

# 應考必讀概要

## 必讀概要 1 圖像繪畫 (Graph Plotting)

### 例子 1：線圖 (Line Graph)

#### Question

An experiment about the rate of photosynthesis of plants A and B under different light intensity was carried out. Two lamps were placed 50 cm away from a beaker containing an inverted test-tube covering plants A and B respectively. The volume of oxygen collected by the test-tube per minute at each distance for each plant represents the rate of photosynthesis. The results are as follow.

Using the data provided, plot a graph to show the results of the experiment. (4 marks)

回答圖表題時，千萬不要遺漏題目文字中提供的有用資料。

Light intensity (arbitrary unit)	Rate of photosynthesis (mm <sup>3</sup> / min)	
	Plant A	Plant B
0.3	0	0
0.6	1	0.8
1.5	2.5	1.8
2.5	3.5	2.5
5	4	3.25
8	4	3.25
10	4	3.25

應變項 (dependent variables) 多展示於第二直行 (vertical column) 或之後。

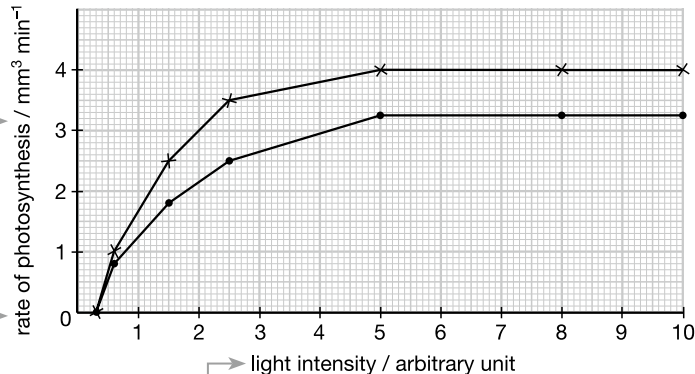
獨立變項 (independent variable) 通常出現在第一直行。

### Solution

標註 x-軸 (橫向) 和 y-軸 (縱向)，並連同準確單位。

Key:   
 ✕ Plant A   
 ● Plant B

The graph shows the rate of photosynthesis in different light intensity



用 y-軸代表應變項 (dependent variables)。

用 x-軸代表獨立變項 (independent variable)。

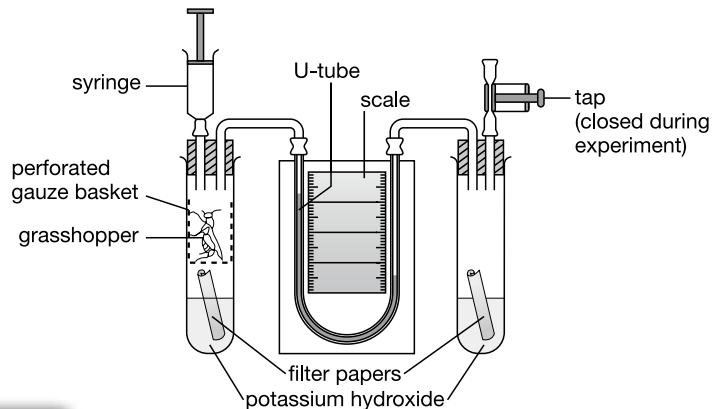
若一曲線圖顯示兩條曲線或以上，考生必須加上圖解 (key) 說明。

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## Experimental Set-up II of Respiration

建議答題時間 2 分鐘

**Direction:** Questions 1 and 2 refer to the set-up below which was used to investigate the rate of respiration of grasshopper. The liquid levels on both sides of the U-tube were the same at the beginning of the experiment.



## 概念速遞

在歷屆的公開試中，這個實驗裝置曾作出不同形式的修改，例如：將 U 型管內的液體轉變為氫氧化鉀溶液 (potassium hydroxide solution) 或碳酸氫鹽指示劑 (hydrogencarbonate indicator)，但其背後的生物學原理也是相似的。

- After 1 hour, the liquid level inside the U-tube near the grasshopper was higher than that of the opposite side. The change in liquid level represents
  - the amount of water vapour given out by the grasshopper.
  - the amount of heat produced by the grasshopper.
  - the amount of carbon dioxide released by the grasshopper.
  - the amount of oxygen absorbed by the grasshopper.

