

# Exercise walk-through

Variation ■ 18.1

eXercise

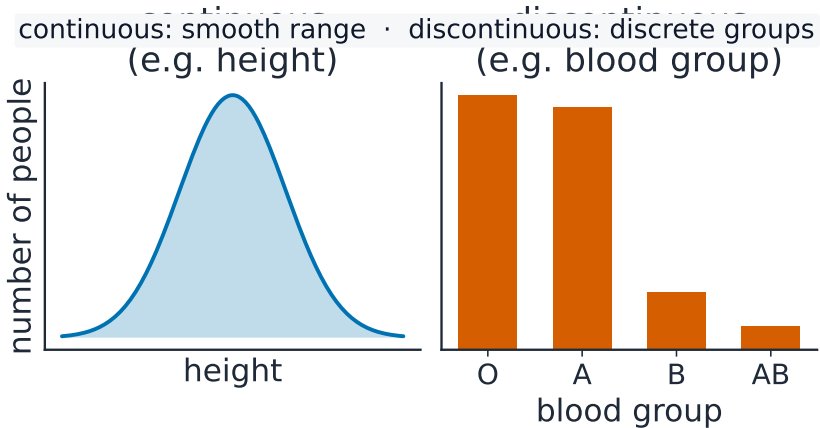
## You must be able to

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

## Method — Two types of variation

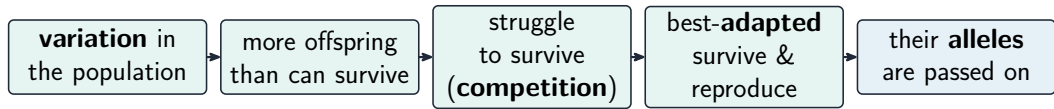
- **continuous:** e.g. height, mass. **discontinuous:** e.g. blood group.
- **mutation:** a random change in DNA — makes new alleles (the source of all variation). Radiation/chemicals raise the rate.

## Method — Two types of variation



*A smooth bell curve (continuous) and separate bars (discontinuous)*

## Method — Two types of variation



over many generations the population becomes better adapted

*Variation is the raw material of natural selection*

## Practice 2.1 ■ 1 mark

Give one example of discontinuous variation.

## Solution 2.1

Method: Two types of variation

### Worked steps

ABO blood groups (or seed shape) **B1**.

## Practice 2.2 ■ 1 mark

State the source of all new alleles.

## Solution 2.2

Method: Two types of variation

### Worked steps

mutation **B1**.

## Exam-style 3.1 ■ 1 mark

Human height shows continuous variation because it is affected by:

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

## Solution 3.1

Method: Two types of variation

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



### Worked steps

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

## Exam-style 3.2 ■ 1 mark

Mutations are genetic changes.

- (a) State what a mutation is.
- (b) State two things that increase the rate of mutation.

## Solution 3.2

Method: Two types of variation

### Worked steps

- (a) a (random) genetic change (in the base sequence of DNA) **B1**.
- (b) ionising radiation (e.g. X-rays); certain chemicals **B1** **B1**.