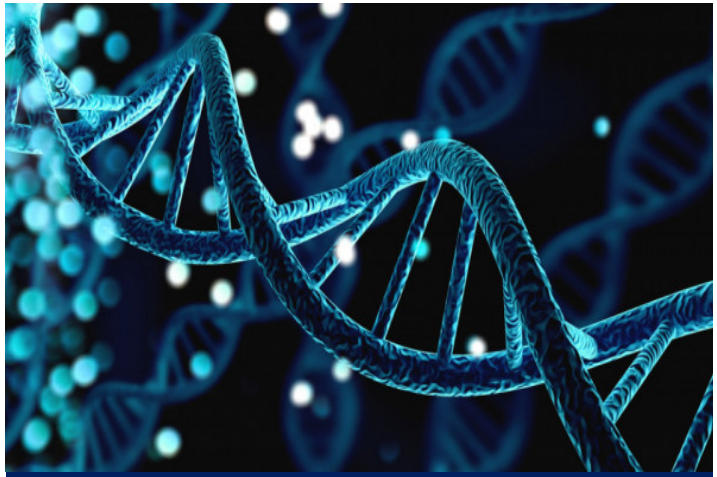
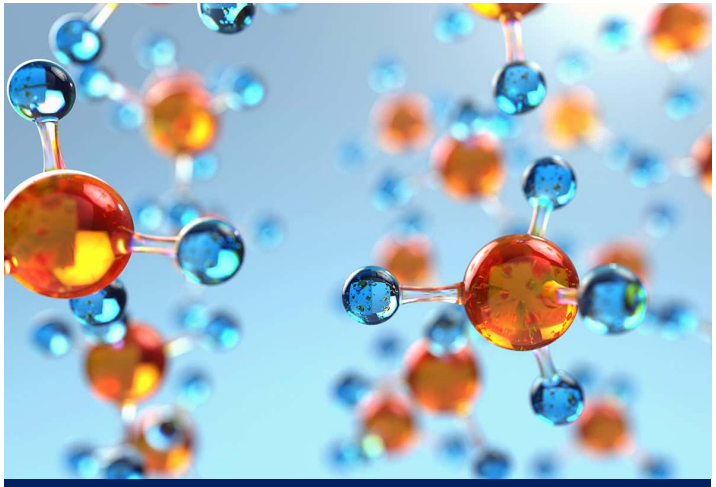
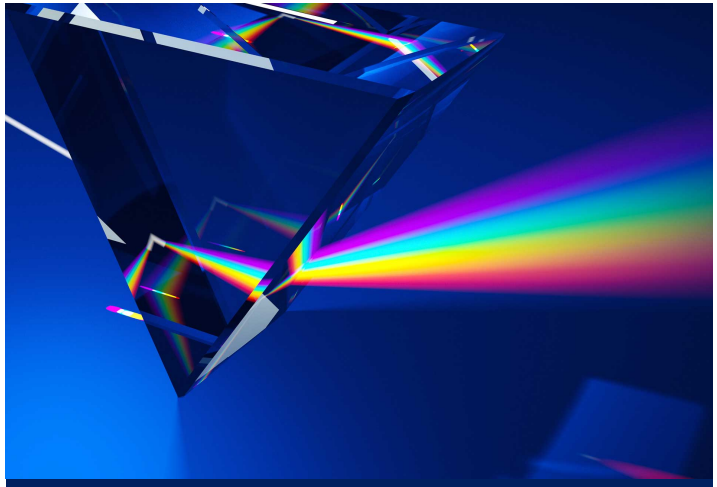
Hessle High School

Science Department







Biology Combined Foundation

This document will help you work with students to assess their understanding of the science curriculum for their exam. The students have their personal learning checklist from their mock exams. They need to revise these topics, then they can use these questions to test their understanding.

Paper 1

Question	Answer	Sub-topic
How do we calculate the total magnification of a microscope?	Eyepiece lens x Objective lens magnifying power	B1.1 The world of microscope
State the equation that links magnification, image size and actual size.	Image Size = Actual Size x Magnification	B1.1 The world of microscope
Define 'resolution'.	The ability to distinguish between two separate points that are very close together	B1.1 The world of microscope
Which type of microscope has higher magnification and resolving power - Light or electron?	Electron microscopes	B1.1 The world of microscope
Why does the tissue sample need to be stained before looking at it under the microscope?	To visualise/see structures clearly	B1.1 The world of microscope
Which objective lens should we start using?	Low power objective lens	B1.1 The world of microscope
Which focus knob should be used during low and medium power magnification?	Coarse focus knob	B1.1 The world of microscope
Which focus knob should be used during high power magnification?	Fine focus knob	B1.1 The world of microscope
Why must we not use the coarse focus knob during high power magnification?	It moves the stage by too much, may break the lens and the slide	B1.1 The world of microscope
What is the function of a scale bar?	To allow us to calculate the actual size of the sample using I=AM	B1.1 The world of microscope
Why would you use an electron microscope instead of a light microscope	Study cells in more detail and see more cub-cellular structures	B1.1 The world of microscope
State the function of the nucleus.	Controls all activities of the cell, contains genetic information	B1.2 Animal and plant cells
State the function of the cytoplasm.	Site for chemical reactions to take place	B1.2 Animal and plant cells
State the function of the cell membrane.	Controls what substances go in and out of the cell	B1.2 Animal and plant cells
State the function of the mitochondria.	Site of aerobic respiration, releasing energy	B1.2 Animal and plant cells
State the function of the ribosomes.	Site of protein synthesis	B1.2 Animal and plant cells
State the function of the cell wall.	Strengthens the cell, provide support	B1.2 Animal and plant cells

