AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.1.3

Advantages and disadvantages of sexual and asexual reproduction (biology only)

Past-paper questions

Tier	**Foundation**
Question groups	**16**
Available paper years	**2007–2025**

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.

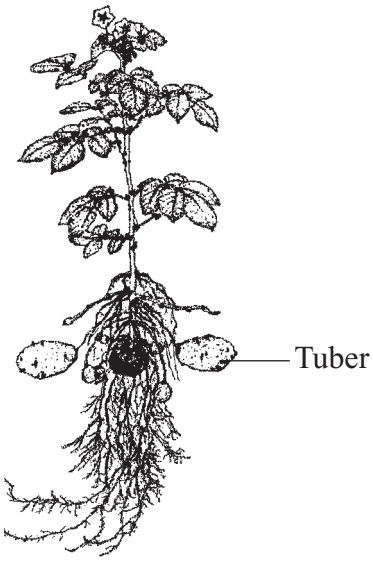
4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 01

March 2007 | BLY1B | Original Q9 | Legacy

QUESTION NINE

The diagram shows a potato plant.



Potato tubers are produced by cell division. Potato plants can reproduce sexually and asexually.

The tubers can be removed and replanted. This produces more potato plants of the same type.

The masses of the tubers of 15 potato plants of the same type were measured using an electronic balance. The results are shown in the table.

Plant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mass of tubers in kg	2.5	1.7	2.3	4.1	2.2	1.9	2.5	3.8	4.6	1.9	3.6	1.3	2.5	2.9	1.2

9A What was the range of the mass of the tubers on the potato plants?

1 1.2 – 2.5 kg

2 1.2 – 4.6 kg

3 1.3 – 4.6 kg

4 1 – 15 kg

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

9B The sensitivity of the balance is . . .

1 0.001 kg

2 0.01 kg

3 0.1 kg

4 1.0 kg

9C Which of the following is **not** a possible reason for the difference in mass of the tubers produced by the potato plants?

1 Some of the plants were growing in the shade.

2 The plants received different amounts of nutrients.

3 The tubers were produced by sexual reproduction.

4 The plants were watered at different time intervals.

9D A plant nursery wants to produce large numbers of young plants quickly and cheaply.

Which technique would be used?

1 growing the seeds produced by sexual reproduction

2 taking cuttings

3 transplanting embryo plants to other plants

4 using genetic engineering

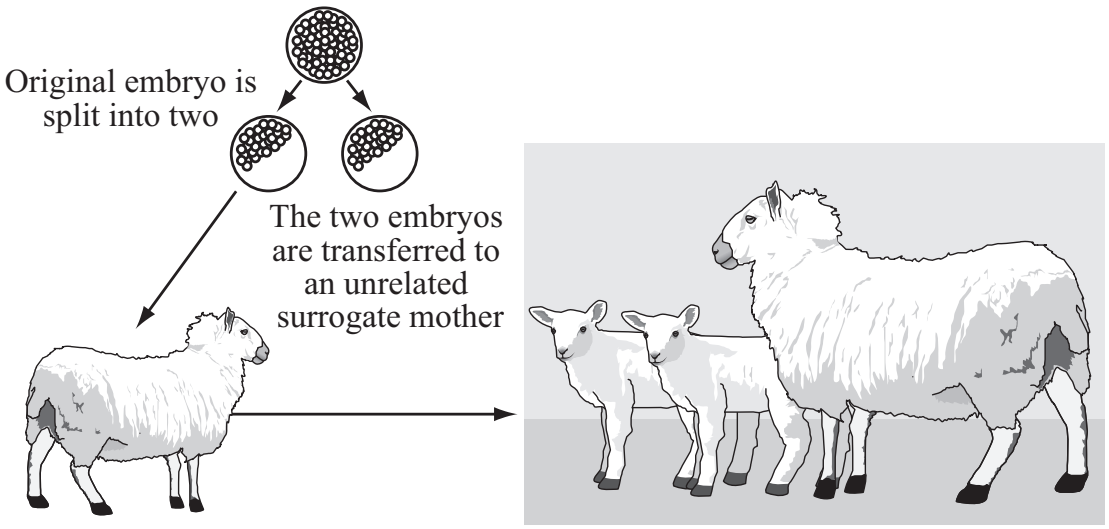
END OF TEST

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 02

June 2007 | BLY1F | Original Q3 | Legacy

3 The diagram shows one way of cloning sheep.



The surrogate mother gives birth to twins

Use words from the box to complete the sentences.

asexual	**clones**	**different**	**gametes**
identical	**joining**	**sexual**	**splitting**

The original embryo in the diagram developed following the ..... of an egg and a sperm. This is called ..... reproduction. The twins in the diagram have ..... genetic information. This is because the two embryos were produced by ..... reproduction. Because of this they are known as ..... .

