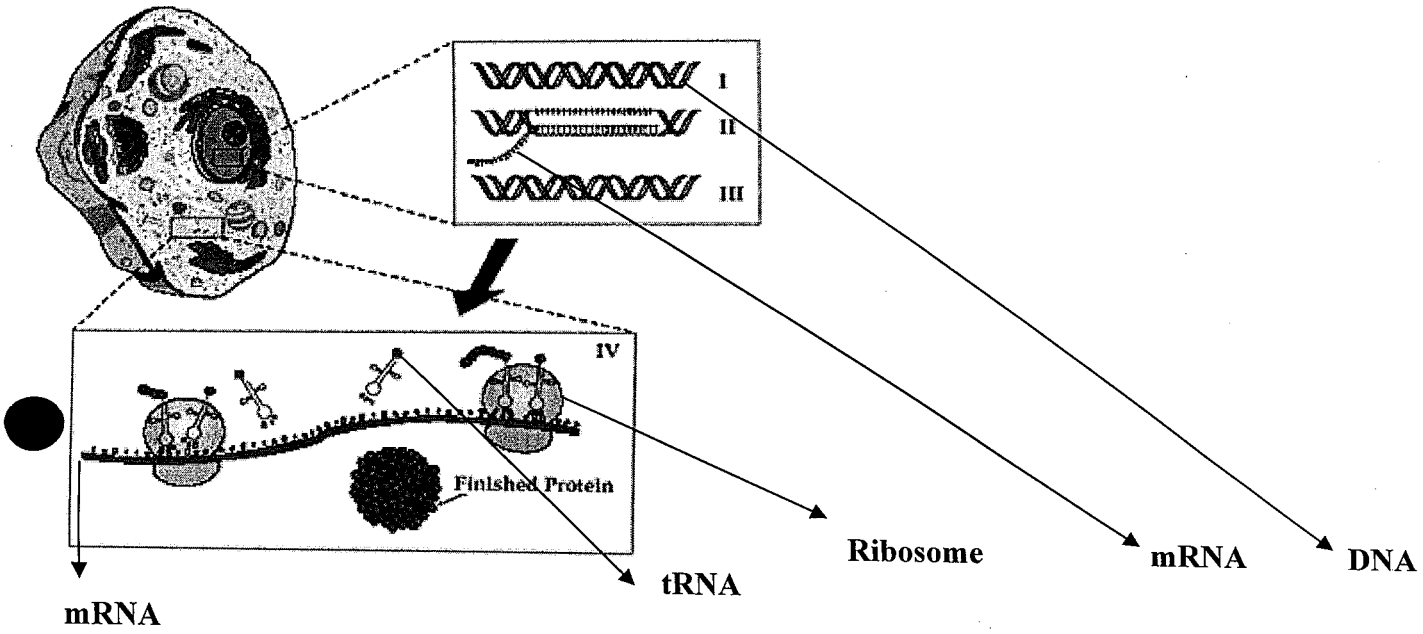
NAME _____ PERIOD _____

PAP PROTEIN SYNTHESIS WORKSHEET

PART A. Read the following passage and answer the questions below.

Protein synthesis is the process used by the body to make proteins. The first step of protein synthesis is called Transcription. It occurs in the nucleus. During transcription, mRNA transcribes (copies) DNA. DNA is "unzipped" and the mRNA strand copies a strand of DNA. Once it does this, mRNA leaves the nucleus. Translation, the second step, occurs in the cytoplasm on the ribosome. mRNA will then attach itself to a ribosome. The strand of mRNA is then read in order to make protein. They are read 3 bases at a time. Three bases is called a codon. tRNA brings the amino acids to the ribosome to help make the protein. The 3 bases on tRNA are called anti-codons. Remember, amino acids are the building blocks for protein. On the mRNA strand, there are start and stop codons. They tell your body where to start and stop making certain proteins.



PART B. Use the passage to answer the following questions:

1. What is the first step of protein synthesis? transcription
2. What is the second step of protein synthesis? translation
3. Where does the first step of protein synthesis occur? nucleus
4. Where does the second step of protein synthesis occur? cytoplasm, on the ribosome
5. Nitrogen bases are read 3 bases at a time.
6. A set of 3 bases on the mRNA strand is called codon.
7. The bases on tRNA are called anticodon.
8. From the passage, what is the purpose of the start and stop codons? to tell the cell where to start and stop making proteins
9. A bunch of amino acids put together makes protein.

