

# Replication, Transcription, Translation Levelled Practice

Name: \_\_\_\_\_ Period: \_\_\_\_\_

## Replication:

**Level 1:** Identify the complementary bases for DNA:

A: \_\_\_\_\_ T: \_\_\_\_\_ C: \_\_\_\_\_ G: \_\_\_\_\_

Where does replication take place? \_\_\_\_\_

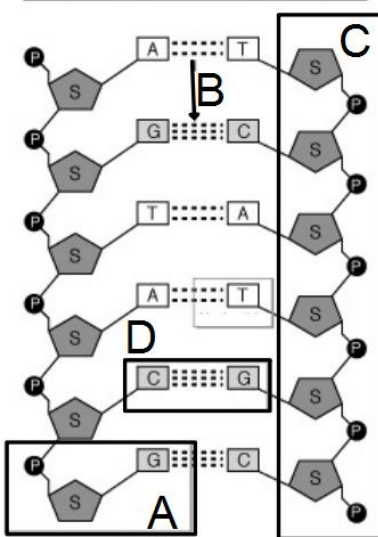
**Level 2:** Replicate the DNA by writing the **COMPLEMENTARY** strand:

T A C G G C A T C G A A T C A

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**Level 3:** Identify the following parts of the DNA molecule:

Hydrogen Bonds, Nucleotide, Sugar-Phosphate Backbone, and Base Pairs



A= \_\_\_\_\_

B= \_\_\_\_\_

C= \_\_\_\_\_

D= \_\_\_\_\_

**Level 4:** Explain how the structure of DNA allows it to replicate itself perfectly each time.

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## Transcription: DNA vs. RNA

**Level 1: Identify the complementary RNA bases from the DNA stand:**

DNA: A T C G

RNA: \_ \_ \_ \_

Where in the cell does transcription take place? \_\_\_\_\_

**Level 2: Transcribe the following DNA strand into mRNA**

T A C G G G A C T T T A G C A

**Level 3: Identify the following characteristics as belonging to DNA, RNA, Both or Neither**

- Double stranded       Single Stranded       Contains Genes  
 Coils into chromosomes       A, U, G, C       Ribose sugar  
 Leaves the nucleus       Transcription       Made of nucleotide

## **Translation:**

**Level 1:** Use the codon chart to identify the amino acid that goes with the following mRNA codons:

UUU= \_\_\_\_\_

CUG= \_\_\_\_\_

AUG= \_\_\_\_\_

UGA= \_\_\_\_\_

(write the amino acid as the three letter abbreviation...ex: Met, Val, Leu)

		Second letter				
		U	C	A	G	
U	UUU } Phe	UCU } Ser	UAU } Tyr	UGU } Cys	U C A G	
	UUC } Leu	UCC } Ser	UAC } Tyr	UGC } Cys		
	UUA } Leu	UCA } Ser	UAA } Stop	UGA } Stop		
	UUG } Leu	UCG } Ser	UAG } Stop	UGG } Trp		
C	CUU } Leu	CCU } Pro	CAU } His	CGU } Arg	U C A G	
	CUC } Leu	CCC } Pro	CAC } His	CGC } Arg		
	CUA } Leu	CCA } Pro	CAA } Gln	CGA } Arg		
	CUG } Leu	CCG } Pro	CAG } Gln	CGG } Arg		
A	AUU } Ile	ACU } Thr	AAU } Asn	AGU } Ser	U C A G	
	AUC } Ile	ACC } Thr	AAC } Asn	AGC } Ser		
	AUA } Ile	ACA } Thr	AAA } Lys	AGA } Arg		
	AUG } Met	ACG } Thr	AAG } Lys	AGG } Arg		
G	GUU } Val	GCU } Ala	GAU } Asp	GGU } Gly	U C A G	
	GUC } Val	GCC } Ala	GAC } Asp	GGC } Gly		
	GUA } Val	GCA } Ala	GAA } Glu	GGA } Gly		
	GUG } Val	GCG } Ala	GAG } Glu	GGG } Gly		

