Name _____

Chlorophyll: The Green Marvel of Photosynthesis

Open-Ended Response Answer Key

1. In a world without chlorophyll, plants would be unable to perform photosynthesis, leading to their inability to create glucose and release oxygen. This would disrupt the food chain and result in lower oxygen levels, impacting all living creatures.
2. Photosynthesis involves two main steps: the light-dependent reactions (in which chlorophyll captures sunlight and converts water into oxygen and chemical energy) and the light-independent reactions (Calvin cycle, in which ATP and NADPH produced in the first step are used to create glucose from carbon dioxide and water).
3. Three plants with unique colors of chlorophyll are red algae (contains chlorophyll-a and phycobilins), purple sulfur bacteria (contains bacteriochlorophyll), and brown algae (contains chlorophyll-c and fucoxanthin).
4. Scientists use the color of chlorophyll to study plant health and the environment through remote sensing. They analyze the greenness of vegetation to monitor plant growth, assess environmental changes, and identify areas affected by factors like pollution or climate change.