

Name \_\_\_\_\_

## The Building Blocks of Life: Understanding Genetic Diversity

### Open-Ended Response Answer Key

1. Genetic diversity allows for the adaptation of species to changing environments by ensuring that some individuals possess traits that are advantageous in specific environmental conditions. For example, in a population of birds, genetic diversity in beak shapes allows some individuals to better exploit different food sources during periods of scarcity, increasing their chances of survival.
2. Maintaining genetic diversity within populations is important for their long-term viability and persistence because it ensures the presence of a variety of genetic variations that can confer resilience against environmental challenges and enable adaptation to changing conditions, reducing the risk of extinction.
3. Preserving and protecting genetic diversity can benefit both natural ecosystems and human populations by maintaining healthy, resilient ecosystems that provide essential services like clean air and water, fertile soil, and food and medicine derived from plants and animals. In addition, preserving genetic diversity in agricultural crops and livestock can ensure food security and resilience in the face of changing climates and pests.
4. Examples of genetic variations that may confer resistance to diseases or pests include certain plant varieties that are resistant to specific plant diseases, animals with genes that make them less susceptible to predation, and humans with genetic traits that provide immunity to certain infectious diseases.

