

18.1 Variation

Name: _____ Class: _____ Date: _____

Total: 6 marks

KEY WORDS variation 变异 • continuous 连续 • mutation 突变 • discontinuous 不连续
• continuous variation 连续变异

Objective

Build the skills to answer exam questions on **variation** 变异 — **continuous** 连续 and **discontinuous** 不连续 variation, and **mutation** 突变.

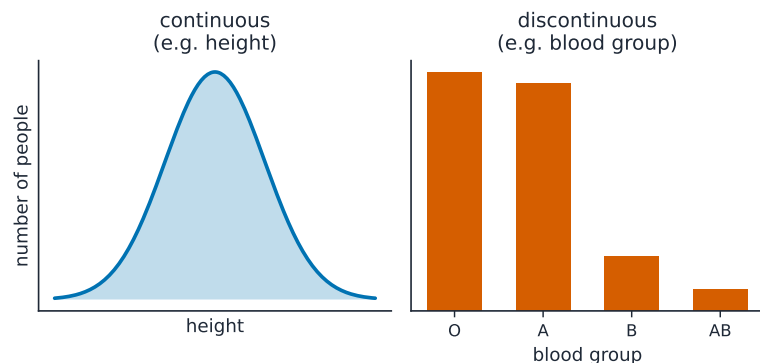
You must be able to:

- distinguish continuous and discontinuous variation, with examples
- state the causes of each
- describe mutation as the source of new alleles

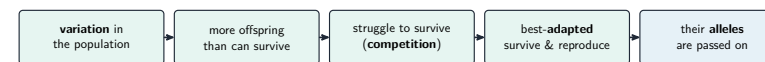
1 Worked examples

Two types of variation

continuous: smooth range • discontinuous: discrete groups



Continuous: a smooth range (genes + environment). Discontinuous: separate groups (genes only)



over many generations the population becomes better adapted

Variation is the raw material of natural selection

- **continuous:** e.g. height, mass. **discontinuous:** e.g. blood group.
- **mutation:** a random change in DNA — makes new alleles (the source of all variation). Radiation/chemicals raise the rate.

2 Practice

2.1 Give one example of discontinuous variation. [1]

2.2 State the source of all new alleles. [1]

3 Exam-style questions

3.1 Human height shows continuous variation because it is affected by: [1]

- **A** genes only
- **B** the environment only
- **C** both genes and the environment
- **D** neither

3.2 Mutations are genetic changes.

(a) State what a mutation is. [1]

(b) State two things that increase the rate of mutation. [2]

Solutions

2.1 ABO blood groups (or seed shape).

2.2 mutation.

3.1 C. Height is affected by both genes and the environment.

3.2 (a) a (random) genetic change (in the base sequence of DNA).

(b) ionising radiation (e.g. X-rays); certain chemicals.