

Variation and selection

Variation

Variation

Differences within a species

Continuous

Range between extremes Body length, mass

Genes and environment

Discontinuous

No intermediates ABO blood groups

Pea seed shape, colour Genes only

Mutation

Genetic change New alleles

Increase mutation rate

Ionising radiation Some chemicals

Gene mutation **Supplement**

Random change in base sequence

Sources of variation **Supplement**

Mutation Meiosis Random mating Random fertilisation

Adaptive features

Adaptive feature

Inherited Helps survive and reproduce

Polar bear

White fur camouflage Fat insulation

Cactus

Spines Thick stem stores water

Hydrophytes **Supplement**

Air spaces Stomata on upper surface

Xerophytes **Supplement**

Thick waxy cuticle Reduced leaf area Water storage

Selection

Natural selection

Variation Many offspring Struggle for survival

Alleles passed on

Adaptation **Supplement**

Population more suited over generations

Antibiotic resistance **Supplement**

Mutation Resistant survive Allele passed on

Selective breeding

Select Cross Select offspring Many generations

Natural vs artificial **Supplement**

Environment selects Humans select