(5 marks)

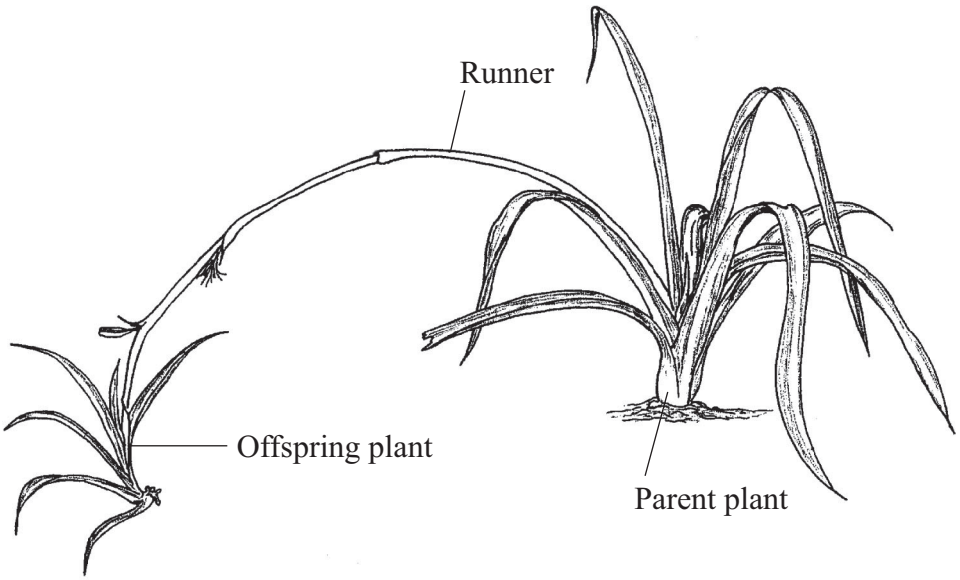
5

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 03

January 2008 | BLY2F | Original Q3 | Legacy

3 The diagram shows a spider plant during one type of reproduction.



Complete the sentences using words from the box.

asexual	**characteristics**	**chromosomes**	
gametes	**genes**	**mitosis**	**sexual**

(a) The colour and shape of the leaves of a spider plant are known as ..... .

(1 mark)

(b) The shape of the leaves is controlled by ..... .

(1 mark)

(c) The thread-like structures inside the nucleus of the cells are called ..... .

(1 mark)

(d) The spider plant produces new cells in the runner by a process called ..... .

(1 mark)

(e) This type of reproduction is called ..... reproduction.

(1 mark)

5

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 04

January 2009 | BLY1F | Original Q5 | Legacy

5 The photographs show a zorse and its parents, a zebra and a horse.

Horse



×

Zebra



Zorse

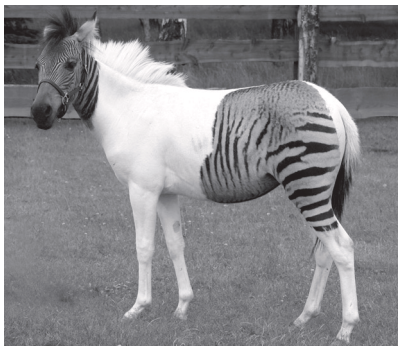


Photo of horse © Arctic-Images/Corbis
Photo of zebra © Arthur Morris/Corbis
Photo of zorse © Udo Richter/epa/Corbis

5 (a) Draw a ring around the correct answer to complete the sentence.

The zorse was produced by

cloning
asexual reproduction
sexual reproduction

.

(1 mark)

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 04 · continued

for mark

5 (b) Explain the appearance of the zorse.

Use **both** words from the box in your explanation.

gametes	**genes**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(3 marks)

4

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 05

November 2009 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

This question is about reproduction in animals and plants.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A clones

B cuttings

C gametes

D variations

Sexual reproduction involves the joining of . . . **1** . . . .

The offspring from sexual reproduction are a mixture of genetic information from two parents.

This leads to . . . **2** . . . .

Asexual reproduction involves genetic information from only one parent.

The offspring are genetically identical to the parent and are known as . . . **3** . . . .

An asexual method of producing plants is by taking . . . **4** . . . .

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 06

March 2010 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

This question is about the way in which new varieties of plants are produced.

8A Genetically identical individuals are known as . . .

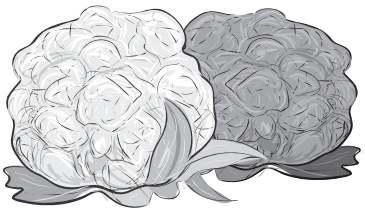
1 embryos.

2 gametes.

3 species.

4 clones.

People can now buy a purple variety of cauliflower.



These purple cauliflowers have been produced as a result of careful selection.

8B How can new varieties of plants be produced?

1 tissue culture

2 asexual reproduction

3 sexual reproduction

4 cloning

8C The purple colour of the first purple cauliflower was due to . . .

1 genetic engineering.

2 a mutation.

3 embryo transplantation.

4 gene transfer.

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 06 · continued

8D At first there was only one purple cauliflower.

How could large numbers of purple cauliflowers be produced from this first one?

