

# 5 Meiosis and genetic variation – Part 1

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

## Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

| English                | 中文   | Write it 3 times (English) |
|------------------------|------|----------------------------|
| Meiosis                | 减数分裂 | _____                      |
| gametes                | 配子   | _____                      |
| crossing over          | 交叉互换 | _____                      |
| independent assortment | 自由组合 | _____                      |

## Recall

You already know that offspring resemble their parents but are not identical:

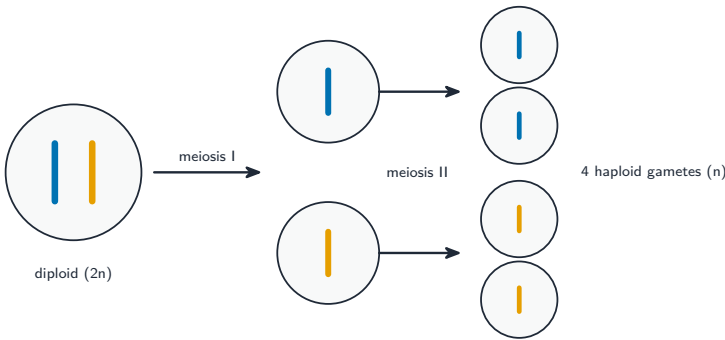
- Body cells divide by mitosis to make identical copies.
- Sex cells (eggs and sperm) are made a different way.
- Brothers and sisters differ, even with the same parents.

This sheet explains where that variety comes from. Each idea has a short worked example.

## New ideas

### ■ 1 Meiosis

**Meiosis** 减数分裂 makes sex cells, called **gametes** 配子 (eggs and sperm), with **half** the number of chromosomes. One cell divides **twice** to give four cells.

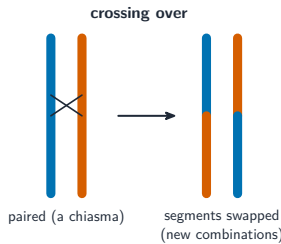


### ■ 2 Fertilisation restores the number

When an egg and sperm join at fertilisation, the full chromosome number is restored – half from each parent.

### ■ 3 Shuffling the genes

Meiosis mixes the genes so each gamete is different:



- **crossing over** 交叉互换 – homologous chromosomes swap pieces,
- **independent assortment** 自由组合 – each chromosome pair lines up randomly.

### ■ 4 Random fertilisation

On top of that, any sperm can meet any egg – **random fertilisation** adds even more variety.

**Watch out:** meiosis makes **four** cells that are **not identical**, each with **half** the chromosomes. This is different from mitosis, which makes **two identical** cells with the **full** number.

## Practice

---

Try these in order. The methods are all above.

**2.1** State what meiosis produces and how many chromosomes those cells have compared with a body cell. [2]

---

---

**2.2** Explain why the chromosome number is restored at fertilisation. [2]

---

---

**2.3** Name two ways meiosis mixes the genes to create variety. [2]

---

---

**2.4** State two differences between meiosis and mitosis. [2]

---

---

**2.5** Explain why brothers and sisters are not genetically identical (unless they are identical twins). [2]

---

---