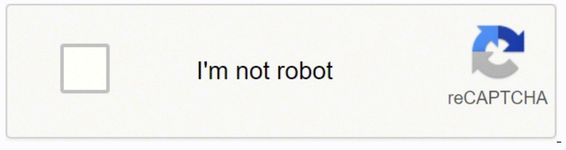

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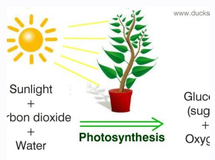
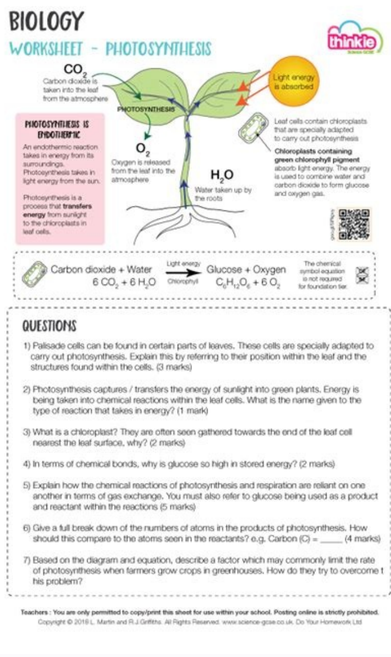
Gcse biology photosynthesis questions and answers




BIOLOGY

WORKSHEET - PHOTOSYNTHESIS

thinkle

CO_2 Carbon dioxide is taken into the leaf from the atmosphere

Light energy is absorbed

PHOTOSYNTHESIS

PHOTOSYNTHESIS IS ENDOTHERMIC

An endothermic reaction takes in energy from its surroundings. Photosynthesis takes in light energy from the sun.

Photosynthesis is a process that **transfers energy** from sunlight to the chloroplasts in leaf cells.

O_2 Oxygen is released from the leaf into the atmosphere

H_2O Water taken up by the roots

Leaf cells contain chloroplasts that are specially adapted to carry out photosynthesis

Chloroplasts containing green chlorophyll pigment absorb light energy. The energy is used to combine water and carbon dioxide to form glucose and oxygen gas.

Carbon dioxide + Water → (Light energy, Chlorophyll) → Glucose + Oxygen

$6\,CO_2 + 6\,H_2O \rightarrow C_6H_{12}O_6 + 6\,O_2$

The chemical symbol equation is not required for foundation tier.

QUESTIONS

1) Palisade cells can be found in certain parts of leaves. These cells are specially adapted to carry out photosynthesis. Explain this by referring to their position within the leaf and the structures found within the cells. (3 marks)

2) Photosynthesis captures / transfers the energy of sunlight into green plants. Energy is being taken into chemical reactions within the leaf cells. What is the name given to the type of reaction that takes in energy? (1 mark)

3) What is a chloroplast? They are often seen gathered towards the end of the leaf cell nearest the leaf surface, why? (2 marks)

4) In terms of chemical bonds, why is glucose so high in stored energy? (2 marks)

5) Explain how the chemical reactions of photosynthesis and respiration are reliant on one another in terms of gas exchange. You must also refer to glucose being used as a product and reactant within the reactions (5 marks)

6) Give a full break down of the numbers of atoms in the products of photosynthesis. How should this compare to the atoms seen in the reactants? e.g. Carbon (C) = ____ (4 marks)

7) Based on the diagram and equation, describe a factor which may commonly limit the rate of photosynthesis when farmers grow crops in greenhouses. How do they try to overcome t his problem?

1. **FIGURE 1** summarises a light dependent reaction in plants.

