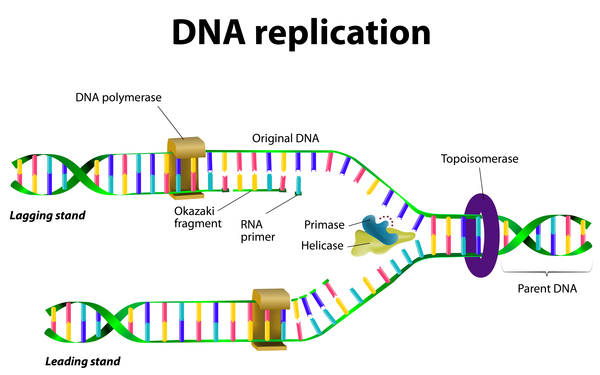
**AP Review – DNA REPLICATION**

Fill in what you remember!

5b.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ seals Okazaki fragments together



5a.

\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ replaces RNA primers with DNA on lagging strand

2.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bubble formed; held open and stabilized by ssb proteins

3a.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lays down RNA primer to start replication

1.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unwinds DNA at origins of replication

4.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ strand grows in 3’ 🡪 5’ direction by the addition of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fragments

3b.

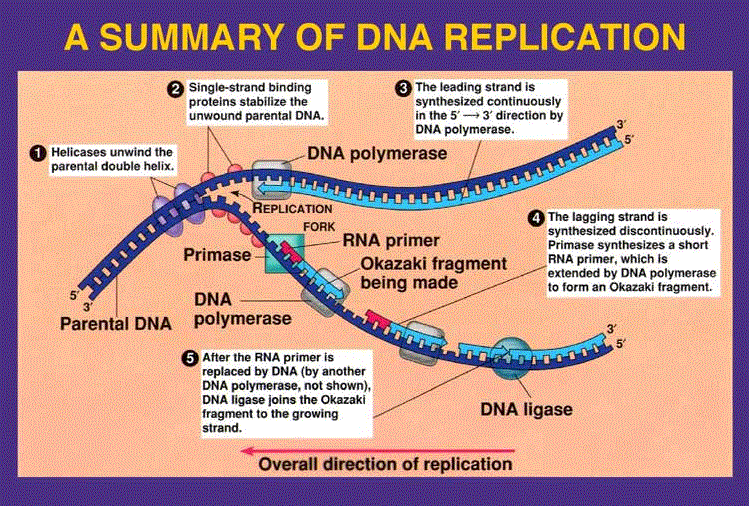
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ add complementary bases to ***leading strand*** (added to 3” end of nucleotide)

New DNA made in \_\_\_\_\_\_\_\_\_\_ direction

**GOTTA KNOW:**

HELICASE DNA POLYMERASE (I, III) LEADING vs LAGGING STRAND

PRIMASE REPLICATION OCCURS 5’ 🡪 3’



**PROTEIN SYNTHESIS**

The Central Dogma explains the direction/flow of genetic information:

