

Name

Mark

Class

Date

GCSE Science/Biology

Internally Assessed Activity Unit B1a

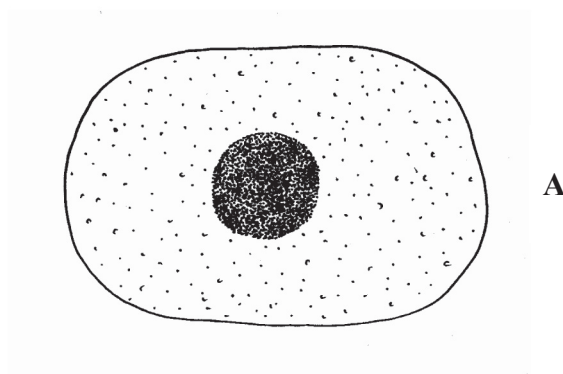
Topic 2 – Genes

Genetics in use

Mark is learning about genes.

Question 1

Mark finds a diagram of a human cell. This is shown below.



(a) Draw a line from the letter A to the part of the diagram where genes are found.

1 mark

(b) Tick the **one** box that shows what genes do in cells.

- protect
- control activity
- give strength

1 mark



(c) Choose a word from the box to complete the sentence below.

inheritance	time	volume
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A gene is known as the unit of

1 mark

(d) Mark learns that we also have chromosomes in our cells.

Explain the difference between a gene and a chromosome.

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2 marks

(5 marks)

Question 2

Mark's teacher tells him about the Human Genome Project. The teacher says that the project has mapped all of the genes on our chromosomes.

(a) The teacher says

The project means that we now know exactly where each gene is in our cells.

Mark says

I think this means we will be able to treat human diseases now.

(i) Underline the correct word to complete the sentence.

Some diseases are caused by **faulty** **growing** **healthy** genes.

1 mark

(ii) Describe how the Human Genome Project means we will be able to treat certain diseases now.

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2 marks

(iii) Give **one** advantage and **one** disadvantage of knowing if we are likely to develop a serious disease in the future.

Advantage

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Disadvantage

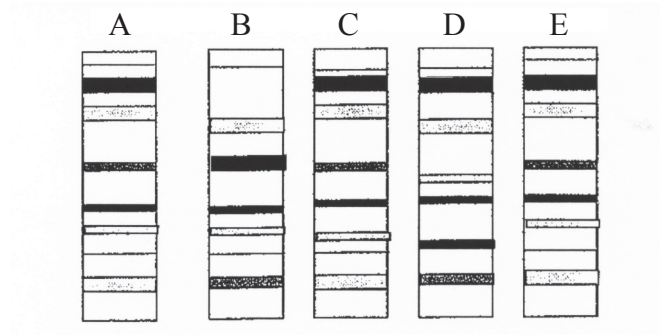
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2 marks

(b) DNA fingerprinting can show how closely people are related.

DNA can be extracted from cells and can be compared with other DNA to see if there is a match. The more similarities there are in the DNA banding the more closely related the people are.

The diagrams show DNA taken from five people, A, B, C, D and E.



(i) Use the information in the diagrams to explain which three people are most closely related.

..... and and

Explanation

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3 marks

(ii) Discuss whether you think other people have any right to know a person's DNA fingerprint.

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2 marks

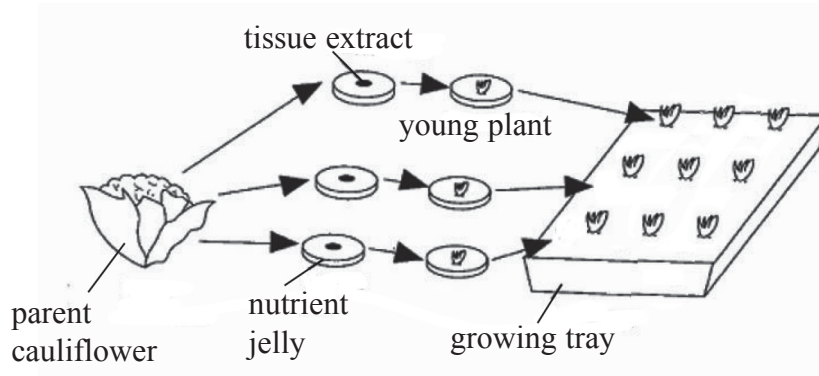
(10 marks)

Question 3

Mark helps his father to grow cauliflowers by micropropagation.

- Cauliflowers can be grown from small pieces of tissue taken from one plant.
- The tissue is grown on nutrient jelly.
- The small plants formed are then transferred to trays.
- They are then planted in soil and allowed to grow to full size.

The process of micropropagation is shown in the diagram.



- (a) The process produces cauliflowers that are clones.

Explain what is meant by the term 'clone'.

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2 marks

- (b) There are advantages and disadvantages of growing cauliflowers that are clones.

- (i) Give **one** advantage.

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1 mark

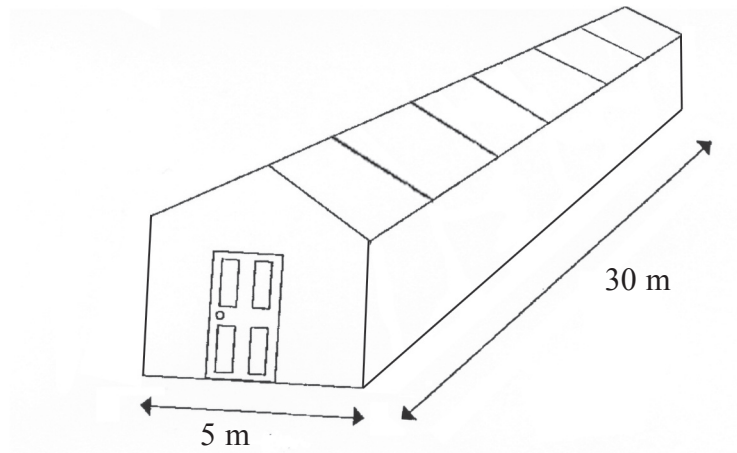
- (ii) Give **one** disadvantage.

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1 mark

- (c) To produce early crops of cauliflowers some of the cloned plants are grown in trays inside large glass houses like the one shown.



- (i) Mark puts his growing trays side by side and touching each other along the 30m side of the glass house.

If the growing trays measure 0.5 m by 0.5 m; how many trays can he fit in one row?

1 mark

- (ii) Mark sets up several rows of trays touching each other but with a 1 m space left down the middle of the glass house.

How many trays in total can Mark fit into the glass house if he stacks them four high?

2 marks

(d) Some of the cloned cauliflowers are grown outside.

All the cauliflowers grown inside the glass house mature earlier than those grown outside. Mark believes that it is valid to say that this is **only** due to the temperature inside the glass house being warmer.

Explain whether you agree with Mark's statement.

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2 marks

(9 marks)

Question 4

Mark's mother likes to grow new varieties of flowers.

She crosses two plants that have red flowers. She then grows 100 of the seeds which are produced and finds that 77 of the plants have red flowers and 23 of the plants have white flowers.

Help Mark explain to his mother why the plants have been produced in this ratio. You may wish to use a diagram in your answer.

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(3 marks)

27 marks

Quality of written communication

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Total 30 marks

