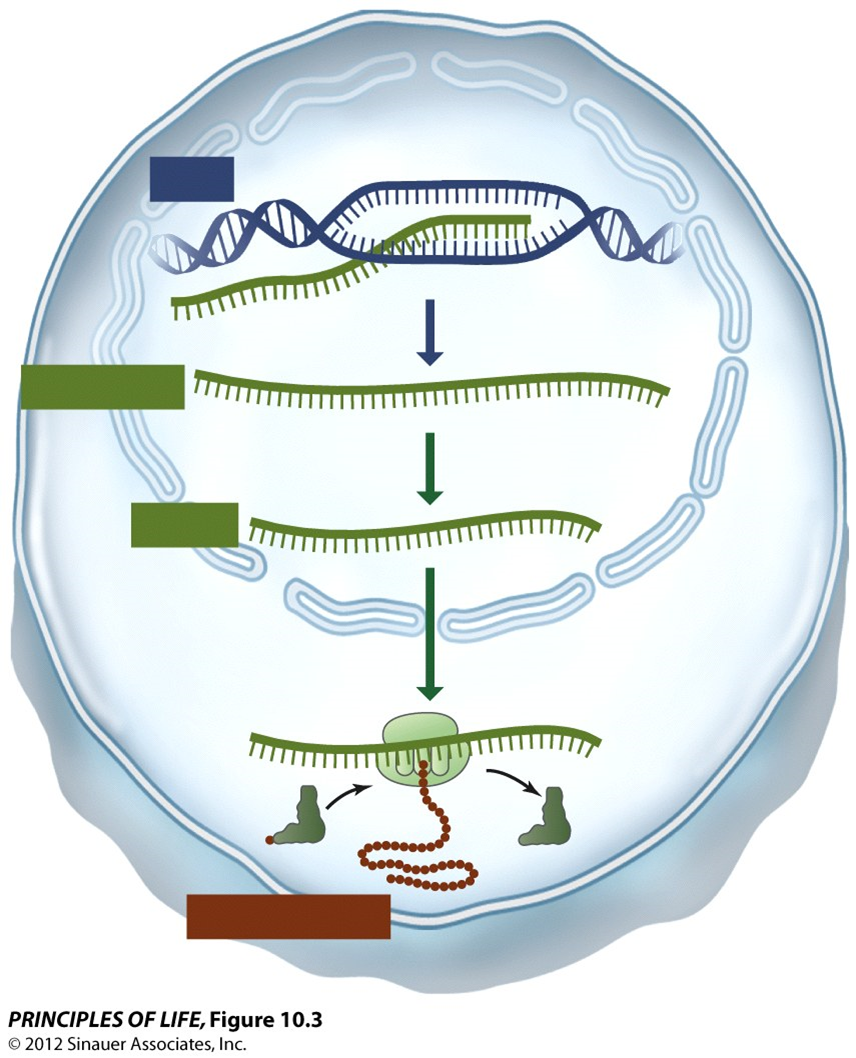
**Chapter 10 Reading Guide: From DNA to Protein**

**Concept 10.1: Genetics Show That Genes Code for Proteins**

1. “One gene-one polypeptide” –
2. Molecular biology
3. Gene expression
   1. Transcription
      1. DNA template
      2. mRNA
   2. translation
      1. rRNA
      2. tRNA

**Concept 10.2: DNA Expression Begins with Its Transcription to RNA**

1. components of transcription
   1. DNA template
   2. Nucleoside triphosphates (substrates)
   3. RNA polymerase
2. Transcription occurs in three steps
   1. Initiation
      1. RNA polymerase
      2. Promoter
   2. Elongation
      1. RNA polymerase
         1. Unwinds
         2. Reads
         3. Adds
      2. mRNA is antiparallel to DNA template
      3. mRNA is complementary to DNA template
   3. termination
3. pre-mRNA is modified
   1. introns are removed
      1. introns
      2. exons
      3. spliceosome
   2. ends are chemically modified
      1. 5’ cap
      2. Poly-A tail



**Concept 10.3: The Genetic Code in RNA Is Translated into the Amino Acid Sequences of Proteins**

1. Codons
   1. 20 different aa
   2. Start codon
   3. Stop codon
2. Characteristics of the genetic code
   1. Redundant
   2. Universal
3. Mutations and the genetic code
   1. Point
   2. Silent
   3. Missense
   4. Nonsense
   5. Frame-shift

**Concept 10.4: Translation of the Genetic Code Is Mediated by tRNA and Ribosomes**

1. tRNAs
   1. bind to amino acids at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_site
   2. bind to mRNA via the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. aa specific
2. ribosomes
   1. structure
      1. large subunit
         1. A site
         2. P site
         3. E site
      2. Small subunit
3. Translation takes place in three steps
   1. Initiation
      1. Initiation complex
      2. Start codon
   2. Elongation
      1. First tRNA moves
      2. Second tRNA binds
      3. Peptide bond forms between two aa
      4. First tRNA is released
   3. Termination
      1. Stop codon
      2. Protein release factor

**Concept 10.5: Proteins Are Modified after Translation**

1. Signal sequence
2. Modifications
   1. Proteolysis
   2. Glycosylation
   3. phosphorylation