1 interbreeding purple and white cauliflowers

2 taking small groups of cells from the purple cauliflower and then growing them

3 genetic modification of white cauliflowers

4 'cutting out' the gene for the purple colour and transferring it into white cauliflowers

Turn over for the next question

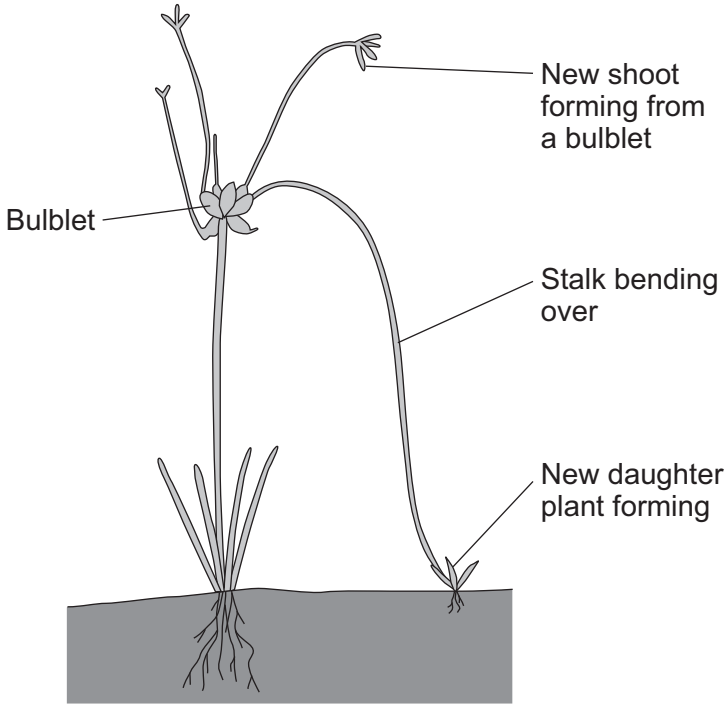
4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 07

June 2010 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

Walking onion plants grow a bunch of bulblets (tiny bulbs).
The bulblets start to grow and the stalks bend over with the weight of the new growth. This makes the onion plant seem to walk across the garden.



Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A bulblet

B clone

C gamete

D parent

Producing plants in this way is called asexual reproduction.

Asexual reproduction needs only one . . . **1** . . . .

Asexual reproduction does **not** involve production of a . . . **2** . . . .

The daughter plant is formed from a . . . **3** . . . .

The daughter plant is identical to the parent plant so it is called a . . . **4** . . . .

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 08

June 2010 | BLY1F | Original Q4 | Legacy

4 We breed animals with the characteristics that we prefer.

4 (a) The photograph shows a rabbit with some of its babies.



Use words from the box to complete the sentences about inheritance in rabbits.

characteristic	**chromosome**	**gene**	**gamete**

4 (a) (i) The colour of a rabbit's fur is known as a ..... .

(1 mark)

4 (a) (ii) This colour is controlled by a ..... .

(1 mark)

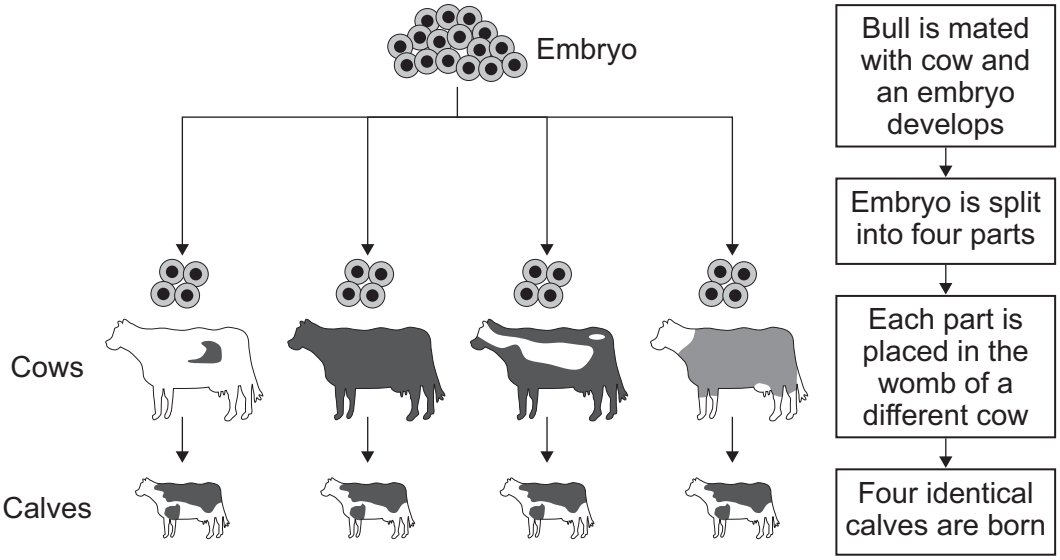
4 (a) (iii) Each sex cell of a rabbit is known as a ..... .

(1 mark)

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 08 · continued

4 (b) The diagram shows one way of producing calves.



Use words from the box to complete the sentences.

asexual	**clones**	**cuttings**	**gametes**	**genetic**	**sexual**

A bull was mated with a cow.

This is ..... reproduction.

The embryo produced was split into four parts.

