المدرسة الوطنية الأرثوذكسية الشميساني

The National Orthodox School Shmaisani

Worksheet | The Secondary Stage of (6-8)

1st Semester | 2023-2024 **Answer key**

Subject: Biology Alternative to practical

Name :

Date :

Objective : be able to answer questions about photosynthesis

Question 1 :

A student investigated the effect of different wavelengths of light on the rate of photosynthesis of the water plant, Cabomba.

The student used the apparatus shown in Fig. 6.1.

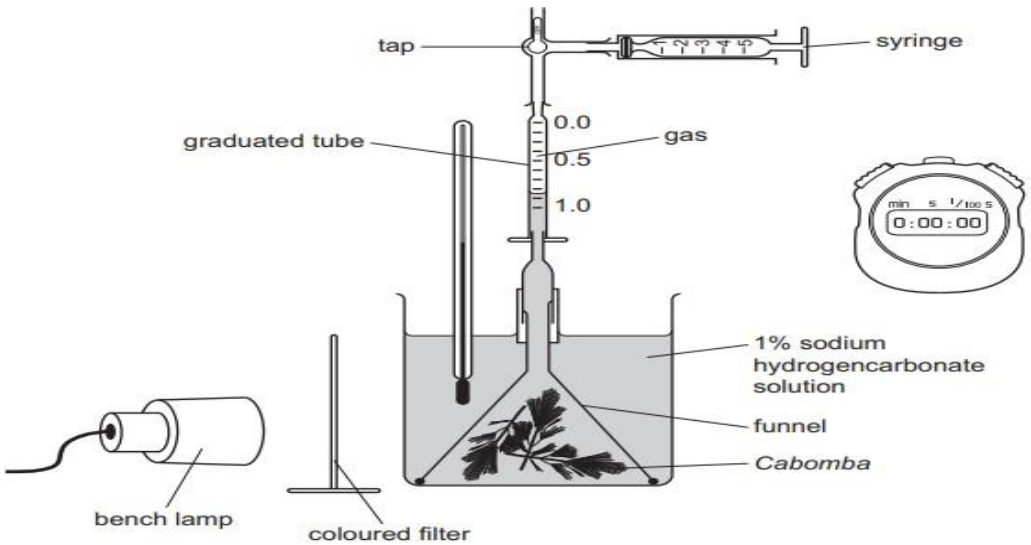


Fig. 6.1

The student collected the gas produced by the plant for five minutes. The results are shown in Table .

Table 6.1

colour of filter	wavelength of light / nm	volume of gas collected / cm^3
violet	400	0.80
blue	475	0.80
green	550	0.20
yellow	600	0.40
red	675	0.90

a. Name the dependent variable **volume of gas**

b. Name the independent variable **color of filter** / wavelength of light

c. Which color of the filter helped to produce the largest volume of gas ? **red**

d. State why the student:
   - kept the lamp at the same distance during the investigation.

     To control the light intensity / fair test

   - Used sodium hydrogen carbonate solution.

     To produce carbon dioxide needed for photosynthesis

e. Complete the table below :

Controlled variables	How to keep them controlled
Plant	Use the same type of plant
Carbon dioxide concentration	Using sodium hydrogen carbonate
Distance of plant from the light source	Using a ruler
Temperature	Using a thermometer

Question 2 :

Three identical beakers of pondweed were left in darkness, dim light, or intense light for an hour .

Then the oxygen in each beaker was measured using an oxygen sensor.

