**Guided Notes: Define Natural Selection**

**Big Idea:** Natural selection is the process by which variations that give an advantage become more common in a population.

**Key Concepts:**

- Natural selection is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by which variations that give an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ become more common in a population.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ describes an organism's suitability to its environment.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are factors that limit the number of individuals the environment can support.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are small differences among individuals of the same species.

- In any environment, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms are most likely to survive and reproduce.

- Natural selection acts on existing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a population.

- A change in the environment can change which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are advantageous.

**Real World Examples:**

1. In areas with high \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, having the sickle cell trait provides some protection against malaria, increasing fitness.

2. When \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are used widely, bacteria that are resistant to them survive and reproduce more, increasing antibiotic resistance in the population over time.

**Guided Notes: Explain Natural Selection**

**Big Idea:** Natural selection is the process by which variations that give an advantage become more common in a population over generations.

**Key Concepts:**

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are the characteristics of an organism.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are small differences in traits among individuals of the same species.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ describes an organism's suitability to its environment.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are factors that limit the number of individuals an environment can support.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ determine traits and are made up of DNA.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are different forms of the same gene.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ contain the complete set of genetic information.

- The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the physical expression of an organism's genes.

- The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the collection of alleles an organism inherits for a trait.

- Natural selection leads to changes in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of different traits in a population over generations.

**Real World Examples:**

1. In areas where \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is scarce, deer with variations for larger bodies may be more fit to survive winters.

2. For polar bears, fur coloration that acts as better \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ helps them hunt more successfully on ice.

**Guided Notes: Genetic Variation Over Time**

**Big Idea:** Natural selection is the process by which variations that give an advantage become more common in a population over time.

**Key Concepts:**

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the process by which advantageous variations become more common in a population.

- Natural selection acts on existing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a population's genes.

- A change in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can make some variations more advantageous than others.

- Advantageous \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ increase an organism's ability to survive and reproduce.

- Over generations, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of advantageous traits increases in the population.

- Natural selection leads to changes in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a population over time.

**Real World Examples:**

1. In areas with intense \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, deer with fur that provides better camouflage are more fit to avoid predators.

2. For humans living at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ altitudes, variations for higher red blood cell counts can increase oxygen supply.

**Guided Notes: Traits, Survival, and Reproduction**

**Big Idea:** Genetic variations in traits can increase the likelihood that some individuals in a population will survive and reproduce in a particular environment.

**Key Concepts:**

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are the small differences in traits among individuals of the same species.

- The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the total collection of genes in a population.

- A large amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ benefits a population by increasing the chance some individuals can survive environmental changes.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the mating of closely related individuals, reducing genetic variation.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are behaviors that help a species survive and reproduce in response to environmental conditions.

- Natural selection acts on existing variations, not new variations that appear due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Real World Examples:**

1. For bears living in urban environments, variations in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ behavior can increase ability to find food sources.

2. In cold climates, the variation for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ insulating fur in certain mammals allows better survival during winters.

**Guided Notes: Probability of Survival**

**Big Idea:** Genetic variations increase the likelihood that some individuals in a population will survive and reproduce in a specific environment.

**Key Concepts:**

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ describes the differences in genes in a population.

- Populations with more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have a greater variety of traits.

- Some variations result in traits that are a good \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with the environment.

- Individuals with advantageous traits have a higher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of surviving and reproducing.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ consists of facts or data from an investigation.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is used to connect evidence to explanations.

**Real World Examples:**

1. For birds in urban environments, having the variation for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ feather coloration provides better camouflage.

2. In regions with very low rainfall, the variation for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in plants allows better drought resistance.

**Guided Notes: Mathematics of Natural Selection**

**Big Idea:** Natural selection can lead to increases and decreases of specific traits in populations over time, which can be represented mathematically.

**Key Concepts:**

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is when natural selection causes traits to shift toward one extreme in a population.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is when traits shift away from both extremes toward an average value.

- In \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, traits at both extremes increase while average/middle traits decrease.

- Graphs can show the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of traits before and after natural selection acts on a population.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ provides facts or data used to support explanations about how populations change.

- Mathematical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ like graphs help visually communicate changes in populations over time.

**Real World Examples:**

1. In bird populations, the variation in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ beak sizes could be impacted by natural selection based on available food sources.

2. For mosquito populations, variations in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ length could be affected by environmental changes like drought or flooding.