DNA Replication Worksheet

Answers

DNA replication occurs in a **semiconservative** manner. This is when two new DNA molecules are created by reusing one of the **original** strands of DNA and creating a **new** strand of DNA.

1. The enzyme, **helicase** breaks the **hydrogen bonds** between the base pairs.
2. **Single strand binding proteins (SSB)** attach to the DNA strands to prevent them from **annealing** or joining together.

Gyrase: **is another enzyme that is used in bacteria to reduce the strain on the DNA during replication.**

3. **RNA primase** is added to the strands by **primase**.
4. It occurs in the **5' to 3'** direction.
5. **DNA polymerase III** adds complementary nucleotides.

The **leading strand** is built towards the replication fork.
The **lagging strand** is built away from the replication fork in short **Okazaki fragments**.
This process is **bidirectional**.

6. **Okazaki fragments** are joined by **DNA ligase**. It creates a **phosphodiester bond** to from a continuous strand of DNA.
7. **DNA polymerase I** removes the **RNA primase** and replaces them with nucleotides.
8. **DNA polymerase I** also checks for errors, and replaces bad nucleotides.
9. DNA does not replicate as a whole, but in small fragments called **replication bubbles**. By doing this, the process is greatly accelerated.

List the four reasons for DNA replication.

1. **Sexual/asexual reproduction.**
2. **Replace old and damaged cells.**
3. **Allow for tissue growth.**
4. **To ensure that cells can perform in an efficient manner.**