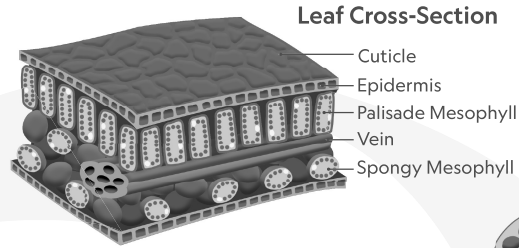
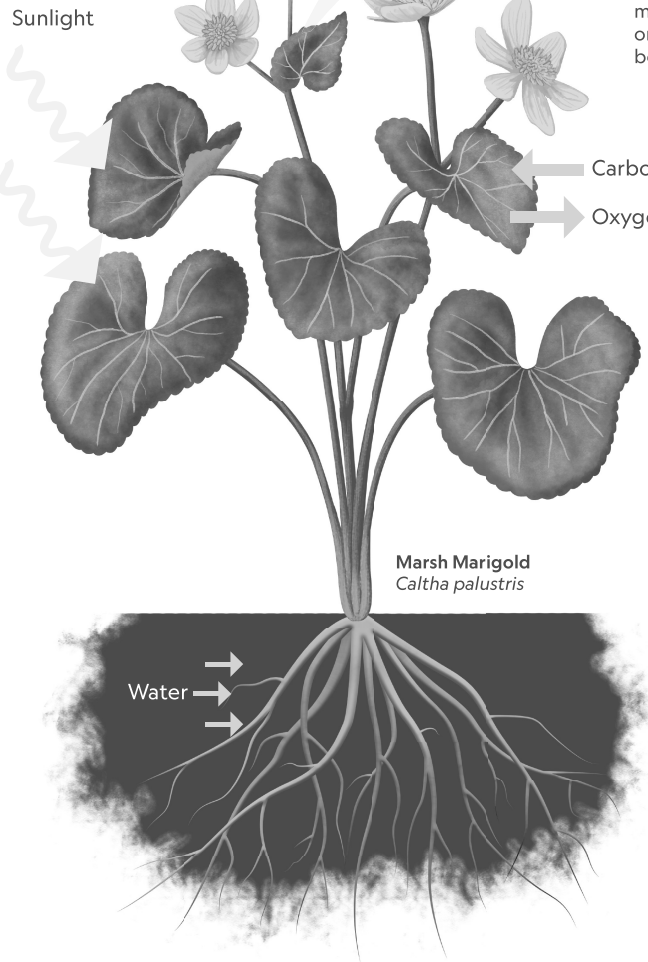


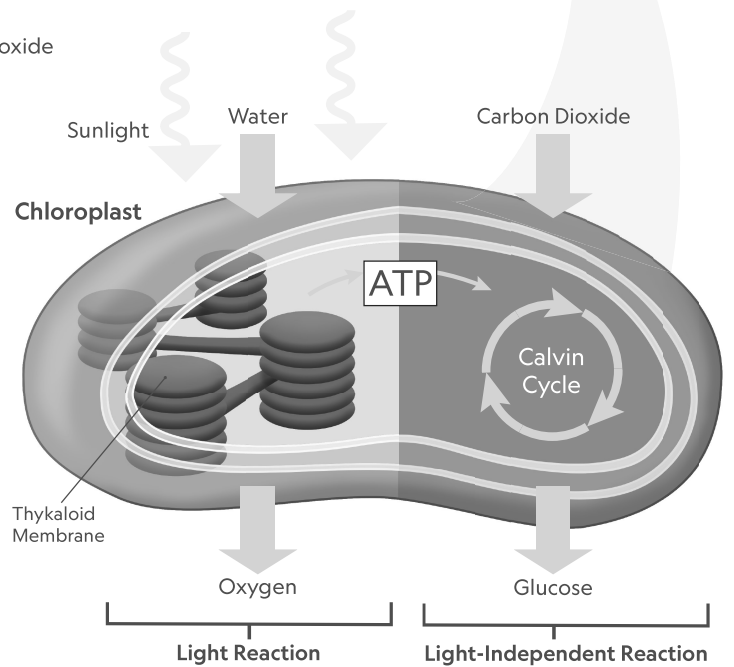
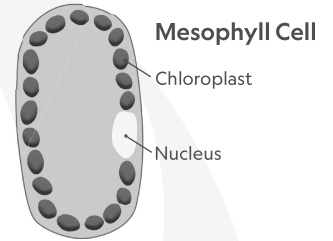
# PHOTOSYNTHESIS

Nearly all life on Earth depends on photosynthesis. Plants, algae, and some types of bacteria use photosynthesis to make their own food and release oxygen. The biochemical process involves using energy from sunlight to convert water (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>) into oxygen (O<sub>2</sub>) and glucose (a sugar).

The energy from sunlight powers photosynthesis. A plant takes in carbon dioxide and water through the air and soil. Inside the plant, water and carbon dioxide are converted to glucose and oxygen through a chemical process.



The top two layers of a leaf are the cuticle and the epidermis, which are thin so light can travel through them easily. Beneath these layers are palisade mesophyll cells and spongy mesophyll cells. These contain chloroplasts, organelles where much of the chemical work behind photosynthesis occurs.



Inside the chloroplast, the cascade of chemical reactions that convert water and carbon dioxide into cellular energy involves two parts: the light-dependent and light-independent reactions. During the light-dependent reaction, the energy of the light waves is absorbed and stored in ATP molecules. During the light-independent reaction, also known as the Calvin Cycle, ATP is used to make glucose, which the plant cell relies on as a source of energy. During these reactions, water is oxidized, meaning it loses electrons, while the carbon dioxide is reduced, meaning it gains electrons. The plant then releases the oxygen into the atmosphere and stores the energy within the glucose molecules.