The calves in the diagram have identical genetic information.

This is because the calves were produced by ..... reproduction.

The identical calves are known as ..... .

(3 marks)

6

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 09

March 2011 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

We can now produce animals and plants with characteristics we prefer.

Match words, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A embryo transplants

B sexual reproduction

C taking cuttings

D tissue culture

1	a quick and cheap way of reproducing a plant
2	produces clones of an animal
3	produces offspring using small groups of cells from a plant
4	produces offspring with a variety of different characteristics

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 10

June 2013 | BL1FP | Original Q6 | Legacy

6 The photographs show two breeds of cow.

Friesian cow



Jersey cow



In parts **(a)** and **(b)** draw a ring around the correct answer to complete each sentence.

6 (a) Cows produce their young (calves) by

asexual reproduction.
cloning.
sexual reproduction.

(1 mark)

6 (b) Cows and their calves have many similar characteristics.

6 (b) (i) The information for characteristics is carried by

clones.
embryos.
genes.

(1 mark)

6 (b) (ii) The information for characteristics is passed to the next generation in cells

called

body cells.
gametes.
neurones.

(1 mark)

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 10 · continued

6 (c) Friesian and Jersey cows can both be used for meat or to produce milk.

The information shows features of Friesian and Jersey cows.

Friesian cows	Jersey cows
Body mass up to 600 kg	Body mass up to 400 kg
Milk contains 3.4% protein	Milk contains 3.8% protein
Can be milked for 325 days after giving birth	Can be milked for 250 days after giving birth
Produce no milk for 55 days before having a calf	Produce no milk for 45 days before having a calf
Produce > 30 litres of milk per day	Produce < 30 litres of milk per day

Use **only** the information above to answer these questions.

In your answers you must make comparisons between the two breeds of cow.

6 (c) (i) Give **two** advantages of a farmer keeping Friesian cows and **not** Jersey cows.

1 .....

.....

2 .....

.....

(2 marks)

6 (c) (ii) Give **two** advantages of a farmer keeping Jersey cows and **not** Friesian cows.

1 .....

.....

2 .....

.....

(2 marks)

Question 6 continues on the next page

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 10 · continued

6 (d) Cow's milk is different from human milk. Cow's milk should **not** be given to young human babies.

Scientists in China have *genetically engineered* cows to produce human milk. Milk from these cows can be fed to young human babies.

6 (d) (i) What is *genetic engineering*?

Tick (✓) **one** box.

Genes from one organism are transferred to a different organism ☐

Cells are separated from an embryo and are transferred to host mothers ☐

The nucleus from a body cell is transferred to an egg cell ☐

(1 mark)

6 (d) (ii) Some people are worried about using milk from genetically engineered cows, to feed human babies.

Give **one** reason why.

.....

.....

(1 mark)

9

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 11

June 2013 | BL3FP | Original Q8 | Legacy

8 There are many ways to increase the efficiency of food production.

8 (a) The table shows the energy available to humans from two different food chains.

Food chain	Energy transferred to humans in kJ per hectare of crop
Wheat → humans	900 000
Wheat → pigs → humans	90 000

8 (a) (i) Compare the amount of energy the two food chains transfer to humans.

.....

.....

(1 mark)

8 (a) (ii) Give **one** reason for the difference in the amount of energy the two food chains transfer to humans.

.....

.....

(1 mark)

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 11 · continued

8 (b) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

Give methods used in the factory farming of animals.
Explain the advantages and disadvantages of these methods.

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(6 marks)

8

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 12

June 2017 | BL3FP | Original Q4 | Legacy

4 Biogas is produced when bacteria break down some plant or animal materials.

4 (a) What is the main useful gas found in biogas?

[1 mark]

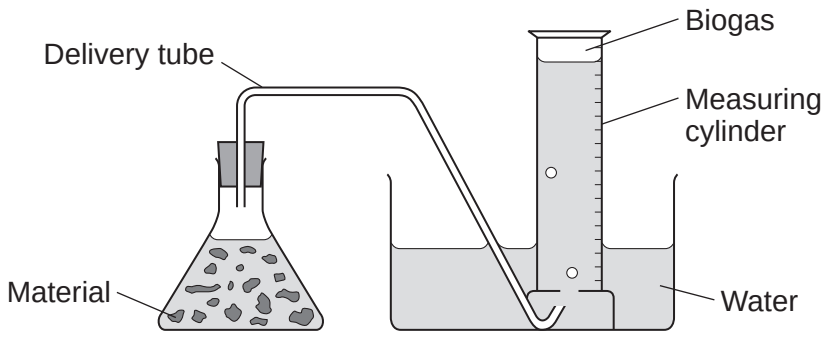
_____

4 (b) Some students investigated which of four types of material produced the most biogas.

The students:

- chopped the material into small pieces
- placed 200 g of each material into a different flask with 100 cm^3 of water
- set up the apparatus as shown in **Figure 5** to collect the biogas produced
- left each set of apparatus at 25 °C for 7 days
- repeated the investigation twice more.

Figure 5



Give **two** variables the students controlled in their investigation.