State the function of the chloroplasts.	Contain chlorophyll, absorb light to do photosynthesis	B1.2 Animal and plant cells
State the function of the permanent vacuole.	Contains cell sap to keep plant cells rigid, provide support	B1.2 Animal and plant cells
State three differences between animal and plant cells.	Plant cells have chloroplasts, permanent vacuole and cellulose cell wall. Animal cells do not	B1.2 Animal and plant cells
What substance makes up plants' cell walls?	Cellulose	B1.2 Animal and plant cells
What sub-cellular structures do all eukaryotic cells have?	a cell membrane, cytoplasm and genetic material enclosed in a nucleus	B1.3 Eukaryotic and prokaryotic cells
State a key difference between prokaryotes and eukaryotes.	Prokaryotes do not have a nucleus. Eukaryotes do.	B1.3 Eukaryotic and prokaryotic cells
State one organism that is prokaryotic.	Bacteria	B1.3 Eukaryotic and prokaryotic cells
Prokaryotes have a cell wall and a cell membrane. True or false?	TRUE	B1.3 Eukaryotic and prokaryotic cells
Where does the genetic material of a prokaryotic cell exist?	Cytoplasm	B1.3 Eukaryotic and prokaryotic cells
What is a difference between prokaryotic and eukaryotic DNA?	Prokaryotic DNA is circular; Eukaryotic DNA is linear	B1.3 Eukaryotic and prokaryotic cells
What is the name of extra small DNA rings found in some prokaryotes?	Plasmid	B1.3 Eukaryotic and prokaryotic cells
Convert 5mm to µm.	5000µm	B1.3 Eukaryotic and prokaryotic cells
What is cell specialisation	Cells are specialised to carry out a particular function	B1.4 Specialisation in animal cells
What is the function of flagella?	To allow the cell to swim and move around	B1.4 Specialisation in animal cells
Explain the use of a tail in sperm cells.	To swim and move around (to reach the egg)	B1.4 Specialisation in animal cells
Why do sperm cells have lots of mitochondria?	To provide lots of energy for swimming	B1.4 Specialisation in animal cells
In a sperm cell what breaks down the surface of an egg	digestive enzymes	B1.4 Specialisation in animal cells
Describe the adaptations of a nerve cell.	Lots of dendrites; Long axon	B1.4 Specialisation in animal cells
What is the function of a nerve cell?	Carry electrical impulses	B1.4 Specialisation in animal cells
How does having a long axon help neurones with their function?	Carry electrical impulses over long distances	B1.4 Specialisation in animal cells
Describe how a muscle cell is adapted for its function.	Special proteins for contraction; Many mitochondria for energy; Store glycogen to release glucose for respiration	B1.4 Specialisation in animal cells
Root hair cells have lots of mitochondria to release energy. What is the energy used for?	Active transport of mineral ions into root hair cells	B1.5 Specialisation in plant cells
How do the extensions in root hair cells help with their function?	Increase surface area for efficient water absorption	B1.5 Specialisation in plant cells
What is another name for photosynthetic cells in plants?	Palisade mesophyll cells	B1.5 Specialisation in plant cells
How are photosynthetic cells adapted for photosynthesis?	Lots of chloroplasts with chlorophyll to absorb light	B1.5 Specialisation in plant cells

