D1.1 DNA replication

Checklist

What you should know

After studying this subtopic you should be able to:

- Describe DNA replication as the process by which exact copies of DNA are created for use in reproduction, growth and tissue replacement in multicellular organisms.
- Explain the semi-conservative nature of DNA replication and how it allows for a high degree of accuracy when copying base sequences.
- Describe the roles of helicase and DNA polymerase in DNA replication.
- Describe the use of polymerase chain reaction and gel electrophoresis for amplifying and separating DNA.
- Describe the applications for PCR and gel electrophoresis.

Higher level (HL)

- Describe the directionality of DNA polymerases based on the difference between the 5′ and 3′ terminals of strands of nucleotides.
- Describe replication on both the leading and lagging strands and how these differ.
- Describe the functions of DNA primase, DNA polymerase I, DNA polymerase III and DNA ligase in replication of prokaryotic DNA.
- Explain DNA polymerase III's role as a proofreader of replicated DNA.