

**Honors biology photosynthesis test pdf free pdf files**

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### Photosynthesis and Plant Structure - Multiple Choice Test

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Name: _____	Class: _____
<b>1</b>	The part of the plant that does the most photosynthesis is the: A leaves B flowers C roots D fruit
<b>2</b>	The little openings in the leaves that collect carbon dioxide from the air and release oxygen are called: A air holes B vacuoles C lungs D stomata
<b>3</b>	In the veins inside the leaves and stems of plants are tubes that carry water up from the roots called: _____. A phloem B xylem C chloroplasts D stomata
<b>4</b>	Water and minerals are brought up from the _____, and they help anchor the plant. A roots B stem C leaves D flowers
<b>5</b>	The organelle in a plant cell that has the green pigment for photosynthesis is the: _____. A chloroplast B stem C chlorophyll D stomata
<b>6</b>	The formula for photosynthesis is: _____ + water + $\text{CO}_2$ = sugars + $\text{O}_2$ . A glucose B light C leaves D oxygen
<b>7</b>	All the following things pass through the leaves' stomata except: A carbon dioxide B pollen C oxygen D water
<b>8</b>	The stomata are found: A on the root B on the stem C in the flowers D under the leaves

There is a clear division of labour within the chloroplast.

- (i) Proteins and pigments (chlorophylls and carotenoids) that function in the photochemical events of photosynthesis, i.e., trapping the light energy and synthesis of ATP and NADPH, are embedded in the thylakoid membrane.
- (ii) In stroma, enzymatic reactions incorporate  $\text{CO}_2$  into the plant leading to the synthesis of sugar, which in turn forms starch.

The former set of reactions, since they are directly light-driven are called **light reactions**. The latter are not directly light-driven but are dependent on the products of light reactions (ATP and NADPH). Hence, to distinguish the latter they are called by convention, as **dark reactions**. However, this should not be construed to mean that they occur in darkness or that they are not light-driven.

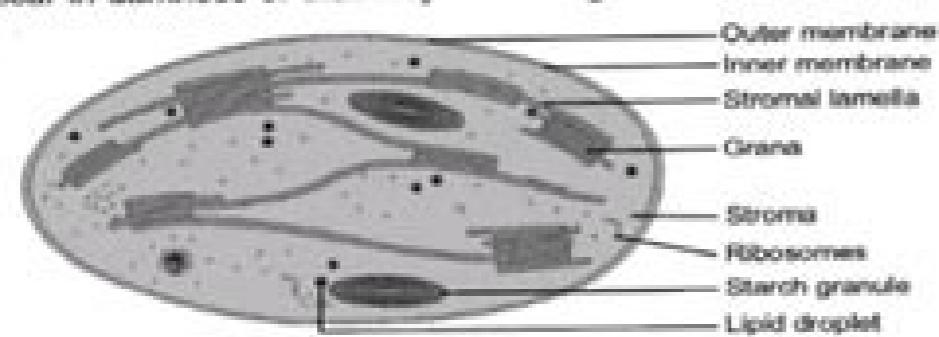


Fig. : Diagrammatic representation of an electron micrograph of a section of chloroplast

#### PHOTOSYNTHETIC PIGMENTS

Pigments are substances that have an ability to absorb light, at specific wavelengths.

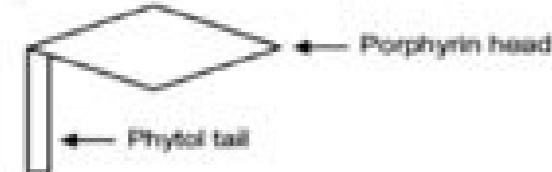
A chromatographic separation of the leaf pigments shows that the colour of leaves is due to four pigments :

- (i) **Chlorophyll a** – Bright or blue green in the chromatogram.
- (ii) **Chlorophyll b** – Yellow-green
- (iii) **Xanthophylls** – Yellow
- (iv) **Carotene** – Yellow to yellow-orange

Of these, **chlorophyll-a** is the primary photosynthetic pigment.

#### Chlorophyll Pigments

Chlorophyll has a tadpole like structure. It consists of a porphyrin head and a phytol tail.



#### Porphyrin head :

- (i) All chlorophylls have a complex ring structure chemically related to the **porphyrin-like** groups found in haemoglobin and cytochromes.
- (ii) Site of the electrons rearrangements when the chlorophyll is excited.
- (iii) A cyclic tetrapyrrolic structure with non-ionic magnesium atom.

#### Phytol tail :

- (i) A long hydrocarbon tail is almost always attached to the ring structure.
- (ii) Anchors the chlorophyll to the hydrophobic portion of the thylakoids.

Major types of chlorophylls are chlorophyll a, b, c, d, e; bacteriochlorophyll a and b etc.

#### Biology Biology : Student Exam Study Guide

Name: \_\_\_\_\_ Test Date: \_\_\_\_\_

This mid-term exam will consist of multiple choice, essay questions, a multiple task problem in either oral and a lab presentation. Questions are based off the topics we have covered in class through labs, notes, discussions, and projects. The following topics should be reviewed:

#### Energy: Matter and Organization

- Chapter 1 : Energy: Interacting with Matter
- Chapter 2 : The Chemical Basis of Life
- Chapter 3 : The Materials of Cells
- Chapter 4 : A Tour of the Cell

#### Introduction to Living Organisms

- Chapter 5 : The Working Cell

#### Cell Energy

- Chapter 6 : How Cells Harvest Chemical Energy
- Chapter 7 : Photosynthesis: Using Light to Make Food

#### Cell Structure & Differentiation

- Chapter 8 : The Cellular Basis of Reproduction & Inheritance: Cancer

#### Biology Topics

- Chapter 9 : Biodiversity
- Chapter 10 : Population Dynamics
- Chapter 11 : Communities & Ecosystems
- Chapter 12 : Conservation Biology

#### How to study:

First and foremost, prepare your packet! Use the packet review, chapter summary, and review questions, notes and additional worksheets to review all packet topics and chapter questions topics are available for you to use. Don't forget your CBL with interactive models, and Standardized tests!

