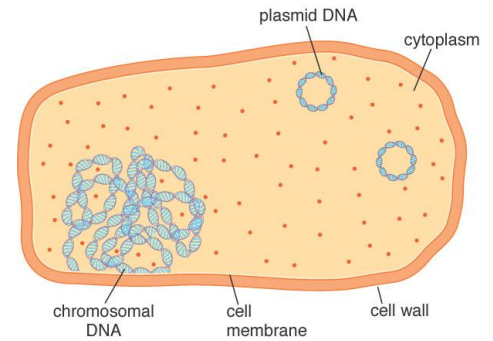
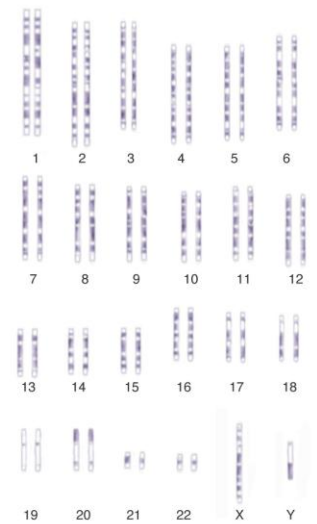


Chapter 13 Making DNA Molecules

1. Compare and contrast the arrangement of genetic material found within a prokaryotic cell, such as in a bacterial cell and a eukaryotic cell, such as in an animal or human cell. Provide a detailed explanation.



Bacterial cell (E.coli)



Animal cell (Human Karyotype)

2. Describe the process of **semi-conservative** DNA replication in cells and compare and contrast this method with DNA synthesis in the laboratory.

3. Complete the following paragraph:

✚ In cells, five enzymes control DNA replication. The enzymes unzip the complementary strands of the DNA double helix (_____), relieve tension along the untwisting strand (_____), attach a primer molecule (_____), synthesize a complementary strand to each template (_____), and seal adjacent DNA replication sites (_____).

4. Explain, in your own words, the function of each of the reagents needed to complete an in vitro DNA synthesis or Polymerase Chain Reaction (PCR):

1) DNA Template -

2) Primer -

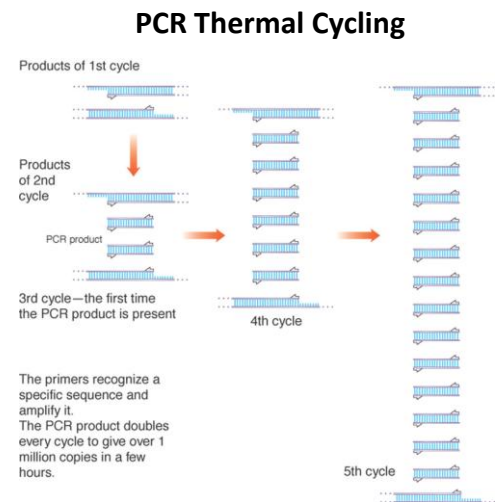
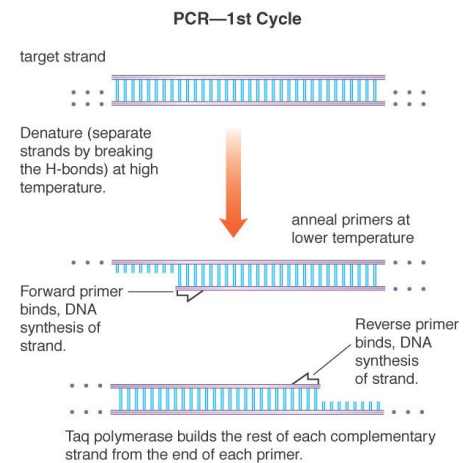
3) Nucleotides -

4) DNA Polymerase -

5) Reaction Buffer -

5. Explain the challenges biotechnologists face when using the polymerase chain reaction (PCR) to amplify DNA samples. How are these obstacles overcome?

6. Discuss the function of a *thermal cycler*. What are the three parts of the thermal cycling reaction?



7. Describe applications of PCR technology and DNA Fingerprinting, including uses in the field of Forensics.