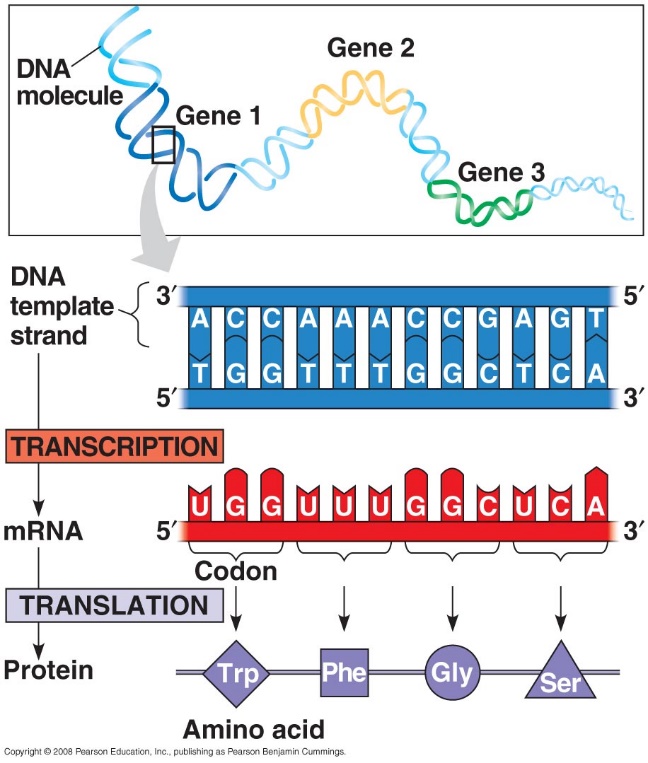


T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_

T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_



TRANSCRIPTION

Template strand -

Complementary Strand -

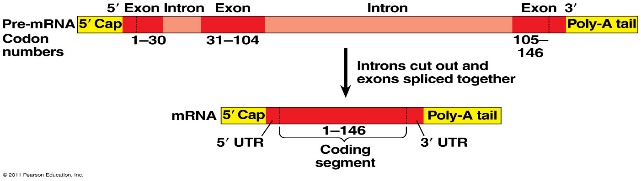
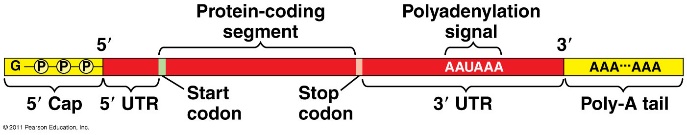
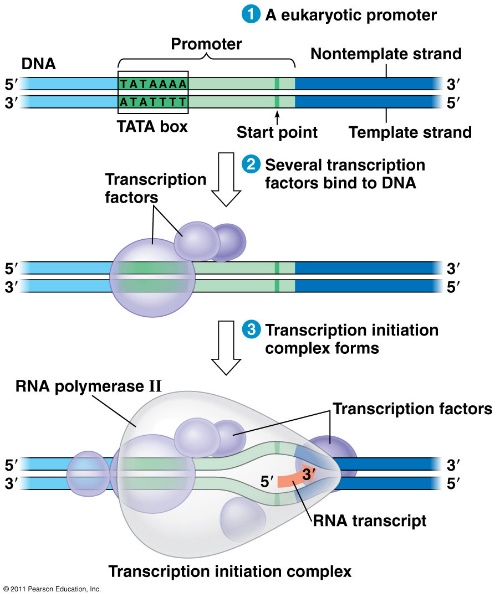
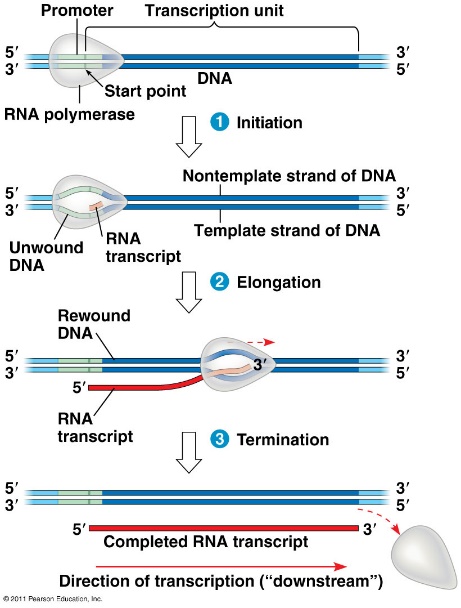
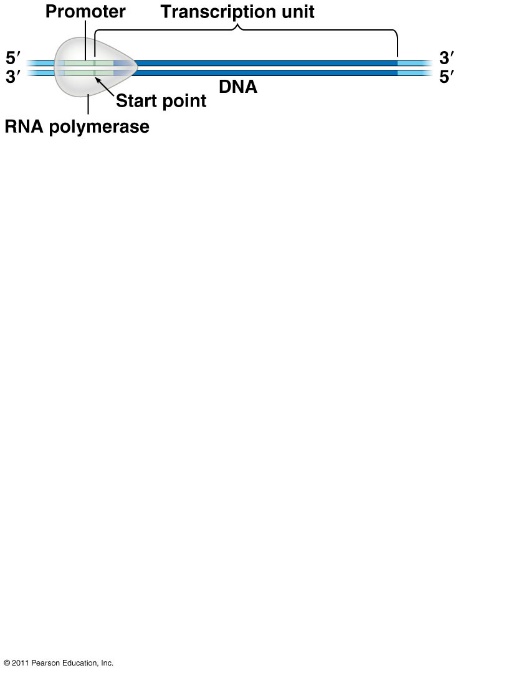
Codon -

**RNA POLYMERASE**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DNA strands and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* mRNA elongates/grows in \_\_\_\_\_\_\_\_\_\_\_\_\_ direction
* Attaches to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (start of gene) and stops at **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (end of gene)

**How is protein synthesis DIFFERENT in PROKARYOTES vs EUKARYOTES?**

Fill in what you remember about **TRANSCRIPTION**! Add as we go.