Which specialised cell in plants make up the tissue for transporting water?	Xylem cells	B1.5 Specialisation in plant cells
Name the substance found in xylem cells that allows the cells to withstand high water pressure.	Lignin	B1.5 Specialisation in plant cells
State a difference in structure between xylem and phloem.	X: dead, hollow tube, has lignin; P: living, has sieve plates, no lignin	B1.5 Specialisation in plant cells
Name the cell that keeps phloem alive.	Companion cells	B1.5 Specialisation in plant cells
Define 'diffusion'.	spreading out of particles resulting in the net movement of particles from an area of high to low concentration (down concentration gradient)	B1.6 Diffusion
What does it mean by 'net movement'?	Overall movement: particles can move in any direction, but generally speaking, most of the particles are moving in one particular direction, hence 'net' movement	B1.6 Diffusion
State three factors that affect the rate of diffusion.	Concentration gradient, temperature, surface area of the membrane	B1.6 Diffusion
How does concentration difference affect the rate of diffusion?	Higher conc difference/Steeper conc gradient --> faster diffusion	B1.6 Diffusion
Explain why a higher temperature results in faster diffusion.	More kinetic energy, particles move around more	B1.6 Diffusion
Name a substance that diffuses into our cells for use.	Oxygen, glucose	B1.6 Diffusion
Name a substance that diffuses out of our cells to be removed.	Carbon dioxide, urea	B1.6 Diffusion
A single-celled organism has a relatively large surface area to volume ratio. True or false?	TRUE	B1.6 Diffusion
Name a structure in the body that is adapted to increase diffusion rate.	Alveoli, villi	B1.6 Diffusion
Define 'osmosis'.	Net movement of water molecules down the water concentration gradient through a partially permeable membrane	B1.7 Osmosis
Define 'dilute'.	A solution with a high water conc, but low solute conc	B1.7 Osmosis
Define 'concentrated'.	A solution with a low water conc, but high solute conc	B1.7 Osmosis
What are partially permeable membranes?	Membranes that only allow some types of substances to pass through	B1.7 Osmosis
What is an isotonic solution?	A solution with the same solute conc as the cell	B1.7 Osmosis
What is a hypertonic solution?	A solution with a higher solute conc than the cell	B1.7 Osmosis

What is a hypotonic solution?	A solution with a lower solute conc than the cell	B1.7 Osmosis
If a cell is in a hypertonic solution, water will ___ (enter/leave) the cell.	Leave	B1.7 Osmosis
If a cell is in a hypotonic solution, water will ___ (enter/leave) the cell.	Enter	B1.7 Osmosis
What will happen to an animal cell if it is in a hypertonic solution?	Water leaves cell --> shrivelled	B1.7 Osmosis
What will happen to an animal cell if it is in a hypotonic solution?	Water enters cell --> burst	B1.7 Osmosis
Why do animal cells burst in hypotonic solutions?	No cell wall	B1.7 Osmosis
What will happen to a plant cell if it is in a hypertonic solution?	Water leaves cell --> plasmolysed	B1.8 Osmosis in plants
What will happen to a plant cell if it is in an isotonic solution?	No net water movement --> flaccid	B1.8 Osmosis in plants
What will happen to a plant cell if it is in a hypotonic solution?	Water enters cell --> turgid	B1.8 Osmosis in plants
What does 'plasmolysed' mean?	The cell membrane becomes detached from cell wall	B1.8 Osmosis in plants
Why does the potato skin need to be removed before putting the potato cylinders into the solutions?	Skin is impermeable	B1.8 Osmosis in plants
How do we calculate % change in mass?	(final mass - initial mass)/initial mass x 100	B1.8 Osmosis in plants
Define 'active transport'.	Movement of substances against the concentration gradient (low to high) using energy	B1.9 Active transport
Explain the importance of active transport in plants.	Root hair cells carry out AT to absorb mineral ions effectively in dilute soil	B1.9 Active transport
Explain the importance of active transport in animals.	Cells in gut lining does AT to absorb glucose effectively from the bloodstream	B1.9 Active transport
State one adaptations cells may have if they need to carry out active transport.	Lots of mitochondria for respiration for energy	B1.9 Active transport
How does active transport differ from diffusion and osmosis?	AT uses energy, D and O do not	B1.9 Active transport
State two differences between diffusion and osmosis.	D: Any particles, does not need a membrane; O: Water specific, needs partially permeable membrane	B1.9 Active transport
Explain the movement of sugar molecules in the gut	move from a low concentration to a high conc in the blood	B1.9 Active transport
State the relationship between size and surface area to volume ratio.	The bigger the size, the smaller the SA: V	B1.10 Exchanging materials
Describe three adaptations of exchange surfaces.	Large SA, thin membrane/surface, ability to maintain high conc difference	B1.10 Exchanging materials
How are alveoli adapted for efficient gaseous exchange?	Large SA, thin membrane (short diffusion distance), rich blood supply (maintain steep conc gradient)	B1.10 Exchanging materials