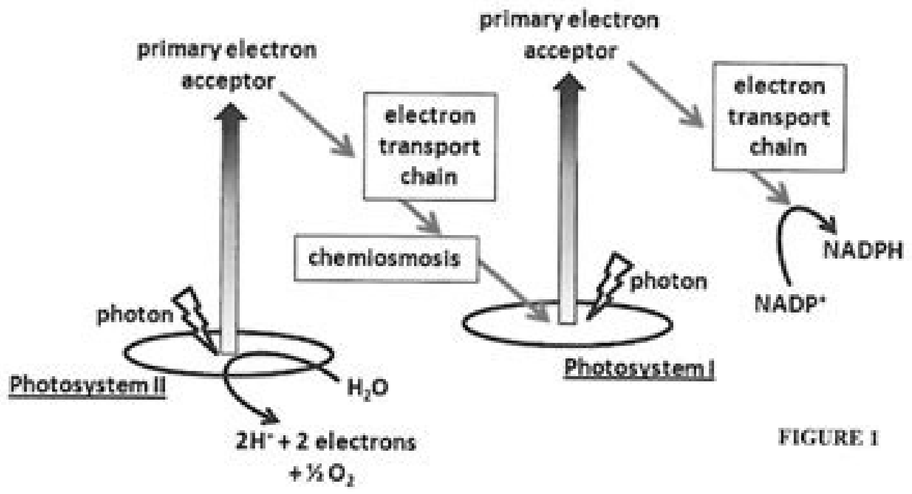


FIGURE 1

(a) (i) What is the reaction shown in **FIGURE 1**? *(1 mark)*

Non-cyclic photophosphorylation

(ii) At which part of chloroplast does the reaction take place? *(1 mark)*

Thylakoid (membrane) / granum / grana

(b) (i) A water molecule is split to its components in process H at Photosystem II. What is process H? *(1 mark)*

Photolysis of water

(ii) Explain how does process H occur. *(3 marks)*

- **Light photons excite electrons at the reaction centre (of PSII)**
- **The lost electrons are replaced by electrons from water**
- **Water molecules are split into electrons, hydrogen ions and oxygen molecules.**

AQA GCSE BIOLOGY

B8-Photosynthesis-Homework

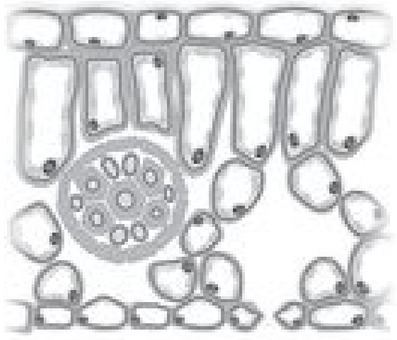
Name ..... **Class** ..... **Date** .....

Questions:

1 **a** View the microscope slide of a cross-section through a leaf.
Label your drawing with the parts of the leaf. Use the labels given below:
This question requires knowledge from the B4 topic.

(You may use kerboodle, gcsepod or BBC bitesize to complete this activity).

air space	guard cell	palisade layer	phloem
spongy mesophyll layer	stomata	upper cuticle	
vascular bundle	xylem		



b *Match the part of the leaf with how it is adapted for photosynthesis.*

palisade layer	cells tightly packed and contain lots of chloroplasts
spongy mesophyll layer	contains xylem and phloem for transport of water and sugars
stomata	pores in lower epidermis to allow gaseous exchange
vascular bundle	lots of air spaces for diffusion of gases

2 You are advising someone on how to improve the yield of their plants in their greenhouse. Answer the questions below to provide a checklist for them. You can use your student book to help you.

a What raw materials do plants need to photosynthesise?

1 .....

2 .....

6

For Examiner's Use

2 Palisade cells have both chloroplasts and mitochondria. Exchanges between a mitochondrion, a chloroplast and the cytoplasm surrounding them are shown in Fig. 2.1.

