**Protein Synthesis Guided Notes**

**Protein Synthesis: Making of a Protein by the Cell**

-This is accomplished with the help of \_\_\_\_\_\_. Like DNA, RNA is made up of \_\_\_\_\_\_\_ nucleotides:

 1. A five carbon \_\_\_\_\_\_\_\_\_\_\_\_

 2. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 3. A nitrogenous \_\_\_\_\_\_\_\_\_

**RNA Structure**

-The sugar in RNA is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. RNA has \_\_\_\_\_\_\_ bases like DNA, except it lacks \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In place of thymine, RNA uses a base called \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Uracil always pairs with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in RNA (example: A—U or \_\_\_\_--A)

**There Are Three Differences Between DNA and RNA**

|  |  |
| --- | --- |
| **DNA** | **RNA** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sugar | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ sugar |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as a base | \_\_\_\_\_\_\_\_\_\_\_\_\_ as a base instead of thymine |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_ stranded | Single \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**\_\_\_\_\_\_ Types of RNA**

-Each type has a different function in making or synthesizing proteins.

 1. Messenger RNA (mRNA)

 2. Transfer RNA (tRNA)

 3. Ribosomal RNA (rRNA)

-mRNA contains DNA’s message from the \_\_\_\_\_\_\_\_\_\_\_\_\_ to the ribosome in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

-tRNA carries the correct \_\_\_\_\_\_\_\_\_\_\_\_\_ acid to the ribosome so they can be \_\_\_\_\_\_\_\_\_\_\_\_\_ to the growing protein chain.

-rRNA makes up part of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It helps to \_\_\_\_\_\_\_\_\_\_\_ mRNA’s message and assembles \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**First Step to Protein Synthesis: Transcription**

Steps of Transcription:

1. Transcription-mRNA is made from the DNA code using RNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The enzyme RNA polymerase \_\_\_\_\_\_\_\_\_\_\_\_\_ DNA and guides the creation of \_\_\_\_\_\_\_\_\_\_\_. It uses one strand as a template
3. This occurs in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where DNA is located. DNA is too \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to leave the nucleus, which is why mRNA is used
4. The mRNA strand will \_\_\_\_\_\_\_\_\_\_\_\_\_ the nucleus and goes to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the next step, **translation.**

**Second Step to Protein Synthesis: Translation**

-Translation-protein is made by adding \_\_\_\_\_\_\_\_\_\_ acids to a growing peptide chain. This occurs at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the cytoplasm where proteins are made. It involves mRNA, tRNA and rRNA

**Steps to Translation**

1. mRNA is \_\_\_\_\_\_\_\_\_\_\_ by rRNA (rRNA makes up the ribosome)
2. mRNA is read three \_\_\_\_\_\_\_\_\_\_\_at a time. Every 3 bases on mRNA codes for one amino acid and is called a \_\_\_\_\_\_\_\_\_\_\_.

-**Codon**-3 bases on mRNA that \_\_\_\_\_\_\_\_\_ for one amino acid

-**Anticodon**-3 bases on \_\_\_\_\_\_\_\_\_\_that are complementary to mRNA

1. Transfer RNA (tRNA) carries the correct amino acid to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and it reads the mRNA codon with rRNA
2. Each time a new \_\_\_\_\_\_\_\_\_ comes into the ribosome, the amino acid that it was carrying gets \_\_\_\_\_\_\_\_\_\_\_\_ to the elongating polypeptide chain.
3. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ continues until it hits a \_\_\_\_\_\_\_\_\_ sequence, then it releases the polypeptide and the mRNA

**DNA is Universal**

-The \_\_\_\_\_\_\_\_\_\_\_ code is shared by almost all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The common nature of the genetic code suggests that almost all organisms arose from a common \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.