**Level 2:** Where does translation take place? \_\_\_\_\_

What is made at the end of translation? \_\_\_\_\_

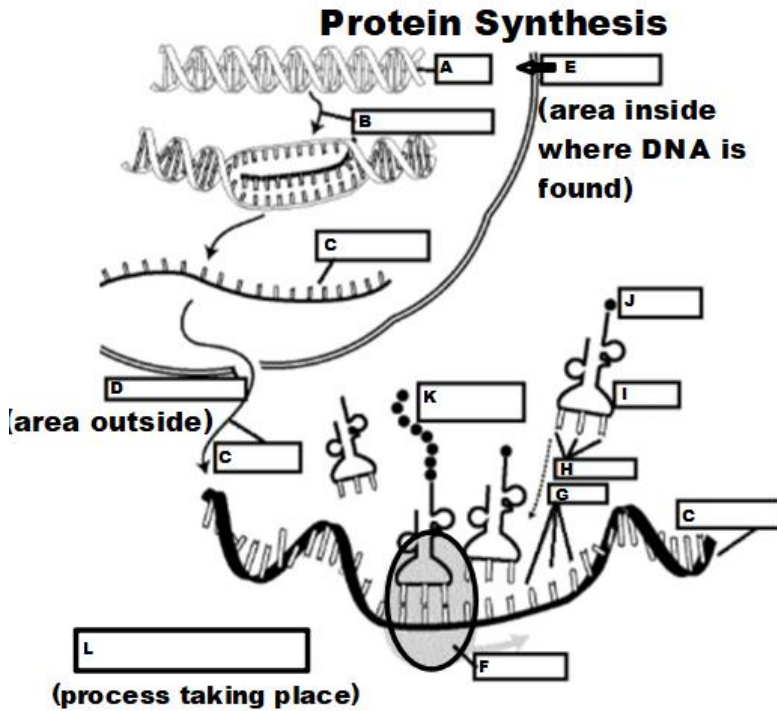
**Level 3:**

Determine the amino acid sequence from the following strand of mRNA (use the codon chart on the other page)

AUG GAA AAU CAC CGG UAG

\_\_\_\_\_

**Level 4:** Use the word bank to identify all of the parts/processes taking place in the picture below



**Word Bank:**

- Nucleus**
- Cytoplasm**
- DNA**
- mRNA (3 times)**
- peptide chain (protein)**
- codon**
- anticodon**
- ribosome**
- amino acid**
- tRNA**
- Transcription**
- Translation**

- |                         |  |
|-------------------------|--|
| A= _____ (molecule)     | G= _____ (3 nucleotides)               |
| B= _____ (process)      | H= _____ (3 nucleotides)               |
| C= _____ (molecule)     | I= _____ (name of molecule)            |
| D= _____ (area of cell) | J= _____ (what is brought by molecule) |
| E= _____ (area of cell) | K= _____ (what is being built)         |
| F= _____ (cell part)    | L= _____ (name of process)             |

**Level 5: Roles:**

What is the role of the mRNA? \_\_\_\_\_

What is the role of the tRNA? \_\_\_\_\_

What is the role of the ribosome? \_\_\_\_\_

## Level 6: Putting it All Together:

Transcribe the following strand of DNA

T A C G A G C C A A T A C C C A T T

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Translate the stand above

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Transcribe the following strand of DNA

T A C C G G A C A T T A G C C A C T

---

Translate the stand above

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		Second letter				
		U	C	A	G	
First letter	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } UCC } Ser UCA } UCG }	UAU } Tyr UAC } UAA Stop UAG Stop	UGU } Cys UGC } UGA Stop UGG Trp	U C A G
	C	CUU } CUC } Leu CUA } CUG }	CCU } CCC } Pro CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } CGC } Arg CGA } CGG }	U C A G
	A	AUU } AUC } Ile AUA } AUG Met	ACU } ACC } Thr ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G
	G	GUU } GUC } Val GUA } GUG }	GCU } GCC } Ala GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } GGC } Gly GGA } GGG }	U C A G