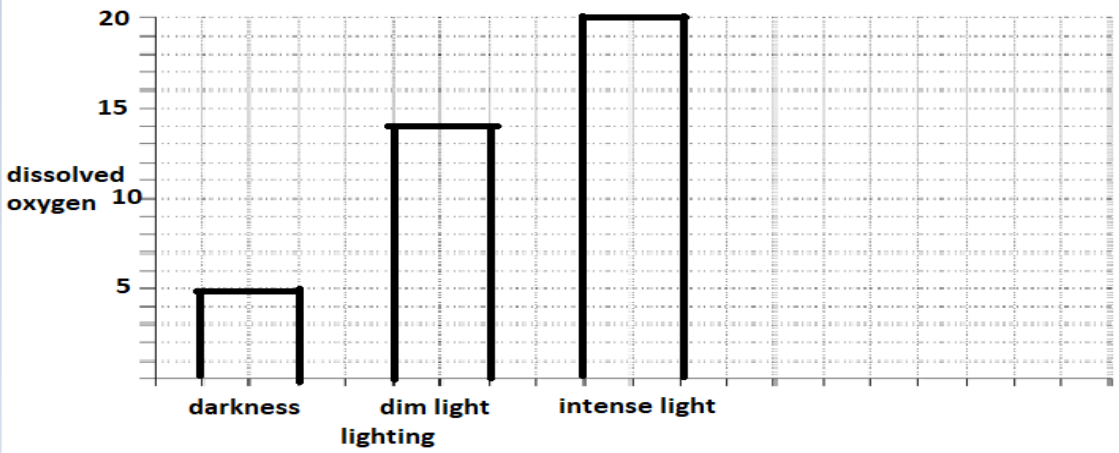
Lighting	Dissolved oxygen (mg/dm^3)
Darkness	5
Dim light	14
Intense light	20

a. Name the dependent variable. **Dissolved oxygen**

b. Name the independent variable **Lighting**

c. Name the controlled variables. **Type of plant , carbon dioxide ,amount of water , time**

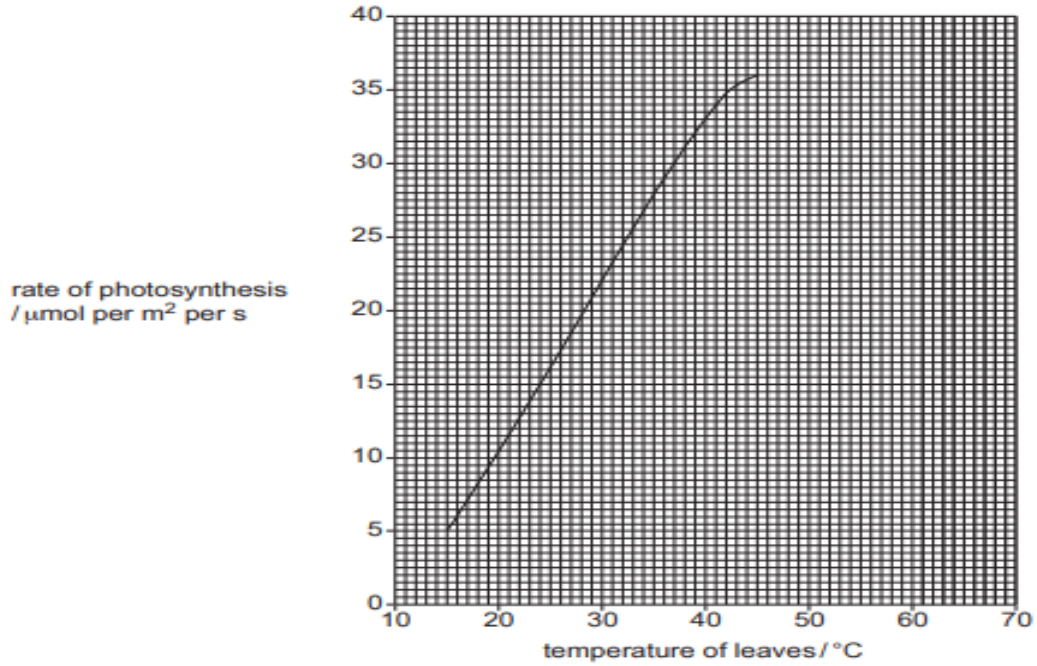
d. Draw a bar graph to show the results .



Question 3 :

An investigation was carried out to measure the rate of photosynthesis at different temperatures in California where the highest temperatures may be greater than 45°C.

- Predict and explain what would happen to the rate of photosynthesis if the investigation is continued at temperatures higher than 45°C.



It will slow down (decrease), enzymes will be denatured due to high temperature.