

Student: \_\_\_\_\_

1. This term describes how cells display their genetic characteristics.
  - A. transcription
  - B. gene expression
  - C. translation
  - D. gene phrasing
2. Which one of the following does NOT apply to RNA?
  - A. It is a single strand.
  - B. It contains the base uracil.
  - C. The sugar is deoxyribose.
  - D. It is involved in translation and transcription.
3. DNA nucleotide sequences that indicate when RNA polymerase should finish making an RNA molecule are called
  - A. enhancer sequences.
  - B. elongation sequences.
  - C. genetic recombinant sequences.
  - D. termination sequences.
4. Which of the following does NOT follow the base pairing rule?
  - A. A with T
  - B. G with C
  - C. U with D
  - D. U with A
5. Both a base and a phosphate are attached \_\_\_\_ in a nucleotide.
  - A. to each other
  - B. to a sugar
  - C. to each other and to a sugar
  - D. None of these answers is true because phosphate is not part of a nucleotide.
6. The process of translation can be broken down into three basic steps. Which of the following is NOT one of these?
  - A. initiation
  - B. elongation
  - C. translocation
  - D. termination
7. In a DNA double helix, the phosphates are bonded to
  - A. phosphates.
  - B. ribose.
  - C. deoxyribose.
  - D. uracil.
8. These proteins are clustered with their encircling DNA into structures called nucleosomes.
  - A. histones
  - B. plastids
  - C. exons
  - D. carrier proteins

9. Which of the following is NOT one of the 4 types of chromosomal aberrations?
- A. translocation
  - B. duplication
  - C. inversion
  - D. alternative reversions
10. In DNA replication,
- A. a new noncoding strand is made for the coding strand.
  - B. a new coding strand is made for the noncoding strand.
  - C. Both of these occur.
  - D. None of these occur.
11. When a gene picks up nucleotides to build its noncoding strand, this is known as
- A. DNA replication.
  - B. RNA transcription.
  - C. DNA translation.
  - D. RNA coverage.
12. In the process of DNA replication, adenine will pair with
- A. guanine.
  - B. cytosine.
  - C. thymine.
  - D. uracil.
13. Which of these **originally** tells where an amino acid is to be positioned in a protein?
- A. DNA
  - B. nucleus
  - C. tRNA
  - D. ribose RNA
14. If all the possible three-letter codes were written using only the four DNA nucleotides for letters, there would be a total of \_\_\_\_\_ combinations possible.
- A. 4
  - B. 20
  - C. 64
  - D. 32
15. Transfer RNA(tRNA) functions in the process of \_\_\_\_\_.
- A. DNA replication.
  - B. transcription.
  - C. translation.
  - D. none of these.
16. Which of the following contains a coded message of how to construct a protein?
- A. ATP
  - B. tRNA
  - C. ribosome
  - D. mRNA
17. Which of the following is a normally correct base pairing in transcription?
- A. (DNA)A...U(mRNA)
  - B. (mRNA)C...G(tRNA)
  - C. (DNA)U...A(mRNA)
  - D. (DNA)A...T(tRNA)

18. If a gene contains a guanine nucleotide, the transcribed messenger RNA would have
- adenine.
  - uracil.
  - cytosine.
  - guanine.
19. If the sequence of bases in mRNA is U, C, A, the sequence of bases in **DNA** is
- A, G, and U.
  - A, G, and T.
  - A, C, and A.
  - T, G, and U.
20. In transcription, the base thymine in DNA will pair opposite the base \_\_\_\_ in mRNA.
- uracil
  - guanine
  - cytosine
  - adenine
21. In translation, a cytosine in tRNA pairs opposite
- uracil.
  - guanine.
  - thymine.
  - adenine.
22. If the mRNA sequence is C, G, and U, the matching tRNA sequence will be
- G, C, and T.
  - G, C, and A.
  - G, C, and U.
  - C, G, and A.
23. If the mRNA base is uracil, the complementary base in translation is
- thymine.
  - cytosine.
  - adenine.
  - uracil.
24. An mRNA molecule leaves the nucleus containing the following base sequence: CAC GUA GUA CCC. Which is the correct complementary base sequence for translation?
- CAC GUA GUA CCC
  - CAC GTA GTA CCC
  - GUG CAU CAU GGG
  - GTG CAT CAT GGG
25. A group of three mRNA nucleotides that translate to an amino acid is called a(n)
- dictionary.
  - initiator.
  - codon.
  - uncodon.
26. If a bacterial protein contains 150 amino acids, there would be how many codons in the specification to construct it?
- 50
  - 150
  - 450
  - One cannot tell what the answer is.

27. The beginning codon of an mRNA strand to produce a protein is a(n)  
A. codon.  
B. initiator/start codon.  
C. terminator/stop codon.  
D. anticodon.
28. A codon calls for the placement of an individual  
A. protein.  
B. rRNA.  
C. amino acid.  
D. mRNA.
29. A codon contains \_\_\_\_ nucleotides.  
A. one  
B. two  
C. three  
D. four
30. What is the term used to describe segments of eukaryotic pre-mRNA that are removed in the final synthesis of mature mRNA?  
A. introns  
B. promoters  
C. exons  
D. terminator
31. In the mRNA codons, UUU encodes for phenylalanine (Phe), AGU encodes for serine (Ser), UGG encodes for tryptophan (Try), and CGA encodes for arginine (Arg). The DNA base sequence to encode for a protein try-arg-ser would be  
A. ACCGCTTCA.  
B. TCCGCUUCA.  
C. UCCGCTTCU.  
D. UGGCGAAGU.
32. In mRNA codons: UUU = phenylalanine, GUU = valine, UAU = tyrosine, UGU = cystine, GGU = glycine. If the third amino acid in a protein were valine, the codon sequence for that amino acid would be  
A. UAU.  
B. GGU.  
C. UUU.  
D. GUU.
33. If the codon AUC codes for the placement of the amino acid isoleucine, and GGU codes for the placement of glycine, which of these sequences codes for glycine-isoleucine-isoleucine-glycine?  
A. AUCGGUUGGCUA  
B. GGUAUCCUAUGG  
C. GGUAUCGGUAUC  
D. GGUAUCAUCGGU
34. If the mRNA codon for proline can be CCU, CCC, CCA, or CCG, an mRNA strand to encode for the use of proline in a protein could be  
A. GGG.  
B. GGA.  
C. CCC.  
D. All of these answers are true.

