AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.3.3

The understanding of genetics (biology only)

Past-paper questions

Tier	**Higher**
Question groups	**2**
Available paper years	**2011–2015**

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:** _____

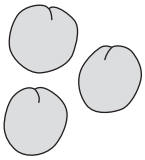
Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.6.3.3 The understanding of genetics (biology only)

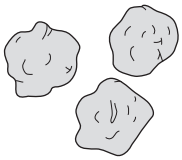
Question 01

June 2011 | BLY2H | Original Q6 | Legacy

6 In the 1860s, Gregor Mendel studied inheritance in nearly 30 000 pea plants.
Pea plants can produce either round seeds or wrinkled seeds.



Round pea seeds



Wrinkled pea seeds

6 (a) Mendel crossed plants that always produced round seeds with plants that always produced wrinkled seeds.

He found that all the seeds produced from the cross were round.

Use the symbol **A** to represent the dominant allele and **a** to represent the recessive allele.

Which alleles did the seeds from the cross have? .....

(1 mark)

4.6.3.3 The understanding of genetics (biology only)

Question 01 · continued

6 (b) Mendel grew hundreds of plants from the seeds of the offspring.
He crossed these plants with each other.

6 (b) (i) Mendel's crosses produced 5496 round pea seeds and 1832 wrinkled pea seeds.

Explain why Mendel's crosses gave him these results.

In your answer you should use:

- a genetic diagram
- the symbols **A** and **a**.

(3 marks)

6 (b) (ii) One of Mendel's crosses produced 19 round seeds and 16 wrinkled seeds.

These numbers do **not** match the expected ratio of round and wrinkled seeds.

Suggest why.

.....

.....

(1 mark)

6 (c) The importance of Mendel's discovery was not recognised until many years after his death.

Give **one** reason why.

.....

.....

(1 mark)

6

4.6.3.3 The understanding of genetics (biology only)

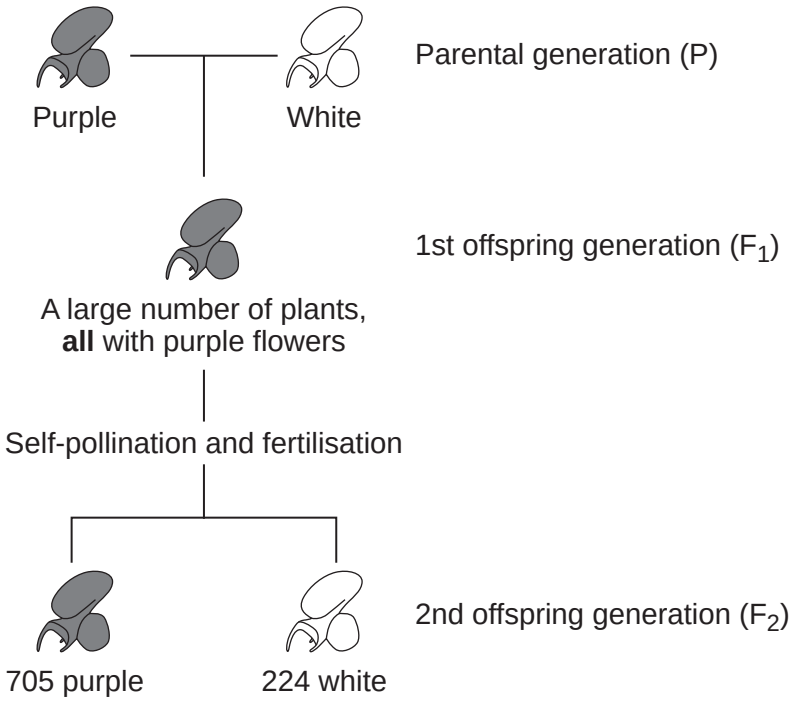
Question 02

June 2015 | BL2HP | Original Q8 | Legacy

8 In 1866, Gregor Mendel published the results of his investigations into inheritance in garden pea plants.

Figure 9 shows the results Mendel obtained in one investigation with purple-flowered and white-flowered pea plants.

Figure 9



8 (a) (i) Calculate the ratio of purple-flowered plants to white-flowered plants in the F_2 generation.

[1 mark]

Ratio of purple : white = ...

8 (a) (ii) There was a total of 929 plants in the F_2 generation.

Mendel thought that the production of a large number of offspring plants improved the investigation.

Explain why.

[2 marks]

.....

.....

.....

.....

4.6.3.3 The understanding of genetics (biology only)

Question 02 · continued

8 (b) (i) Some of the plants in **Figure 9** are homozygous for flower colour and some are heterozygous.

Complete **Table 1** to show whether each of the plants is homozygous or heterozygous. For each plant, tick (✓) **one** box.

[2 marks]

Table 1

	Homozygous	Heterozygous
Purple-flowered plant in the P generation		
White-flowered plant in the P generation		
Purple-flowered plant in the F_1 generation		

8 (b) (ii) Draw a genetic diagram to show how self-pollination of the F_1 purple-flowered plants produced mainly purple-flowered offspring in the F_2 generation together with some white-flowered offspring.

Use the following symbols:

N = allele for purple flower colour
n = allele for white flower colour

[3 marks]

8 (c) When Mendel published his work on genetics, other scientists at the time did not realise how important it was.

Suggest **two** reasons why.

[2 marks]

1 .....

.....

2 .....

.....

10