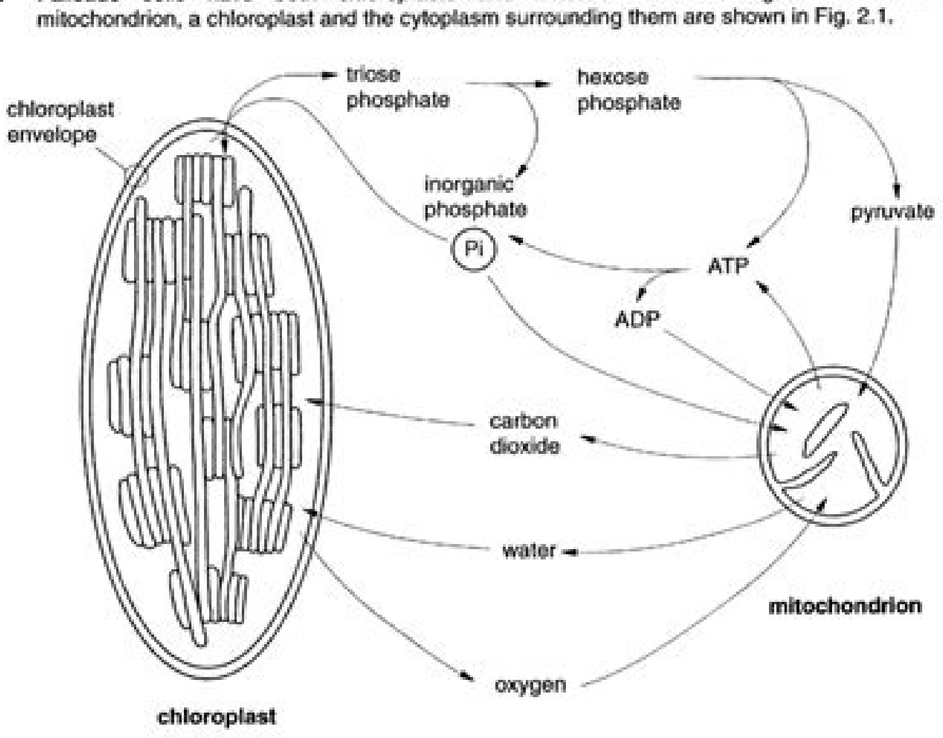


Fig. 2.1

(a) A leafy shoot can be sealed inside a transparent container. The concentration of oxygen in the atmosphere within this container can be measured. In the dark, the oxygen concentration falls. At high light intensities, the oxygen concentration increases. At a particular light intensity, the oxygen concentration in the container remains constant.

Use Fig. 2.1 to explain how it is possible for the oxygen concentration to remain constant.

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..... [4]

