

Life Sciences, Grade 11, Photosynthesis

Written questions

Question 1: Basics of Photosynthesis

- 1.1 Define Photosynthesis, including the reactants, products, energy source, and key pigment involved.
- 1.2 Where in the chloroplast do the light-dependent and light-independent phases of photosynthesis occur, respectively?.
- 1.3 Name and describe the process by which water molecules are split during the light-dependent phase, and state what happens to the oxygen produced.

Question 2: Energy Transfer and Limiting Factors

- 2.1 Explain the role of ATP and NADPH as energy carrier molecules in photosynthesis, indicating which phase they are formed in and where they are utilized.
- 2.2 Define "Limiting Factor" in the context of photosynthesis and identify three common limiting factors.
- 2.3 Describe the effect of increasing carbon dioxide concentration on the rate of photosynthesis, assuming other factors are not limiting.

Question 3: Environmental Effects on Photosynthesis

- 3.1 Explain how extreme temperatures (both too low and too high) affect the rate of photosynthesis, with specific reference to enzymes.
- 3.2 Describe the relationship between light intensity and the rate of photosynthesis. What happens if light intensity increases beyond the optimum?.
- 3.3 Discuss why a plant's stomata might shut at very high light intensities, and how this relates to a limiting factor.