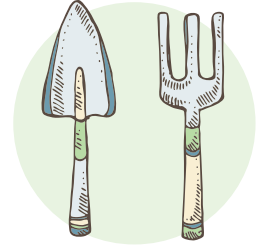


Growth and Development: Genetic and Environmental Factors

Based on the reading, answer the questions below. **Sample answers**

1. Identify and describe at least two environmental factors that influenced the growth of both plants.

How did these factors affect the growth of the plants? Water and sunlight are two environmental factors that influenced the growth of the plants. When Plant B was receiving more direct sunlight, it grew taller and bushier than Plant A. However, when Plant B's roots were flooded, its leaves shriveled and yellowed. By the time it was transplanted to the front yard, Plant A had surpassed it in growth.



2. Name at least three additional environmental factors that could affect the plants' growth in the future. Drought, soil nutrients, fertilizer, extreme wind, or pests might affect the growth of the plants.
3. Identify and describe at least two observable traits of the plants that demonstrate how genetic factors influenced their development. Plant A and Plant B are the same species. Up until the moment their leaves sprouted, they were both exposed to nearly identical environmental conditions, yet their leaves were different colors. Additionally, Plant A consistently produced white flowers larger in diameter than the pink flowers produced by Plant B, even when it was receiving less sunlight.
4. Think about a different example. Two of the largest horses on a farm mate and produce a foal. Is it a guarantee that their foal will grow up to be the largest horse on the farm? Explain why or why not. Cite both environmental and genetic factors in your answer. It is not a guarantee that the foal of the two largest horses on a farm will become the largest horse on the farm. Plant B had the genetics to become a tall, bushy shrub until environmental factors affected its growth potential. In a similar way, the foal could have the genetic potential to become the largest horse on the farm, but it won't reach that potential if it is not supplied with the care and nutrition it needs to grow up healthy.
5. Identical twins share all of their genes. Scientists often study identical twins to better understand how nature and nurture work together. Why do you think studying twins is helpful to understand the interaction between environmental and genetic factors? Identical twins have the same genes, but their environments often become more different as they age. So, by studying similarities and differences in the traits of identical twins, scientists can better understand the extent to which certain traits are inherited or influenced by the environment.
6. Identical twins share all of their genes, while fraternal twins share only half of their genes. For twins with the disorder *schizophrenia*, about 50% of identical twins share the disease, while only about 10-15% of fraternal twins do. What does this tell you about the way genetic and environmental factors affect schizophrenia? The fact that identical twins are more likely than fraternal twins to share the disorder suggests that schizophrenia is strongly influenced by genetic factors. However, the fact that only one identical twin in a pair develops the disorder 50% of the time suggests that environmental factors are also at play.