35. Which of the following would demonstrate a point mutation to the following DNA sequence: CAT GAT ATC?
- A. GUACUAUAG
  - B. AUGCUAUAG
  - C. CATCATATC
  - D. GUAAUCAUG
36. If a protein is supposed to consist of the amino acid sequence valine-valine-histidine and instead it consists of the sequence alanine-valine-histidine, most likely
- A. there has been a point mutation in the first codon.
  - B. there has been a point mutation at the eighth base pair.
  - C. the change will not be noticed.
  - D. this is a gross mutation; the organism will not survive.
37. A change of information from normal hemoglobin to sickle hemoglobin is a
- A. gross mutation.
  - B. structural mutation.
  - C. point mutation.
  - D. natural result of your skin color.
38. In the mRNA codon, AGU encodes for serine (ser), GAG encodes for glutamic acid (glu), GGG encodes for glycine (gly) and UGG encodes for tryptophan (try). If an mRNA sequence was GGGGAGUGG and mutated so it now reads UGGGAGUGG, a new amino acid will replace
- A. glutamic acid.
  - B. tryptophan.
  - C. glycine.
  - D. serine.
39. If the base in a DNA strand is changed from cytosine to adenine, the base pair in mRNA is
- A. uracil.
  - B. cytosine.
  - C. thymine.
  - D. guanine.
40. When only one nucleotide base is involved in a mutation, this is called
- A. chromosomal mutation.
  - B. template error.
  - C. point mutation.
  - D. nonsense codon.
41. During which stage do two tRNAs properly align their two amino acids so that they may be chemically attached to one another?
- A. translation
  - B. transcription
  - C. replication
  - D. mutation
42. A human cell contains 46 chromosomes consisting of about \_\_\_\_\_ genes.
- A. 50
  - B. 25,000
  - C. 80,000,000
  - D. 3,000,000
43. This kind of mutation causes a ribosome to stop protein syntheses by introducing a stop codon too early.
- A. missence
  - B. nonsense
  - C. point
  - D. All of these answers are true.

44. The primary way that genes control the activities of a cell is by means of
- hormones.
  - electrical impulses.
  - ATP.
  - enzymes.
45. In a complete chemical analysis of double-stranded DNA, which would **always** be true?
- The amount of adenine equals the amount of thymine.
  - The amount of thymine equals the amount of cytosine.
  - The amount of ribose equals the amount of deoxyribose.
  - Nitrogenous bases pair with sugar.
46. Which is the **best** reason for adenine base-pairing with thymine in DNA?
- The two molecules covalently bond together.
  - Both are large bases and, therefore, bond tightly.
  - Both are small bases and, therefore, bond tightly.
  - These two bases fit together like jigsaw puzzle pieces.
47. Nucleic acid is found
- only in animal cells.
  - only in plant cells.
  - in all living cells.
  - only in carbohydrates.
48. Which of the following is the correct sequence of events in protein synthesis?
- DNA-tRNA-mRNA-Protein
  - mRNA-tRNA-Ribosome-Protein
  - DNA-mRNA-tRNA-Ribosome-Protein
  - tRNA-mRNA-DNA-Protein
49. You are given the chemical code of one-half of a DNA double helix: CATGATTACCTAGAATCCTGTAAT. Which of the following sequences represents the codons and anticodons that would be used in creating a protein if the other half of the DNA strand is the coding strand?
- mRNA codons: CATGATTACCTAGAATCCTGTAAT tRNA anticodons: CATGATTACCTAGAATCCTGTAAT
  - mRNA codons: CAUGAUUACCUAGAAUCCUGUAAU tRNA anticodons: GUACUAAUGGAUCUUAGGACAUUA
  - mRNA codons: CATGATTACCTAGAATCCTGTAAT tRNA anticodons: CAUGAUUACCUAGAAUCCUGUAAU
  - mRNA codons: GUACUAAUGGAUCUUAGGACAUUA tRNA anticodons: CAUGAUUACCUAGAAUCCUGUAAU
50. The process of making a DNA copy of a DNA molecule is
- transcription.
  - replication.
  - translation.
  - protein synthesis.
51. The process of manufacturing RNA from template DNA is
- transcription.
  - replication.
  - translation.
  - protein synthesis.

52. Base pairs in DNA are attracted to each other by  
A. ionic bonds.  
B. covalent bonds.  
C. hydrogen bonds.  
D. unzipping enzymes.
53. \_\_\_\_ is(are) NOT **directly** involved with translation.  
A. DNA  
B. mRNA  
C. tRNA  
D. Ribosome
54. \_\_\_\_ is(are) NOT **directly** involved with transcription.  
A. Unzipping enzymes  
B. RNA polymerase  
C. Amino acids  
D. DNA
55. \_\_\_\_ represents the complementary strand of DNA for gene segment GCCAATGCT.  
A. CGGUUACGA  
B. CGGTTACGA  
C. GCCAATGCT  
D. GCCAAUGCU
56. \_\_\_\_ represents the mRNA that will be produced from DNA gene segment GCCAATGCT.  
A. CGGUUACGA  
B. CGGTTACGA  
C. GCCAATGCT  
D. GCCAAUGCU
57. \_\_\_\_ represents the transfer RNA bases that correspond to DNA gene segment GCCAATGCT.  
A. CGGUUACGA  
B. CGGTTACGA  
C. GCCAATGCT  
D. GCCAAUGCU
58. Which one of the following is **true** of your mRNA?  
A. The **mature** mRNA is produced **directly** from DNA.  
B. A **pre-mRNA** is produced **directly** from DNA, and then a mature mRNA is created by the removal of introns.  
C. A **pre-mRNA** is produced **directly** from DNA and then a mature mRNA is created by the removal of exons.  
D. DNA is produced **directly** from mRNA.
59. Asp, Gln, Leu, and Phe are all abbreviations for  
A. codons.  
B. **RNA polymerase**.  
C. **amino acids**.  
D. anticodons.
60. This kind of **mutation** causes the wrong amino acid to be used in making a protein.  
A. **missense**  
B. **nonsense**  
C. **point**  
D. silent

61. A single-stranded, straight chain copy of a coding strand of DNA that comes from the process of transcription is
- A. DNA.
  - B. tRNA.
  - C. mRNA.
  - D. rRNA.
62. The molecule that contains an anticodon is
- A. DNA.
  - B. tRNA.
  - C. mRNA.
  - D. rRNA.
63. The molecule that carries the message of the gene from the nucleus to the ribosome is
- A. DNA.
  - B. tRNA.
  - C. mRNA.
  - D. rRNA.
64. The molecule that carries the amino acid to the ribosome is
- A. DNA.
  - B. tRNA.
  - C. mRNA.
  - D. rRNA.
65. A molecule that is a component of a ribosome is
- A. DNA.
  - B. tRNA.
  - C. mRNA.
  - D. rRNA.
66. During transcription, free nucleotides of RNA bond with \_\_\_\_ nucleotides.
- A. DNA
  - B. other tRNA
  - C. mRNA
  - D. rRNA
67. \_\_\_\_ code(s) for the placement of one amino acid.
- A. Three codons
  - B. One nucleotide
  - C. Three nucleotides
  - D. One intron
68. The promoter sequence of DNA is located
- A. behind the initiator codon.
  - B. ahead of the initiator codon.
  - C. immediately ahead of the gene.
  - D. behind the gene.
69. This occurs when insertions or deletions cause the ribosome to read the wrong sets of three nucleotides.
- A. point mutation
  - B. frameshift
  - C. translocation
  - D. transcription



