Name _____

The Wonderful World of Genetic Diversity: Meiosis Unveiled

Open-Ended Response Answer Key

1. In a world without meiosis, there would be no genetic diversity generated through sexual reproduction. All offspring would be genetically identical to their parents, limiting adaptability and the ability to thrive in a changing environment. This could lead to a lack of biodiversity and increased vulnerability to environmental changes or threats.
2. An example of genetic diversity allowing a species to adapt is the case of the peppered moth during the Industrial Revolution in England. As the environment became polluted and darkened, darker moths became more common because they were better camouflaged against the soot-covered trees, illustrating the role of genetic diversity in adaptation.
3. "Survival of the fittest" means that individuals with advantageous traits are more likely to survive and reproduce, passing on their traits to the next generation. Genetic diversity creates a pool of various traits, increasing the chances that some individuals will possess traits that make them more fit for their environment.
4. Understanding genetic diversity can help improve agriculture by selectively breeding plants with desired traits, increasing crop resilience to pests, diseases, and changing environmental conditions. It also aids in preserving genetic resources for future crop breeding efforts.