

Unit 2: Mechanisms of inheritance – Molecular Genetics

This section looks at the microscopic aspects of molecular genetics.

Checklist:

For each of the following, ask yourself,

- Can I describe the key features?
- Can I relate them to real life?
- Can I provide examples?
- Can I solve example problems?

1. Outline significant scientific contributions/discoveries that led to the current understanding of the structure and function of the DNA molecule.

Include: timeline, individual contributions, multidisciplinary collaboration, and competitive environment

2. Describe the structure of a DNA nucleotide.

Include: deoxyribose sugar; phosphate group, and nitrogenous bases

3. Describe the structure of a DNA molecule.

Include: double helix, nucleotides, base pairing, and gene

4. Describe the process of DNA replication.

Include: template, semi-conservative replication, and role of enzymes

5. Compare DNA and RNA in terms of their structure, use, and location in the cell.

6. Outline the steps involved in protein synthesis. Include: mRNA, codon, amino acid, transcription, tRNA, anticodon, ribosome, and translation

7. Relate the consequences of gene mutation to the final protein product.

Examples: point mutation in sickle-cell anemia, frameshift mutation in β -thalassemia . . .

8. Discuss implications of gene mutation for genetic variation.

Include: source of new alleles

9. Investigate an issue related to the application of gene technology in bioresources.

Include: understanding the technology/processes involved, economic implications, a variety of perspectives, and personal/societal/global implications

10. Investigate an issue related to the application of gene technology in humans.

Include: understanding the technology/processes involved, ethical and legal implications, a variety of perspectives, and personal/societal/global