[2 marks]

1 _____

_____

2 _____

_____

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 12 · continued

4 (c) **Table 2** shows the students' results.

Table 2

Type of material	Volume of biogas collected in 7 days in cm^3			
	Test 1	Test 2	Test 3	Mean
Beans	12.0	12.4	12.2	12.2
Manure	15.0	15.2	8.2	15.1
Manure and beans	18.6	18.8	18.4	18.6
Sweet potato	14.3	14.1	14.5	

4 (c) (i) One of the results in **Table 2** is anomalous.

Draw a ring around the anomalous result shown in **Table 2**.

[1 mark]

4 (c) (ii) Calculate the mean volume of biogas collected, in 7 days, for sweet potato in **Table 2**.

[1 mark]

_____

_____

4 (c) (iii) Which type of material in **Table 2** would be the most effective to use in a biogas generator?

Give a reason for your answer.

[2 marks]

_____

_____

_____

_____

Question 4 continues on the next page

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 12 · continued

4 (d) A farmer built a biogas generator on his cow farm.

Suggest **one** advantage and **one** disadvantage of having a biogas generator.

[2 marks]

Advantage _____

_____

Disadvantage _____

_____

9

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 13

June 2022 | 8461/2F | Original Q8

0 8 There are two types of reproduction:

- sexual reproduction
- asexual reproduction.

0 8 . 1 Complete **Table 4** to compare sexual reproduction with asexual reproduction.

Write a tick (✓) in the box if the statement is true.

The first row has been completed for you.

[2 marks]

Table 4

	Sexual reproduction	Asexual reproduction
Cell division occurs	✓	✓
Fertilisation occurs		
Genes are passed on from parent to offspring		
Offspring are genetically identical to each other		

0 8 . 2 Gametes are formed in sexual reproduction.

Name the male gamete formed in flowering plants.

[1 mark]

_____

Question 8 continues on the next page

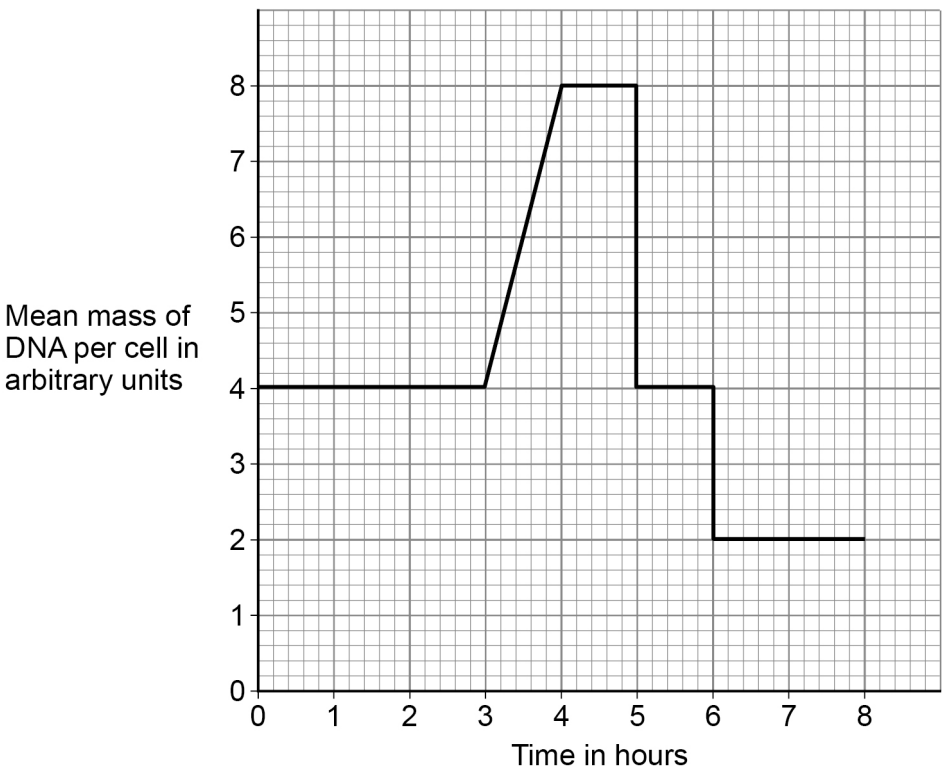
4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 13 · continued

Cell division by meiosis forms gametes.

Figure 12 shows the mean mass of DNA per cell before, during and after meiosis.

Figure 12



Use information from **Figure 12** to answer questions **08.3** to **08.6**.

0 8 . 3 When is the DNA in the chromosomes being copied?

[1 mark]

Tick (✓) **one** box.

Between 0 and 3 hours ☐

Between 3 and 4 hours ☐

Between 4 and 5 hours ☐

Between 5 and 6 hours ☐

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 13 · continued

June 2022 | 8461/2F | Original Q8

0 8 . 4 Cells divide twice during meiosis.

Which **two** times in **Figure 12** show one cell dividing into two cells?

[2 marks]

Tick (✓) **two** boxes.

