

GCSE Double Award Biology Foundation Tier

Unit 4/Biology 2: Topic 4.4

Variation and evolution

1. This question is about the disease cystic fibrosis.

(a) Complete the following sentences by underlining the correct word or words for each.

(i) Cystic fibrosis affects
blood vessels
bronchioles
nerves [1]

(ii) One symptom of cystic fibrosis is
increased body temperature
production of thick mucus
raised blood pressure [1]

(iii) Gene therapy for cystic fibrosis uses
an inhaler
an injection
a powder taken in a drink [1]

2. A scientist investigated the range of heights of a flowering plant species at two different locations; in the middle of a woodland and in a hedgerow. He measured the heights of 20 plants in each location.

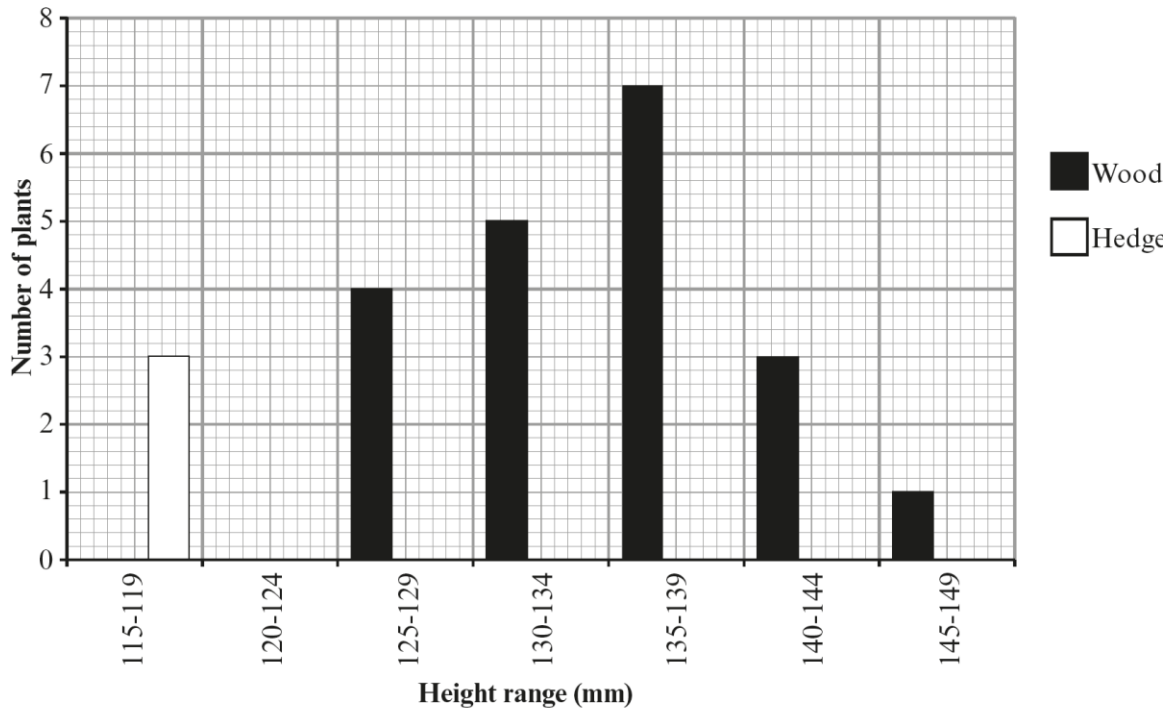
Heights of plants from woodland (mm)			
125	134	139	126
135	149	144	135
130	137	128	136
136	141	143	133
131	129	133	138

Heights of plants from hedgerow (mm)			
115	134	127	117
127	123	131	122
132	126	118	123
121	125	124	128
134	137	129	138

- (a) (i) Complete the tally chart below by scoring the height ranges of the **hedgerow** plants. Some have been done for you. [1]

Range (mm)	Tally of plants at each location	
	Woodland	Hedgerow
115-119	0	
120-124	0	
125-129		
130-134	+++	
135-139	+++	
140-144		
145-149		

- (ii) The woodland data have been plotted below. Complete the bar chart by plotting the data for hedgerow plants. One bar has been done for you. Use a ruler to carefully draw the bars. [2]



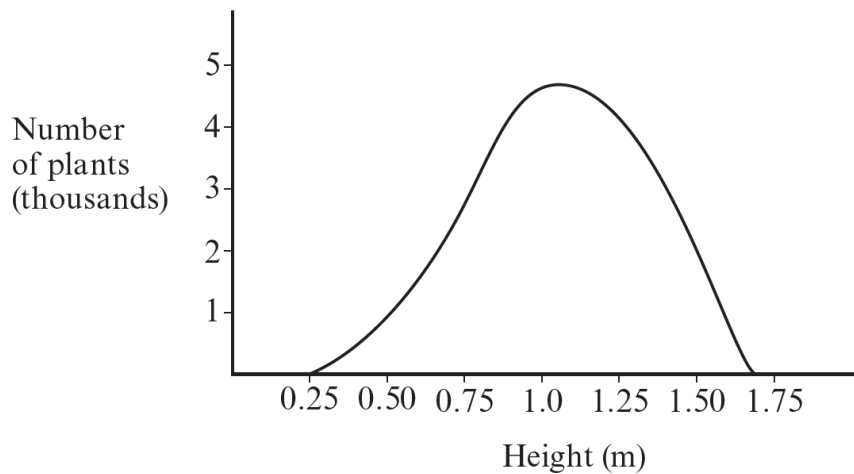
- (iii) Using the data and graph only what conclusion can you make about the plants growing in the hedgerow? [1]

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- (b) Suggest a way in which the scientist could find out whether the difference in height of the flowering plant species found at the two locations is due to environmental or genetic causes. [2]

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3. The graph shows variation in the height of wheat plants.



(a) Complete the sentences below using some words from the list. [2]

asexual environmental genetic sexual

The plants were grown in the same conditions, so the differences in height are due mostly to causes. Differences in appearance between individuals are common because of reproduction.

(b) Some variations may be inherited from parents.

Which of the following can be inherited in humans?

Place a tick (✓) in the box against the **two** correct answers. [2]

mutation in a gamete

broken bone

eye colour

mutation in a skin cell

4. Some rats have evolved a resistance to the rat poison warfarin.

(a) The information below shows some stages in the development of this resistance **but not in the correct order**.

- 1 so the useful mutation is passed on to offspring
- 2 a mutation occurred in a gene
- 3 the mutation is useful
- 4 rats with the mutation survive to reproduce
- 5 as a result, there is an increase in the population of rats with the mutation

Complete the sequence below to show the stages in the *correct order*. *One has been done for you.*



(b) What may happen to species that do not adapt to new environmental conditions? [1]

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5.

The dodo is an extinct bird that lived on the island of Mauritius in the Indian Ocean. It is believed to have evolved from pigeon like birds that flew to the island millions of year ago. The dodo was a large, fat ground bird that could not fly. It nested and fed on fruit and seeds found on the ground. The dodo was not scared of humans and easy to catch as it had no natural predators.



Dutch sailors arrived on the island bring animals including cats, dogs and rats. The Dodo became extinct within 80 years.

(a) The dodo was well adapted to it environment before the sailors arrived, state what could have caused it to die out and explain by linking to its adaptions?

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.....[1]

(b) Why didn't the dodo evolve to adapt to the new conditions?

.....[1]

(c) Suggest how the flightless dodo evolved from the pigeon-like ancestor.

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.....[5]