CONSTRUCTING A PROTEIN SENTENCE

INTRODUCTION:

Every cell in your body is made up of proteins. Special proteins, called enzymes, regulate nearly all the chemical activities of the body. **How are these proteins produced?** In this activity, you **WILL WORK IN PAIRS** to apply what you have learned about transcription and translation in the process of protein synthesis. You will construct a "protein" (in the form of a sentence) from a DNA template.

Review the following terms before beginning this activity: DNA, tRNA, mRNA, nucleotide, triplet, codon, anti-codon, amino acid, transcription, and translation.

When DNA nucleotides pair with RNA nucleotides, they do so in the following manner:

ADENINE (in DNA) pairs with URACIL (A-U) in the RNA molecule.
THYMINE (in DNA) pairs with ADENINE (T- A) in the RNA molecule.
CYTOSINE (in DNA) pairs with GUANINE (C-G) in the RNA molecule.
GUANINE (in DNA) pairs with CYTOSINE (G-C) in the RNA molecule.

Also, recall that tRNA pairs with mRNA to translate the message**. Therefore, you will NOT be making any base pairs with THYMINE.**

MATERIALS: **DNA TEMPLATES; 64 ANTI-CODONS; DATA SHEETS**.
PROCEDURE:

1. You will be given a **DNA** template. Write the template sequence in the space provided on the **DATA SHEET. NOTE: LEAVE A SMALL SPACE BETWEEN EACH TRIPLET AND PLACE THE NUMBER OF THE TEMPLATE IN THE SPACE PROVIDED AT THE TOP OF YOUR DATA SHEET.**

2. **Transcribe the DNA template into mRNA**. **Record** the **mRNA** sequence of codons in the space provided on the **DATA SHEET**.

3. **Record** the **tRNA** sequence of anti-codons in the space provided on the **DATA SHEET.**

4. Once you have determined the **tRNA** sequence of anti-codons, use the **ANTI-CODON WORD LIST** to find the proper match of anti-codons and words.

5. **Record** the **message** in the space provided on the **DATA SHEET**.

6. If your "protein" has been properly constructed, you will end up with a coherent message. If not, you will end up with a nonsense message.

7. Show your word sequence to your instructor.

If it is INCORRECT, repeat steps 1-5 using the same DNA template.
If it is CORRECT, you will be given two more DNA templates.

DATA SHEET

Period _____ **Names** _____

_____

DNA TEMPLATE NUMBER _____

DNA template _____

mRNA _____

tRNA _____

MESSAGE _____

DNA TEMPLATE NUMBER _____

DNA template _____

mRNA _____

tRNA _____

MESSAGE _____