03 Steps to test the presence of starch in leaf: Step 1 Put the leaf in boiling water for 1 minute to soften the leaves.The leaf was flaccid (soft) after being boiled in water Step 2 Transfer the leaf into boiling ethanol for 5 minutes to destroy the waxy cuticle and then to remove the colour the ethanol changed from colorless to green Step 3 Wash the leaf in hot water to soften them again. b) Light energy is needed for photosynthesis, so as the light intensity increases, the rate of photosynthesis chemical reactions steadily increases in a linear manner. The energy released in making carbon dioxide and water is more than the energy taken in to break glucose and oxygen Cristae are the folding of the inner membrane of the mitochondria to increase the surface area for the attachment of the enzymes WHY WE NEED ENERGY MOVEMENT Energy is required by the muscles to contract. PROTEINS Glucose is combined with nitrates and other mineral ions from the soil to form protein. Step 4 Spread the leaf on a white tile and cover it with iodine solution. It can be broken down during the process of respiration, releasing energy stored in the glucose molecules. If you are growing plants hydroponically, pure water could cause your plants to swell, and the internal cells to rupture, thereby killing or severely damaging your plants. In photosynthesis, the sun's energy combines hydrogen from water (H20) with carbon dioxide (CO2) turning them into carbohydrates. Chloroplast – They have chloroplast which contains chlorophyll and traps light for photosynthesis Guard cell – They have stomata which are the pores for gas exchange FACTORS AFFECTING PHOTOSYNTHESIS As the light intensity increases the rate of photosynthesis increases and then it levels off. Photosynthesis is considered an endothermic reaction because plants gets the energy to convert carbon dioxide and water into glucose and oxygen from the outside (Sun) environment. Fats and oil can form the component of the cell membrane They are also stored in seeds as an energy store for germination. They need simple things like carbon dioxide and water and can make complex things like sugar, starch, fat, and proteins. For your GCSE Biology exam you can simply write the word equation below as a definition. – GCSE Biology Exam Questions By Topic Photosynthesis Respiration and Enzymes Topic AQA, Edexcel, OCR AQA, Edexcel, OCR OCR AQA, Edexcel, OCR AQA, Edexcel, OCR AQA, Edexcel, OCR AQA, Edexcel, OCR AQA, Edexcel, OCR Green plants and algae use light energy to make glucose and oxygen from carbon dioxide and water. The enzyme changes shape and is not functions if the shape changes Banner 3 LAW OF LIMITING FACTORS The factor that limits the rate OF photosynthesis Limiting factor is that factor that is present in a least amount than required and affect the rate of photosynthesis. Because they don't take nearly as long to ripen as their larger counterparts, they provide home growers with fairly quick gratification. Coloured filters can be used, but these will affect light intensity by different amounts depending on the colour. – Light Banner 5 AQA GCSE BIOLOGY B8 Summary questions : KERBOODLE ANSWER Page No. 132 1 a) carbon dioxide + water —> glucose + oxygen + water If we balance the equation, we get : 6CO2 + 6H2O —> C6H12O6 + 6O2. In your GCSE Biology exam you may be asked to list some specific examples such as age, weight, gender along with lifestyle choices such as exercise. Explain your choice. ANABOLISM Building of bigger molecules from smaller ones like making proteins fats and lipids from minerals ions require energy RESPONSE TO EXERCISE Demand for oxygen and glucose increases as more energy is needed BREATHING RATE The breathing rate increases so that more oxygen is inhaled to meet the demands of oxygen by the muscles. Lactic acid + O2 CO2 + H2O METABOLISM It is the sum of all the reactions of the body CATABOLISM Breakdown reaction in which bigger molecule is broken down into smaller ones. OXYGEN DEBT* During Exercise the body switches to anaerobic respiration. 