Trajectory Education

Headstart 2026

Subject Syllabus & Timeline

VCE Biology 3+4

WEEK 1: NUCLEIC ACIDS & THE BLUEPRINT OF LIFE — 06-12-2025

- Compare and contrast the structure and function of DNA and the three forms of RNA.
- Explain why the genetic code is described as universal and degenerate.
- Draw a nucleotide and identify the 5' and 3' ends of a nucleic acid strand.

WEEK 2: GENE EXPRESSION & THE CENTRAL DOGMA — 13-12-2025

- Distinguish between the coding (exons) and non-coding (introns) regions of a gene.
- Describe the three stages of gene expression: transcription, RNA processing, and translation.
- Explain why RNA processing occurs in eukaryotes but not prokaryotes.

WEEK 3: GENE REGULATION — 20-12-2025

- Describe the purpose of gene regulation in an organism.
- Define the functional components of an operon (promoter, operator, structural genes).
- Explain the mechanism of repression in the *trp* operon when tryptophan levels are high versus low.

WEEK 4: THE WORLD OF PROTEINS — 27-12-2025

- Draw the general structure of an amino acid.
- Distinguish between the four levels of protein structure and the bonds responsible for each.
- Explain why the proteome is larger and more dynamic than the genome.

WEEK 5: CELLULAR LOGISTICS & THE SECRETORY PATHWAY — 03-01-2026

- Trace the path of a protein from synthesis to export via the protein secretory pathway.
- Describe the specific role of the Golgi apparatus in packaging proteins.
- Explain the process of exocytosis as a form of bulk transport.

Headstart classes are **completely free** and a great way to set yourself up for the new school year.

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Questions?

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