

# MODULE: *Photosynthesis and Respiration*

## Pre Test

### Marking Scheme

1. (10 minutes)

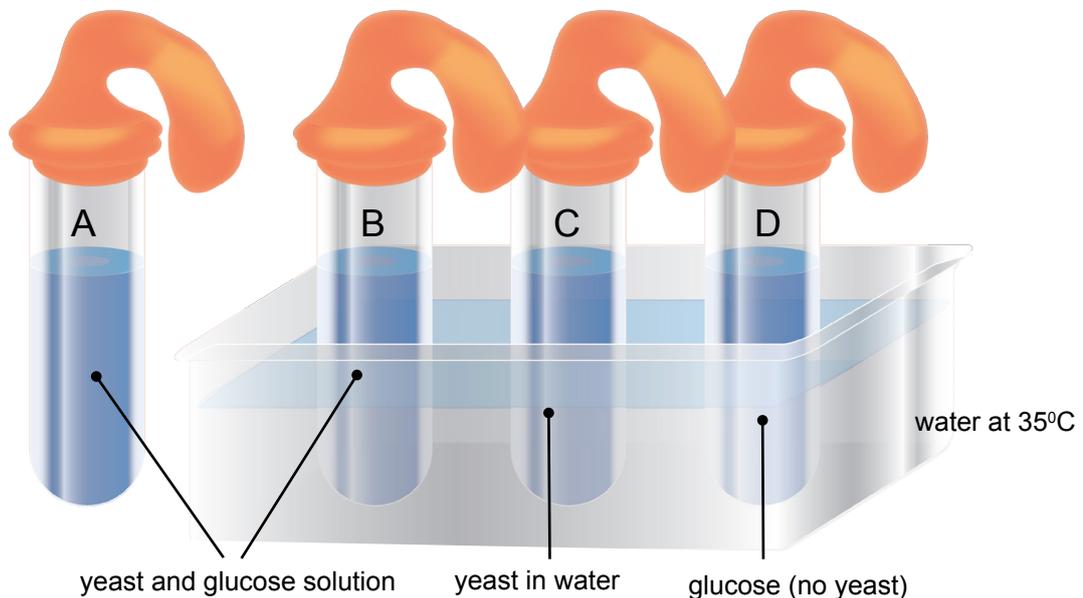
A student investigated how much gas was given off under different conditions in the production of gasohol. The diagram shows the apparatus she used.

Test tubes A and B contained the same volume of yeast mixed with glucose solution.

Test tube C contained yeast in water, but no glucose

Test tube D contained glucose, but no yeast.

Test tube A was placed in room temperature at 20°C. The other test tubes were placed in a warm water bath at 35°C. A balloon was put over the opening of each tube.



The table describes the appearance of the balloons after 15 minutes:

Tube	Appearance of balloon after 15 minutes
A	slightly inflated
B	very inflated
C	no change
D	

a. Explain why the balloons on tubes A and B inflated.

*The explanation should link the following points:*

- *respiration (of the yeast)*
- *(produces) carbon dioxide (gas)*

b. Explain why tube B being in a higher temperature than tube A caused the balloon on tube B to inflate more than the balloon on tube A.

*The explanation should link the following points:*

- *Increased enzyme/yeast activity*
- *Increased chemical reactions*

*Accept: warmer gas takes up a larger volume.*

c. Why did the balloon on tube C not show any change?

*No glucose, so no gas/ carbon dioxide produced.*

d. Describe the appearance you would expect the balloon on tube D to have at the end of the experiment.

*No change: no yeast, so no respiration, so no carbon dioxide produced.*

2. (10 minutes)

a. The diagram below shows plants growing in a greenhouse. It is noon on a hot, sunny day.



In the sentences below, cross out TWO words which are wrong in each box.