03.3 Test for presence of starch in leaf : Green parts containing chlorophyll- stained black – starch is present. AEROBIC RESPIRATION Takes place in the presence of Oxygen Releases more energy and the food is completely broken down. So what they do is convert the extra glucose into starch. – It is a protein which is a biological catalyst. One set was grown in 85% full sunlight and the other set in only 35% full sunlight. It works on the principle of greenhouse effect in which light is allowed to enter but is not allowed to escape thereby increasing light and temperature inside the greenhouse. e) Plants grown in pure water will die, even if they are supplied with light, carbon dioxide, and a growing temperature of around 20°C because pure water is aggressive to dissolve anything it comes into contact with and same is in the case of plants grown in pure water . In the presence of starch iodine solution will turn into blue-black color and in the absence of starch iodine added to leaf will turn into brown color.In this experimental leaf, the part of the variegated leaf which contain green patches will give a positive test for starch i.e. iodine when added to this part of the leaf will turn into blue-black color. Iodine solution turns blue black in the presence of starch .No colour changes in case of absence of starch 03.2 Safety precautions when you transfer the leaf into boiling ethanol :Put on your eye protection.Add enough ethanol to cover the leaf, and stand the boiling tube in your beaker of hot water, or in the hot water bath. b) The pulp (mesocarp) around the nut contains the red palm oil. PHOTOSYNTHESIS VERSUS RESPIRATION PHOTOSYNTHESIS RESPIRATION Only in plant cells Occurs in all living cells It is endothermic reaction It is exothermic reaction. The more photons of light that fall on a leaf, the greater the number of chlorophyll molecules that are ionized and the more ATP and NADPH are generated so the oak seedlings getting more sunlight grows faster as comparison to the one getting lesser sunlight.3) a) Plants make food in their leaves. The leaves contain a pigment called chlorophyll, which colors the leaves green. Chlorophyll can make food the plant can use from carbon dioxide, water, nutrients, and energy from sunlight. b) In plants, water is absorbed through the roots which rises to the leaves and enters special cells called chloroplasts. Chlorophyll is the green pigment that traps light for the leaves and helps them to photosynthesis. Respiration provides energy for muscle contraction. The reason for this is, this part of the experimental leaf containing green patches include chlorophyll and thus prepare starch through photosynthesis. Takes place in the mitochondria It is opposite of photosynthesis ANAEROBIC RESPIRATION Takes place in absence of oxygen. Anaerobic results in the partial break down of glucose. When intensity of light increases, rate of photosynthesis also increases. Light parts of plant with no chlorophyll the iodine remains orange – no starch present. It is also good to time yourself while doing these questions so that you can work on the speed as well. Then when the plants "drink" the water, they will get a good dose of food. Increase blood supply increases the supply of both glucose and oxygen via blood to the muscles cells. Oxygen (O2) is given off as a by-product of photosynthesis. This benefits other animals that utilize this oxygen and the plants for food. For optimal growth and production the tree requires stable climatic conditions, in particular with respect to light and moisture supply . Culinary herbs are also easy to grow using hydroponics, particularly since many home cooks prefer to use the juveniles versions of these plants. d) i) Benefits of the natural environment You get food You can use standard equipment and labor for planting and harvesting You use compost for fertilizer Problems: Your yields are not optimum You have growing seasons You have to practice "crop rotation" or be continuously checking and fertilizing Weeds compete with your plants Insects eat your plants and you will have to spray with pesticides ii) Benefits of an artificially manipulated environment: If you include artificial lighting and heating you can get yields all year 'round Problems of an artificially manipulated environment: It's expensive (initial setup, cost of the chemicals to add to the water, electricity for lighting, energy cost for heating) A "water mold" type disease will wipe out everything, and a fungus disease will wipe out almost everything You need specialized equipment for harvesting some of the listed crops Baneer 6 AQA GCSE BIOLOGY Practice questions : Kerboodle answer Page No.133 01.1The chemical equation for photosynthesis is Water +carbon dioxide–> glucose+ oxygen 01.2 The chemical symbol for glucose is C6H12O601.3 Photosynthesis is an endothermic reaction. GLYCOGENOLYSIS Glycogen Glucose Stored carbohydrates, glycogen is converted to glucose in the muscles during exercise to meet the demand for increased glucose. What factors affect metabolism? a) Graph showing that the growth of both sets of oak seedlings. Where Next? Measuring Photosynthesis FATE OF GLUCOSE Glucose is

