AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.6.1.6

Sex determination

Past-paper questions

Tier	**Higher**
Question groups	**1**
Available paper years	**2025–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.6.1.6 Sex determination

Question 01

June 2025 | 8464/B/2H | Original Q1

0 1 This question is about genetics.

The fur colour of rabbits is controlled by two alleles.

0 1 . 1 Draw **one** line from each term to the meaning of the term relating to genetics in rabbits.

[3 marks]

Term	Meaning of the term
Chromosome	A fur colour that is seen
Gene	A whole strand of DNA found in the nucleus of a rabbit cell
Genome	Codes for a protein that affects fur colour
	The complete genetic composition of a rabbit

Question 1 continues on the next page

4.6.1.6 Sex determination

0 1 . 2 In rabbits:

- the allele for brown fur (**B**) is dominant
- the allele for white fur (**b**) is recessive.

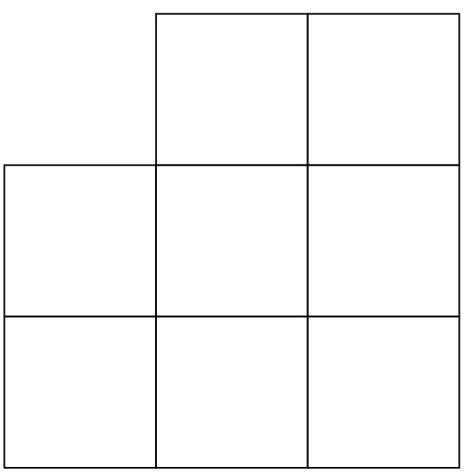
A rabbit with the alleles **Bb** and a rabbit with the alleles **bb** breed together.

Determine the probability that one of the offspring will have white fur.

You should:

- complete the Punnett square diagram
- identify any offspring that will have white fur.

[5 marks]



Probability = _____

4.6.1.6 Sex determination

Question 01 · continued

0 1 . 3 A male rabbit is heterozygous for fur colour.

The rabbit's body cells have the genotype **Bb**.

One of the sperm cells from the rabbit has the allele **b**.

Explain why the alleles in the rabbit's body cells and the allele in the sperm cell are different.

[2 marks]

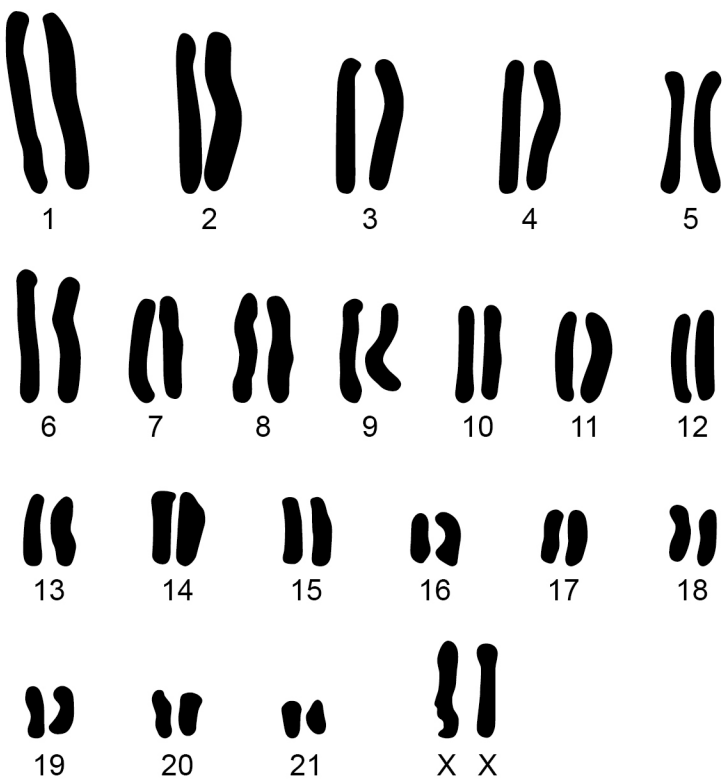
Question 1 continues on the next page

4.6.1.6 Sex determination

Question 01 · continued

Figure 1 shows the chromosomes of a rabbit.

Figure 1



0 1 . 4 How many chromosomes would be found in a skin cell of a rabbit?

Use **Figure 1**.

[1 mark]

Number of chromosomes = _____

0 1 . 5 The sex of a rabbit is controlled in the same way as the sex of a human.

Give the evidence from **Figure 1** that the rabbit is female.

[1 mark]

_____

_____

12