

MODULE: *Photosynthesis and Respiration*

Post Test

Marking Scheme

1. (10 minutes)

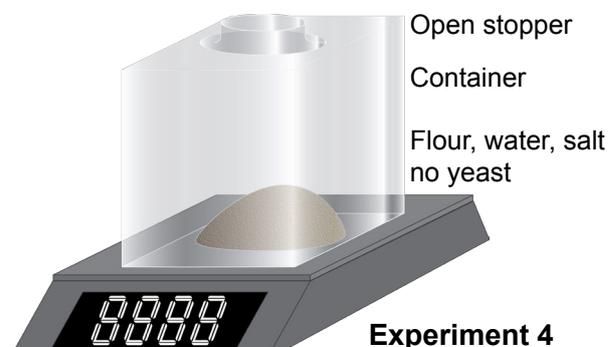
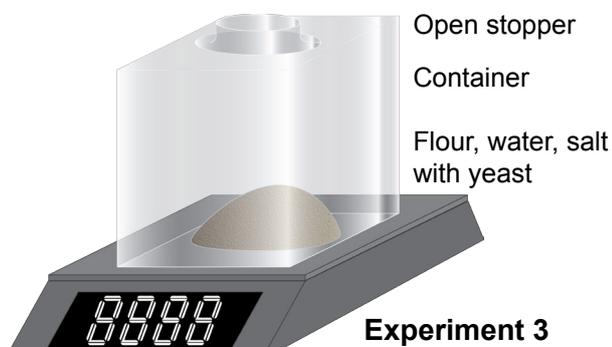
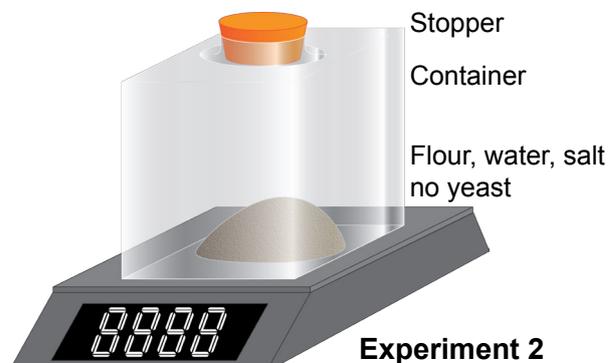
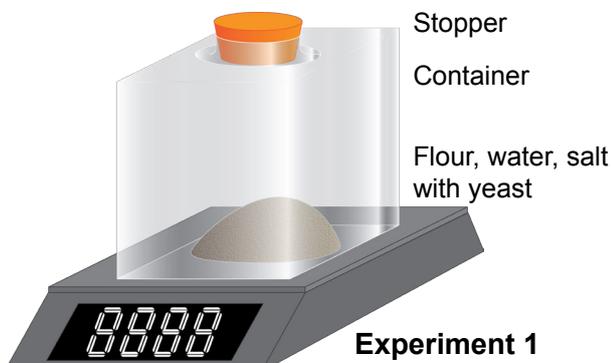
When we make bread, we mix flour, water, salt and yeast. After the ingredients have been mixed, the mixture is left for some time in a warm place for a reaction called fermentation to take place. This involves the yeast transforming the starch in the flour into carbon dioxide and water. It also causes the bread dough to rise.

a. Why?

- A. Because alcohol is produced and turns into a gas.
- B. Because the yeast is reproducing.
- C. Because a gas, carbon dioxide, is produced. ✓
- D. Because fermentation turns water into a vapour.

b. After this process, called proving, has happened, if we weighed the dough we would observe that its weight had decreased.

Look at the experiments below. The dough weighed the same at the start of all four investigations.



Which two experiments would you compare if it was the yeast that was causing the loss of weight?

- A. You should compare experiments 1 and 2.
- B. You should compare experiments 1 and 3.
- C. You should compare experiments 2 and 4.
- D. You should compare experiments 3 and 4. ✓

c. In the dough, yeast helps to transform starch and sugars in the flour. A chemical reaction occurs during which carbon dioxide and alcohol form.