soluble in water and if present longer will disturb osmotic balance of the cell Starch is complex molecule which is insoluble and can store large amount of glucose. These processes extract three major palm products: crude palm oil, crude palm kernel oil and palm kernel expeller. It can however hardly survive or regenerate in dense secondary forest because of the lack of sunshine. Temperature, carbon dioxide concentration and light intensity can affect the rate of photosynthesis. The palm kernel, the nut found in the centre of each piece of fruit, is extracted and sent to a palm kernel crushing mill. Light intensity No matter how much water and carbon dioxide is present, without light plant can't do photosynthesis. Any one of the factors (carbon dioxide, water, or light) can limit photosynthesis. In three ways glucose can be used: Glucose can be converted into cellulose which help in growth of the plant. Banner 7 DISCLAIMER Disclaimer: I have tried by level best to provide the answers and video explanations to the best of my knowledge. When they need to use the energy, they can turn the starch back into glucose. What do I need to know about photosynthesis for my GCSE Biology exam? Even if the plant has open stomata barley is a C3 so as the temperature increases so does the rate of carbon lost to photorespiration. Initially the rate increases an€ then it has no effect as at that point other factors become limiting. 02.1 The gas used in photosynthesis is Oxygen 02.2 The funnel is supported on pieces of plasticine to raise the funnel. As the light intensity increases the rate of photosynthesis increases and then it levels off. In case you spot any errors then do let us know and we will rectify it. Banner 4 TEST FOR STARCH Add Iodine Solution If the solution turns blue black it indicates the presence of starch. If the temperature is over 30C only a fraction of the CO2 taken in can enter the Calvin cycle with the rest lost to photorespiration. c) Wheat and Cabbage be least sensible to grow hydroponically? Glucose is also used in muscle contraction as well as active transport. Oxygen is produced Oxygen is used up Takes place in chloroplast Takes place in Mitochondria Anabolic reaction, glucose is made Catabolic reaction, glucose is broken down. If the plant is over-watered, the pure water will take a lot of the nutrients from the soil and drip away, or seep into soil away from your plants. b i) Light for photosynthesis in the geranium come from the sun, in form of sunlight, that is absorbed by the leaves. This means it speeds up reactions without being used up. This process releases energy, water and carbon dioxide. If any one of these factors is limiting, then the whole process slows down or stops. Light dependent Light independent Banner 8 Key Terms Photosynthesis – It is the process by which green plants prepare their own food carbon dioxide and water are combined to form glucose and oxygen in presence of sunlight Respiration – breakdown of food to release energy Limiting Factors — Factor that limits the rate of photosynthesis Endothermic Reaction— Reaction that takes in heat Exothermic Reaction — Reaction that releases heat Glucose — product of photosynthesis and fuel for respiration Starch — Storage carbohydrate in plants Glycogen — Storage carbohydrate in animals Aerobic Respiration – Breaking down of food in presence of oxygen Anaerboic Respiration – breaking down of food in absence of oxygen Fermentation – Anaerobic respiration in plants that produces ethanol and carbon dioxide Greenhouse – A glass or a plastic house to control the limiting factors and increase the rate of photosynthesis. 04 This is the procedure by which plants make starch from simple raw materials Plants are Autotrophs. Beyond optimum the rate decreases as enzymes get denatured. As the pH increases the rate increases upto optimum. – Both genetic and lifestyle factors can impact on metabolism. Light Intensity = Power/Area Temperature of the water – The higher the temperature then typically the greater the rate of photosynthesis Carbon dioxide concentration. The plants make glucose by the process of photsynthesis. We use it in respiration to release energy to make proteins and complete other cellular processes. More importantly, chlorophyll absorbs light in the red and blue parts of the spectrum and uses it to power a crucial chemical reaction. There are limiting factors that can slow down photosynthesis process are: Concentration of carbon dioxide, intensity if light and temperature. The chemical equation for the process of photosynthesis is: 6CO2 + 6H20 + light C6H12O6 + 6O2 The process is directly dependent on the supply of water, light, temperature and carbon dioxide. Only leaves can photosynthesize as they have chloroplast which contains chlorophyll. Glucose can be stored as starch that can be converted back to glucose when required. The breathing rate is still high to get maximum oxygen to break lactic acid. The energy released in making glucose and oxygen is less than the energy required to break the bonds of carbon dioxide and water. a) Synthesis of cellulose from glucose b) Synthesis of starch and glycogen from glucose c) Synthesis of fats and lipids d) Synthesis of proteins Banner 7 LIVER DETOXIFICATION The alcohol or any poisonous substance taken in the body is detoxified in the liver as liver contains enzymes for detoxification BREAKDOWN OF BLOOD CELLS Old and work out blood cells are broken down in liver. GLUCOSE Principle source of energy. WHY BREATHING RATE Б HOH AFTER STOPPING THE EXERCISE Extra Oxygen needed by the body after exercise to recover. BREAKDOWN OF HARMFUL SUBSTANCES FOR EXCRETION Excess proteins is broken down into urea in the liver which is excreted by kidney as Urine BREAK DOWN OF LACTIC ACID Lactic acid produced during anaerobic respiration in the muscles is transported into the liver via blood and liver converts it into carbon dioxide and water by taking in more oxygen which is inhaled as oxygen debt. But this is not an alternative to the textbook. CELLULOSE Excess glucose can be converted into structural carbohydrate called Cellulose Cellulose is the component of the cell wall which provide shape and support to the plant. Banner 9 Disclaimer: I have tried my level best to cover the maximum of your specification. It broken down during respiration and produces energy for the plant to grow and reproduce. Some of the things are good, and some are bad. THERMOREGULATION Respiration produces heat which helps to maintain the body temperature. 