The plant leaves will be taking in

- Carbon dioxide
- Nitrogen
- Oxygen

The plant leaves will be making

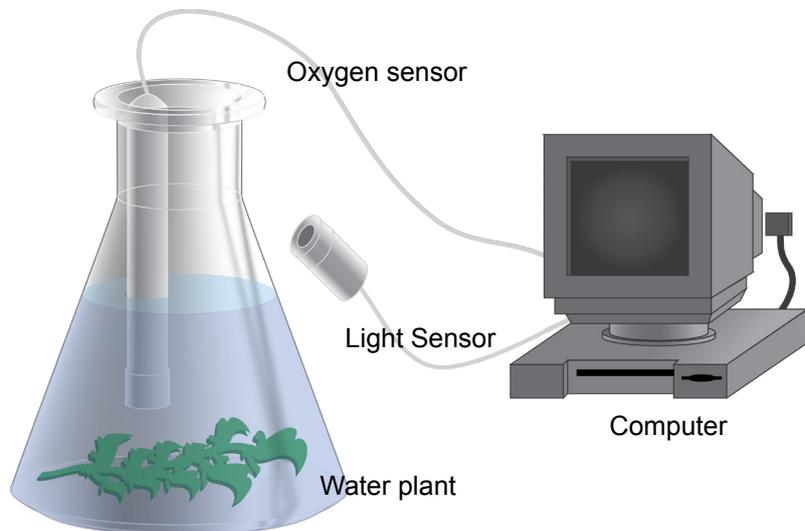
- Sugar
- Magnesium
- Nitrate

The energy needed for this process comes from

- Electricity
- Fossil fuels
- Light

b. The diagram shows a computer being used as a data logger in a photosynthesis experiment.

The experiment is to find how the oxygen output of the water plant varies over a 24-hour period.



Give TWO advantages of using a data logger in this experiment

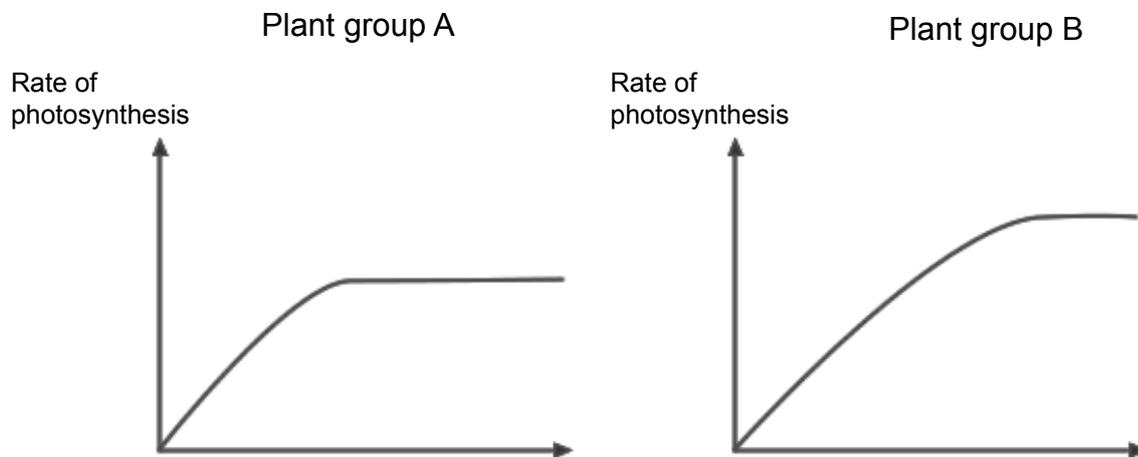
*Many more readings/ much more data*

*Records for 24 hours/does not require manual readings during the night.*

c. A student investigates the rate of photosynthesis in plants. She has two test groups of plants of the same species in different conditions.

For each group she measures the rate of photosynthesis at different concentrations of carbon dioxide.

The graphs show her results.



Suggest how the conditions for group B have differed from group A, and explain why this has produced the results shown in the graphs.

*The rate of photosynthesis can be limited by carbon dioxide, light intensity and temperature.*

*In group A, light intensity or temperature is limiting the rate of photosynthesis (at high carbon dioxide levels).*

*In group B there is greater light intensity/higher temperature.*

*So a faster rate of photosynthesis is possible before light intensity/temperature becomes limiting.*