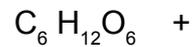
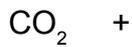
Where do the carbon atoms that are present in carbon dioxide and alcohol come from? Circle 'yes' or 'no' for each of the following explanations:

Is this a correct explanation of where the carbon atoms come from?	
Some carbon atoms come from the sugars	Yes
Some carbon atoms come from the salt	No
Some carbon atoms come from the water	No

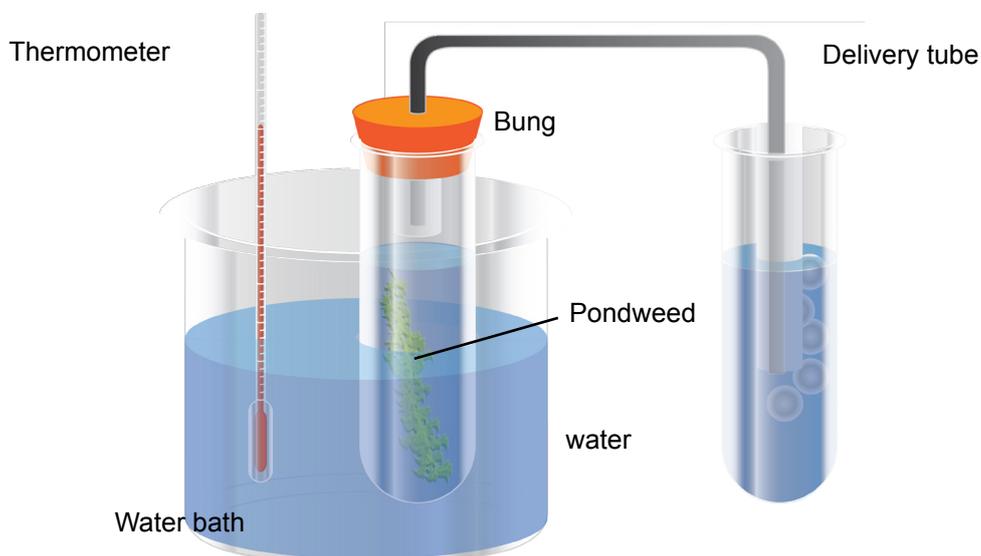
2. (15 minutes)

Plants produce food by photosynthesis.

a. Complete and balance the chemical equation for photosynthesis



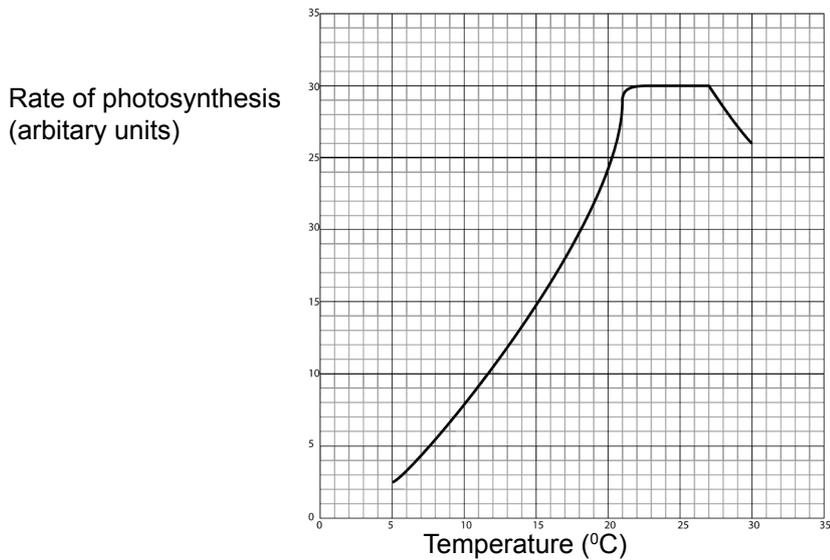
Some students investigated the effect of temperature on the rate of photosynthesis in pondweed. They set up the apparatus in the water bath and altered the temperature using ice and hot water.



They counted the number of bubbles given off in a minute at different temperatures.

b. Why did the students use a water bath?

To keep the temperature constant.



The graph shows the students' results.

- c. Explain the shape of the graph between 22°C and 27°C.

A factor other than temperature is limiting, e.g. carbon dioxide.

- d. A greenhouse owner wants to grow vegetables as quickly and cheaply as possible in winter. At what temperature should he keep his greenhouse in order to grow the vegetables as quickly and cheaply as possible?

21/22°C.

Explain your answer:

The rate of photosynthesis is at maximum for the least heating cost.