How are plant roots adapted for efficient water and mineral absorption?	Large SA (root hairs), transpiration stream	B1.10 Exchanging materials
How does stomata help maintain efficient gas exchange in leaves?	Allow gases to move in and out of leaf, maintaining steep concentration gradient	B1.10 Exchanging materials
What is a gene?	A short section of DNA that codes for a protein/controls a characteristic	B2.1 Cell division
What are chromosomes?	Structures in the nucleus that carry genes	B2.1 Cell division
How many chromosomes are in one human body cell?	46	B2.1 Cell division
Chromosomes are arranged in ___ pairs in a human body cell.	23	B2.1 Cell division
How many percent of your chromosomes have you inherited from your father?	0.5	B2.1 Cell division
Briefly describe the cell cycle.	the genetic material is doubled and then divided into two identical cells.	B2.1 Cell division
Define 'mitosis'.	Cell division that produces two genetically identical daughter cells	B2.1 Cell division
Which type of reproduction is based only on mitosis?	Asexual	B2.1 Cell division
State three key importance's of mitosis.	Growth, repair, asexual reproduction	B2.1 Cell division
Briefly describe the first stage in the cell cycle. (Before cell and nucleus division)	Cell size increase, DNA and organelle replication	B2.1 Cell division
Briefly describe the second stage (mitosis) in the cell cycle.	Nucleus divides - One set of chromosomes is pulled to each end of the dividing cell	B2.1 Cell division
Briefly describe the third stage in the cell cycle.	Cytoplasm and cell membrane divides into two identical daughter cells	B2.1 Cell division
Why is cell division by mitosis important?	Growth, repair and development.	B2.1 Cell division
What has to happen to the cell before mitosis to ensure we can two genetically identical daughter cells?	DNA and organelles must replicate before division	B2.1 Cell division
Define 'differentiation'.	The process where a cell becomes specialised/adapted to perform specific functions	B2.2 Growth and differentiation
#REF!	False	B2.2 Growth and differentiation
Many types of plant cells retain the ability to differentiate throughout life. T or F	TRUE	B2.2 Growth and differentiation
What type of cell that carries out certain functions?	Specialised cell	B2.2 Growth and differentiation
Define 'stem cell'.	Undifferentiated cell with the potential to become specialised	B2.2 Growth and differentiation
Define 'adult stem cells'.	Stem cells that can only differentiate into a specific type of cell	B2.2 Growth and differentiation

Where does differentiation of stem cells occur in humans?	Bone marrow	B2.2 Growth and differentiation
Where does differentiation occur in plants?	Meristem/Root tip/Shoot tip	B2.2 Growth and differentiation
Define 'cloning'.	Production of identical offspring by asexual reproduction/mitosis	B2.2 Growth and differentiation
By which cell division type does cloning occur?	Mitosis	B2.2 Growth and differentiation
Define 'zygote'.	The single new cell formed right after fusion of gametes (sperm and egg)	B2.3 Stem cells
Define 'embryo'.	A ball of cells made from mitosis of zygote	B2.3 Stem cells
Define 'embryonic stem cells'.	Stem cells from an early embryo that can differentiate into all cell types	B2.3 Stem cells
Where do you get adult stem cells in animals?	Bone marrow	B2.3 Stem cells
Suggest two diseases that may be treated with stem cell treatment.	Paralysis and diabetes	B2.3 Stem cells
Briefly describe how we can use stem cells to treat someone with type 1 diabetes.	Induce embryonic stem cells to produce healthy pancreas cells to make enough insulin	B2.3 Stem cells
Where do you get stem cells in plants?	Meristem/Root tip/Shoot tip	B2.3 Stem cells
What type of cells can meristem tissue differentiate into?	All types of plant cells	B2.3 Stem cells
Why is the ability to clone plants quickly a benefit?	Produce large numbers of rare plants quickly and economically. Stop their extinction and make them disease resistant.	B2.3 Stem cells
State one medical/scientific benefit of therapeutic cloning.	No rejection problems as has the same genes	B2.4 Stem cell dilemmas
State one risk or concern people may have about using stem cells.	Unethical to use aborted embryos; difficult and expensive project; cancer concern; viral infection/transmission	B2.4 Stem cell dilemmas
Cells are.	basic building blocks of all living organisms	B3.1 Tissues and organs
Define 'tissue'.	A group of cells with a similar structure and function.	B3.1 Tissues and organs
Define 'organ'.	A group of tissues working together for specific functions	B3.1 Tissues and organs
Reorder the following in increasing size order: Organ, cell, tissue, organ system, organism	Cell < Tissue < Organ < Organ system < Organism	B3.1 Tissues and organs
Organs work together and form…	Organ systems	B3.1 Tissues and organs
The digestive system is a Tissue/organ or organ system?	Organ system	B3.2 The human digestive system
Name the tube that carries food from the mouth to the stomach.	Oesophagus/Gullet	B3.2 The human digestive system
What is found in the stomach?	Stomach (HCl) acid and protease	B3.2 The human digestive system

