9BB Biological Systems and Processes

Section 1: Level of Organisation	
1 Cell	Building blocks of life
2 Tissue	Group of cells of the same type working together for a similar function
3 Organ	Group of different tissues working together for a similar function
4 Organ System	Group of organs working together for a similar function

Section 2: Gas Exchange and Breathing	
5 Inhale	Breathing in, filling the lungs with air – taking in oxygen
6 Exhale	Breathing out – removing carbon dioxide
7 Ventilation	Breathing in and out
8 Respiration	A chemical reaction where sugar and oxygen and converted into energy, water and carbon dioxide
9 Diaphragm	A sheet of muscle used in breathing – contraction draws air in

Section 3: Respiratory System	
10 Trachea	Large tube that air moves down into the lungs (windpipe)
11 Bronchus	Smaller tubes that branch into the lungs
12 Alveolus	Structure found in the lungs where gas exchange takes place
13 Lungs	The organ where gas exchange takes place
14 Lung Volume	The volume of air lungs can hold
15 Respiratory System	Organs involved in gas exchange

Section 4: Movement	
16 Bones	Tissue that forms a hard structure used to protect organs and for movement
17 Skeleton	All the bones in the skeleton
18 Cartilage	The strong smooth tissue that covers the end of bones to prevent them rubbing together
19 Ligaments	Tissue that joins two bones together
20 Tendons	A tissue that joins a muscle to a bone
21 Antagonistic Muscles	A pair of muscles that work together to control movement at a joint – as one muscle contracts the other relaxes

9BP Plants and Photosynthesis

Section 1: Photosynthesis equation

1 Carbon dioxide + water → glucose + oxygen

2 $6CO_2$ + $6H_2O$ → $C_6H_{12}O_6$ + $6O_2$

3 Reactants	The chemical(s) taking part in a reaction; **carbon dioxide** and **water**
4 Products	The chemical(s) produced in a reaction; **glucose** and **oxygen**

Section 2: Rate of Reaction

5 Chloroplast	The plant **organelle** where **photosynthesis** takes place.
6 Chlorophyll	The **green pigment** that **absorbs energy from light**.
7 Endothermic	Photosynthesis **takes energy** in (in the form of **light**). It is an endothermic reaction.
8 Diffusion	**The spreading out of particles by random motion from where they are in high concentration to a low concentration. Occurs in gases and liquids.**

Section 3: Uses of glucose

9 Used in **respiration** to provide **energy**.

10 Converted into **starch** for **storage**.

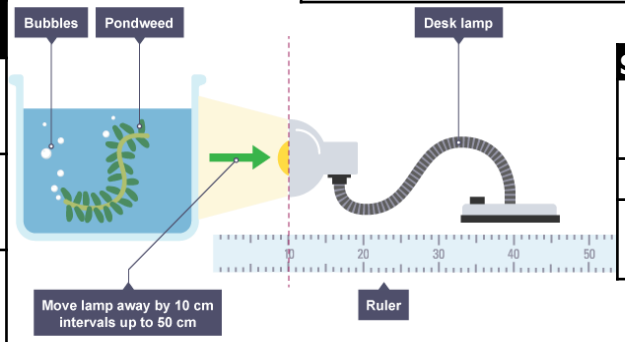
11 Converted into **fats** and **oils** for **storage**.

12 Produce **cellulose** to **strengthen** the **cell wall**.

13 Produce **amino acids** to **make proteins** (also needs nitrate ions from the soil)

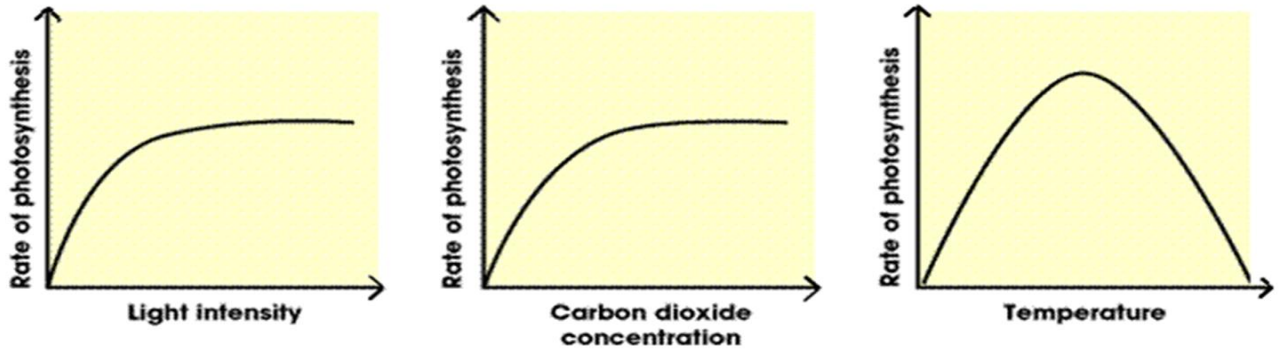
Section 4: Rate of photosynthesis experiment

