

DNA, genes, and protein synthesis

Specification reference	Checklist questions	
3.4.1	Can you explain that, in prokaryotic cells, DNA molecules are short, circular, and not associated with proteins?	<input type="checkbox"/>
3.4.1	Can you explain that, in the nucleus of eukaryotic cells, DNA molecules are very long, linear and associated with proteins, called histones?	<input type="checkbox"/>
3.4.1	Can you describe how a DNA molecule and its associated proteins form a chromosome?	<input type="checkbox"/>
3.4.1	Can you explain that the mitochondria and chloroplasts of eukaryotic cells also contain DNA which, like the DNA of prokaryotes, is short, circular and not associated with protein?	<input type="checkbox"/>
3.4.1	Can you explain how a gene is a base sequence of DNA that codes for the amino acid sequence of a polypeptide and a functional RNA (including ribosomal RNA and tRNAs)?	<input type="checkbox"/>
3.4.1	Can you describe how a gene occupies a fixed position, called a locus, on a particular DNA molecule?	<input type="checkbox"/>
3.4.1	Can you explain how a sequence of three DNA bases, called a triplet, codes for a specific amino acid?	<input type="checkbox"/>
3.4.1	Can you explain that the genetic code is universal, non-overlapping, and degenerate?	<input type="checkbox"/>
3.4.1	Can you explain that in eukaryotes, much of the nuclear DNA does not code for polypeptides?	<input type="checkbox"/>
3.4.1	Can you explain that, even within a gene only some sequences, called exons, code for amino acid sequences?	<input type="checkbox"/>
3.4.1	Can you explain that, within the gene, these exons are separated by one or more non-coding sequences, called introns?	<input type="checkbox"/>

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3.4.2	Can you explain the concept of the genome as the complete set of genes in a cell?	<input type="checkbox"/>
3.4.2	Can you explain the concept of the proteome as the full range of proteins that a cell is able to produce?	<input type="checkbox"/>
3.4.2	Can you describe the structure of molecules of messenger RNA (mRNA) and of transfer RNA (tRNA)?	<input type="checkbox"/>
3.4.2	Can you explain transcription as the production of mRNA from DNA?	<input type="checkbox"/>
3.4.2	Can you describe the role of RNA polymerase in joining mRNA nucleotides?	<input type="checkbox"/>
3.4.2	Can you explain how, in prokaryotes, transcription results directly in the production of mRNA from DNA?	<input type="checkbox"/>
3.4.2	Can you explain how, in eukaryotes, transcription results production of pre-mRNA, which is then spliced to form mRNA?	<input type="checkbox"/>
3.4.2	Can you explain translation as the production of polypeptides from the sequence of codons carried by mRNA?	<input type="checkbox"/>
3.4.2	Can you describe the roles of ribosomes, tRNA, and ATP?	<input type="checkbox"/>
3.4.2	Can you relate the base sequence of nucleic acids to the amino acid sequence of polypeptides, when provided with suitable data about the genetic code?	<input type="checkbox"/>
3.4.2	Can you interpret data from experimental work investigating the role of nucleic acids?	<input type="checkbox"/>