70. If a drug interferes with the activities of transfer RNA, which one of the following is likely to occur?
- A. DNA will not be able to make copies of itself.
  - B. Proteins will not be produced.
  - C. Mutations will occur to the DNA.
  - D. Messenger RNA will not be manufactured.
71. Which of the following is necessary for DNA to make copies of itself?
- A. Ribosomes must be present.
  - B. The cell must have an abundant supply of RNA nucleotides.
  - C. The two strands of the DNA molecule must separate.
  - D. Chromosomes must be synapsed.
72. If a bacterial protein contains 5 amino acids, the messenger RNA that would direct its manufacture would have at least \_\_\_\_\_ nucleotides.
- A. one
  - B. five
  - C. ten
  - D. fifteen
73. If you want to get DNA from a eukaryotic cell, which of the following structures would provide the largest concentration?
- A. ribosome
  - B. nucleus
  - C. mitochondria
  - D. lysosome
74. If a drug interferes with the function of ribosomes, which of the following is likely to occur?
- A. DNA will not be able to make copies of itself.
  - B. Proteins will not be produced.
  - C. Mutations will occur to the DNA.
  - D. Messenger RNA will not be manufactured.
75. Which one of the following is necessary for messenger RNA to be formed in the nucleus?
- A. Ribosomes must be present.
  - B. The cell must have an abundant supply of DNA nucleotides.
  - C. RNA polymerase must be present and functioning.
  - D. Chromosomes must be synapsed.
76. If a single strand of mature messenger RNA contains 12 coding nucleotides, the protein that it will manufacture will have \_\_\_\_\_ amino acids.
- A. one
  - B. four
  - C. six
  - D. twelve
77. Which of the following does NOT belong in DNA?
- A. nucleotides
  - B. ribose
  - C. thymine
  - D. phosphate
78. Which one of the following correctly describes the way in which DNA works?
- A. DNA makes RNA and RNA changes into protein.
  - B. DNA makes amino acids which form ribosomes.
  - C. DNA makes mRNA which directs where tRNA places amino acids.
  - D. DNA makes mRNA which manufactures amino acids which attach to tRNA.

79. Which of the following is NOT needed for transcription?
- A. enzymes
  - B. DNA
  - C. RNA nucleotides
  - D. ribosomes
80. Which of the following is NOT a characteristic of genetic material?
- A. It has the ability to replicate itself.
  - B. It is capable of storing the information needed to synthesize proteins.
  - C. It may mutate (change) and accommodate new situations.
  - D. It is metabolized as the chief source of cellular energy.
81. Which is NOT a component of RNA?
- A. deoxyribose
  - B. adenine
  - C. phosphate
  - D. uracil
82. Which enzyme is used in the synthesis of new eukaryotic genetic material?
- A. DNA polymerase
  - B. tyrosine
  - C. RNA polymerase
  - D. reverse transcriptase
83. "Bubbles" along a strand of DNA indicate that
- A. DNA replication is occurring.
  - B. RNA synthesis is taking place.
  - C. transcription is occurring.
  - D. All of these are possible.
84. The terms exon and intron are best associated with
- A. transcription.
  - B. translation.
  - C. replication.
  - D. prokaryotic cells.
85. If an RNA does not normally code for a protein, then
- A. it is mature mRNA.
  - B. the RNA is pre-mRNA.
  - C. it is probably tRNA or rRNA
  - D. the RNA is a lipid.
86. Not every piece of DNA is used in a cell to make proteins because
- A. some of the DNA is used for regulation of gene expression.
  - B. not all genes are needed in every cell.
  - C. some sequences are needed to stabilize the end of the chromosomes.
  - D. All of the choices are correct.
87. "Since every cell in this patient's body has the same genetic change, it is most likely that . . ."
- A. he acquired this change from one of his parents.
  - B. he was exposed to mutagenic agents.
  - C. his mother was the only source of the mutant gene.
  - D. All of the choices are true.

88. These structures are required for chromosome replication; they protect the chromosome from being destroyed by dangerous DNAase enzymes, and they keep chromosomes from bonding to one another end to end.
- A. telomeres
  - B. nucleoproteins
  - C. histones
  - D. nucleotides
89. The enzyme transcriptase would be used to accomplish which of the following?
- A. DNA → DNA
  - B. DNA → RNA
  - C. RNA → RNA
  - D. RNA → protein
90. Cells regulate gene expression by
- A. producing termination factors.
  - B. turning on DNAase genes.
  - C. adding histones to the DNA.
  - D. limiting the length of time that mRNA is available for translation.

## 8 Key

1. This term describes how cells display their genetic characteristics.
- A. transcription
  - B. gene expression**
  - C. translation
  - D. gene phrasing

Blooms Level: 1. Remember  
Enger - Chapter 08 #1

Learning Outcome: State why single cellular and multicellular organisms control gene expression.  
Section: 08.01

Topic: Molecular Biology

2. Which one of the following does NOT apply to RNA?
- A. It is a single strand.
  - B. It contains the base uracil.
  - C. The sugar is deoxyribose.**
  - D. It is involved in translation and transcription.

Blooms Level: 2. Understand  
Enger - Chapter 08 #2

Learning Outcome: State the nucleotides commonly found in DNA and RNA.  
Section: 08.03

Topic: Molecular Biology

3. DNA nucleotide sequences that indicate when RNA polymerase should finish making an RNA molecule are called
- A. enhancer sequences.
  - B. elongation sequences.
  - C. genetic recombinant sequences.
  - D. termination sequences.**

Blooms Level: 2. Understand  
Enger - Chapter 08 #3

Section: 08.04

Topic: Molecular Biology

4. Which of the following does NOT follow the base pairing rule?
- A. A with T
  - B. G with C
  - C. U with D**
  - D. U with A

Blooms Level: 1. Remember  
Enger - Chapter 08 #4

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.  
Section: 08.02

Topic: Molecular Biology

5. Both a base and a phosphate are attached \_\_\_\_ in a nucleotide.
- A. to each other
  - B. to a sugar**
  - C. to each other and to a sugar
  - D. None of these answers is true because phosphate is not part of a nucleotide.

