

Chapter 7 — Photosynthesis

Plants convert light energy into chemical energy stored in glucose.

The light-dependent reactions occur in the thylakoid membrane.

They produce ATP and NADPH, releasing oxygen as a by-product.

Approximately 30 percent of incident sunlight is reflected by leaves.

7.1 The Calvin Cycle

The Calvin cycle fixes carbon dioxide using the enzyme RuBisCO.

Three turns of the cycle produce one molecule of G3P.

For every 3 CO₂ entering, 9 ATP and 6 NADPH are consumed.

C₄ plants such as maize pre-concentrate CO₂ in bundle sheath cells.

7.2 Chloroplast Anatomy

A typical chloroplast measures 5 micrometres across.

The stroma hosts the Calvin cycle enzymes.

Grana are stacks of thylakoids connected by lamellae.

Chlorophyll a absorbs most strongly at 430 and 662 nanometres.