

LEARN AT CHESTER ZOO

EVOLUTION QUESTIONS

Often there are multiple theories (hypotheses) as to why a certain adaptation evolved.

For each question, we list two or more hypotheses – choose whichever you feel is the most convincing and give reasons for your answer. You may need to go away and do some research.

Decide which selection type would be appropriate for the hypothesis chosen. You can find these on page four.

QUESTION ONE: WHY THE LONG NECK?

If asked this question, most people would say straight away that food foraging is the answer...BUT in some areas up to 50% of giraffes have been observed feeding at shoulder height (left), rather than at 'full height'. Is there another reason?



HYPOTHESIS A: FOOD FORAGING

Larger necks allow giraffes to reach the food other herbivores can't get to



HYPOTHESIS B: NECK FIGHTING

Larger necks give males an advantage during neck fights when competing for females

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QUESTION TWO: HOW DID CAMOUFLAGE BECOME EFFECTIVE?

Camouflage in snakes is unique to the individual, as a result of random mutations within the genes and inheritance of characteristics from one generation to the next. Which selection pressure is most important for the Natural Selection of a snake's camouflage?



HYPOTHESIS A: HUNTING SUCCESS

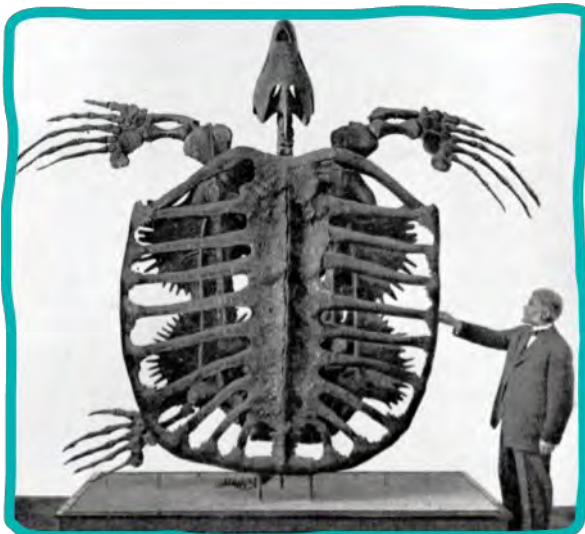
Individuals that successfully catch their prey are most likely to survive long enough to reproduce.

HYPOTHESIS B: NATURAL HABITAT

Individuals that look most like their natural habitat are most likely to survive long enough to reproduce.

QUESTION THREE: HAVE TURTLES STOPPED EVOLVING?

The basic body shape of turtles has remained the same for millions of years. Does this mean they have completely stopped evolving?



HYPOTHESIS A: TURTLES HAVE STOPPED EVOLVING

HYPOTHESIS B: TURTLES ARE STILL EVOLVING

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QUESTION FOUR: WHY DO ZEBRAS HAVE STRIPES

The reason for zebras having black and white stripes remains a mystery, with four hypothesis proposed.



HYPOTHESIS A: TEMPERATURE REGULATION

The stripes on the back of a zebra help with thermoregulation.

HYPOTHESIS B: CAMOUFLAGE

The stripes allow the zebras to blend into their surroundings, especially long grass on the African savannah.

HYPOTHESIS C: CRYPTIC COLOURING

Stripes give zebras an advantage as they are more confusing to hunt while living in a herd.

HYPOTHESIS D: TSE-TSE FLIES

Stripes make zebras less of a target for blood-sucking Tse-tse flies

Just so you know: Scientists are still undecided on this one! Therefore whichever hypothesis you choose is valid, as long as you make a good argument in favour of it!

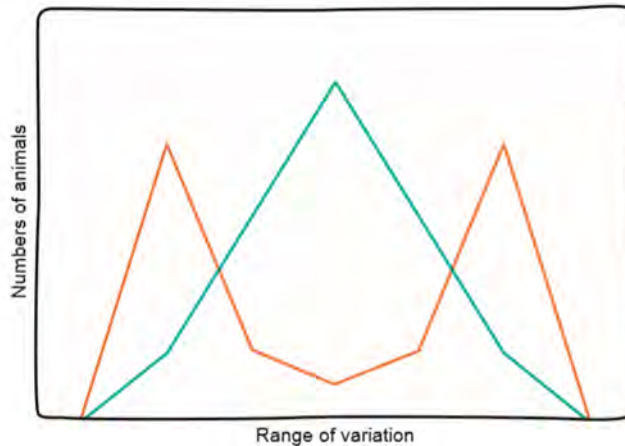
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SELECTION TYPES

For each of the above, pick the selection type that best matches the hypothesis chosen. Give reasons for your answer.

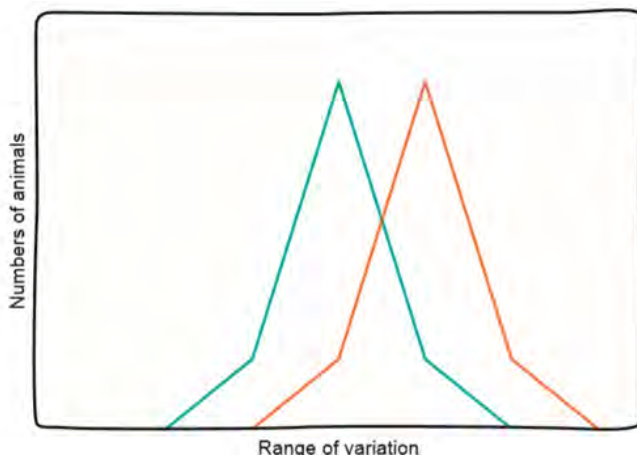
DISRUPTIVE SELECTION

Disruptive selection favours individuals at both extremes of variation. Selection is against the middle of the curve.



DIRECTIONAL SELECTION

Directional selection tends to favour phenotypes at one extreme of the range of variation.



STABILISING SELECTION

Stabilising selection favours the intermediate phenotype out of the range of variation. The extremes of variation are selected against.

