# Genetic Variation

## AS91157: 4 Credits External

This achievement standard involves demonstrating understanding of genetic variation and change.

| Achievement | Achievement with Merit | Achievement with Excellence |
|---|---|---|
| Demonstrate understanding of genetic variation and change. | Demonstrate in-depth understanding of genetic variation and change. | Demonstrate comprehensive understanding of genetic variation and change. |

*Demonstrate understanding* involves defining, using annotated diagrams or models to describe, and describing characteristics of, or providing an account of, genetic variation and change.

*Demonstrate in-depth understanding* involves providing reasons as to how or why genetic variation and change occurs.

*Demonstrate comprehensive understanding* involves linking biological ideas about genetic variation and change. The discussion of ideas may involve justifying, relating, evaluating, comparing and contrasting, or analysing.

*Genetic variation and change* involves the following concepts:

- sources of variation within a gene pool
- factors that cause changes to the allele frequency in a gene pool.

Biological ideas and processes relating to sources of variation within a gene pool are selected from:

- mutation as a source of new alleles
- independent assortment, segregation and crossing over during meiosis
- monohybrid inheritance to show the effect of co-dominance, incomplete dominance, lethal alleles, and multiple alleles
- dihybrid inheritance with complete dominance
- the effect of crossing over and linked genes on dihybrid inheritance.

Biological ideas and processes relating to factors affecting allele frequencies in a gene pool are selected from:

- natural selection
- migration
- genetic drift.

**Key words:** These are the words that you are expected to understand when used in questions and be able to use in your answers.

- ❑ Allele
- ❑ Meiosis
- ❑ Variation
- ❑ Bottle neck effect
- ❑ Founder effect
- ❑ Gene flow
- ❑ Gene frequency
- ❑ Immigration
- ❑ Population
- ❑ Recombination / crossing over
- ❑ Species
- ❑ Cytosine
- ❑ Haploid
- ❑ Double helix
- ❑ Mitosis
- ❑ Recessive
- ❑ Dominant
- ❑ Thymine
- ❑ Chiasma
- ❑ Diploid
- ❑ Somatic
- ❑ Homologous pair
- ❑ Recombination
- ❑ Genotype
- ❑ Directional selection
- ❑ Stabilising selection
- ❑ Heterozygous
- ❑ Centromere
- ❑ Segregation
- ❑ Gene
- ❑ Mutation
- ❑ Adaptation
- ❑ Evolution
- ❑ Gene pool
- ❑ Genetic drift
- ❑ Genetic equilibrium
- ❑ Mate selection
- ❑ Natural selection
- ❑ Speciation
- ❑ Adenine
- ❑ DNA
- ❑ Diploid
- ❑ Gene
- ❑ Monohybrid
- ❑ Test cross
- ❑ Sex chromosome
- ❑ Autosome
- ❑ Chromatid
- ❑ Gametic
- ❑ Selective pressure
- ❑ Locus
- ❑ Semi-conservative
- ❑ Phenotype
- ❑ Disruptive selection
- ❑ Allele frequency
- ❑ Homozygous
- ❑ Independent assortment
- ❑ nucleotide