Unit 1: Part I: Understanding Biological inheritance

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 Gregor Mendel's principles of inheritance, stating their importance to the understanding of heredity.

   Include: principles of segregation, dominance, and independent assortment

2. Explain what is meant by the terms heterozygous and homozygous.

3. Distinguish between genotype and phenotype, and use these terms appropriately when discussing the outcomes of genetic crosses.

4. Use Punnett squares to solve a variety of autosomal inheritance problems, and justify the results using appropriate terminology.

   Include: monohybrid cross, dihybrid cross, testcross, P generation, F_1 generation, F_2 generation, phenotypic ratio, genotypic ratio, dominant alleles, recessive alleles, purebred, hybrid, and carrier

5. Describe examples of and solve problems involving the inheritance of phenotypic traits that do not follow a dominant-recessive pattern.

   Examples: co-dominance, incomplete dominance, multiple alleles, lethal genes . . .

6. Explain the basis for sex determination in humans.

   Include: XX and XY chromosomes

7. Describe examples of and solve problems involving sex-linked genes.

   Examples: red-green colour-blindness, hemophilia, Duchenne muscular dystrophy . . .

8. Use pedigree charts to illustrate the inheritance of genetically determined traits in a family tree and to determine the probability of certain offspring having particular traits.

   Include: symbols and notations used

9. Discuss ethical issues that may arise as a result of genetic testing for inherited conditions or disorders.

10. Discuss the role of meiosis and sexual reproduction in producing genetic variability in offspring.
    Include: crossing over and randomness

11. Explain how chromosome mutations may arise during meiosis.

    Include: nondisjunction

12. Identify monosomy and trisomy chromosome mutations from karyotypes.

    Examples: Down syndrome, Turner syndrome, Klinefelter syndrome