Blooms Level: 2. Understand  
Enger - Chapter 08 #5

Learning Outcome: State the nucleotides commonly found in DNA and RNA.  
Section: 08.02

Topic: Molecular Biology

6. The process of translation can be broken down into three basic steps. Which of the following is NOT one of these?
- A. initiation
  - B. elongation
  - C. translocation**
  - D. termination

Blooms Level: 1. Remember  
Enger - Chapter 08 #6

Learning Outcome: Define gene, transcription, translation.  
Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

7. In a DNA double helix, the phosphates are bonded to
- A. phosphates.
  - B. ribose.
  - C. deoxyribose.**
  - D. uracil.

Blooms Level: 1. Remember  
Enger - Chapter 08 #7

Learning Outcome: State the nucleotides commonly found in DNA and RNA.  
Section: 08.02

Topic: Molecular Biology

8. These proteins are clustered with their encircling DNA into structures called nucleosomes.
- A. histones**
  - B. plastids
  - C. exons
  - D. carrier proteins

Blooms Level: 1. Remember  
Enger - Chapter 08 #8

Learning Outcome: Define gene, transcription, translation.  
Section: 08.05

Topic: Molecular Biology

9. Which of the following is NOT one of the 4 types of chromosomal aberrations?
- A. translocation
  - B. duplication
  - C. inversion
  - D. alternative reversions**

Blooms Level: 1. Remember  
Enger - Chapter 08 #9

Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.  
Section: 08.06

Topic: Molecular Biology

10. In DNA replication,
- A. a new noncoding strand is made for the coding strand.
  - B. a new coding strand is made for the noncoding strand.
  - C. Both of these occur.**
  - D. None of these occur.

Blooms Level: 2. Understand  
Enger - Chapter 08 #10

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.  
Section: 08.02

Topic: Molecular Biology

11. When a gene picks up nucleotides to build its noncoding strand, this is known as
- A. DNA replication.**
  - B. RNA transcription.
  - C. DNA translation.
  - D. RNA coverage.

Blooms Level: 1. Remember  
Enger - Chapter 08 #11

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.  
Section: 08.02

Topic: Molecular Biology

12. In the process of DNA replication, adenine will pair with  
A. guanine.  
B. cytosine.  
C. thymine.  
D. uracil.

Blooms Level: 1. Remember  
Enger - Chapter 08 #12

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.  
Section: 08.02

Topic: Molecular Biology

13. Which of these **originally** tells where an amino acid is to be positioned in a protein?  
A. DNA  
B. nucleus  
C. tRNA  
D. ribose RNA

Blooms Level: 2. Understand  
Enger - Chapter 08 #13

Learning Outcome: Define gene, transcription, translation.  
Section: 08.02

Topic: Molecular Biology

14. If all the possible three-letter codes were written using only the four DNA nucleotides for letters, there would be a total of \_\_\_\_\_ combinations possible.  
A. 4  
B. 20  
C. 64  
D. 32

Blooms Level: 2. Understand  
Enger - Chapter 08 #14

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.02

Section: 08.04

Topic: Molecular Biology

15. Transfer RNA(tRNA) functions in the process of \_\_\_\_\_.  
A. DNA replication.  
B. transcription.  
C. translation.  
D. none of these.

Blooms Level: 1. Remember  
Enger - Chapter 08 #15

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

16. Which of the following contains a coded message of how to construct a protein?  
A. ATP  
B. tRNA  
C. ribosome  
D. mRNA

Blooms Level: 1. Remember  
Enger - Chapter 08 #16

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

17. Which of the following is a normally correct base pairing in transcription?  
A. (DNA)A...U(mRNA)  
B. (mRNA)C...G(tRNA)  
C. (DNA)U...A(mRNA)  
D. (DNA)A...T(tRNA)

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #17

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

18. If a gene contains a guanine nucleotide, the transcribed messenger RNA would have  
A. adenine.  
B. uracil.  
**C. cytosine.**  
D. guanine.

Blooms Level: 1. Remember  
Enger - Chapter 08 #18

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

19. If the sequence of bases in mRNA is U, C, A, the sequence of bases in **DNA** is  
A. A, G, and U.  
**B. A, G, and T.**  
C. A, C, and A.  
D. T, G, and U.

Blooms Level: 2. Understand  
Enger - Chapter 08 #19

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

20. In transcription, the base thymine in DNA will pair opposite the base \_\_\_\_\_ in mRNA.  
A. uracil  
B. guanine  
C. cytosine  
**D. adenine**

Blooms Level: 1. Remember  
Enger - Chapter 08 #20

Learning Outcome: Define gene, transcription, translation.  
Section: 08.04

Topic: Molecular Biology

21. In translation, a cytosine in tRNA pairs opposite  
A. uracil.  
**B. guanine.**  
C. thymine.  
D. adenine.

Blooms Level: 1. Remember  
Enger - Chapter 08 #21

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

22. If the mRNA sequence is C, G, and U, the matching tRNA sequence will be  
A. G, C, and T.  
**B. G, C, and A.**  
C. G, C, and U.  
D. C, G, and A.

Blooms Level: 2. Understand  
Enger - Chapter 08 #22

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.04

Topic: Molecular Biology

23. If the mRNA base is uracil, the complementary base in translation is  
A. thymine.  
B. cytosine.  
**C. adenine.**  
D. uracil.

Blooms Level: 1. Remember  
Enger - Chapter 08 #23

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.  
Section: 08.03

Section: 08.04  
Topic: Molecular Biology

24. An mRNA molecule leaves the nucleus containing the following base sequence: CAC GUA GUA CCC. Which is the correct complementary base sequence for translation?
- A. CAC GUA GUA CCC
  - B. CAC GTA GTA CCC
  - C. GUG CAU CAU GGG**
  - D. GTG CAT CAT GGG

Blooms Level: 5. Evaluate

Enger - Chapter 08 #24

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.

Section: 08.04

Topic: Molecular Biology

25. A group of three mRNA nucleotides that translate to an amino acid is called a(n)
- A. dictionary.
  - B. initiator.
  - C. codon.**
  - D. uncodon.

Blooms Level: 1. Remember

Enger - Chapter 08 #25

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.

Section: 08.03

Section: 08.04

Topic: Molecular Biology

26. If a bacterial protein contains 150 amino acids, there would be how many codons in the specification to construct it?
- A. 50
  - B. 150**
  - C. 450
  - D. One cannot tell what the answer is.

