

## DNA Structure Worksheet Answer Key PDF

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### Part 1: Building a Foundation

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**What does DNA stand for?**

**undefined. A) Deoxyribonucleic Acid ✓**

undefined. A) Deoxyribose Nucleic Acid

undefined. A) Dioxyribonucleic Acid

undefined. A) Deoxyribonucleotide Acid

DNA stands for Deoxyribonucleic Acid.

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DNA stands for Deoxyribonucleic Acid.

**Which of the following are components of a nucleotide in DNA? (Select all that apply)**

**undefined. A) Phosphate group ✓**

undefined. A) Ribose sugar

**undefined. A) Deoxyribose sugar ✓**

**undefined. A) Nitrogenous base ✓**

Components of a nucleotide include a phosphate group, deoxyribose sugar, and a nitrogenous base.

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**List the four nitrogenous bases found in DNA.**

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**Which base pairs with Adenine in DNA?**

undefined. A) Cytosine

undefined. A) Guanine

**undefined. A) Thymine ✓**

undefined. A) Uracil

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**Part 2: Application and Analysis**

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**During DNA replication, which enzyme is responsible for unwinding the DNA double helix? (Select all that apply)**

undefined. A) DNA polymerase

**undefined. A) Helicase ✓**

undefined. A) Ligase

undefined. A) Primase

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Helicase is responsible for unwinding the DNA double helix during replication.

**Describe how the base pairing rules are applied during DNA replication.**

**During DNA replication, base pairing rules ensure that adenine pairs with thymine and cytosine pairs with guanine, allowing for accurate copying of the DNA.**

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**In a hypothetical scenario, if a DNA strand has a sequence of AGCT, what would be the sequence of the complementary strand?**

**undefined. A) TCGA ✓**

undefined. A) CGAT

undefined. A) AGCT

undefined. A) TCGU

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**Analyze the impact of a mutation that changes an adenine to a guanine in a DNA sequence. How might this affect the structure and function of the resulting protein?**

**A mutation changing adenine to guanine could alter the amino acid sequence of the resulting protein, potentially affecting its structure and function.**

**Analyze the impact of a mutation that changes an adenine to a guanine in a DNA sequence. How might this affect the structure and function of the resulting protein?**

**A mutation changing adenine to guanine could lead to a different amino acid being incorporated into a protein, potentially altering its structure and function.**

**Analyze the impact of a mutation that changes an adenine to a guanine in a DNA sequence. How might this affect the structure and function of the resulting protein?**

**A mutation changing adenine to guanine could alter the amino acid sequence of the protein, potentially affecting its structure and function.**

**Which of the following scenarios would most likely disrupt the stability of the DNA double helix? (Select all that apply)**

**undefined. A) A decrease in hydrogen bonding ✓**

undefined. A) An increase in covalent bonding

undefined. A) A substitution of thymine with uracil

**undefined. A) A deletion of a phosphate group ✓**

A decrease in hydrogen bonding and a deletion of a phosphate group would likely disrupt the stability of the DNA double helix.

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### Part 3: Evaluation and Creation

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**Evaluate the role of DNA in hereditary diseases. How can understanding DNA structure help in developing treatments?**

**Understanding DNA structure can help identify genetic mutations responsible for hereditary diseases, leading to targeted treatments.**

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**Evaluate the role of DNA in hereditary diseases. How can understanding DNA structure help in developing treatments?**

**Understanding DNA structure can help identify mutations that cause hereditary diseases and guide the development of targeted treatments.**

**Imagine you are designing a new type of DNA molecule for a synthetic biology project. Which features would you prioritize to ensure stability and functionality? (Select all that apply)**

**undefined. A) Strong covalent bonds in the backbone ✓**

undefined. A) Flexible hydrogen bonds between bases

undefined. A) High variability in base pairing

**undefined. A) Uniform strand length ✓**

Prioritizing strong covalent bonds in the backbone and uniform strand length would enhance stability and functionality.

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Prioritizing strong covalent bonds in the backbone and uniform strand length would enhance the stability and functionality of the DNA molecule.

**Propose a method for using DNA technology to solve a real-world problem, such as forensic analysis or genetic engineering. Explain your approach and its potential impact.**

**Proposing a method for DNA technology could involve using CRISPR for genetic engineering to address diseases or improve crops.**

**Propose a method for using DNA technology to solve a real-world problem, such as forensic analysis or genetic engineering. Explain your approach and its potential impact.**

**Using DNA technology in forensic analysis can help solve crimes by matching DNA samples to suspects, while genetic engineering can improve crop resilience.**

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