14 Independent variables	Distance from the lamp / colour of light
15 Dependent variable	number of bubbles in 1 min / volume of gas produced every x minutes.
16 Control variables	type of plant, power of lamp, temperature of the water



Section 5: Limiting Factors

14 Limiting Factor	The factor that stops the rate of photosynthesis from increasing; could be light intensity, CO_2 concentration, temperature or amount of chlorophyll.



14 Light Intensity
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15 CO_2 concentration
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16 Temperature
As temperature increases, the rate of photosynthesis increases. Above the optimum there is a decrease in photosynthesis. Enzymes needed for photosynthesis become **denatured**.

Section 6: Leaf adaptations

17 Broad and flat	to maximise surface area exposed to the sun
18 Veins	Carry water from the root to the leaves, take glucose away to the rest of the plant
19 Green	Cells contain chlorophyll (6) for absorbing energy from the sun.
20 Stomata	Tiny holes on the bottom of the leaves so that carbon dioxide can enter and oxygen can leave.

Section 7: Plant transport

21 Transpiration	When water evaporates from the surface of the leaf, water moves up the stem from the roots.
22 Xylem	The vessels that carry water up the plant to the leaves.
23 Phloem	The vessels that allow movement of glucose up AND down the plant

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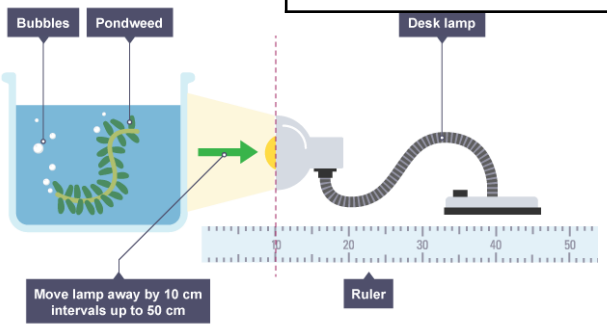

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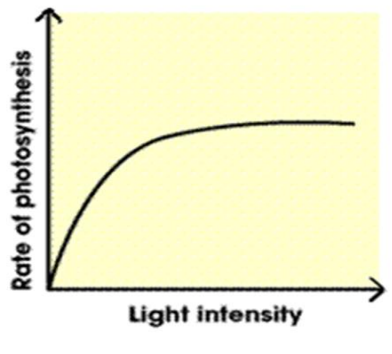

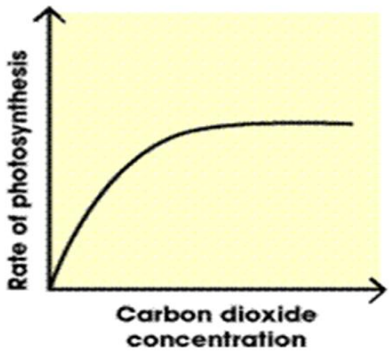

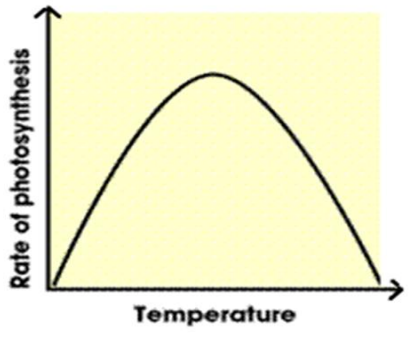

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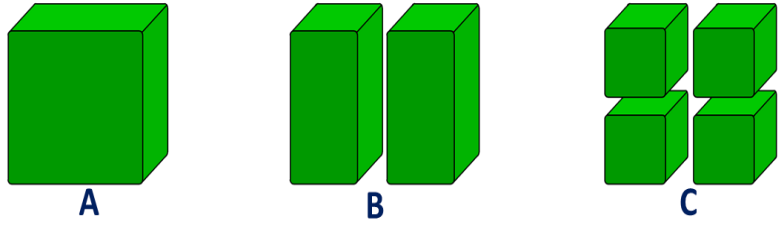
Section 1: Chemical Reactions

