

**PENANG SANGAM HIGH SCHOOL**  
**P.O.BOX 44, RAKIRAKI**  
**LESSON NOTES**

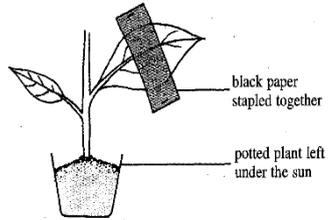
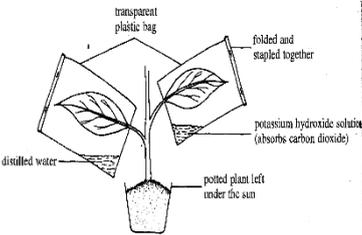
**Subject:** Biology  
**Week 15**

**Year/Level:** 11

<b>Strand</b>	1 Structure and Life Processes
<b>Sub Strand</b>	1.5 Structure And Functions In Plants
<b>Content Learning Outcome</b>	Discuss the conditions required, factors affecting and the importance of photosynthesis reaction

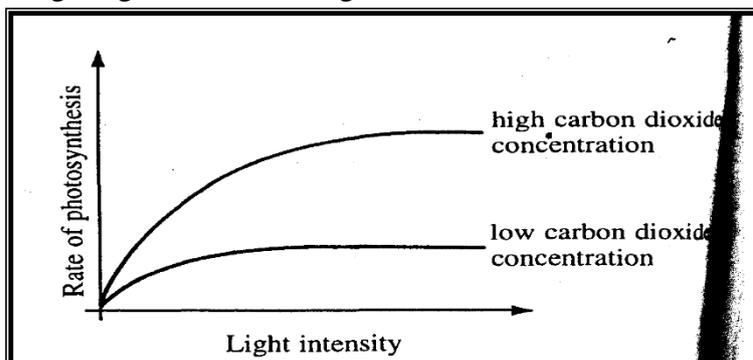
**Leaf adaptations for photosynthesis**

**Conditions required for photosynthesis**

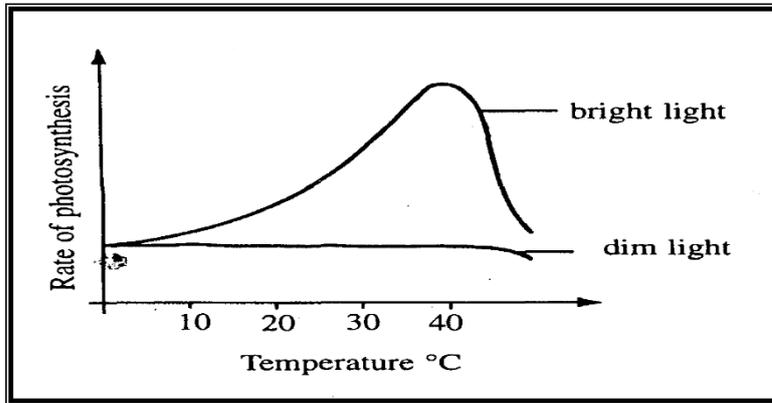
<b>Requirement</b>	<b>Investigation to show its necessity in photosynthesis</b>	<b>Diagram</b>
Chlorophyll	A variegated leaf is taken from a plant that has been left in the light. Only the green areas of the leaf show the presence of starch.	
Light	A portion of green leaf is sandwiched between two pieces of black paper. The plant is then left in the light. Only the exposed areas of the leaf show the presence of starch.	
Carbon dioxide	Two leaves are enclosed in airtight transparent plastic bags. One of the bags contains a solution of potassium hydroxide to absorb CO <sub>2</sub> . The plant is then left in the light. Only the leaf that has a supply of CO <sub>2</sub> shows the presence of starch.	

**Factors controlling photosynthesis**

1. **Light intensity** as the light intensity increases, the rate of photosynthesis also increases until it reaches a maximum rate (light saturation point) i.e. photosynthesis is higher in bright light than in dim light.



2. **Carbon dioxide concentration** – as the CO<sub>2</sub> concentration increases, the rate of photosynthesis also increases.
3. **Chloroplast concentration** – the more number of chloroplast, the higher the rate of photosynthesis.
4. **Temperature** – the photosynthesis rate increases with a rise in temperature up to a maximum of 40°C, after which it drops rapidly.



5. **Amount of moisture/ Water** - as the amount of water increases, the rate of photosynthesis also increases i.e. Photosynthesis is faster in moist soil than in dry soil.

**Importance of Photosynthesis:**

1. Provides food or energy for all living things.
2. Provides O<sub>2</sub> for all living things.

**Activity**

1. Name the materials needed for photosynthesis and state how the leaf obtains these materials.

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2. Describe three environmental factors that control the rate of photosynthesis.

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3. How are the mesophyll cells adapted for photosynthesis?

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