Blooms Level: 3. Apply

Enger - Chapter 08 #26

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.

Section: 08.03

Section: 08.04

Topic: Molecular Biology

27. The beginning codon of an mRNA strand to produce a protein is a(n)
- A. codon.
  - B. initiator/start codon.**
  - C. terminator/stop codon.
  - D. anticodon.

Blooms Level: 1. Remember

Enger - Chapter 08 #27

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.

Section: 08.03

Section: 08.04

Topic: Molecular Biology

28. A codon calls for the placement of an individual
- A. protein.
  - B. rRNA.
  - C. amino acid.**
  - D. mRNA.

Blooms Level: 1. Remember

Enger - Chapter 08 #28

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.

Section: 08.04

Topic: Molecular Biology



29. A codon contains \_\_\_\_ nucleotides.  
A. one  
B. two  
**C. three**  
D. four

Blooms Level: 1. Remember  
Enger - Chapter 08 #29

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.02  
Section: 08.03  
Section: 08.04

Topic: Molecular Biology

30. What is the term used to describe segments of eukaryotic pre-mRNA that are removed in the final synthesis of mature mRNA?  
**A. introns**  
B. promoters  
C. exons  
D. terminator

Blooms Level: 2. Understand  
Enger - Chapter 08 #30

Learning Outcome: Define gene, transcription, translation.  
Learning Outcome: Describe how the processes of transcription and translation relate.  
Section: 08.05

Topic: Molecular Biology

31. In the mRNA codons, UUU encodes for phenylalanine (Phe), AGU encodes for serine (Ser), UGG encodes for tryptophan (Try), and CGA encodes for arginine (Arg). The DNA base sequence to encode for a protein try-arg-ser would be  
**A. ACCGCTTCA.**  
B. TCCGCUUCA.  
C. UCCGCTTCU.  
D. UGGCGAAGU.

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #31

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.05

Topic: Molecular Biology

32. In mRNA codons: UUU = phenylalanine, GUU = valine, UAU = tyrosine, UGU = cystine, GGU = glycine. If the third amino acid in a protein were valine, the codon sequence for that amino acid would be  
A. UAU.  
B. GGU.  
C. UUU.  
**D. GUU.**

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #32

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.05

Topic: Molecular Biology

33. If the codon AUC codes for the placement of the amino acid isoleucine, and GGU codes for the placement of glycine, which of these sequences codes for glycine-isoleucine-isoleucine-glycine?  
**A. AUCGGUUGGCUA**  
B. GGUAUCCUAUGG  
C. GGUAUCGGUAUC  
**D. GGUAUCAUCGGU**

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #33

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.05

Topic: Molecular Biology

34. If the mRNA codon for proline can be CCU, CCC, CCA, or CCG, an mRNA strand to encode for the use of proline in a protein could be
- A. GGG.
  - B. GGA.
  - C. CCC.
  - D. All of these answers are true.

Blooms Level: 2. Understand  
Enger - Chapter 08 #34

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.05

Topic: Molecular Biology

35. Which of the following would demonstrate a point mutation to the following DNA sequence: CAT GAT ATC?
- A. GUACUAUAG
  - B. AUGCUAUAG
  - C. CATCATATC
  - D. GUAAUCAUG

Blooms Level: 2. Understand  
Enger - Chapter 08 #35

Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.  
Section: 08.06

Topic: Molecular Biology

36. If a protein is supposed to consist of the amino acid sequence valine-valine-histidine and instead it consists of the sequence alanine-valine-histidine, most likely
- A. there has been a point mutation in the first codon.
  - B. there has been a point mutation at the eighth base pair.
  - C. the change will not be noticed.
  - D. this is a gross mutation; the organism will not survive.

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #36

Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.  
Section: 08.06

Topic: Molecular Biology

37. A change of information from normal hemoglobin to sickle hemoglobin is a
- A. gross mutation.
  - B. structural mutation.
  - C. point mutation.
  - D. natural result of your skin color.

Blooms Level: 1. Remember  
Enger - Chapter 08 #37

Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.  
Section: 08.06

Topic: Molecular Biology

38. In the mRNA codon, AGU encodes for serine (ser), GAG encodes for glutamic acid (glu), GGG encodes for glycine (gly) and UGG encodes for tryptophan (try). If an mRNA sequence was GGGGAGUGG and mutated so it now reads UGGGAGUGG, a new amino acid will replace
- A. glutamic acid.
  - B. tryptophan.
  - C. glycine.
  - D. serine.

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #38

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.05

Section: 08.06

Topic: Molecular Biology

39. If the base in a DNA strand is changed from cytosine to adenine, the base pair in mRNA is  
A. uracil.  
B. cytosine.  
C. thymine.  
D. guanine.

Blooms Level: 2. Understand  
Enger - Chapter 08 #39

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.

Section: 08.02

Section: 08.04

Topic: Molecular Biology

40. When only one nucleotide base is involved in a mutation, this is called  
A. chromosomal mutation.  
B. template error.  
C. point mutation.  
D. nonsense codon.

Blooms Level: 1. Remember  
Enger - Chapter 08 #40

Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.

Section: 08.06

Topic: Molecular Biology

41. During which stage do two tRNAs properly align their two amino acids so that they may be chemically attached to one another?  
A. translation  
B. transcription  
C. replication  
D. mutation

Blooms Level: 2. Understand  
Enger - Chapter 08 #41

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.

Section: 08.04

Topic: Molecular Biology

42. A human cell contains 46 chromosomes consisting of about \_\_\_\_\_ genes.  
A. 50  
B. 25,000  
C. 80,000,000  
D. 3,000,000

Blooms Level: 1. Remember  
Enger - Chapter 08 #42

Learning Outcome: Define gene, transcription, translation.

Learning Outcome: State why single cellular and multicellular organisms control gene expression.

Section: 08.05

Topic: Molecular Biology

43. This kind of mutation causes a ribosome to stop protein syntheses by introducing a stop codon too early.  
A. missence  
B. nonsense  
C. point  
D. All of these answers are true.

Blooms Level: 1. Remember  
Enger - Chapter 08 #43

Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.

Section: 08.06

Topic: Molecular Biology

44. The primary way that genes control the activities of a cell is by means of
- A. hormones.
  - B. electrical impulses.
  - C. ATP.
  - D. enzymes.**

Blooms Level: 2. Understand  
Enger - Chapter 08 #44  
Learning Outcome: Define gene, transcription, translation.  
Section: 08.01  
Section: 08.02  
Topic: Molecular Biology

45. In a complete chemical analysis of double-stranded DNA, which would **always** be true?
- A. The amount of adenine equals the amount of thymine.**
  - B. The amount of thymine equals the amount of cytosine.
  - C. The amount of ribose equals the amount of deoxyribose.
  - D. Nitrogenous bases pair with sugar.