**Packet:** use the corresponding chapters to help you prepare topics.

Your old notes will be available for studying and

To ensure an effective review, know what questions YOU need to ask.

#### Final Exam

## Cyclic Photophosphorylation

The process of cyclic photophosphorylation involves only PS I and this process takes place in the stroma lamella membrane. When only PS I is functional, the electron is circulated within the photosystem and the phosphorylation occurs, due to cyclic flow of electrons.

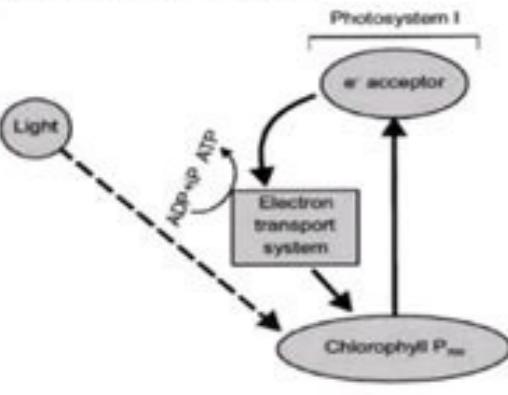


Fig.: Cyclic photophosphorylation

The membrane or lamella of the grana have both PS I and PS II, the stroma lamella membranes lack PS II as well as NADP reductase enzyme. The excited electron does not pass on to NADP<sup>+</sup> and is cycled back to the PS I complex through the electron transport chain. Cyclic photophosphorylation also occurs when only light of wavelength beyond 680 nm are available for excitation.

## Knowledge Cloud

Hill and Bendall proposed Z-scheme. Reaction centre is involved in "quantum conversion" where energy of light is converted to chemical energy possessed by excited electron.

Some important differences between Cyclic and Non-cyclic photophosphorylation are as follows :

Cyclic Photophosphorylation	Non-cyclic Photophosphorylation
1. It is performed by photosystem I independently.	It is performed by collaboration of both photosystems II and I.
2. An external source of electrons is not required.	The process requires an external electron donor.
3. It is not connected with photolysis of water. Therefore, no oxygen is evolved.	It is connected with photolysis of water and liberation of oxygen occurs.
4. It synthesizes ATP only.	It is not only connected with ATP synthesis, but also with production of NADPH.
5. It operates under low light intensity, anaerobic conditions or when CO <sub>2</sub> availability is poor.	Non-cyclic photophosphorylation takes place under optimum light, aerobic conditions and in the presence of carbon dioxide.
6. The system does not take part in photosynthesis except in certain bacteria.	The system is connected with CO <sub>2</sub> fixation in green plants.
7. It occurs mostly in stroma lamella membrane.	It occurs in the granal thylakoids.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

Honors Biology: Sections 6.1 to 6.4 Guide Reading Cellular Respiration Overview

What are the similarities and differences between Cellular Respiration and Photosynthesis in terms of energy and the general chemical equation for each?

How does the process of cellular respiration use the chemical energy needed by cells?

1. On your own...Read sections 6.1 to 6.6

2. Define the following terms:  
• Redox reaction: The movement of electrons from one molecule to another...short for "oxidation-reduction".

• Oxidation: The loss of electrons from a substance

• Reduction: The gain of electrons by a substance

• Dehydrogenase: An enzyme that removes hydrogen atoms (and their corresponding electrons) from a molecule

• NAD<sup>+</sup> (nicotinamide adenine dinucleotide): A molecule that accepts electrons during cellular respiration. Its reduced form is written as NADH.

• Electron Transport Chain: A series of proteins in the mitochondria that use the energy of "falling" electrons to produce ATP.

• Glycolysis: A process which occurs in the cytoplasm that breaks glucose into two pyruvate molecules and produces a small amount of ATP.

• Citric Acid Cycle: A process which occurs in the mitochondria which further breaks down pyruvate and generates a supply of electrons for the electron transport chain.

• Oxidative Phosphorylation: The process that occurs in the mitochondria where a flow of electrons from the electron transport chain is used to produce a large quantity of ATP by adding a phosphate group to ADP.

• Chemiosmosis: The energy coupling mechanism that uses the potential energy of a proton gradient across the mitochondria to provide the energy needed to phosphorylate ADP to form ATP.

• ATP synthase: Mitochondrial protein complexes that synthesize ATP

• NADH: Nicotinamide adenine dinucleotide

• NAD<sup>+</sup>: Nicotinamide adenine dinucleotide

• FAD: Nicotinamide adenine dinucleotide

• FADH<sub>2</sub>: Nicotinamide adenine dinucleotide reduced

• NADPH: Nicotinamide adenine dinucleotide reduced

• NADH: Nicotinamide adenine dinucleotide reduced

• NAD<sup>+</sup>: Nicotinamide adenine dinucleotide

• NADH: Nicotinamide adenine dinucleotide reduced

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