

<p>Q: What is the monomer for nucleic acids?</p> <p>A: Nucleotide. The nucleotide for DNA contains deoxyribose (sugar), phosphate, and a nitrogenous base.</p>	<p>Q: Describe the structure of a DNA molecule.</p> <p>A: The DNA molecule is a double stranded helix, similar to a spiral staircase or twisted ladder. The sides of the ladder are made of alternating molecules of phosphate and sugar, while the rungs of the ladder are made of bases held together by hydrogen bonds.</p>
<p>Q: What is the base pair rule?</p> <p>A: The base pair rule for DNA requires that adenine pairs with thymine and cytosine pairs with guanine. The base pair rule for RNA is similar except that adenine pairs with uracil instead of thymine.</p>	<p>Q: Compare and contrast the structure of DNA with the structure of RNA.</p> <p>A: DNA is a double stranded molecule while RNA is a single stranded molecule. DNA contains the deoxyribose sugar molecule while RNA contains the ribose sugar molecule. DNA uses the thymine base to pair with adenine while RNA uses Uracil.</p>
<p>Q: What is the purpose of DNA?</p> <p>A: DNA is used to transmit genetic information to future generations. The genetic information is coded in form of the bases, <i>A, T, C, G</i>.</p>	<p>Q: Why must cells replicate their DNA before reproducing?</p> <p>A: DNA must be replicated so that each daughter cell receives an identical set of DNA.</p>
<p>Q: Describe the steps of replication.</p> <p>A: 1) The DNA molecule is split into two strands by breaking hydrogen bonds.</p> <p>2) The DNA polymerase enzyme attaches free floating nucleotides to each strand of DNA.</p> <p>3) Two identical strands of DNA are formed.</p>	<p>Q: Why is DNA replication called semi-conservative?</p> <p>A: DNA replication is referred to as semi-conservative because each copy of the DNA contains one old strand of DNA and one new strand of DNA.</p>

<p>Q: Provide the complementary strand to the following DNA strand:</p> <p>CCCAAATATA</p> <p>What rule did you use to figure it out?</p> <p>A: GGGTTTATAT</p> <p>The base pair rule is used as it states that C matches with G and T matches with A.</p>	<p>Q: Which organelle is responsible for the production of new DNA molecules in eukaryotic organisms?</p> <p>A: The nucleus. DNA never leaves the nucleus in eukaryotic organisms.</p>
<p>Q: Describe the purpose of transcription and translation</p> <p>A: Transcription is copying the genetic code into an mRNA molecule that can be sent into the cytoplasm.</p> <p>Translation is the decoding of the mRNA molecule into an amino acid chain.</p>	<p>Q: What is the relationship between transcription and translation?</p> <p>A: Transcription MUST occur BEFORE translation. Translation uses the mRNA molecule created by transcription to create a chain of amino acids.</p>
<p>Q: What is the relationship between anticodons and codons?</p> <p>A: Anticodons are on tRNA and are complementary bases to the mRNA codons. Both the codons and anticodons contain 3 bases. Anticodons ensure that the correct sequence of amino acids are formed as only matching anticodons will attach to the mRNA and link the amino acid into the chain.</p>	<p>Q: Describe the steps of transcription.</p> <p>A: Transcription begins with the unzipping of a small portion of the DNA molecule. As the molecule is unzipped, free floating RNA nucleotides build a complementary mRNA. After the mRNA molecule is created, it is released and sent into the cytoplasm.</p>

<p>Q: Describe the steps of translation.</p> <p>A: Translation begins with the binding of the mRNA molecule to the ribosome. A tRNA molecule with an amino acid attached matches the AUG codon on the mRNA and deposits an amino acid on the ribosome. The tRNA leaves the ribosome and looks for another copy of that amino acid. Other tRNA molecules continue to build the chain of amino acids according to the mRNA code. When the final amino acid has been attached, the amino acid chain is released and forms into a protein.</p>	<p>Q: What are three kinds of RNA and what is their role in protein synthesis?</p> <p>A: Three forms of RNA are mRNA, tRNA, and rRNA. mRNA is responsible for delivering the DNA message to the ribosome. tRNA is responsible for attaching the correct sequence of amino acids. rRNA and proteins make up the ribosome where translation occurs.</p>
<p>Q: Why are transcription and translation both necessary for protein synthesis?</p> <p>A: Transcription is necessary because it is the only way the DNA's message can leave the nucleus, and translation is necessary because it is the process responsible for decoding the mRNA's DNA message into a chain of amino acids. An amino acid chain is what makes up a protein.</p>	<p>Q: Transcribe the following molecule:</p> <p>TATCATGGG</p> <p>What rule did you use and what kind of molecule did you make?</p> <p>A: AUAGUACCC</p> <p>I used the base pair rule for RNA which states that A is complementary to U, U is complementary to A, G is complementary to C, and C is complementary to G.</p> <p>I made an mRNA molecule.</p>
<p>Q: What are two characteristics of tRNA?</p> <p>A: tRNA must have an anticodon and must carry an amino acid to the mRNA molecule.</p> <p>This is an amino acid chain that can be folded into a protein.</p>	<p>Q: Compare and contrast the products and locations of the following process: replication, transcription, translation.</p> <p>A: replication and transcription both occur in the nucleus while translation occurs on the ribosome in the cytoplasm. Replication results in the production of two identical double stranded DNA molecules. Transcription results in the production of a single stranded mRNA molecule. Translation results in the production of a protein.</p>