Blooms Level: 1. Remember  
Enger - Chapter 08 #45  
Learning Outcome: State the nucleotides commonly found in DNA and RNA.  
Section: 08.02  
Topic: Molecular Biology

46. Which is the **best** reason for adenine base-pairing with thymine in DNA?
- A. The two molecules covalently bond together.
  - B. Both are large bases and, therefore, bond tightly.
  - C. Both are small bases and, therefore, bond tightly.
  - D. These two bases fit together like jigsaw puzzle pieces.**

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #46  
Learning Outcome: State the nucleotides commonly found in DNA and RNA.  
Section: 08.02  
Topic: Molecular Biology

47. Nucleic acid is found
- A. only in animal cells.
  - B. only in plant cells.
  - C. in all living cells.**
  - D. only in carbohydrates.

Blooms Level: 1. Remember  
Enger - Chapter 08 #47  
Learning Outcome: Define gene, transcription, translation.  
Section: 08.01  
Topic: Molecular Biology

48. Which of the following is the correct sequence of events in protein synthesis?
- A. DNA-tRNA-mRNA-Protein
  - B. mRNA-tRNA-Ribosome-Protein
  - C. DNA-mRNA-tRNA-Ribosome-Protein**
  - D. tRNA-mRNA-DNA-Protein

Blooms Level: 1. Remember  
Enger - Chapter 08 #48  
Learning Outcome: Describe how the processes of transcription and translation relate.  
Section: 08.04  
Topic: Molecular Biology

49. You are given the chemical code of one-half of a DNA double helix: CATGATTACCTAGAATCCTGTAAT. Which of the following sequences represents the codons and anticodons that would be used in creating a protein if the other half of the DNA strand is the coding strand?
- A. mRNA codons: CATGATTACCTAGAATCCTGTAAT tRNA anticodons: CATGATTACCTAGAATCCTGTAAT
- B. mRNA codons: CAUGAUUACCUAGAAUCCUGUAAU tRNA anticodons: GUACUAAUGGAUCUUAGGACAUAU**
- C. mRNA codons: CATGATTACCTAGAATCCTGTAAT tRNA anticodons: CAUGAUUACCUAGAAUCCUGUAAU
- D. mRNA codons: GUACUAAUGGAUCUUAGGACAUAU tRNA anticodons: CAUGAUUACCUAGAAUCCUGUAAU

Blooms Level: 5. Evaluate

Enger - Chapter 08 #49

Learning Outcome: Apply the base-pairing rule to predict the nucleotide structure of RNA.

Section: 08.03

Section: 08.04

Topic: Molecular Biology

50. The process of making a DNA copy of a DNA molecule is
- A. transcription.
- B. replication.**
- C. translation.
- D. protein synthesis.

Blooms Level: 1. Remember

Enger - Chapter 08 #50

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.

Section: 08.02

Topic: Molecular Biology

51. The process of manufacturing RNA from template DNA is
- A. transcription.**
- B. replication.
- C. translation.
- D. protein synthesis.

Blooms Level: 1. Remember

Enger - Chapter 08 #51

Learning Outcome: Define gene, transcription, translation.

Section: 08.04

Topic: Molecular Biology

52. Base pairs in DNA are attracted to each other by
- A. ionic bonds.
- B. covalent bonds.
- C. hydrogen bonds.**
- D. unzipping enzymes.

Blooms Level: 1. Remember

Enger - Chapter 08 #52

Learning Outcome: State the nucleotides commonly found in DNA and RNA.

Section: 08.02

Topic: Molecular Biology

53. \_\_\_\_\_ is(are) NOT **directly** involved with translation.
- A. DNA**
- B. mRNA
- C. tRNA
- D. Ribosome

Blooms Level: 2. Understand

Enger - Chapter 08 #53

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.

Section: 08.04

Topic: Molecular Biology

54. \_\_\_\_ is(are) NOT **directly** involved with transcription.

- A. Unzipping enzymes
- B. RNA polymerase
- C. Amino acids**
- D. DNA

Blooms Level: 2. Understand  
Enger - Chapter 08 #54

Learning Outcome: Describe how the processes of transcription and translation relate.  
Section: 08.04

Topic: Molecular Biology

55. \_\_\_\_ represents the complementary strand of DNA for gene segment GCCAATGCT.

- A. CGGUUACGA
- B. CGGTTACGA**
- C. GCCAATGCT
- D. GCCAAUGCU

Blooms Level: 2. Understand  
Enger - Chapter 08 #55

Learning Outcome: State the nucleotides commonly found in DNA and RNA.  
Section: 08.02

Topic: Molecular Biology

56. \_\_\_\_ represents the mRNA that will be produced from DNA gene segment GCCAATGCT.

- A. CGGUUACGA**
- B. CGGTTACGA
- C. GCCAATGCT
- D. GCCAAUGCU

Blooms Level: 2. Understand  
Enger - Chapter 08 #56

Learning Outcome: Define gene, transcription, translation.  
Section: 08.04

Topic: Molecular Biology

57. \_\_\_\_ represents the transfer RNA bases that correspond to DNA gene segment GCCAATGCT.

- A. CGGUUACGA
- B. CGGTTACGA
- C. GCCAATGCT
- D. GCCAAUGCU**

Blooms Level: 2. Understand  
Enger - Chapter 08 #57

Learning Outcome: Define gene, transcription, translation.  
Section: 08.04

Topic: Molecular Biology

58. Which one of the following is **true** of your mRNA?

- A. The mature mRNA is produced directly from DNA.
- B. A pre-mRNA is produced directly from DNA, and then a mature mRNA is created by the removal of introns.**
- C. A pre-mRNA is produced directly from DNA and then a mature mRNA is created by the removal of exons.
- D. DNA is produced directly from mRNA.

Blooms Level: 2. Understand  
Enger - Chapter 08 #58

Learning Outcome: Define gene, transcription, translation.  
Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.

Section: 08.03

Section: 08.04

Topic: Molecular Biology

59. Asp, Gln, Leu, and Phe are all abbreviations for  
A. codons.  
B. RNA polymerase.  
C. amino acids.  
D. anticodons.

Blooms Level: 1. Remember  
Enger - Chapter 08 #59

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.02  
Section: 08.04

Topic: Molecular Biology

60. This kind of mutation causes the wrong amino acid to be used in making a protein.  
A. missense  
B. nonsense  
C. point  
D. silent

Blooms Level: 1. Remember  
Enger - Chapter 08 #60

Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.  
Section: 08.06

Topic: Molecular Biology

61. A single-stranded, straight chain copy of a coding strand of DNA that comes from the process of transcription is  
A. DNA.  
B. tRNA.  
C. mRNA.  
D. rRNA.