02.3 The apparatus used to measure the rate of photosynthesis: When placed closer to a light source, the rate of bubbling will speed up, and as the pondweed is taken further away, the bubbles will slow down again – an instant and visual indicator of the importance of light intensity in photosynthesis. Photosynthesis is ENDOTHERMIC Endothermic as it takes in heat from the sunlight. Plants growing on a woodland floor in winter. All the answers and notes are written by me and if there is any similarity in the content then it is purely coincidental. You should cover the specification or the textbook thoroughly. The oil is extracted from the kernel. d) Some of the glucose produced by the geranium plant is used for respiration. One small pot of chives, for instance, can keep producing enough vegetative material on a regular basis to meet the needs of most average families. 2) The figures in Table 1 show the mean growth of two sets of oak seedlings. ii) Sunlight is absorbed by Leaves, in which a pigment is present called as chlorophyll, inside chloroplasts. Many people who live in northern climates grow cherry tomatoes indoors all year long. What are the factors that affect the rate of photosynthesis? Any deviation from these conditions enhances a yield decrease. For optimal growth and production the crop requires a high and year round rainfall with little or no dry season and stable high temperatures; soils should be deep and well drained. (Light intensity is proportional to 1/distance2. The bubbles can be counted and the rate of bubbling can serve as an indication of the rate of photosynthesis, or the gas can be collected in a pipette or microsyringe and the amount measured. 02.4 Three factors that could affect the rate of photosynthesis are: Light intensity or distance of the pondweedfrom the lamp. Enzymes play important roles in all living organisms. What actually happens to your particular plants depends on a variety of factors. The same field later on in the day – If the ground is hot & dry so the plants risk wilting and the stomata close then the CO2 could be limiting. Releases less energy and food is not completely broken down. Starch can be stored in leaves or other parts of the plant. LIPIDS Glucose can be converted to fats and oil to serve as energy source. So iodine added in this region will change into brown color. Banner 5 RESPIRATION It is the process of breaking down food to release energy. Temperature Extreme temperatures limit the photosynthesis, high or low temperature decreases the rate of photosynthesis. Acidity: use buffer solutions to maintain different pHs. Colour of light. What is aerobic respiration? Lettuce is another crop that is easily grown using hydroponic techniques. STARCH Excess glucose is stored in the plant as starch and is used by the plant when needed. a) Breakdown of glycogen b) Breakdown of proteins c) Breakdown of lipids d) Respiration ANABOLISM It is the synthesis reaction in which bigger molecule js formed from the smaller ones. The purer the water, the more dramatic the damage will be. GREENHOUSE It controls all the limiting factors to provide maximum yield of photosynthesize Temperature, light, carbon dioxide and other factors affecting photosynthesis are controlled and monitored. – Temperature d. This is the quick revision to help you cover the gist of everything. Plants can make enough glucose on a sunny day to last them through the night and through lots of cloudy dark days, but they cannot store up lots of glucose. Beyond optimum the rate decreases as at the higher temperature the enzymes get denatured. Does not involve enzyme Involve Enzymes It is breathing in oxygen and breathing out carbon dioxide It is breaking of food in presence of oxygen for energy No energy is released Energy is released Takes place outside the cells Takes place inside the cells EXOTHERMIC As it releases heat. Metabolism – Sum Of all the catabolic and anabolic reactions of the body. So glucose is stored in the form of starch in plants. HEART RATE Increase heart rate pumps more blood to the muscles. This is also the reason why stand-alone trees in villages are generally much taller than in palm groves. Because there is no need to use herbicides or pesticides in indoor environments, the products of hydroponic gardens are clean and pure. But this is not the alternative to the textbook. 