

# 18 Variation and mutation – Part 1

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

## Vocabulary

Write each word three times.

| English                 | Write it 3 times (English) |       |       |
|-------------------------|----------------------------|-------|-------|
| Variation               | _____                      | _____ | _____ |
| species                 | _____                      | _____ | _____ |
| continuous variation    | _____                      | _____ | _____ |
| genes                   | _____                      | _____ | _____ |
| environment             | _____                      | _____ | _____ |
| discontinuous variation | _____                      | _____ | _____ |
| blood groups            | _____                      | _____ | _____ |
| mutation                | _____                      | _____ | _____ |
| alleles                 | _____                      | _____ | _____ |
| Ionising radiation      | _____                      | _____ | _____ |
| rate                    | _____                      | _____ | _____ |

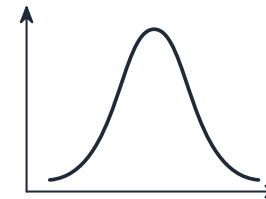
## Recall

**Variation** means the differences between individuals of the same **species**.

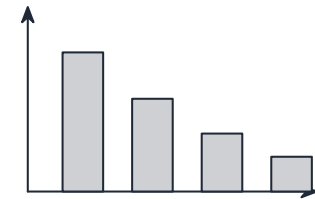
## New ideas

Read these first, then do the Practice.

### 1 Two kinds of variation



continuous  
(a smooth range)



discontinuous  
(separate groups)

- **continuous variation** – a smooth range (e.g. height); caused by **genes and the environment** ;
- **discontinuous variation** – a few separate groups (e.g. **blood groups** ); caused by genes only.

### 2 Mutation

A **mutation** is a random change in the DNA. It makes **new alleles** – the source of all variation:

|           |                  |   |                                      |
|-----------|------------------|---|--------------------------------------|
| original: | A T G C A        |   |                                      |
|           |                  | → | a change in the bases = a new allele |
| mutated:  | A T <u>T</u> C A |   |                                      |

**Ionising radiation** (e.g. X-rays) and some chemicals raise the **rate** of mutation.

**Watch out:** **continuous** variation is a smooth range (e.g. height), caused by *genes and environment*; **discontinuous** variation falls into separate groups (e.g. blood group), caused by *genes only*. A **mutation** is a random DNA change – the source of new alleles.

## Practice

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Try these in order.

**18.1** What is *variation*? [1]

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**18.2** Give one example of continuous variation. [1]

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**18.3** What two things cause continuous variation? [1]

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**18.4** What is a *mutation*? [1]

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**18.5** Name one thing that increases the rate of mutation. [1]

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**18.6 Challenge.** Height is continuous but blood group is discontinuous. Explain the difference in how each is caused. [2]