**Solution**

When grasshopper uses oxygen for respiration, it will release similar volume of carbon dioxide. The carbon dioxide released is absorbed by potassium hydroxide and this decreases the pressure in the test-tube. The pressure decrease causes the increase of liquid level. Thus, the change in liquid level eventually represents the volume of oxygen absorbed.

- ∴ The answer is D.
- To show that carbon dioxide is related to the change in liquid level, which of the following modifications should be made in the above set-up?
    - replacing potassium hydroxide with distilled water
    - removing the grasshopper from the set-up
    - putting the set-up in a water bath at 30°C
    - covering both boiling tubes with black paper

**Solution**

The rate of respiration is measured by the rate of oxygen absorption that is reflected by the rate of carbon dioxide produced by grasshopper. The control set-up is used to indicate the carbon dioxide produced by respiration causing the change in liquid level.

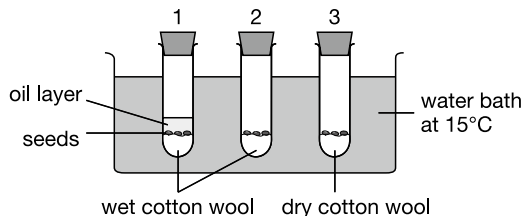
- ∴ The answer is A.

## 42

## Seed Germination

建議答題時間 1 分鐘

The diagram below shows an experiment used to investigate the conditions for seed germination. The test-tubes were kept at 15°C and illuminated under sunlight. Seeds in test-tube 2 germinated but others did not.



Based on the design of the set-up, what conclusion can be drawn from the results above?

- (1) Light is necessary for germination.
  - (2) Water is necessary for germination.
  - (3) Oxygen is necessary for germination.
- A. (1) only                      B. (3) only  
C. (1) and (2) only            D. (2) and (3) only

**Solution**

Comparing the results of test-tubes 1 and 2, oxygen is required for seed germination. Comparing the results of test-tubes 2 and 3, water is required for seed germination.

∴ The answer is D.

## 概念速遞

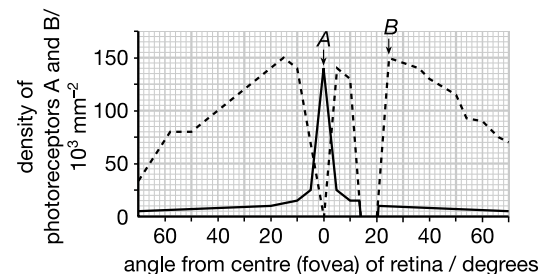
考生應懂得實驗 (experimental set-up) 和對照裝置 (control set-up) 只可以存在一個差別，其結果和結論才會可信，因為兩個裝置結果 (dependent variable) 的差異是源自於這個差別。

## 43

## Density of Rods and Cones on Retina

建議答題時間 1 分鐘

The graph below shows the densities of two types of photoreceptors, A and B, on the retina.



Which of the following descriptions about the photoreceptors is/are correct?

- (1) Photoreceptor A cannot be found at yellow spot.
  - (2) The total number of photoreceptor B is more than that of A.
  - (3) Photoreceptor B is absent at the blind spot.
- A. (1) only                      B. (1) and (2) only  
C. (2) and (3) only            D. (1), (2) and (3)

**Solution**

For (1), photoreceptor B cannot be found at yellow spot.

For (3), both photoreceptors A and B are absent at the blind spot.

∴ The answer is C.

## 概念速遞

光感細胞 A 和 B 分別是視錐細胞 (cones) 和視桿細胞 (rods)。視錐細胞對強光十分敏感，主要集中在黃點 (yellow spot)，視網膜邊緣數量很少。視桿細胞對昏暗光線較敏感，遍佈視網膜 (retina)，但黃點和盲點 (blind spot) 均沒有此細胞。