State the function of the liver in the digestive system.	Produces bile for lipid digestion and to neutralise stomach acid	B3.2 The human digestive system
State the function of the small intestine.	Digest food and absorb nutrients from digested food	B3.2 The human digestive system
State the function of the large intestine.	Absorb water from digested food	B3.2 The human digestive system
State the function of the pancreas.	Produces/Releases digestive enzymes	B3.2 The human digestive system
State the function of the gall bladder.	Store bile before release into small intestine	B3.2 The human digestive system
What are carbohydrates made up of?	Simple sugars	B3.3 The chemistry of food
State the chemical formula of glucose.	C6H12O6	B3.3 The chemistry of food
Name a complex carbohydrate that is made up of glucose.	Starch/Cellulose/Glycogen	B3.3 The chemistry of food
State the importance of having carbohydrates in our diet.	Energy source - Break down glucose in respiration to release energy for metabolic reactions	B3.3 The chemistry of food
What elements make up carbohydrates?	C, H, O	B3.3 The chemistry of food
What are lipids made up of?	glycerol and fatty acids.	B3.3 The chemistry of food
State the importance of having lipids in our diet.	Energy store/Make up cell membranes/Steroid hormones	B3.3 The chemistry of food
What are proteins made up of?	Amino acids	B3.3 The chemistry of food
Name the reagent used to test for starch.	Iodine	B3.3.2 Food tests
What is a positive result for starch test?	Starch turns iodine from brown, red to blue-black	B3.3.2 Food tests
Name the reagent used to test for sugars.	Benedict's solution	B3.3.2 Food tests
What is the positive result for sugars?	Benedict's solution turns from clear blue to brick-red (precipitate)	B3.3.2 Food tests
What is the reagent used to test for proteins?	Biuret solution	B3.3.2 Food tests
What is the positive result for proteins?	Biuret turns from blue to purple	B3.3.2 Food tests
What is the reagent used to test for lipids?	Ethanol (+water)	B3.3.2 Food tests
What is the positive test for lipids?	White milky layer	B3.3.2 Food tests
State a hazard in doing food tests.	Ethanol is flammable/Biuret is corrosive	B3.3.2 Food tests
Define 'catalyst'.	A substance that speeds up chemical reactions but don't get used up	B3.4 Catalysts and enzymes
Define 'enzyme'.	Biological catalysts that speed up chemical reactions made of proteins	B3.4 Catalysts and enzymes
What kind of molecule are enzymes - carbohydrates, lipids or proteins?	Proteins	B3.4 Catalysts and enzymes
Define 'active site'.	The site on an enzyme where the specific substrate binds	B3.4 Catalysts and enzymes

Any substance can fit into the active site of an enzyme. True or false?	FALSE	B3.4 Catalysts and enzymes
Briefly describe the lock- and-key model.	Substrate fits into the active site to form enzyme-substrate complex --> Reaction occurs --> Enzyme releases products and binds to another substrate	B3.4 Catalysts and enzymes
Define 'metabolism'.	All the reactions in a cell/body	B3.4 Catalysts and enzymes
Define 'denaturation'.	The process where the protein loses its shape and function	B3.5 Factors affecting enzyme action
How does temperature affect enzymes' rate of reaction?	As temp increases, RoR increases until optimum	B3.5 Factors affecting enzyme action
Why do enzymes stop working past their optimum temperature?	Denatured (substrate can no longer bind to active site)	B3.5 Factors affecting enzyme action
Why do enzymes not work well at lower temperatures?	Inactive (not enough KE to collide and bind to active site)	B3.5 Factors affecting enzyme action
How does a change in pH affect enzyme structure?	pH change affects forces holding enzyme structure together, causing it to denature	B3.5 Factors affecting enzyme action
Define ' digestion'.	Breakdown of large insoluble molecules into smaller soluble substances	B3.6 How the digestive system works
Name the type of enzyme that digests carbohydrates.	Carbohydrase	B3.6 How the digestive system works
Name the enzyme that digests starch.	Amylase	B3.6 How the digestive system works
Name the product of the breakdown of starch.	Simple sugars	B3.6 How the digestive system works
Name the type of enzyme that digests proteins.	Proteases	B3.6 How the digestive system works
Name the protease that works well in the stomach.	Pepsin	B3.6 How the digestive system works
Name the product of the breakdown of proteins.	Amino acids	B3.6 How the digestive system works
Name the type of enzyme that digests lipids.	Lipases	B3.6 How the digestive system works
Name the products of the breakdown of lipids.	Glycerol and fatty acids	B3.6 How the digestive system works
Which organs produce amylase?	Salivary glands and pancreas	B3.6 How the digestive system works
Which organs produce proteases?	Stomach, pancreas, small intestine	B3.6 How the digestive system works
Which organs produce lipases?	Pancreas and small intestine	B3.6 How the digestive system works
Where does starch digestion occur?	Mouth + Small intestine	B3.6 How the digestive system works
Where does protein digestion occur?	Stomach + Small intestine	B3.6 How the digestive system works
Where does lipid digestion occur?	Small intestine	B3.6 How the digestive system works
How are the nutrients carried away from the gut?	Absorbed into bloodstream through small intestine	B3.6 How the digestive system works
State an observation to determine when the amylase has completed its digestion of starch.	Iodine remains brown, red rather than turning blue-black	B3.6 How the digestive system works

