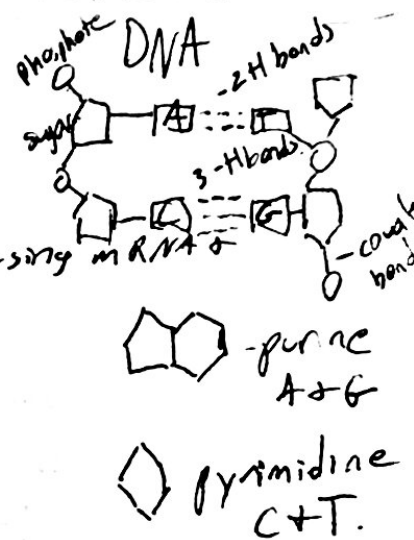


* Protein Functions: hormones, muscles, enzymes, antibody
 insulin, hemoglobin, etc. Key

* Protein → made of amino acids

* Nucleic acids → made of nucleotides.

Practicing Translation



1. Define Translation: creating an amino acid chain (protein) by using mRNA & matching it to tRNA in a ribosome.
2. Where does translation occur in the cell? In cytoplasm on a ribosome
3. What is the function of each type of RNA during Translation?
 - a. Messenger mRNA - carries code to make protein
 - b. transfer tRNA - transfer amino acid to ribosome
 - c. Ribosomal rRNA (ribosomes) - combines w/ protein to create a ribosome.
4. Translate the following sequences of mRNA.

a. AUG CCC GCA CUA CAA GAU AUU AAA GCG UCU AUG UGA
 Met - Pro - Ala - Leu - Glu - Asp - Iso - Lys - Ala - Ser - Met - stop

b. AUG GCU GCC CAG AAA GGA CAC CUC CGA ACG CCC UAA
 Met - Gly - Ala - Glu - His - Gly - His - Leu - Arg - Thr - Pro - stop

c. AUG CCC CGU AAU AUA GGC GAA CAU AUG CGG UUU UAA
 Met - Pro - Arg - Asp - Iso - Gly - Glu - His - Met - Arg - Phe - stop

Putting it all together ...

Here is a strand of DNA: (in the nucleus)

TAC GGG CAT CTA GTA GAT GGC GTG CTG AAT ATA ACC GAC TGC ATC

Transcribe it here into mRNA: (travels from the

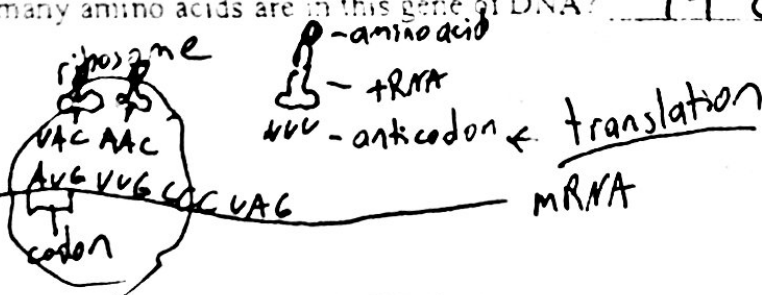
AUG CCC GUA G-AU CAU CUA CCG CAC GAC UUA UAU UGG CUG ACG UAG

Translate it here:

Met - Pro - Val - Asp - His - Leu - Pro - His - Asp - Leu - Tyr - Try - Leu - The - stop

How many codons are in this gene of DNA? 15 (codon - 3 nucleotides on mRNA)

How many amino acids are in this gene of DNA? 14 (stop does not count).

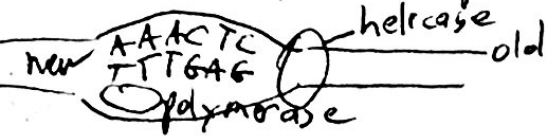


DNA replication: 1) Helicase unzips DNA

2) Poly merase adds new nucleotides

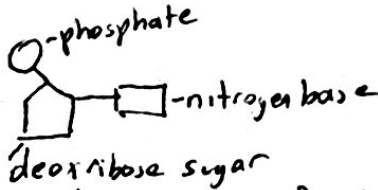
3) 2 identical strands (semiconservative)

Practicing Replication



1. How many strands of DNA are in one double helix? 2 strands of nucleotides

2. Draw the structure of a nucleotide:



3. Define DNA Replication:

Process that creates 2 identical copies of DNA (called semi conservative)
1 old + 1 new

4. Where does Replication occur in the cell?

In the nucleus of the cell

5. How do the bases pair up when DNA replicates?

A=T, C=G (hydrogen bonds connect the bases)

6. Replicate the following sequences of DNA:

a. ATG CCG CAG CGG GAT TTA ATG CAG TCA
TAC GGC GTC GCC CTA AAT TAG CTC AGT

complementary opposites A-T, & C-G

b. GCA CAG GGT TAT TCG TGA CGT GAT TCG
CGT GTC CCA ATA AGC ACT GCA CTA AGC

Practicing Transcription

1. Define Transcription. DNA serves as the template to create mRNA.

2. Where does transcription occur in the cell?

Nucleus of the cell.

3. Which type of RNA is made during transcription?

mRNA - leaves nucleus + moves to cytoplasm to ribosome

4. Transcribe the following sequences of DNA:

a. ATG CCG CAG CGG GAT TTA ATG CAG TCA
UAC GGC GUC GCC CUA AAU UAC GUC AGU

b. GCA CAG GGT TAT TCG TGA CGT GAT TCG
CGU GUC CCA AUA AGC ACU GCA CUA AGC

c. ACG GGC CCA CCG TTA TAA CAG CTA CGG
UGC CCG GGU GGC AAU AUV GUC GAV GCC

Frameshift: alters the codon reading frame by adding / deleting a base.

Mutations

point: 1 base is substituted for another

ex. silent - no change in amino acid

ex. Missense - some amino acids changed

ex. Nonsense - amino acid chain stopped early