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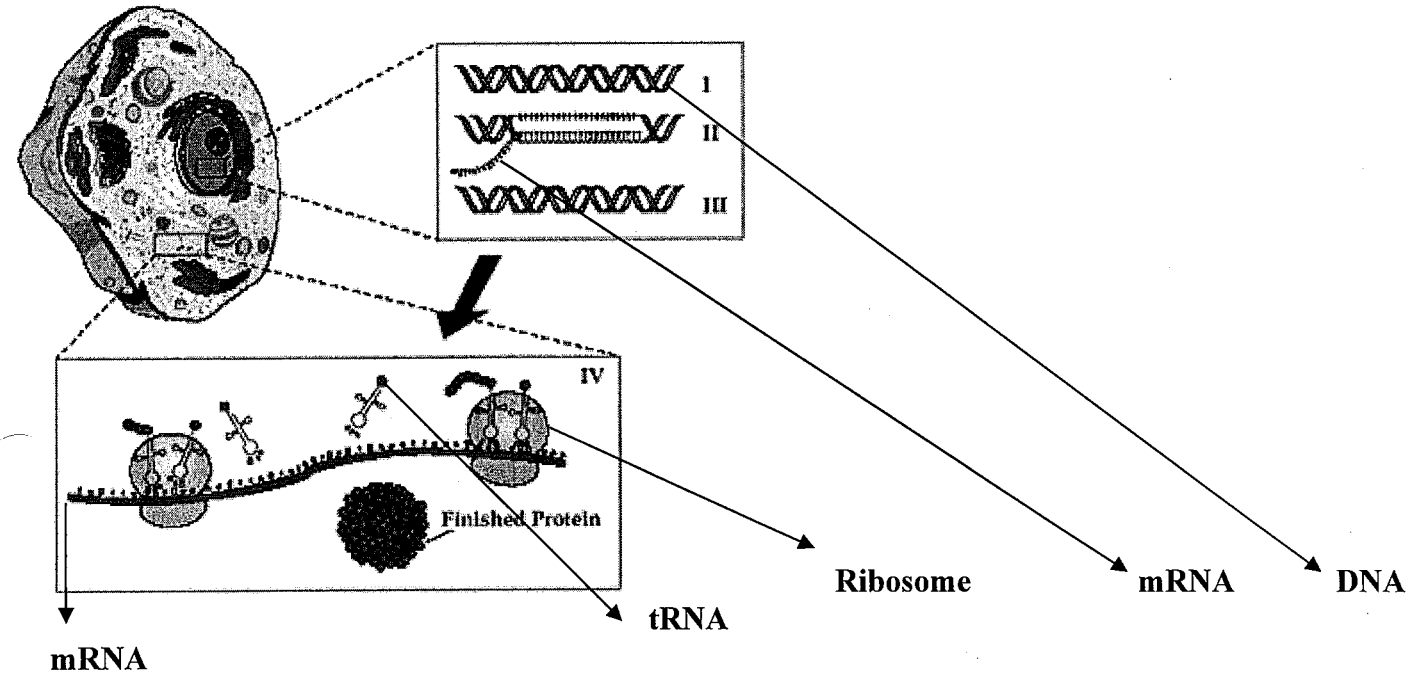

PART B. Use the passage to answer the following questions:

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8. From the passage, what is the purpose of the start and stop codons? to tell the cell where to start and stop making proteins
9. A bunch of amino acids put together makes protein.

PART C. Use your codon chart to determine the amino acid sequence. Remember to read through the strand and **ONLY start on AUG and STOP when it tells you to stop.** Follow example below:

Example:

DNA → AGA CGG TAC CTC CGG TGG GTG CTT GTC TGT ATC CTT CTC AGT ATC
mRNA → UCU GCC AUG GAG GCC ACC CAC GAA CAG ACA UAG GAA GAG UCA UAG
protein → met - glu - ala - thr - his - asp - glu - thr - stop

1. DNA → CCT CTT TAC ACA CGG CGC TAT TCT ATG ATT ACA CGG TTG ATC
   mRNA → GGA GAA AUG UGU GCC GCG AUA AGA UAC UAA UGU GCC AAC UAG
   protein → met - cys - ala - ala - ile - arg - tyr -

2. DNA → AGA ACA TAA TAC CTC TTA TAA AGA CCA GCA CTC TGA ACT GGA
   mRNA → UCU UGU AUU AUG GAG AAU AUU UCU GGU CGU GAG ACU UGA CCU
   protein → met - glu - asn - ile - glu - gly - arg - glu - thr -

3. DNA → TAC CTT GGG GAA TAT ACA CTT CGA TGA ATC CGT ACG GTA CTC
   mRNA → AUG GAA CCC CUU AUA UGUGAA GCU ACU UAG GCA UGC CAU GAG
   protein → met - glu - pro - leu - ile - cys - glu - ala - thr -

4. DNA → TAAACTCGGTACCTAGCTTAGATCTAATTACCCATC
   mRNA → AUU UGAGCCAUG GAU CGA AUC UAG AUU AAU GGG UAG
   protein →

5. DNA → CATTATTACGATACTAGAGCGAATAGAAACTTATCATCGTT
   mRNA → GUAAUAAUGCUA UGA UCU CGC UUA UCU UUG AAU AGU AGC AA
   protein →

6. DNA → ACTACCTTAGTTATCCATTGACTCGAATTGTGCGCTTGCTGATC
   mRNA → UG AUG GAA UCA AUA GGU AAC UGA GCU UAA CAC GCG AAC GAC UAG
   protein → met - glu - ser - ile - gly - asn -

7. DNA → ACCCGATACCTCTCTTATAGCATTACAAACCTCCGAGCG
   mRNA → UGGGCU AUG GAG AGA AUA UCG UAA UGU UUG GAG GCU CGC
   protein → met - glu - arg - ile - ser -

8. DNA → CGCCATACAGACGGCAACTCTGGGTGCTTTGTTCTCTTCTCAGTATC
   mRNA → GCG GU AUG UCU GCC GUU GAG ACC CAC GAA ACA AGA GAA GAG UCA UAG
   protein → met - ser - ala - val - glu - thr - his - glu - thr - arg - glu - glu - ser -