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:

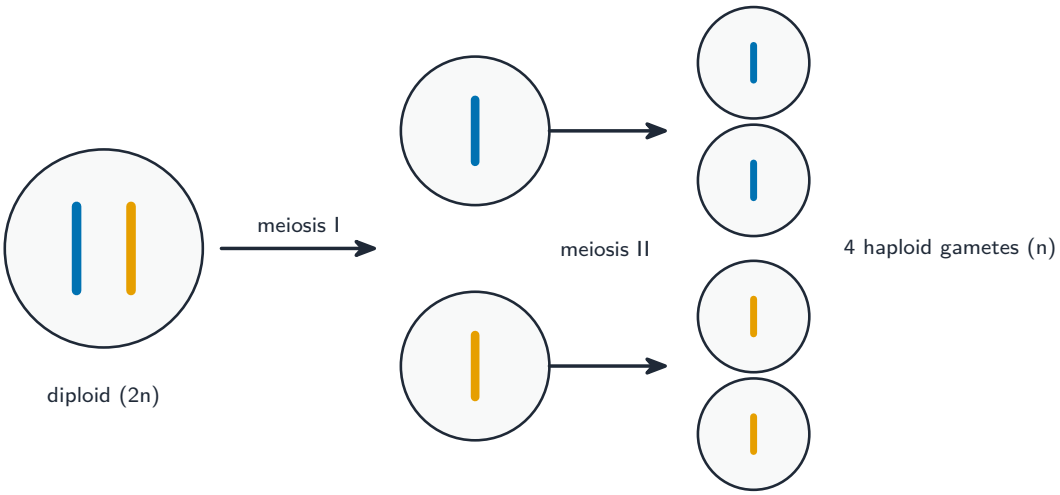
- Body cells divide by mitosis to make identical copies.
- Sex cells (eggs and sperm) are made a different way.
- Brothers and sisters differ, even with the same parents.

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.

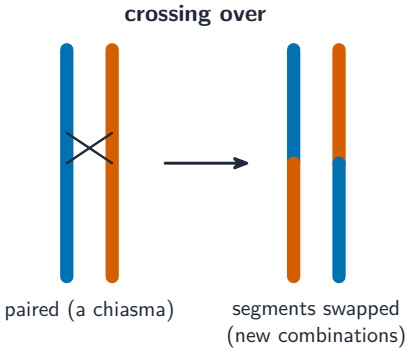


2 Fertilisation restores the number

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]