**IB Biology HL:** DNA Structure & Replication Review **NAME:**

1. Draw a single nucleotide, labeling the phosphate, deoxyribose sugar and nitrogen base, in the box to the right:
2. Compare DNA and RNA.

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| --- | --- |
| **DNA** | **RNA** |
| **Similarities:** |
| **Differences:** |
|  |  |
|  |  |
|  |  |

1. **Draw** and **label** a double stranded segment of DNA with four nucleotides (arranged in two base pairs):



1. The diagram shows a DNA double helix. How does a double helix form? What bonds hold it in position?

1. Draw and label a *nucleosome*:
2. What are the functions of nucleosomes?
3. Describe what is meant by ‘Highly-repetitive DNA sequences’ and list several functions of these sequences.
4. What information did Rosalind Franklin’s X-ray image show about the structure of DNA?
5. Outline how the Hershey-Chase experiment showed DNA, not protein, was the genetic material.
6. What is the main purpose of replicating DNA?
7. Explain the meaning of ‘*DNA replication is semi-conservative’*.
8. How does complementary base pairing ensure the accuracy of the new strand of DNA?
9. Describe how the Polymerase Chain Reaction (PCR) works, including the role of Taq DNA Polymerase:
10. Complete the table with the functions of these five enzymes involved in DNA replication.

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| --- | --- |
| **Enzyme** | **Function** |
| Helicase |  |
| DNA Primase |  |
| DNA Polymerase III |  |
| DNA Polymerase I |  |
| DNA Gyrase (Topoisomerase) |  |
| DNA Ligase |  |

1. What are *Okazaki fragments*?
2. In which direction does DNA replication occur?
3. Describe the use of Dideoxyribnonucleotides to sequence unknown DNA samples.