- 3 hours ☐
- 4 hours ☐
- 5 hours ☐
- 6 hours ☐
- 8 hours ☐

0 8 . 5 What is the mean mass of DNA in arbitrary units in a sperm cell?

[1 mark]

Tick (✓) **one** box.

2 ☐ 4 ☐ 8 ☐ 16 ☐

0 8 . 6 What is the mean mass of DNA in arbitrary units in each cell in an embryo?

[1 mark]

Tick (✓) **one** box.

2 ☐ 4 ☐ 8 ☐ 16 ☐

8

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 14

0 4 Malaria is caused by a protist.

The protist is passed from one person to another person by mosquitos.

0 4 . 1 Which term describes the mosquito?

[1 mark]

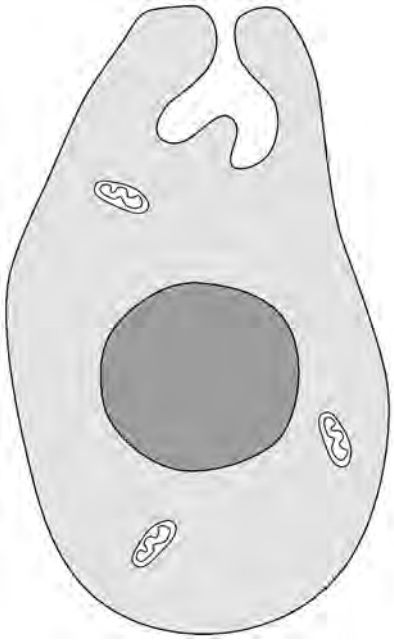
Tick (✓) **one** box.

- Bacterium ☐
- Gene ☐
- Vector ☐

0 4 . 2 The malarial protist is a eukaryotic cell.

Figure 2 shows a malarial protist.

Figure 2



4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 14 · continued

Give **two** features of the malarial protist that show the cell is eukaryotic and **not** prokaryotic.

[2 marks]

1 _____

_____

2 _____

_____

0 4 . 3 Which organism is prokaryotic?

[1 mark]

Tick (✓) **one** box.

Cow ☐

Grass ☐

Salmonella ☐

0 4 . 4 The malarial protist reproduces asexually.

What is a feature of asexual reproduction?

[1 mark]

Tick (✓) **one** box.

Only one parent is involved. ☐

The offspring show genetic variation. ☐

Two gametes fuse. ☐

Question 4 continues on the next page

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 14 · continued

0 4 . 5 Mitosis occurs in the malarial protist during asexual reproduction.

The protist has 14 chromosomes.

How many chromosomes will each new protist cell have after mitosis?

[1 mark]

Tick (✓) **one** box.

7 ☐ 14 ☐ 21 ☐ 28 ☐

0 4 . 6 When a person has malaria, the protists destroy red blood cells.

What change would happen in the blood of a person with malaria?

[1 mark]

Tick (✓) **one** box.

Decreased antibodies ☐

Decreased haemoglobin ☐

Increased plasma ☐

Increased platelets ☐

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 14 · continued

0 4 . 7 It is estimated that 210 million people are infected with malaria every year. Half of these infected people survive the disease.

Calculate how many people would survive the disease in 3 years if the estimate is correct.

Give your answer in standard form.

[4 marks]

Number of people (in standard form) = _____

0 4 . 8 The spread of malaria can be controlled by using mosquito nets to avoid being bitten.

Describe **two** other ways that people can reduce the chance of being bitten by mosquitos.

Do **not** refer to mosquito nets in your answer.

[2 marks]

1 _____

2 _____

Question 4 continues on the next page

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 14 · continued

0 4 . 9 Different types of disease may interact.

Scientists studied how having disorder **S** interacts with malaria.

The scientists calculated the chance of children with disorder **S** getting malaria.

Table 4 shows the results.

Table 4

Age in years	Percentage (%) chance of children with disorder S getting malaria
2	70
4	65
6	50
8	45

Describe the trend shown in **Table 4**.

Use data from **Table 4**.

[2 marks]

15

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 15

June 2023 | 8461/2F | Original Q9

0 9 Reproduction can produce offspring which are:

- genetically different

  or

- genetically identical.

Farmers grow tomato plants in greenhouses.

The tomatoes are sold in supermarkets.

0 9 . 1 Suggest **one** advantage of growing tomato plants that are genetically different.

[1 mark]

0 9 . 2 Suggest **one** advantage of growing tomato plants that are genetically identical.

[1 mark]

0 9 . 3 Scientists can grow genetically identical tomato plants using tissue culture.

What is tissue culture?

[1 mark]

0 9 . 4 Genetically identical tomato plants growing in the same garden do **not** all grow to the same height.

Give **one** reason why.