Blooms Level: 2. Understand  
Enger - Chapter 08 #61

Learning Outcome: Define gene, transcription, translation.  
Section: 08.03  
Section: 08.04

Topic: Molecular Biology

62. The molecule that contains an anticodon is  
A. DNA.  
B. tRNA.  
C. mRNA.  
D. rRNA.

Blooms Level: 1. Remember  
Enger - Chapter 08 #62

Learning Outcome: Define gene, transcription, translation.  
Section: 08.03  
Section: 08.04

Topic: Molecular Biology

63. The molecule that carries the message of the gene from the nucleus to the ribosome is  
A. DNA.  
B. tRNA.  
C. mRNA.  
D. rRNA.

Blooms Level: 1. Remember  
Enger - Chapter 08 #63

Learning Outcome: Define gene, transcription, translation.  
Section: 08.03  
Section: 08.04

Topic: Molecular Biology



64. The molecule that carries the amino acid to the ribosome is  
A. DNA.  
**B. tRNA.**  
C. mRNA.  
D. rRNA.

Blooms Level: 1. Remember  
Enger - Chapter 08 #64  
Learning Outcome: Define gene, transcription, translation.  
Section: 08.03  
Section: 08.04  
Topic: Molecular Biology

65. A molecule that is a component of a ribosome is  
A. DNA.  
B. tRNA.  
C. mRNA.  
**D. rRNA.**

Blooms Level: 1. Remember  
Enger - Chapter 08 #65  
Learning Outcome: Define gene, transcription, translation.  
Section: 08.03  
Section: 08.04  
Topic: Molecular Biology

66. During transcription, free nucleotides of RNA bond with \_\_\_\_\_ nucleotides.  
**A. DNA**  
B. other tRNA  
C. mRNA  
D. rRNA

Blooms Level: 1. Remember  
Enger - Chapter 08 #66  
Learning Outcome: Define gene, transcription, translation.  
Section: 08.04  
Topic: Molecular Biology

67. \_\_\_\_\_ code(s) for the placement of one amino acid.  
A. Three codons  
B. One nucleotide  
**C. Three nucleotides**  
D. One intron

Blooms Level: 1. Remember  
Enger - Chapter 08 #67  
Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.  
Section: 08.02  
Section: 08.04  
Topic: Molecular Biology

68. The promoter sequence of DNA is located  
A. behind the initiator codon.  
**B. ahead of the initiator codon.**  
C. immediately ahead of the gene.  
D. behind the gene.

Blooms Level: 1. Remember  
Enger - Chapter 08 #68  
Learning Outcome: Explain how promoters, transcription factors, and splicing affect transcription.  
Section: 08.04  
Topic: Molecular Biology

69. This occurs when insertions or deletions cause the ribosome to read the wrong sets of three nucleotides.  
A. point mutation  
**B. frameshift**  
C. translocation  
D. transcription

Blooms Level: 2. Understand  
Enger - Chapter 08 #69  
Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.  
Section: 08.06  
Topic: Molecular Biology



70. If a drug interferes with the activities of transfer RNA, which one of the following is likely to occur?

- A. DNA will not be able to make copies of itself.
- B. Proteins will not be produced.**
- C. Mutations will occur to the DNA.
- D. Messenger RNA will not be manufactured.

Blooms Level: 5. Evaluate

Enger - Chapter 08 #70

Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.

Section: 08.04

Topic: Molecular Biology

71. Which of the following is necessary for DNA to make copies of itself?

- A. Ribosomes must be present.
- B. The cell must have an abundant supply of RNA nucleotides.
- C. The two strands of the DNA molecule must separate.**
- D. Chromosomes must be synapsed.

Blooms Level: 1. Remember

Enger - Chapter 08 #71

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.

Section: 08.02

Topic: Molecular Biology

72. If a bacterial protein contains 5 amino acids, the messenger RNA that would direct its manufacture would have at least \_\_\_\_\_ nucleotides.

- A. one
- B. five
- C. ten
- D. fifteen**

Blooms Level: 5. Evaluate

Enger - Chapter 08 #72

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.

Section: 08.04

Topic: Molecular Biology

73. If you want to get DNA from a eukaryotic cell, which of the following structures would provide the largest concentration?

- A. ribosome
- B. nucleus**
- C. mitochondria
- D. lysosome

Blooms Level: 2. Understand

Enger - Chapter 08 #73

Learning Outcome: Describe how DNA is organized differently in various types of cells.

Section: 08.01

Section: 08.02

Topic: Molecular Biology

74. If a drug interferes with the function of ribosomes, which of the following is likely to occur?

- A. DNA will not be able to make copies of itself.
- B. Proteins will not be produced.**
- C. Mutations will occur to the DNA.
- D. Messenger RNA will not be manufactured.

Blooms Level: 5. Evaluate

Enger - Chapter 08 #74

Learning Outcome: Define gene, transcription, translation.

Learning Outcome: Describe how the processes of transcription and translation relate.

Section: 08.04

Topic: Molecular Biology

75. Which one of the following is necessary for messenger RNA to be formed in the nucleus?
- A. Ribosomes must be present.
  - B. The cell must have an abundant supply of DNA nucleotides.
  - C. RNA polymerase must be present and functioning.**
  - D. Chromosomes must be synapsed.

Blooms Level: 2. Understand  
Enger - Chapter 08 #75

Learning Outcome: Define gene, transcription, translation.

Learning Outcome: Describe how the processes of transcription and translation relate.

Section: 08.04

Topic: Molecular Biology

76. If a single strand of mature messenger RNA contains 12 coding nucleotides, the protein that it will manufacture will have \_\_\_\_\_ amino acids.
- A. one
  - B. four**
  - C. six
  - D. twelve

Blooms Level: 5. Evaluate  
Enger - Chapter 08 #76

Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.

Learning Outcome: Describe how the processes of transcription and translation relate.

Section: 08.02

Section: 08.04

Topic: Molecular Biology

77. Which of the following does NOT belong in DNA?
- A. nucleotides
  - B. ribose**
  - C. thymine
  - D. phosphate

Blooms Level: 1. Remember  
Enger - Chapter 08 #77

Learning Outcome: State the nucleotides commonly found in DNA and RNA.

Section: 08.02

Topic: Molecular Biology

78. Which one of the following correctly describes the way in which DNA works?
- A. DNA makes RNA and RNA changes into protein.
  - B. DNA makes amino acids which form ribosomes.
  - C. DNA makes mRNA which directs where tRNA places amino acids.**
  - D. DNA makes mRNA which manufactures amino acids which attach to tRNA.