What are the products of digestion used for?	To build new carbohydrates, lipids and proteins. Glucose >respiration	B3.6 How the digestive system works
State a reason for setting the amylase solution, starch solution and the buffer in the water bath before the experiment.	To ensure all of the same temp, so that temp will not affect the results (fair test)	B3.6 How the digestive system works
How does the hydrochloric acid in the stomach help with digestion?	Provides optimum pH for pepsin to digest proteins	B3.7 Making digestion efficient
Apart from digestion, what is another function of hydrochloric acid in the stomach?	Kill pathogens in food	B3.7 Making digestion efficient
How is the stomach adapted to protect itself from the hydrochloric acid?	Thick mucus layer/quick renewal of epithelial layer	B3.7 Making digestion efficient
Is bile alkaline or acidic?	Alkaline	B3.7 Making digestion efficient
State the two functions of bile.	Emulsifies fats + Neutralises food from stomach (HCl)	B3.7 Making digestion efficient
What is emulsification?	Physically breaking down large oil drops into smaller droplets, increasing surface area for lipases to work on	B3.7 Making digestion efficient
Bile is an enzyme. True or false?	FALSE	B3.7 Making digestion efficient
Hydrochloric acid in the stomach breaks down food. True or false?	FALSE - provides optimum pH for pepsin and kills bacteria, NOT digest food	B3.7 Making digestion efficient
State the importance of the neutralising role bile has.	Small intestine does not have protective mucus layer + Enzymes will denature in small intestine	B3.7 Making digestion efficient
Blood is a type of? Cell, tissue, organ or organ system?	Tissue	B4.1 The blood
What does blood consist of?	red blood cells, white blood cells and platelets in plasma	B4.1 The blood
What is plasma in the blood?	Yellow liquid that carries blood cells, proteins and dissolved substances around the body	B4.1 The blood
What are red blood cells?	Biconcave cells that have haemoglobin - carry oxygen	B4.1 The blood
Name the pigment found in red blood cells that binds to oxygen.	Haemoglobin	B4.1 The blood
State the functions of white blood cells.	Engulf pathogens, produce antibodies and antitoxins	B4.1 The blood
How does being biconcave help red blood cells with their function?	Increase SA: V for efficient diffusion	B4.1 The blood
How is not having a nucleus good for red blood cells?	More space to pack more haemoglobin	B4.1 The blood
State the function of platelets.	Blood clotting	B4.1 The blood
Which organ system transports substances to and from body cells?	Circulatory system	B4.1 The blood

Name the blood vessel type that carries blood from the heart to other parts of the body.	Artery	B4.2 The blood vessels
Name the blood vessel type that carries blood from the organs back to the heart.	Vein	B4.2 The blood vessels
Name the blood vessel type that is found within organs that link arteries and veins.	Capillaries	B4.2 The blood vessels
State a structural difference between arteries and veins.	A: thicker walls, more elastic tissue, no valves; V: thinner walls, less elastic tissues, have valves	B4.2 The blood vessels
State a difference in the blood flowing in arteries and veins.	A: oxygenated, more nutrients, less wastes; V: deoxygenated, less nutrients, more wastes	B4.2 The blood vessels
The flow of blood in veins relies on ……	Skeletal muscle contraction	B4.2 The blood vessels
Why can substances diffuse easily between capillaries and the cells?	Thin capillary walls (one cell thick)	B4.2 The blood vessels
What is the double circulatory system?	Right side carries blood between heart and lungs; the left side carries blood around the body	B4.3 The heart
Name the vessels that supply oxygen to the heart muscles.	Coronary arteries	B4.3 The heart
Name the large vessel that brings deoxygenated blood back into the heart.	Vena cava	B4.3 The heart
Name the upper chambers of the heart.	Atria	B4.3 The heart
Name the lower chambers of the heart.	Ventricles	B4.3 The heart
Name the vessel that brings deoxygenated blood from the heart to the lungs.	Pulmonary artery	B4.3 The heart
Name the vessel that brings oxygenated blood from the lungs to the heart.	Pulmonary vein	B4.3 The heart
Which side of the heart has deoxygenated blood - right or left?	Right	B4.3 The heart
Describe the flow of blood as atria of the heart contract.	Blood flows from atria down to ventricles	B4.3 The heart
Name the large vessel that brings oxygenated blood out of the heart to the body.	Aorta	B4.3 The heart
Why is the muscle wall of the left ventricle thicker than the right ventricle?	To generate more pressure to force blood all over the body (left side only to lungs)	B4.3 The heart
What is the function of heart valves?	Prevent backflow of blood	B4.3 The heart
Why are oxygen levels to the heart low in coronary heart disease?	Reduced blood flow through the coronary arteries = lack of oxygen to heart muscle	B4.3 The heart
What happens in coronary heart disease?	layers of fatty material build up inside the coronary arteries, narrowing them	B4.3 The heart
Name a method to unblock a coronary artery in the heart.	Stent	B4.3 The heart