KEY VOCAB:

Promotor

TATA box

Transcription factors

RNA polymerase

Pre-mRNA vs mature mRNA

5’ cap

Poly-A tail

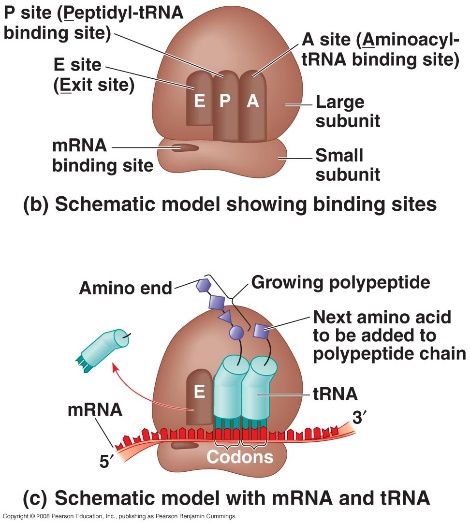
RNA processessing

Splicing

Spliceosomes

Introns

Exons



TRANSLATION

Occurs at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Active sites:

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: holds **AA** to be added
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: holds growing **p**olypeptide chain
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: **e**xit site for tRNA

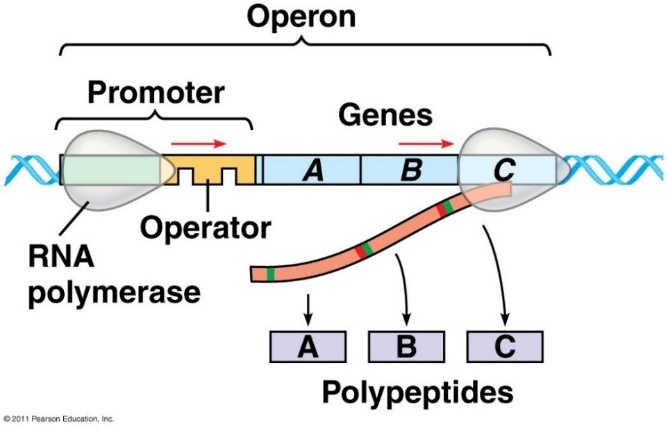
Can more than 1 ribosome translate a single mRNA?

How does protein production differ between…

* (Free) Cytoplasmic Ribosomes
* (Bound) Ribosomes attached to ER

What cell components make up the endomembrane system?

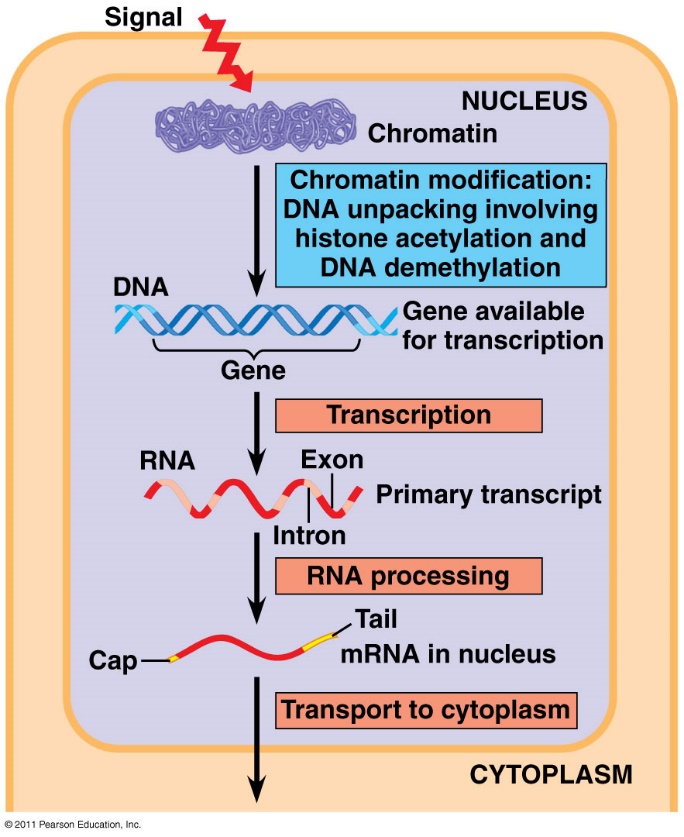
**GENE EXPRESSION IN PROKARYOTES**

* Bacteria respond to environmental changes by regulating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Genes clustered into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (turned on) or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (turned off) 3 parts:

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** – where RNA polymerase attaches to begin transcription
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** – “on/off”, controls access of RNA polymerase to the mRNA
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** – code for related enzymes in a pathway

* **Regulatory genes**: produces **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** protein that binds to operator to block RNA polymerase and turn operon off
* Example of a Repressible Operon:
* Example of an Inducible Operon:

**GENE EXPRESSION IN EUKARYOTES**



In the **nucleus,** there is **chromatin** regulation:

1. **DNA Methylation:**

* methyl groups added to DNA
* keeps DNA/chromosome \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, unaccusable
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ transcription
* (turns genes \_\_\_\_\_\_\_\_\_)

1. **Histone Acetylation:**

* acetyl groups added to histones
* chromatin \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – easily accessed
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ transcription
* (turns genes \_\_\_\_\_\_\_\_)

In the **nucleus**, **transcription** is regulated by:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that bind to control regions of the DNA; 2 kinds:
   1. **Activators**:
   2. **Repressors**:
2. Transcription regulation by micro RNAs and small interfering RNAs
3. RNA Processing:

In the **cytoplasm**, **translation** is regulated by: