Name _____

## How Carbon Gets from the Air into Plants and Trees

### Open-Ended Response Answer Key

1. The journey of carbon dioxide from the air into a plant's cells during photosynthesis starts with the entry of carbon dioxide through stomata, tiny openings on plant leaves. Once inside the leaf, carbon dioxide diffuses through leaf cells to reach chloroplasts, which contain chlorophyll. Chlorophyll captures sunlight, using its energy to convert carbon dioxide and water into glucose and oxygen through a series of chemical reactions. The glucose becomes part of the plant's structure and energy source, while oxygen is released into the atmosphere.
2. Photosynthesis is essential in the carbon cycle because it captures carbon dioxide from the air and converts it into glucose and oxygen. This process helps regulate the balance of carbon in the environment, provides energy and nutrition for plants, and releases oxygen for respiration by humans and animals.
3. Diffusion is the process by which carbon dioxide moves from areas of high concentration (outside the leaf) to areas of low concentration (inside the leaf) during photosynthesis. This movement is driven by the concentration gradient and ensures that carbon dioxide enters plant cells where it is needed for the photosynthesis process.
4. As a scientist studying photosynthesis, I would conduct experiments to investigate how different factors, such as light intensity, temperature, and carbon dioxide concentration, affect the rate of photosynthesis in plants. I would also explore how changes in photosynthesis rates impact plant growth and the environment. These experiments could provide valuable insights into optimizing plant growth and understanding the role of photosynthesis in mitigating climate change.