4) a) Oil palms can grow rapidly in the conditions that support a tropical rainforest because it is a typical tree crop of the tropical rainforest. Muscle cells have loads of mitochondria and glycogen for efficient respiration. So glucose is broken down into lactic Acid Glucose Lactic Acid The lactic acid needs to be broken down into carbon dioxide. Increased breathing rates also increases the rate of removal of carbon dioxide. Initially the rate increases and then it has no effect as at that point other factors become limiting As the temperature increases the rate increases as the particles gain kinetic energy and moves faster causing greater collision and increase reaction rate. TRANSPORT Transport of substance in an out of the cell against the concentration gradient via active transport required energy. c) The energy stored for embryo development before it can start making their own food by photosynthesis. d) In plants Glucose can be converted into chemicals required for growth of plant cells such as cellulose, can be converted into starch, a storage molecule, that can be converted back to glucose when the plant requires it and also it can be broken down during the process of respiration, releasing energy stored in the glucose molecules. c) Demonstrating that photosynthesis take place in the leaves of a plant by Starch Test Iodine is a purple colored reagent used to test the presence or absence of starch in the leaf conducted for photosynthesis process. Banner 1 BIOENERGETIC 4.1 BIOENERGETIC Photosynthesis Factors affecting photosynthesis How plants use glucose Greenhouses Respiration Banner 2 PHOTOSYNTHESIS It is the process by which green plants prepare their own food by using water, carbon dioxide in presence of sunlight to form glucose and oxygen. Thus this experiment proves chlorophyll is necessary for leaves to prepare starch through photosynthesis. c) On a cold morning the rate of photosynthesis in the geranium plant is very slow. References: BBC Bitesize Wikipedia Wikimedia Commons Image Source: Wikipedia Wikimedia Commons Flickr Pixabay Make sure you have watched the above videos and are familiar with the key definations before trying these questions. Carbon dioxide concentration Occasionally photosynthesis is limited by the amount of carbon dioxide in environment. What happens is the pure water pulls electrolytes out of the plant cells and the pure water, under what is called hyper-osmotic pressure runs into the plant cells causing them to swell. Liver – An organ involved in metabolism. The pulp left over from this process is pressed together, forming palm kernel cake or expeller. But colored patches of variegated leaf doesn't include chlorophyll and thus don't prepare starch through photosynthesis. Plants growing on a woodland floor in summer. Glucose + Oxygen -> Carbon Dioxide + Water + Energy What is the difference between aerobic respiration and anaerobic respiration? The most common incorrect exam answer is water. The kernel in the nut contains oil very similar to coconut oil, but palm oil and palm kernel oil are chemically different. In this case using pure water can deplete your plants of nutrients. These cells contain chlorophyll, a green pigment that gives leaves their color by reflecting green wavelengths. LEAF ADAPTATIONS FOR PHOTOSYNTHESIS Mesophyll – Photosynthetic cells lies parallel to the surface to absorb maximum light and are closed to the stomata for quick diffusion of gases. References: BBC Bitesize AQA GCSE Science Kerboodle textbook Wikipedia Wikimedia Commons Join Our Free Facebook Group : Get A* in GCSE and A LEVEL Science and Maths by Mahima Laroyia: For Free Tips, advice and Maths and Science Help This page contains the detailed and easy notes for AQA GCSE Biology Bioenergetic for revision and understanding Bioenergetic. b. The food that plants produce is important, not only for the plants themselves, but for the other organisms that feed on the plants. There are two types of chlorophyll present in chloroplasts, Chlorophyll a and chlorophyll b that are used to absorb light with red and blue wavelengths. 5) a) Hydroponically-grown plants grow more quickly than soil-grown plants because they have food and water available to them all the time. CATABOLISM Breaking of large substances to smaller ones like digestion requires energy. – We store glucose as glycogen. In fact, many commercial growers are finding this to be much more cost effective than growing lettuce in the traditional way. Temperature & CO2 are limited c. It is chemical process. B8- Photosynthesis 01.4 Photosynthesis in plants is essential for the survival of animals becauseplants take the light from sun and use it to make their own food. – Aerobic respiration uses oxygen and anaerobic doesn't. They can make lots of organic chemicals from a few simple inorganic chemicals. – You will need to know the word and symbol equation as well as the factors the affect photosynthesis. Proteins are responsible for growth and also to make enzymes for metabolic reactions. Also starch being insoluble does not disturb the osmotic balance of the cell. – Temperature, light intensity and carbon dioxide all impact on the rate of photosynthesis. The pure water will tend to dissolve and hold the fertilizer and nutrients in the water. What is an enzyme? b) Crops that would be most economically sensible to grow hydroponically are: Cherry tomatoes do exceptionally well when grown hydroponically. Conclusion: Chlorophyll must be present in leaf cells for photosynthesis to occur. Thus iodine added to this region will turn into blue-back color. This means they don't need a large root system to find nutrients and water and can devote more energy to producing their crop which results in the plant maturing more quickly so rhe yields are always higher. What are the uses of Glucose in animals and humans? In the process they use carbon dioxide and light to make sugar (glucose) and oxygen. – Aerobic respiration is the breakdown of glucose using oxygen. Lactic Acid — The product of anaerobic respiration in animals Oxygen Debt —The extra oxygen needed exercise to break down lactic acid and recover to pre exercise state. Takes place in the Cytoplasm Glucose + Oxygen Carbon Dioxide + Water C6H12O6 +602 6CO2 + H2O PLANTS known as fermentation forms ethanol and carbon-dioxide Glucose Ethanol + Carbon Dioxide ANIMALS takes place in muscles Glucose Lactic Acid Baneer 6 BREATHING AND RESPIRATION BREATHING RESPIRATION It is a physical process. The photosynthetic process occurs only in the chloroplasts.. Plants make their own food using photosynthesis.

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