

# mRNA AND TRANSCRIPTION

Name \_\_\_\_\_

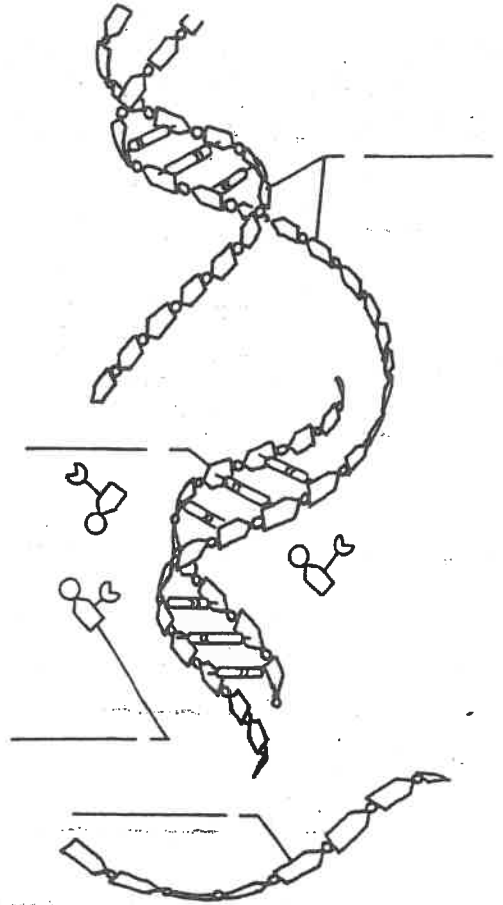
## Transcription

Fill in the blanks below. On the illustration of transcription, label the DNA, the newly-forming mRNA, the completed strand of mRNA and a free nucleotide.

Messenger RNA (mRNA) carries the instructions to make a particular \_\_\_\_\_ from the DNA in the \_\_\_\_\_ to the ribosomes. The process of producing mRNA from instructions in the DNA is called \_\_\_\_\_.

During transcription, the DNA molecule unwinds and separates, exposing the nitrogenous bases. Free RNA \_\_\_\_\_ pair with the exposed bases. There is no \_\_\_\_\_ (T) in RNA. \_\_\_\_\_ (U) pairs with adenine (A) instead. RNA contains the sugar \_\_\_\_\_ instead of deoxyribose. The mRNA molecule is completed by the formation of \_\_\_\_\_ between the RNA \_\_\_\_\_, and it then separates from the DNA.

The mRNA molecule is a \_\_\_\_\_ strand, unlike DNA.



## Codons

Each combination of three nitrogenous bases on the mRNA molecule is a codon, a three-letter code word for a specific amino acid.

The table below shows the mRNA codon for each amino acid. Use the table to answer the questions below.

- The codon for tryptophan is \_\_\_\_\_.
- For leucine, there are \_\_\_\_\_ different codons.
- The codon GAU is for \_\_\_\_\_.
- In a stop codon, if the second base is G, the first and third bases are \_\_\_\_\_ and \_\_\_\_\_.

		Second Base in Code Word.				
		A	G	U	C	
A	Lysine	Arginine	Arginine	Isoleucine	Threonine	A G U C A G U C A G U C
	Lysine	Arginine	Arginine	Methionine	Threonine	
	Asparagine	Serine	Serine	Isoleucine	Threonine	
	Asparagine	Serine	Serine	Isoleucine	Threonine	
G	Glutamic Acid	Glycine	Glycine	Valine	Alanine	A G U C A G U C A G U C
	Glutamic Acid	Glycine	Glycine	Valine	Alanine	
	Aspartic Acid	Glycine	Glycine	Valine	Alanine	
	Aspartic Acid	Glycine	Glycine	Valine	Alanine	
U	"Stop" codon	"Stop" codon	"Stop" codon	Leucine	Serine	A G U C A G U C A G U C
	"Stop" codon	"Stop" codon	"Stop" codon	Leucine	Serine	
	Tyrosine	Tryptophan	Cysteine	Leucine	Serine	
	Tyrosine	Cysteine	Cysteine	Phenylalanine	Serine	
C	Glutamine	Arginine	Arginine	Leucine	Proline	A G U C A G U C
	Glutamine	Arginine	Arginine	Leucine	Proline	
	Histidine	Arginine	Arginine	Leucine	Proline	
	Histidine	Arginine	Arginine	Leucine	Proline	

## DNA Transcription and Translocation

### Procedure :

The following is the base sequence on one strand of a DNA molecule

**AAT GCC AGT CCT TCG CAC**

1. Give the base sequence of the complementary DNA strand.
2. Draw this DNA strand.
3. Give the base sequence of the strand of mRNA read from the original DNA strand.
4. Draw this mRNA strand.
5. What protein fragment would this mRNA code for?
6. If the fourth nucleotide in the original DNA strand were changed from G to C, what would the resulting mRNA look like?
7. What would the resulting protein look like?
8. If a G were added to the original DNA strand after the 3<sup>rd</sup> nucleotide, what would the resulting mRNA look like?
9. What would the resulting protein look like?
10. If the 8<sup>th</sup> nucleotide in the original DNA strand were changed from G to C, what would the resulting mRNA look like?
11. What would the resulting protein look like?