Name _____

The Mysteries of Plant Behavior: Can They Perform Photosynthesis at Night?

Open-Ended Response Answer Key

1. Photosynthesis and respiration work in tandem to maintain the energy balance of plants over a 24-hour cycle. During photosynthesis, plants create glucose and oxygen using sunlight, while respiration consumes glucose and oxygen to release energy. This balance ensures that plants have a constant supply of energy and the necessary building blocks for growth and maintenance.
2. CAM and C4 plant adaptations are advantageous in specific environments. CAM plants conserve water by opening stomata at night, making them suitable for arid regions. C4 plants efficiently capture carbon dioxide in low light conditions, making them well-suited to intense sunlight and heat. These adaptations contribute to plant survival and ecosystem diversity in different environments.
3. In a world where plants could only perform photosynthesis during the day, ecosystems would face challenges. Oxygen levels might decrease during the night, impacting oxygen-dependent organisms. Food chains could be affected, as many animals rely on plants for sustenance. Overall, it would disrupt the delicate balance of life on Earth.
4. Plant adaptations showcase nature's efficiency in using available resources. These adaptations are essential for plant survival, as they enable efficient energy capture, water conservation, and growth in various conditions. They contribute to the health and stability of ecosystems by allowing plants to thrive and support other organisms in their habitats.