

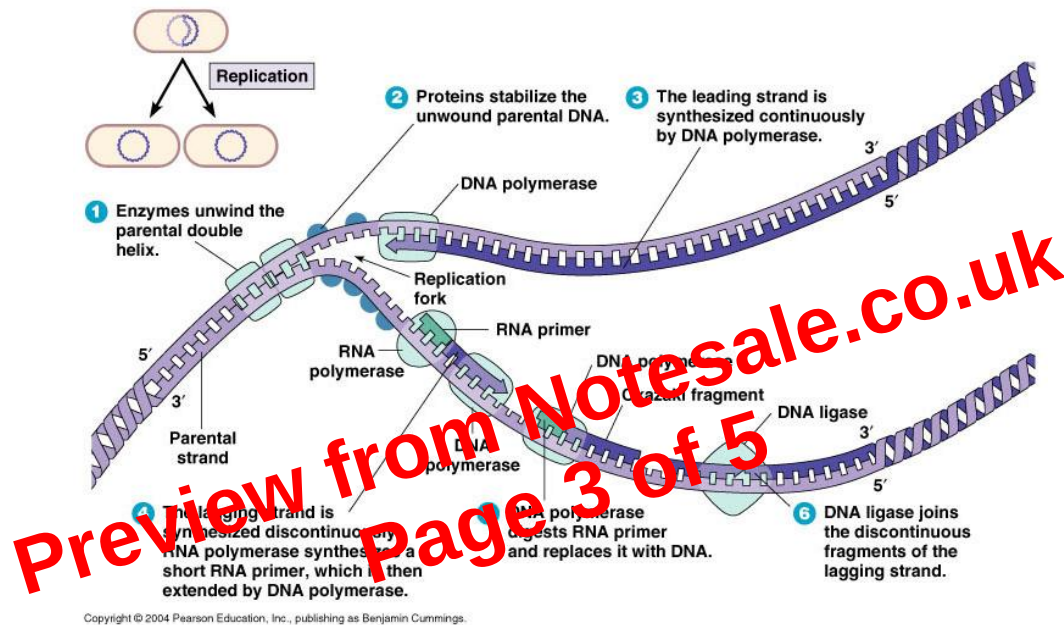
- Within a species, the number of A and T bases are roughly equal and the number of G and C bases are roughly equal. ☞

Building a Structural Model of DNA: Scientific Inquiry

☞ Watson and Crick deduced that DNA is a **double helix** and built a structural model. Two **antiparallel** sugar-phosphate chains wind around the outside of the molecule. The nitrogenous bases project into the interior, where they hydrogen-bond in specific pairs: A with T, G with C. ☞

13.2 Many proteins work together in DNA replication and repair

☞ The Meselson-Stahl Experiment showed that **DNA Replication** is **semiconservative**: The parental molecule unwinds, and each strand then serves as a template for the synthesis of a new strand according to base-pairing rules ☞ DNA Replication at one replication fork is summarized here:



☞ DNA Polymerases proofread new DNA, replacing incorrect nucleotides. In **mismatch repair**, enzymes correct errors that persist. Nucleotide excision repair is a general process by which **nucleases** cut out and replace damaged stretches of DNA. ☞

13.3 A chromosome consists of a DNA molecule packed together with proteins

☞ The chromosome of most bacterial species is a circular DNA molecule with some associated proteins, making up the **nucleoid** of the cell. The **chromatin** making up a eukaryotic chromosome is composed of DNA, **histones**, and other proteins bind to each other and to the DNA to form **nucleosomes**, the most basic units of DNA packing. Additional coiling and folding lead ultimately to the highly condensed chromatin of the metaphase chromosome. ☞ In interphase cells, most chromatin is less compacted (**euchromatin**), but some remains highly condensed (**heterochromatin**). Euchromatin, but not heterochromatin, is generally accessible for transcription of genes. ☞