

Role-based & Chain-of-Thought Prompting

Type	Prompt	Model Output	Reflection
Role-based Prompt	<i>“You are a high school biology teacher. Explain photosynthesis to students in simple words.”</i>	<i>"Photosynthesis is the process plants use to make their own food. They take in sunlight, water from the soil, and carbon dioxide from the air. Inside the plant's leaves, a green substance called chlorophyll helps capture sunlight. Using this energy, plants turn water and carbon dioxide into glucose (a type of sugar) and oxygen. The sugar is food for the plant, and the oxygen is released into the air for us to breathe."</i>	The role-based approach makes the tone friendlier, uses simple words, and focuses on teaching clarity for a specific audience. It naturally avoids jargon and anticipates students' understanding level.
Chain-of-Thought Prompt	<i>“Explain photosynthesis step by step, reasoning each step clearly.”</i>	<i>"Step 1: Plants absorb sunlight using chlorophyll in their leaves. Chlorophyll captures light energy. Step 2: Roots absorb water from the soil, which travels up the plant. Step 3: Leaves take in carbon dioxide from the air through tiny openings called stomata. Step 4: Using the light energy, the plant's cells combine water and carbon dioxide through a chemical reaction to form glucose. Step 5: Oxygen is produced as a by-product and released into the air. Step 6: The glucose is transported around the plant to be used for energy and growth."</i>	The chain-of-thought approach focuses on logical sequencing and makes sure each stage connects clearly to the next. It's systematic, but slightly more technical than the role-based explanation, with a stronger emphasis on process rather than tone.