

Biology National 4 Homework "Photosynthesis"

1. (a) Photosynthesis is the process by which plants make food.

Complete the word equation for photosynthesis.

water + _____ + energy → glucose + _____ 1

(b) Name the substance, found in a plant cell, which converts light energy to chemical energy.

_____ 1

(c) Instead of using the glucose produced straight away, it can be converted into a storage carbohydrate.

Name this carbohydrate.

_____ 1

(d) Glucose is transported to the roots of the plant from the leaves.

(i) Suggest a reason why the roots of the plant cannot make glucose.

_____ 1

2. In an investigation into the factors needed for photosynthesis, three Wandering Sailor plants were destarched. The three plants were put into clear glass jars with lids. The jars were then placed in different conditions.

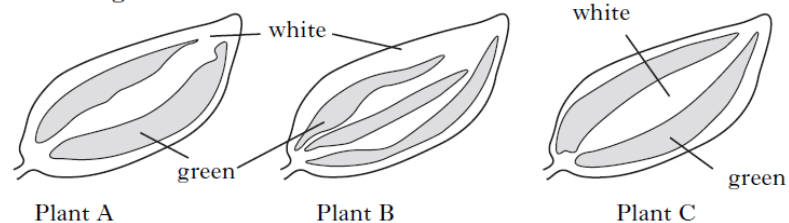
<i>Plant</i>	<i>Condition</i>
A	On a laboratory window sill
B	On a laboratory window sill with a chemical in the jar to remove carbon dioxide
C	In a dark cupboard

After 48 hours, a leaf from each plant was tested for starch. The test produces a blue-black colour when starch is present.

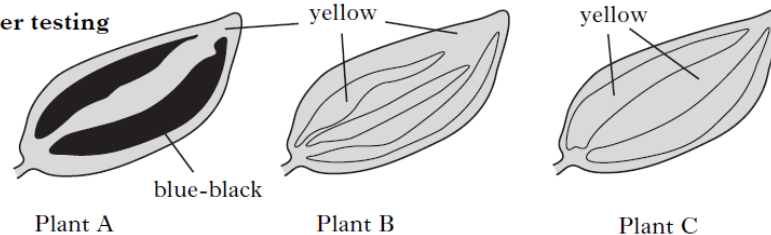
2. contd.

The following diagrams show the results.

Before testing



After testing



(a) Use these results to identify the **two** plants which show that light is needed for photosynthesis. Tick (✓) **two** boxes.

Plant A Plant B Plant C

1

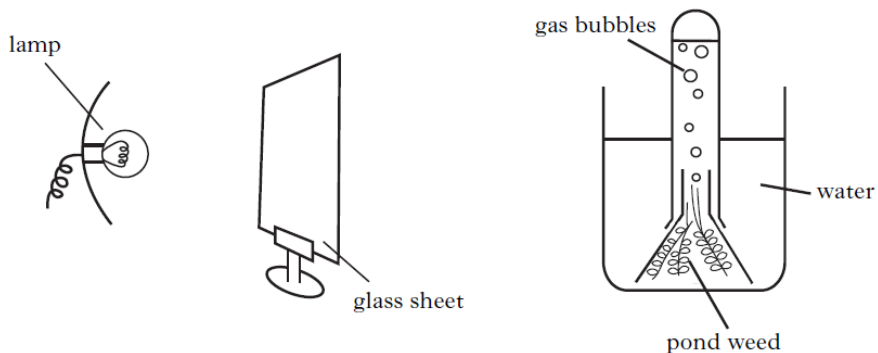
(b) Which plant showed that chlorophyll is needed for photosynthesis?

Plant _____

1

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3. (a) The investigation below was set up to show the effect of light intensity on the rate of photosynthesis in pond weed. The rate was measured by counting the number of gas bubbles released per minute.



(i) If the glass sheet was removed what factor, other than light intensity, might affect the rate of photosynthesis?

1

(ii) Suggest a way in which the light intensity could be altered.

1

(iii) What raw material needed for photosynthesis is **not** shown in the diagram?

1

3. contd. (iv) Six groups of pupils carried out the investigation. The averages of their results are shown in the table.

<i>Light intensity (units)</i>	2	4	6	8	10	12	14
<i>Average rate of photosynthesis (bubbles/minute)</i>	4	9	12	20	22	24	24

1 From the results, describe the effect of increasing light intensity on the rate of photosynthesis.

2

2 What is the advantage of having six groups carry out the investigation?

1

(b) (i) Name the openings which allow gases to pass in or out of the leaves of land plants.

1

(ii) Use words from the list to describe **one** of the transport systems in plants.

List leaves phloem roots
 sugar water xylem

Name of transport system _____

Material transported _____

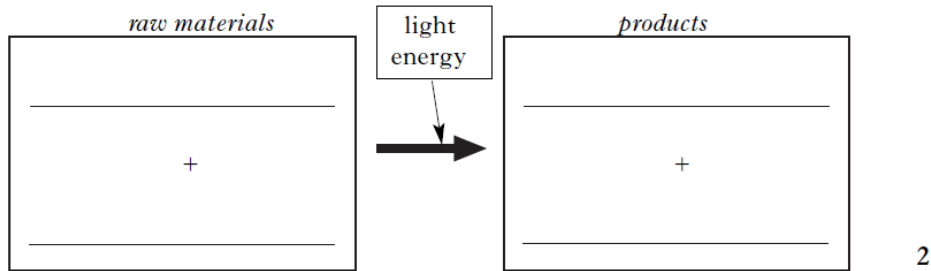
Direction of transport

from _____ to _____

2

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4. (a) Complete the word equation for photosynthesis.



(b) One of the products of photosynthesis may be converted into a storage carbohydrate in the plant. Name this storage carbohydrate.

1

(c) Plants exchange gases with the air during photosynthesis.

Name the openings which allow gases to pass into and out of the leaf.

1

(d) What substance in green leaves absorbs the light energy for photosynthesis?

1

End of homework questions.