Blooms Level: 2. Understand  
Enger - Chapter 08 #78

Learning Outcome: Define gene, transcription, translation.

Learning Outcome: Describe how the processes of transcription and translation relate.

Section: 08.02

Section: 08.04

Topic: Molecular Biology

79. Which of the following is NOT needed for transcription?
- A. enzymes
  - B. DNA
  - C. RNA nucleotides
  - D. ribosomes**

Blooms Level: 1. Remember  
Enger - Chapter 08 #79

Learning Outcome: Define gene, transcription, translation.

Learning Outcome: Describe how the processes of transcription and translation relate.

Section: 08.04

Topic: Molecular Biology

80. Which of the following is NOT a characteristic of genetic material?
- A. It has the ability to replicate itself.
  - B. It is capable of storing the information needed to synthesize proteins.
  - C. It may mutate (change) and accommodate new situations.
  - D. It is metabolized as the chief source of cellular energy.**

Blooms Level: 1. Remember  
Enger - Chapter 08 #80

Learning Outcome: State why single cellular and multicellular organisms control gene expression.  
Section: 08.01  
Section: 08.02

Topic: Molecular Biology

81. Which is NOT a component of RNA?
- A. deoxyribose**
  - B. adenine
  - C. phosphate
  - D. uracil

Blooms Level: 1. Remember  
Enger - Chapter 08 #81

Learning Outcome: State the nucleotides commonly found in DNA and RNA.  
Section: 08.03

Topic: Molecular Biology

82. Which enzyme is used in the synthesis of new eukaryotic genetic material?
- A. DNA polymerase**
  - B. tyrosine
  - C. RNA polymerase
  - D. reverse transcriptase

Blooms Level: 1. Remember  
Enger - Chapter 08 #82

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.  
Section: 08.02

Topic: Molecular Biology

83. "Bubbles" along a strand of DNA indicate that
- A. DNA replication is occurring.
  - B. RNA synthesis is taking place.
  - C. transcription is occurring.
  - D. All of these are possible.**

Blooms Level: 2. Understand  
Enger - Chapter 08 #83

Learning Outcome: Define gene, transcription, translation.  
Section: 08.02  
Section: 08.03  
Section: 08.04

Topic: Molecular Biology

84. The terms exon and intron are best associated with
- A. transcription.**
  - B. translation.
  - C. replication.
  - D. prokaryotic cells.

Blooms Level: 1. Remember  
Enger - Chapter 08 #84

Learning Outcome: Describe how DNA is organized differently in various types of cells.  
Section: 08.04  
Section: 08.05

Topic: Molecular Biology

85. If an RNA does not normally code for a protein, then
- A. it is mature mRNA.**
  - B. the RNA is pre-mRNA.
  - C. it is probably tRNA or rRNA
  - D. the RNA is a lipid.

Blooms Level: 1. Remember  
Enger - Chapter 08 #85

Learning Outcome: Define gene, transcription, translation.  
Learning Outcome: Describe how the processes of transcription and translation relate.  
Section: 08.02

Topic: Molecular Biology

86. Not every piece of DNA is used in a cell to make proteins because
- A. some of the DNA is used for regulation of gene expression.
  - B. not all genes are needed in every cell.
  - C. some sequences are needed to stabilize the end of the chromosomes.
  - D. All of the choices are correct.**

Blooms Level: 1. Remember  
Enger - Chapter 08 #86

Learning Outcome: Describe how DNA is organized differently in various types of cells.  
Section: 08.02

Topic: Molecular Biology

87. "Since every cell in this patient's body has the same genetic change, it is most likely that . . ."
- A. he acquired this change from one of his parents.**
  - B. he was exposed to mutagenic agents.
  - C. his mother was the only source of the mutant gene.
  - D. All of the choices are true.

Blooms Level: 2. Understand  
Enger - Chapter 08 #87

Learning Outcome: Describe how DNA is organized differently in various types of cells.  
Section: 08.02

Topic: Molecular Biology

88. These structures are required for chromosome replication; they protect the chromosome from being destroyed by dangerous DNAase enzymes, and they keep chromosomes from bonding to one another end to end.
- A. telomeres**
  - B. nucleoproteins
  - C. histones
  - D. nucleotides

Blooms Level: 1. Remember  
Enger - Chapter 08 #88

Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.  
Section: 08.02

Topic: Molecular Biology

89. The enzyme transcriptase would be used to accomplish which of the following?
- A. DNA -> DNA
  - B. DNA -> RNA**
  - C. RNA -> RNA
  - D. RNA -> protein

Blooms Level: 3. Apply  
Enger - Chapter 08 #89

Learning Outcome: Define gene, transcription, translation.  
Learning Outcome: Describe how the processes of transcription and translation relate.

Section: 08.04

Topic: Molecular Biology

90. Cells regulate gene expression by
- A. producing termination factors.
  - B. turning on DNAase genes.
  - C. adding histones to the DNA.
  - D. limiting the length of time that mRNA is available for translation.**

Blooms Level: 2. Understand  
Enger - Chapter 08 #90

Learning Outcome: Define gene, transcription, translation.  
Learning Outcome: State why single cellular and multicellular organisms control gene expression.

Section: 08.03

Section: 08.04

Topic: Molecular Biology

## 8 Summary

<u>Category</u>	<u># of Questions</u>
Blooms Level: 1. Remember	47
Blooms Level: 2. Understand	28
Blooms Level: 3. Apply	2
Blooms Level: 5. Evaluate	13
Enger - Chapter 08	90
Learning Outcome: Accurately use the codon table to predict the amino acid sequence of a protein.	16
Learning Outcome: Apply the base-pairing rule to predict the nucleotide structure of RNA.	1
Learning Outcome: Define gene, transcription, translation.	26
Learning Outcome: Describe DNA replication using base-pairing rules and DNA polymerase.	8
Learning Outcome: Describe how DNA is organized differently in various types of cells.	4
Learning Outcome: Describe how the processes of transcription and translation relate.	10
Learning Outcome: Explain how promoters, transcription factors, and splicing affect transcription.	1
Learning Outcome: Explain the use of mRNA and tRNA in the process of translation.	14
Learning Outcome: Provide examples of insertions, deletions, and frameshift mutations.	8
Learning Outcome: State the nucleotides commonly found in DNA and RNA.	9
Learning Outcome: State why single cellular and multicellular organisms control gene expression.	4
Section: 08.01	5
Section: 08.02	30
Section: 08.03	16
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Topic: Molecular Biology	90