[1 mark]

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 15 · continued

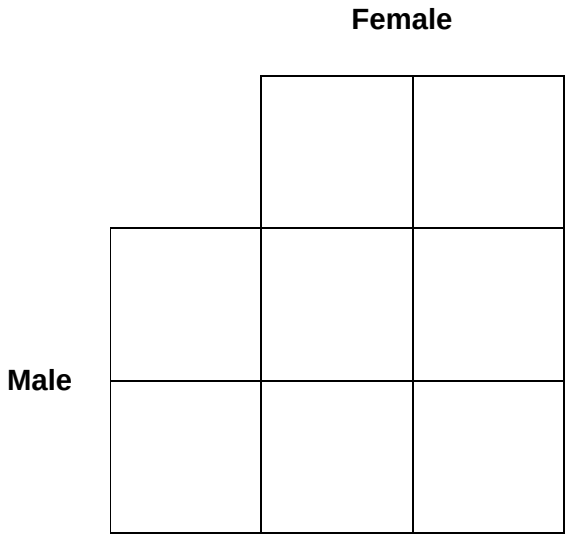
The sex of dogs is determined by **X** and **Y** chromosomes in the same way as in humans.

0 9 . 5 Complete the Punnett square diagram in **Figure 15** to show the inheritance of sex in dogs.

Use the symbols **X** and **Y**.

[3 marks]

Figure 15



0 9 . 6 A female dog gave birth to six offspring.

Why would you expect there to be three male offspring and three female offspring?

Use your answer to Question **09.5**.

[1 mark]

Question 9 continues on the next page

Question 15 · continued

Farmers keep chickens for:

- meat production
- egg production.

Some varieties of chicken grow more quickly and are more suitable for meat production.

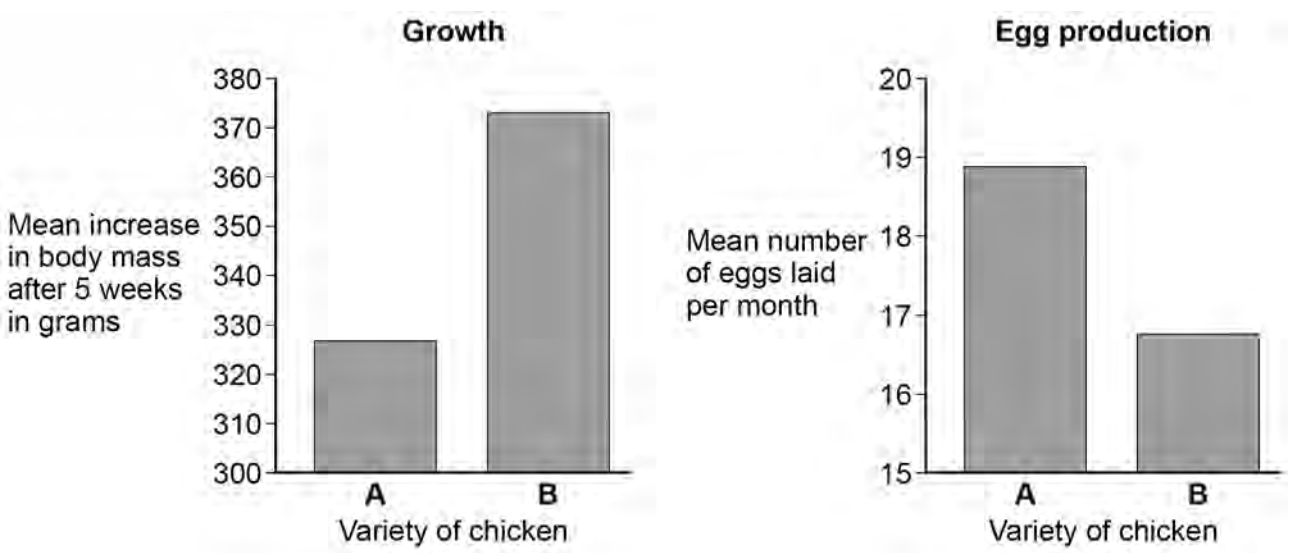
Other varieties of chicken produce more eggs.

A farmer keeps two varieties of chicken, **A** and **B**.

The farmer investigated the growth rates and egg-production rates of both varieties.

Figure 16 shows the results.

Figure 16



0 9 . 7 Suggest **two** control variables the farmer should have used in this investigation.

[2 marks]

1 _____

_____

2 _____

_____

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 15 · continued

June 2023 | 8461/2F | Original Q9

0 9 . 8 **Figure 16** shows mean values from 500 chickens of each variety.

Give the reason the farmer used a large number of chickens.

[1 mark]

0 9 . 9 The farmer wants to produce a new variety of chicken that is good for **both** meat production **and** egg production.

Describe how selective breeding of chicken varieties **A** and **B** can produce the new variety of chicken.