Name a drug that reduces blood cholesterol levels.	Statins	B4.3 The heart
What can be used to replace a damaged heart valve?	Biological or mechanical valves	B4.4 Helping the heart
What is a natural pacemaker?	A group of cells in the right atrium that controls the resting heart rate	B4.4 Helping the heart
Briefly describe how an artificial pacemaker works.	Sends strong, regular electrical signals to the heart to stimulate it to contract properly	B4.4 Helping the heart
How are artificial hearts used to treat patients with a damaged heart?	A temporary treatment while waiting for heart transplant	B4.4 Helping the heart
Outline the flow of air from the atmosphere into our lungs, starting from the nasal cavity.	Nasal cavity --> trachea --> bronchi --> bronchioles --> alveoli	B4.5 Breathing and gas exchange
What two structures change the pressure inside the chest cavity to ventilate lungs?	Intercostal muscles + Diaphragm	B4.5 Breathing and gas exchange
Describe the state of the diaphragm as we breathe in.	Contracts and flattens	B4.5 Breathing and gas exchange
Describe the state of the diaphragm as we breathe out.	Relaxes and return to dome shape	B4.5 Breathing and gas exchange
State the function of the ribcage.	Protect the heart and lungs	B4.5 Breathing and gas exchange
State one adaptation of the lungs for efficient gas exchange.	Lots of alveoli to increase surface area; Rich blood supply/Extensive capillary network; Thin walls (one cell thick)	B4.5 Breathing and gas exchange
Why is it important for the lungs to have a rich blood supply?	Maintain steep concentration gradient for efficient diffusion	B4.5 Breathing and gas exchange
Give an example of plant tissue	• epidermal tissues • palisade mesophyll • spongy mesophyll • xylem and phloem • meristem tissue	B4.6 Tissues and organs in plants
What is the plants organ system?	The whole plant	B4.6 Tissues and organs in plants
Leaf is an example of a cell, tissue, organ or organ system?	Organ	B4.6 Tissues and organs in plants
Name the tissue that covers and protects the surface of plants.	Epidermal tissue	B4.6 Tissues and organs in plants
Name the part of the plant that waterproofs the leaf surface.	Waxy cuticle	B4.6 Tissues and organs in plants
Name the cell that contains lots of chloroplasts for photosynthesis.	Palisade mesophyll cells	B4.6 Tissues and organs in plants
Briefly explain an adaptation of spongy mesophyll tissue in plants.	Big air spaces and large surface area for efficient gas diffusion	B4.6 Tissues and organs in plants
Briefly describe the arrangement of xylem and phloem in the stem of a plant.	Organised in bundles, with xylem on the inside and phloem on the outside	B4.6 Tissues and organs in plants
The hollow tubes in the xylem are strengthened by?	lignin	B4.7 Transport systems in plants
State the function of xylem.	Transports water and mineral ions from roots to other parts of the plants	B4.7 Transport systems in plants
Name the process of the transport of dissolved sugars in plants.	Translocation	B4.7 Transport systems in plants

State the function of phloem.	Transports dissolved sugars from leaves to the rest of the plant	B4.7 Transport systems in plants
What is the role of the stomata and guard cells?	To control gas exchange and water loss.	B4.8 Evaporation and transpiration
Which part of the plant allows gases to diffuse in and out of leaves?	Stomata	B4.8 Evaporation and transpiration
What controls the opening and closing of stomata?	Guard cells	B4.8 Evaporation and transpiration
Define 'transpiration'.	Loss of water vapour by evaporation from the leaf surface through stomata	B4.8 Evaporation and transpiration
Briefly describe the transpiration stream.	Constant movement of water through xylem from roots to leaves	B4.8 Evaporation and transpiration
Increasing the rate of photosynthesis will ……(increase/decrease) the rate of transpiration.	Increase	B4.9 Factors affecting transpiration
How does temperature affect rate of transpiration?	Higher temp increases rate	B4.9 Factors affecting transpiration
How does humidity affect rate of transpiration?	Higher humidity decreases rate	B4.9 Factors affecting transpiration
How does wind or air flow affect rate of transpiration?	More wind increases rate (as maintains steep conc gradient)	B4.9 Factors affecting transpiration
How does light intensity affect rate of transpiration?	More light increases rate	B4.9 Factors affecting transpiration
Name the equipment used to estimate transpiration rate.	Potometer	B4.9 Factors affecting transpiration
What are communicable diseases?	Diseases caused by pathogens that can be transmitted from one individual to another	B5.1 Health and disease
What are non-communicable diseases?	Diseases that cannot be transmitted from one person to another	B5.1 Health and disease
Define 'pathogens'.	microorganisms that cause infectious disease	B5.1 Health and disease
Define 'health'.	State of physical and mental well-being	B5.1 Health and disease
Suggest three factors that affect health.	Diet/Stress/life situations (e.g. Hygiene)/pathogens/immune system	B5.1 Health and disease
State the four types of pathogens.	Bacteria, viruses, protists, fungi	B5.2 Pathogens and disease
How do bacteria make you ill?	Reproduce rapidly and damage cells + Produce toxins	B5.2 Pathogens and disease
How do viruses make you ill?	Produce inside body cells, causing cell damage	B5.2 Pathogens and disease
How can pathogens be spread?	By air/droplet infection, direct contact, water	B5.2 Pathogens and disease
State one method to prevent the spread of disease.	Isolation; Maintain good hygiene; Destroy vectors; Vaccination	B5.5 Preventing infections
Which disease has symptoms of fever and a red skin rash	Measles	B5.6 Viral diseases
Name a viral disease that leads to blindness and brain damage.	Measles	B5.6 Viral diseases
How can measles spread?	Droplet infection	B5.6 Viral diseases

