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Activity 11.1 <https://www.pearsonsuccessnet.com/snpapp/login/login.jsp>

1. Since scientists knew that genes were composed of either DNA or protein, why would they choose to study a bacteriophage?
2. When the phage attaches to the host and injects its DNA, what part of the phage enters the bacterium?
3. What conclusion can you make about the chemical nature of the gene-is it composed of protein or DNA? Explain.

Activity 11.2

Page 1

1. What are the three components of a DNA nucleotide?
2. What is the unique pairing pattern between nucleotide bases?
3. Look back at the chemical structures of the nucleotide bases. What similarities do you observe between adenine and guanine? Cytosine and thymine?

Page 2

1. How does this 3-D model illustrate the double helix?
2. What is the position of the phosphate groups in relation to the nitrogenous bases?
3. How does a 3-D animation help you to better understand the nature of a DNA molecule?

Activity 11.3

1. One strand of a DNA molecule has the following base sequence: GTTCAGA. What is the sequence of the complementary strand?
2. When the complementary strand in question 1 replicates, what will the new base sequence be?
3. In this activity you studied a model of DNA replication. What is one way that this model differs from the actual process in a cell?

Activity 11.4

1. Where is the code for making a protein stored?
2. What is the name of the process that converts DNA’s nucleotide sequence to a single-stranded RNA molecule? What is the name of the process that reads the code and makes the protein?
3. Salivary amylase is another protein (an enzyme) essential for digestion. It is secreted by salivary glands in the mouth. In which cells of the human body is the genetic information found? In which cells of the human body is the genetic information found? In which cells is that information transcribed and translated?

Activity 11.5

Page 1

1. Where does most transcription take place in a eukaryotic cell?
2. When the RNA polymerase enzyme makes an mRNA molecule from DNA, does the enzyme copy one strand or both strands of the DNA?
3. What is the difference between the RNA transcript and mRNA?

Page 2

1. Why are there 64 possible codons?
2. Name two types of RNA molecules that bind to ribosomes in the process of protein synthesis.
3. How many nucleotides make up a section of an mRNA molecule that codes for a protein with 100 amino acids?

Page 3

1. Place the following events in the order in which they occur during translation. Use only the numbers to represent each step.
   1. The completed polypeptide is freed from the ribosome.
   2. The small subunit of the ribosome attaches to the mRNA.
   3. The ribosome moves down the mRNA codon by codon.
   4. The large subunit of the ribosome binds to the small subunit and the mRNA.
   5. The stop codon on the mRNA is reached.
2. To build a protein, each of the following events must occur. In which events do you think the ribosome might take part? Write the event numbers in the box and explain your choices.
   1. Make mRNA
   2. Attach amino acids to tRNA
   3. Find the start codon on mRNA
   4. Test whether a tRNA matches the codon in the A site
   5. Link a new amino acid to the end of a growing protein molecule
   6. Recognize the stop codon

Activity 11.6

1. Sometimes a mutation in DNA does not cause a change in the protein that is made. What feature of the genetic code makes this possible?
2. Now that you understand base substitution as a cause for mutation, what do you think would happen if a base were deleted?

Take the assessment. How many of the 20 questions did you get right?