[4 marks]

15

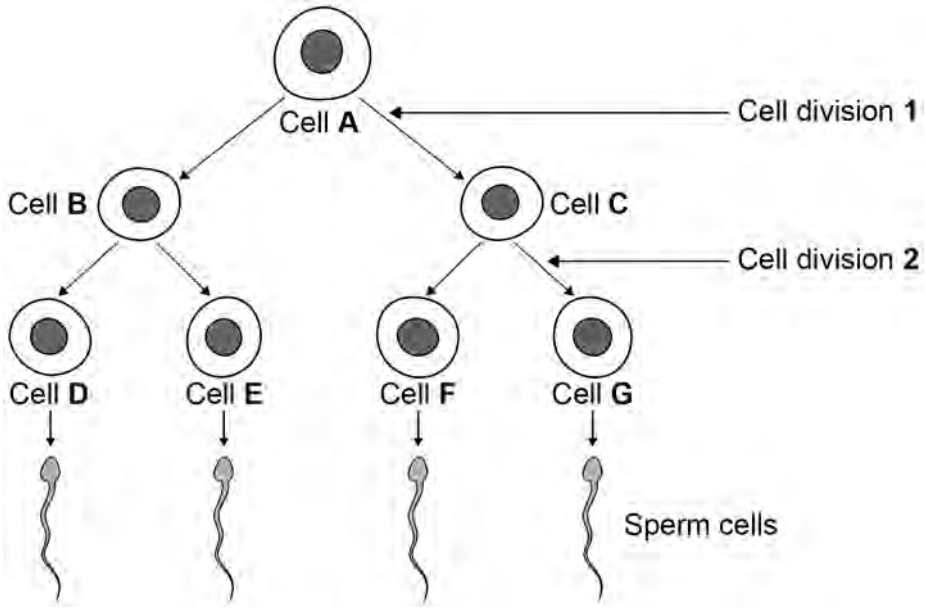
4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 16

0 3 New cells are produced by cell division.

Figure 5 shows sperm formation in a human.

Figure 5



0 3 . 1 Where in the body are sperm cells produced?

[1 mark]

_____

0 3 . 2 How many chromosomes are there in cell **A** and in cell **D**?

Choose answers from the box.

[2 marks]

23	24	46	92

Cell **A** _____

Cell **D** _____

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 16 · continued

0 3 . 3 Complete the sentence.

Choose the answer from the box.

[1 mark]

differentiation	evolution	fertilisation

A sperm cell joins with an egg cell in a process called _____.

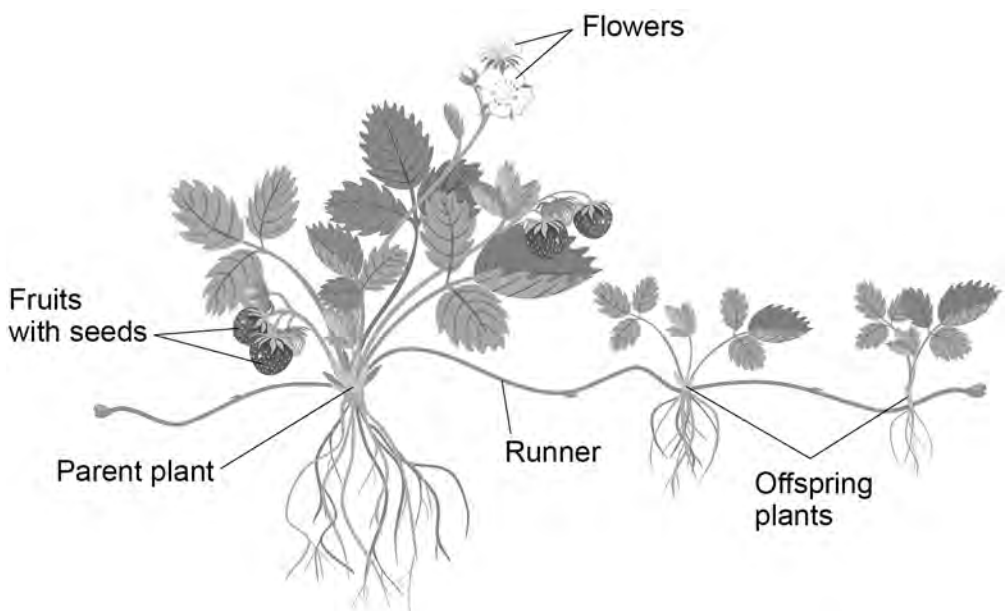
Question 3 continues on the next page

Strawberry plants can reproduce both sexually and asexually.

Figure 6 shows a strawberry plant reproducing:

- sexually, using flowers, fruits and seeds
- asexually, using horizontal stems called runners.

Figure 6



0 3 . 4 Meiosis produces gametes.

What is the name of the male gamete in a flower?

[1 mark]

Tick (✓) **one** box.

Embryo ☐

Ovum ☐

Pollen ☐

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 16 · continued

0 3 . 5 Which process produces new cells in runners?

[1 mark]

Tick (✓) **one** box.

- Binary fission ☐
- Evolution ☐
- Mitosis ☐

0 3 . 6 Substances used for growth pass through the runners from the parent plant to the offspring plants.

Which **two** substances pass through the runners?

[2 marks]

Tick (✓) **two** boxes.

- Carbon dioxide ☐
- DNA ☐
- Insulin ☐
- Sugar ☐
- Water ☐

Question 3 continues on the next page

4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction (biology only)

Question 16 · continued

Sexual reproduction and asexual reproduction each have different advantages for the strawberry plant.

0 3 . 7 Give **one** advantage of reproducing **sexually**.

[1 mark]

0 3 . 8 Give **one** advantage of reproducing **asexually**.

[1 mark]

10