

Name _____

Meiosis I vs. Meiosis II: The Great Chromosomal Divide

Open-Ended Response Answer Key

1. Genetic diversity resulting from meiosis is advantageous for a species facing environmental changes. For example, in a changing climate, species with diverse traits have a better chance of survival and adaptation.
2. Without crossover events in meiosis I, genetic diversity would be greatly reduced, and offspring would inherit combinations of traits from only one parent, limiting adaptability and evolution.
3. Meiosis I shuffles genetic material between homologous chromosomes and reduces the chromosome number, while meiosis II separates sister chromatids. Together, they create genetically unique gametes essential for sexual reproduction.
4. Understanding meiosis and genetic diversity can help conserve endangered species by preserving genetic variation. In agriculture, it can improve crop breeding techniques to develop more resilient and productive plants.

