Always know the vocabulary!

___ 5.1 Explain the flow of information from DNA to RNA to protein (i.e. the central dogma of molecular biology). (pg. 225)

___ 5.2 Explain the role of transcription in the flow of genetic information. (pg. 225-228)
   5.2.A Identify the location of transcription in the cell. (pg. 225)
   5.2.B Identify what is made at the end of transcription. (pg. 225)
   5.2.C Describe the structure of RNA and how it differs from DNA. (pg. 225-226)
   5.2.D Given a strand of DNA, transcribe it into RNA. (pg. 226-226 & class notes)

___ 5.3 Explain the role of translation in the flow of genetic information. (pg. 225, 229-233)
   5.3.A Identify the location of translation in the cell. (pg. 225)
   5.3.B Identify what is made at the end of translation. (pg. 225)
   5.3.C Explain the importance of the ribosome, codons, and the genetic code in the process of translation. (pg. 229-233)
   5.3.D Given a strand of RNA, translate it into protein. (Note: You will be given a copy of the genetic code to use on your test.) (pg. 230)
   5.3.E Explain how the ribosome knows where to begin and end translation. (pg. 230)

___ 5.4 Explain mutations and the possible effect they may or may not have on a protein. (pg. 238-241)
   5.4.A Define mutation and mutagen. (pg. 238, 241)
   5.4.B Differentiate between base substitutions, insertions, and deletions. (pg. 238-239)
   5.4.C Explain why each type of mutation may or may not alter the structure and function of a protein. (pg. 238-240)
   5.4.D Explain how mutations can be beneficial, negative, or have no impact on the organism they occur in. (pg. 238-240 & class notes)
   5.4.E Describe errors or mutations that affect more than one gene, including nondisjunction, large scale insertions and deletions, and translocations. (pg. 239 & class notes)
5.5 Explain how differences in gene expression can lead to variances in cellular differentiation. (pg. 144-147)

5.5.A Explain how two cells with the same DNA can have entirely different structures and functions. (pg. 144-145)

5.5.B Define stem cells, and explain the differences between adult and embryonic stem cells. (pg. 145-147)

5.6 Explain how restriction maps are generated and how they can be used as a tool in molecular biology. (pg. 248-251, 256-258)

5.6.A Explain how restriction enzymes work and what they do to the DNA they are exposed to. (pg. 249-250)

5.6.B Explain the principles of gel electrophoresis, including why different bands travel different lengths of a gel and how it can be used with restriction enzymes to identify unique segments of DNA. (pg. 250-251)

5.6.C Define DNA fingerprinting, and explain how it can be used with restriction enzymes and gel electrophoresis to identify individuals. (pg. 251, 256-258)

5.6.D Explain the importance of PCR to the process of gel electrophoresis. (pg. 253)

5.7 Explain how an entire animal can be cloned. (pg. 259 & class notes)

5.8 Explain how bacteria have been engineered to carry certain genes. (pg. 260-263)

5.8.A Define genetic engineering and recombinant DNA technology. (pg. 260)

5.8.B Explain how plasmids, restriction enzymes, and ligases can be used to introduce a piece of DNA into a bacterial cell. (pg. 260-261 & class notes)

5.8.C Provide examples of how genetic engineering has been used to benefit humans. (pg. 261-263)

5.8.D Explain common concerns about the use of genetic engineering and the organisms it produces. (pg. 263)

5.9 Describe the two main goals of the Human Genome Project, and identify which of these goals scientists are still working on today. (pg. 264-265)

5.9.A Define genomics, and explain how genome sequencing has benefitted the study of genomics. (pg. 264-265)

***Note: When studying, class notes should be used to study ALL Learning Targets. The targets above that specifically refer to class notes are targets that were covered in class to a depth deeper than what is described in your textbook.***