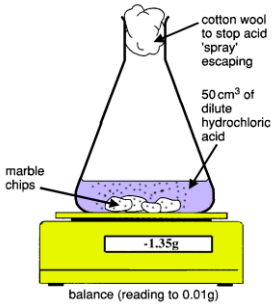
1 Chemical Reaction	A change in which atoms are rearranged o create new substances. The atoms are joined together in one way before the reaction and a different way after the reaction. All chemical reactions make new substances, and transfer energy to or from the surroundings.
2 Activation Energy	The minimum amount of energy needed to start a reaction
3 Reactants	The chemical taking part in a reaction
4 Products	The chemicals produced in a reaction
5 Reversible	Most chemical reactions are no easily reversible. This means you cannot easily get back what you started with
6 Physical Change	Changes of state and dissolving are physical changes. You can get back what you started with

Section 2: Rate of Reaction

7 Rate of Reaction	A measure of the change in product or reactant over time during a reaction
9 Concentration	The measure of how many particles are dissolved per cm^3
10 Surface Area	Total area of the exposed sides of a substance
11 Catalyst	A catalyst speeds up the reaction, but it is not used up in the reaction (you get t back at the end)

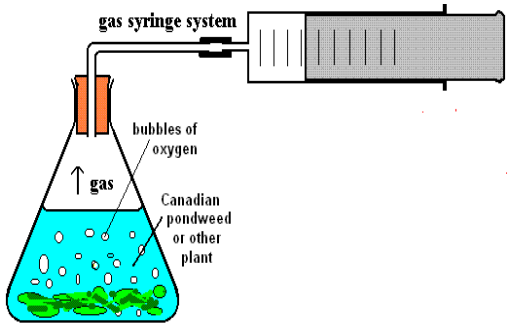
***10** Changing **surface area** – low (A) to high (C)*





8 Ways to measure rate of reaction

- Change in mass over time
- Volume of gas / number of bubbles in a set unit time



Section 3: Exothermic and Endothermic Reactions

12 Exothermic	A chemical reaction that transfers energy to its surroundings
13 Endothermic	A chemical reaction that takes in energy from its surroundings

Section 4: Burning Fuels

14 Fuel	A material that burns to transfer useful energy
15 Complete Combustion	The process of burning something in an abundance of oxygen where the only products are carbon dioxide and water
16 Incomplete Combustion	The process of burning something in a lack of oxygen where the products are carbon, carbon monoxide and water
17 Hydrocarbon	A compound containing hydrogen and carbon **only**
18 Oxidation	When a chemical joins oxygen to form a new compound

Section 5: Thermal Decomposition

19 Thermal Decomposition	This is a reaction in which compounds are **broken down** using **heat.**
20 Decomposition	A chemical reaction in which a compound breaks down to form simpler compounds and or elements

Section 6: Conservation of Mass

21 Conservation of mass	In a chemical reaction, the total mass of reactants is equal to the total mass of products. Mass is conserved in chemical reactions and in physical changes
22 Balanced symbol equations	In a balanced symbol equation, chemical formulae represents the reactants and products. The equation shows how atoms are rearranged, and gives the relative amounts of reactants and products

9PS Sound

Section 1: Features of a Wave	
1 Amplitude	The distance from the middle to the top or bottom of the wave
2 Frequency	The number of waves that go past a fixed point per second. Measured in Hertz (Hz)
3 Wavelength	The distance from peak to peak
4 Wave	An oscillation or vibration that transfers energy or information

Section 2: Transverse or Longitudinal?	
5 Longitudinal Wave	The oscillation is parallel to the direction of the wave.
6 Transverse Wave	Oscillation is at 90 degrees to the direction of travel

Section 3: Waves can be reflected	
7 PICTURE	The incident wave goes into the barrier
8 PICTURE	The reflected wave comes off from the barrier

Section 4: The ear	
9 PICTURE	Vibrations travel from your eardrum to the hairs in your cochlea. This produces a signal which is sent to your brain.

Section 5: Sound and waves	
10 Loudness	A loud sound has a bigger amplitude than a quiet sound. Measured in decibels (dB)
11 Pitch	A higher frequency results in a higher pitched noise. Measured in Hertz (Hz)

Section 6: Loudness and pitch	
12 Audible range	20 - 20,000 Hz in humans.
13 Infrasound	Below 20 Hz
14 Ultrasound	Above 20,000 Hz Is used for seeing inside soft structures in the body and fro ships to detect the depth of the ocean.
15 SONAR	Stands for **SO**und **NA**vigation and **R**anging.
16 Transmitter	Sends out a beam of ultrasound, which is reflected off an object.
17 Receiver	Detects the reflection and uses the time taken to calculate the distance.

Section 7: How fast does sound travel?	
18 Sound	Travels at 340 m/s in air, 500 m/s in liquids and 5,000 m/s in metals. Cannot travel in a vacuum
19 Light	Travels at 300,000,000 m/s Can travel through a vacuum