TRANSCRIPTION

- the process of copying the DNA code onto a strand of RNA

Initiation
- RNA Polymerase binds to the segment of DNA that is to be transcribed, opening up the double helix
- it binds just before the actual gene to be transcribed
- this area is called the **promoter**, a base sequence that signals the beginning of a gene
- see Fig. 2 a and b on pg. 243

Elongation
- mRNA is built in the direction of 5' to 3'
- mRNA will use one side of the DNA, called the **template** and copy the code (mRNA is complementary to the **template** strand
- the DNA strand not used in transcription is the coding strand and is identical to the mRNA (except for T in DNA and U in mRNA)
- instead of Thymine mRNA uses Uracil
- as the DNA is transcribed it winds back up
- see Fig. 2 c - e on pg. 243

Termination
- RNA polymerase will stop transcribing when it reaches a **terminator sequence**
- mRNA and RNA polymerase will be released
- see Fig. 2f on pg. 243

Posttranscriptional Modifications
- modifications are made to the **primary transcript**
- a **5' cap** is added to protect the mRNA from being digested by enzymes (nucleases and phosphatases)
- a 3' tail, (**poly-A tail)** consisting of 200 adenine ribonucleotides is added with the help of **poly-A polymerase**
- the cap promotes the binding of mRNA to a ribosome, and the tail will gradually be destroyed by enzymes
- **introns** are pieces of DNA strand that is not incorporated into an amino acid sequence
- introns separate **exons** (pieces of DNA that are incorporated into an amino acid sequence)
- if the introns are included the protein produced will not fold properly and will be dysfunctional
- **spliceosomes** (particles made of protein and RNA) separate out introns from exons
- the introns stay inside the nucleus where they are broken down and the nucleotides are recycled
- see Fig. 4 on Pg. 244
- the **mRNA transcript** is now ready to leave the nucleus; it is not checked for accuracy

Seatwork

Pg. 249 # 1 - 12