Honors Biology Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
NDSH Per: \_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

**Polypeptide Synthesis**



DNA controls the cell by directing the manufacture of .

Proteins are  made up of  **.**

Amino acids are held together by chemical bonds called  **.** Thus a long chain of amino acids is also called a .
 (Remember: Proteins are digested in the stomach by the enzyme PEPSIN.)

**Three Main Steps of Polypeptide (Protein) Synthesis**

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
Three types of RNA are made:
	1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
	2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
	3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. is altered to its final form = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**BACKGROUND**:
**RNA Structure**:
 - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 - **\_\_\_\_\_\_\_\_\_\_\_\_\_** instead of **\_\_\_\_\_\_\_\_\_\_\_\_\_**
 - **\_\_\_\_\_\_\_\_\_\_\_\_\_** instead of **\_\_\_\_\_\_\_\_\_\_\_\_\_**



**mRNA Structure:** - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of nucleotides long
 - 5’ end gets capped with a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 - 3’ end gets a long tail of **\_\_\_\_\_\_\_\_\_\_\_\_\_**

**tRNA Structure**:
 - about **\_\_\_\_\_** nucleotides long
 - attaches to itself and forms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sections and then
 - 3’ end is where the  for the process of translation
 - in the middle of the tRNA is a three segment nucleotide sequence called the
 - this  nucleotide sequences which are called the

 

**rRNA Structure:** - rRNA combines with proteins in the nucleolus to form two ribosomal structures: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 - small subunit holds the
 - large subunit holds the  to make the amino acid chain (protein)
 - the where the



**Polypeptide Synthesis**: The Details

1. **Transcription**:
WHERE:

WHAT:

HOW:

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



1. **RNA Processing**:
WHERE:
WHAT:

HOW:
tRNA folds into its correct shape
rRNA goes to nucleolus to become the ribosome

mRNA undergoes three main changes

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** – this is called the **\_\_\_\_\_\_\_\_\_\_**
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** – lots of adenines are added – helps **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
DNA contains two types of nucleic acid sequences in a gene.
 **\_\_\_\_\_\_\_\_**: nucleotides that will be **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_**: nucleotides that .
 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



1. **Translation**:

WHERE:
WHAT:

HOW:

The whole system is based on the .
 DNA is called the .
 Three nucleotide sequences in mRNA are called .
 Three nucleotide sequences in tRNA are called \_\_\_\_\_\_\_\_\_\_ – the anti-codon is complementary to the codon, which is complementary to the code.

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

– directed by enzymes

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**The first three nucleotides of every . This codes for the amino acid **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
3. The
4. The .
* Determine the  – use mRNA codon chart.
1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
- the tRNA in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

- the tRNA in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. This process (steps 5 – 7) repeats over and over building the amino acid chain **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
 - STOP codons = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 - bring in a protein called a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and this causes the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the ribosome to detach from the mRNA.

Determining the Amino Acid Sequence Based on the mRNA Codon

Step 1: Transcribe the DNA into RNA
Step 2: Use Codon Chart to determine the amino acid brought in by tRNA

DNA CODE: TAC GAA CTG TGC GGG CCA ATC

mRNA CODON: \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

AMINO ACID: \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

