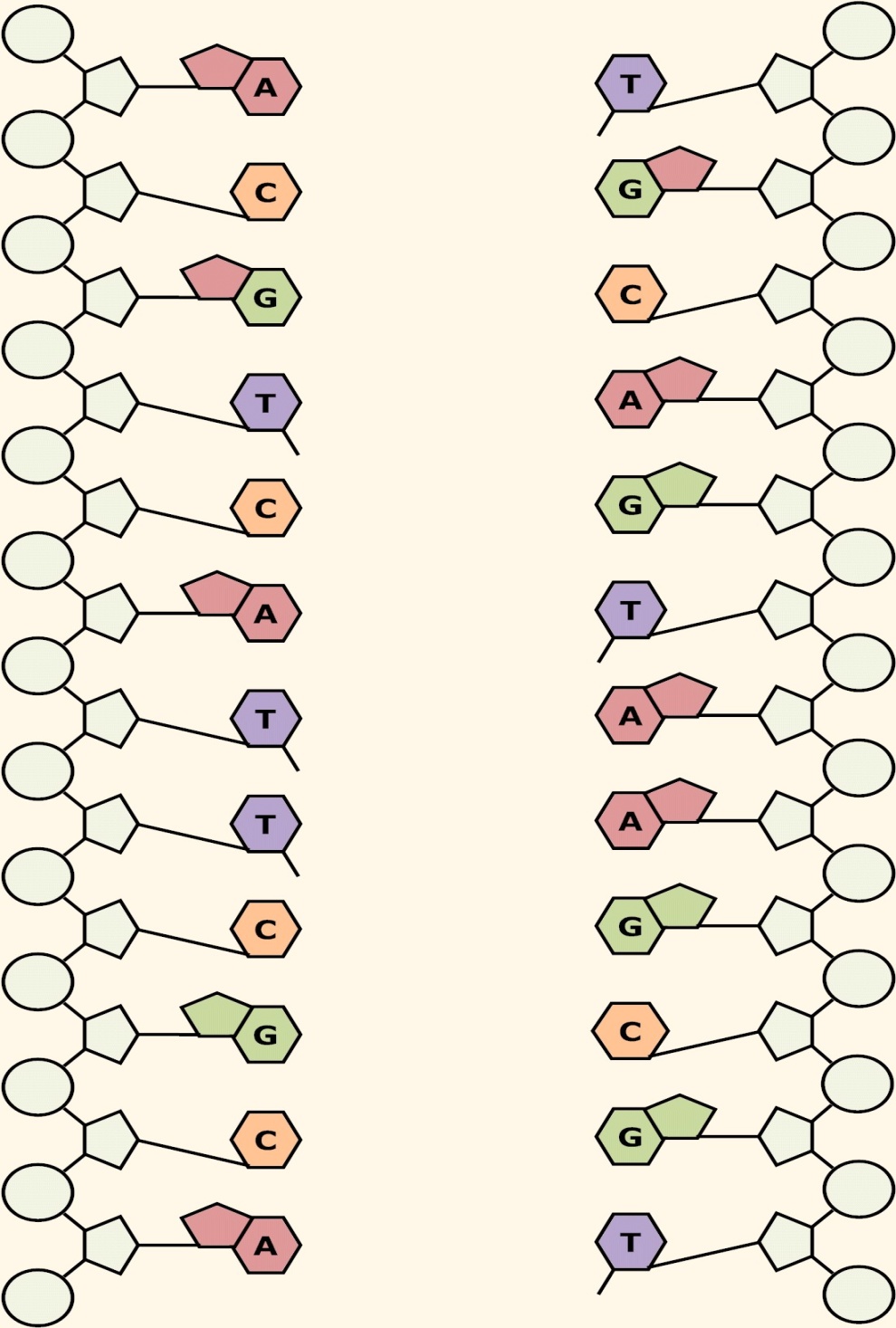
**Protein Synthesis – Transcription & Translation**

**RNA (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**

* \_\_\_\_\_\_\_\_-stranded (not double-stranded)
* Contains \_\_\_\_\_\_\_\_\_\_\_\_ sugar (not deoxyribose)
* Contains \_\_\_\_\_\_\_\_\_\_\_\_ (instead of Thymine)

**3 Types of RNA:**

1. **mRNA (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**
   * \_\_\_\_\_\_\_\_\_\_\_\_\_ copy of DNA.
   * Moves from \_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_.
   * \_\_\_\_\_\_\_\_\_\_\_: 3 nitrogenous bases (codes for an amino acid)
2. **tRNA (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**
   * Transfers amino acid to ribosome.
   * Contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_ &   
     \_\_\_\_\_\_\_\_\_\_\_: 3 bases (complement to mRNA codon)
3. **rRNA (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**



* + Makes up the ribosome.

**Ribosome**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ factory
* Contains \_\_\_\_\_\_\_ subunits.
* Made of \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_.

**Transcription:** mRNA makes a copy of a DNA segment.

* + Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \*Don’t forget: U is used instead of T
  + Example

**Translation:** mRNA is used as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to create \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + mRNA travels from the nucleus to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + The two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ subunits clamp onto the mRNA.
  + \_\_\_\_\_\_\_\_\_\_\_\_\_ brings an amino acid to the ribosome.
  + tRNA’s anticodon bonds to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_ mRNA codon   
    (this is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).
  + Amino acids are attached together with \_\_\_\_\_\_\_\_\_\_ to form \_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_)

**64 possible mRNA codons:**

* Different codons can code for the same amino acid
  + There are only \_\_\_\_\_\_ amino acids.
* Others code for instructions:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: AUG (also codes for methionine)
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: UAA (does not code for an amino acid)

**Translation Example:**

mRNA strand: AUG CCC CUU AAA GAG UUU ACA UAU UGC UGG AGG CGU UAA

Protein: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Translation Practice:**

1. mRNA: AUGCUUUUAGCACGACAACAAUGUUGA  
   Protein: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. mRNA: UAUCAAGAUGAUACAGUUUUUUAG  
   Protein: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. DNA: TACGGTCATCGTGCA  
   mRNA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   Protein: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. DNA: TACGGCAATATT  
   mRNA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Protein: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

