

CIE Biology GCSE

18 - Variation and Selection

Flashcards



What is variation?



What is variation?

The difference between organisms of the same species



What causes variation?



What causes variation?

Mutations in the genetic code



What is phenotypic variation?



What is phenotypic variation?

The variation in physical traits and characteristics of organisms of the same species



What is phenotypic variation caused by
(Higher/Supplement)



What is phenotypic variation caused by
(Higher/Supplement)

Both genes and the environment



What is genetic variation?



What is genetic variation?

The difference between the genetic makeup of different organisms of the same species



What is discontinuous variation?



What is discontinuous variation?

Variation that produces distinct categories (e.g. eye colour or blood groups)



What is continuous variation?



What is continuous variation?

Variation that cannot be placed into distinct categories and instead produces a spectrum (e.g. height, weight)



What is a mutation?



What is a mutation?

A random change in the genetic material of an organism



What is a mutation? (Higher/Supplement)



What is a mutation? (Higher/Supplement)

A random change in the base sequence of the DNA of an organism



State 2 things which may increase the rate of mutation



State 2 things which may increase the rate of mutation

- Ionising radiation
- Certain chemicals (like those found in cigarette smoke)



State 3 symptoms of sickle cell anaemia
(Higher/Supplement)



State 3 symptoms of sickle cell anaemia
(Higher/Supplement)

Headaches

Fatigue

Fainting



How does sickle cell anaemia arise? (Higher/Supplement)



How does sickle cell anaemia arise?

(Higher/Supplement)

- The base sequence in the DNA that codes for the haemoglobin protein changes
- This produces abnormal haemoglobin which leads to sickle shaped red blood cells



How does sickle cell anaemia arise? (Higher/Supplement)



How does sickle cell anaemia arise?

(Higher/Supplement)

- The base sequence in the DNA that codes for the haemoglobin protein changes
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What disease do people who are heterozygous for sickle cell anaemia have a resistance to?
(Higher/Supplement)



What disease do people who are heterozygous for sickle cell anaemia have a resistance to?

(Higher/Supplement)

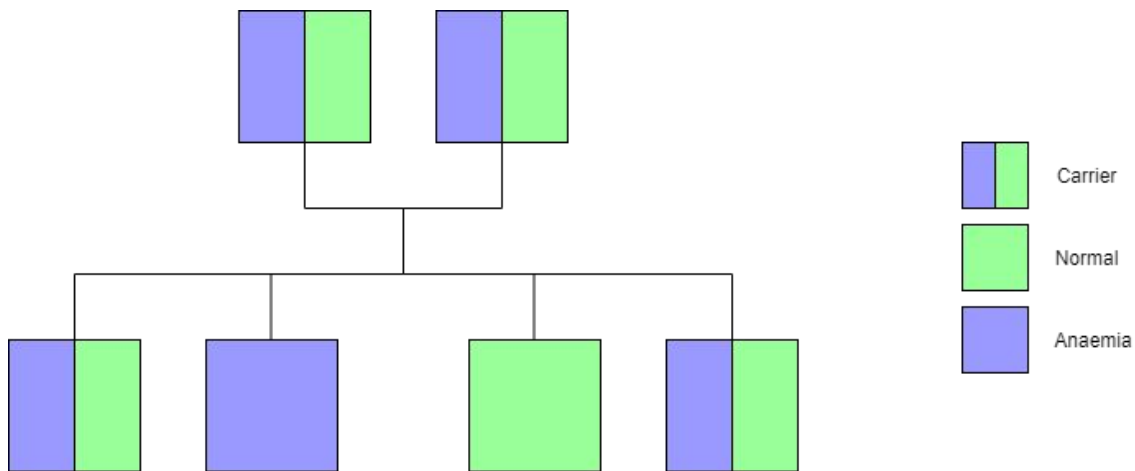
Malaria



Use a genetic diagram to show the 4 offspring produced when two heterozygous sickle cell anaemia carriers reproduce
(Higher/Supplement)



Use a genetic diagram to show the 4 offspring produced when two heterozygous sickle cell anaemia carriers reproduce (**Higher/Supplement**)



Describe the distribution of sickle cell anaemia with reference to the distribution of malaria
(Higher/Supplement)



Describe the distribution of sickle cell anaemia with reference to the distribution of malaria
(Higher/Supplement)

Sickle cell anaemia tends to be found more in places where malaria is common



Explain the distribution of sickle cell anaemia with reference to the distribution of malaria
(Higher/Supplement)



Explain the distribution of sickle cell anaemia with reference to the distribution of malaria (Higher/Supplement)

- People who have sickle cell anaemia are resistant to malaria
- Those without sickle cell anaemia are not immune and are more likely to die from malaria
- Over time, a majority of the population will carry the sickle cell anaemia gene



What is an adaptive feature?



What is an adaptive feature?

Any inherited feature which helps an organism to survive in its environment and pass on its genes



What is an adaptive feature? (Higher/Supplement)



What is an adaptive feature? (Higher/Supplement)

The inherited functional features of an organism that increase the fitness of the organism



Define fitness (Higher/Supplement)



Define fitness (Higher/Supplement)

The ability of an organism to survive and pass on its genes in its environment



What are hydrophytes? (Higher/Supplement)



What are hydrophytes? (Higher/Supplement)

Plants which are adapted to live in aquatic conditions



State 3 adaptations of hydrophytes (Higher/Supplement)



State 3 adaptations of hydrophytes (Higher/Supplement)

- Wide and flat leaves
- Large air spaces
- Thin waxy cuticle



What are xerophytes? (Higher/Supplement)



What are xerophytes? (Higher/Supplement)

Plants which are adapted to live in very arid and dry conditions



State 3 adaptations of xerophytes (Higher/Supplement)



State 3 adaptations of xerophytes (Higher/Supplement)

- Rolled leaves
- Thick waxy cuticle
- Small needle shaped leaves



Describe the process of natural selection



Describe the process of natural selection

- Populations are naturally varied due to random genetic mutations
- Some of these mutations provide a selective advantage
- These organisms survive and reproduce, passing on the successful genes



Define evolution (Higher/Supplement)



Define evolution (**Higher/Supplement**)

A change in the features of organisms over time due to natural selection



What is the process of adaptation? (Higher/Supplement)



What is the process of adaptation?

(Higher/Supplement)

Populations become more suited to their environment over time due to natural selection



What is the development of antibiotic resistance an example of?
(Higher/Supplement)



What is the development of antibiotic resistance an example of? (Higher/Supplement)

Evolution by natural selection



Describe how antibiotic resistance arises
(Higher/Supplement)



Describe how antibiotic resistance arises (Higher/Supplement)

- A random genetic mutation causes a bacterium to become resistant to the antibiotic
- When the antibiotic is used, all the bacteria that do not have the mutation are killed
- The population containing just the resistant bacteria then begins to grow



Describe how selective breeding is carried out



Describe how selective breeding is carried out

- Organisms with the desired traits are selected
- These organisms are bred together
- This process is repeated until the offspring have the desired characteristics



What is the difference between natural selection and artificial selection?
(Higher/Supplement)



What is the difference between natural selection and artificial selection? (Higher/Supplement)

Natural selection occurs when the selection pressures are created by the environment whereas artificial selection is when humans deliberately create selection pressures