Name the pathogen that causes AIDS.	HIV (Human immunodeficiency virus)	B5.6 Viral diseases
How can AIDS be spread?	Sexual contact; Exchange of bodily fluids (shared needles, blood transfusion)	B5.6 Viral diseases
How can AIDS be treated?	Antiretroviral drugs to control (not cure) it	B5.6 Viral diseases
Name a viral disease in plants.	Tobacco mosaic virus	B5.6 Viral diseases
Describe the appearance of a plant infected with tobacco mosaic virus.	Mosaic pattern of discoloration on leaves	B5.6 Viral diseases
How does tobacco mosaic virus affect the plants?	Destroy chloroplasts, so reduce photosynthesis	B5.6 Viral diseases
How can tobacco mosaic virus be spread?	Direct contact/Vectors	B5.6 Viral diseases
Viral diseases can be cured. True or false?	FALSE	B5.6 Viral diseases
How is Salmonella spread?	Bacteria in ingested food	B5.6 Viral diseases
How is the UK controlling salmonella spread?	poultry are vaccinated against Salmonella	B5.7 Bacterial diseases
Where can Salmonella bacteria be found?	Raw meat, chicken, eggs	B5.7 Bacterial diseases
State one symptom of Salmonella poisoning.	Fever/Abdominal cramps/diarrhoea/vomiting	B5.7 Bacterial diseases
Which pathogen causes gonorrhoea?	Bacteria	B5.7 Bacterial diseases
How does gonorrhoea spread?	Sexual contact	B5.7 Bacterial diseases
State a symptom of gonorrhoea.	Yellow/green discharge from penis/vagina; pain on urination	B5.7 Bacterial diseases
State a long-term effect of gonorrhoea.	Long-term pelvic pain, infertility, ectopic pregnancies	B5.7 Bacterial diseases
How can the spread of gonorrhoea be stopped?	Use barrier method (condom); antibiotics	B5.7 Bacterial diseases
How can bacterial diseases be treated?	Antibiotics	B5.7 Bacterial diseases
Which pathogen causes rose black spot?	Fungi	B5.8 Diseases caused by fungi and protists
How are fungal diseases treated?	Fungicides and removing affected leaves	B5.8 Diseases caused by fungi and protists
State a symptom of rose black spot.	Damages leaves and reduce photosynthesis	B5.8 Diseases caused by fungi and protists
Which pathogen causes malaria.	Protists	B5.8 Diseases caused by fungi and protists
How is malaria spread?	Through a vector - mosquitoes	B5.8 Diseases caused by fungi and protists
State a symptom of malaria.	Fevers, shaking	B5.8 Diseases caused by fungi and protists
How can the spread of malaria be stopped?	Use mosquito nets; stop vectors breading	B5.8 Diseases caused by fungi and protists
Give an example of a non-specific defence system	• skin • nose • trachea and bronchi • stomach.	B5.9 Human defence responses
How does your skin act as a defence against pathogen entry?	Barrier; Antimicrobial secretions; Microorganism layer	B5.9 Human defence responses
How does the trachea defend the body against pathogens?	Secrete mucus to trap pathogens + Cilia move mucus up the trachea to be removed	B5.9 Human defence responses

How does the stomach defend the body against pathogens?	Hydrochloric acid destroys microorganisms in mucus/food	B5.9 Human defence responses
State the three ways in which white blood cells defend the body.	phagocytosis+ Produce antibodies + Produce antitoxins	B5.9 Human defence responses
What are antibodies?	Proteins that bind to specific antigens on pathogens	B5.9 Human defence responses
What are antigens?	Proteins on cell surface for cell recognition	B5.9 Human defence responses
What makes up vaccines?	Dead/Inactive pathogens	B6.1 Vaccination
How does vaccination make a person become immune to a disease?	Inactive antigens in vaccine stimulates WBC to make antibodies and memory cells, which stimulates secondary response	B6.1 Vaccination
What is the function of memory white blood cells?	Recognise same pathogen when it invades to produce large number of antibodies in short time	B6.1 Vaccination
What is herd immunity?	Large proportion of population is immune to a disease	B6.1 Vaccination
Painkillers destroy the pathogens in our body. True or false?	FALSE	B6.2 Antibiotics and painkillers
Which pathogen does antibiotics destroy?	Bacteria	B6.2 Antibiotics and painkillers
What are painkillers used for?	Treat the symptoms of disease but do not kill pathogens.	B6.2 Antibiotics and painkillers
Why can't antibiotics kill viruses?	Viruses reproduce inside cells; antibiotics cannot enter cells without damaging the cell	B6.2 Antibiotics and painkillers
How might an antibiotic be useless against a bacterium?	Antibiotic resistance	B6.2 Antibiotics and painkillers
Which plant did the heart drug digitalis originated from?	Foxgloves	B6.3 Discovering drugs
Which drug originated from willow?	Aspirin (painkiller)	B6.3 Discovering drugs
Name the microorganism that produces penicillin.	Penicillium mould	B6.3 Discovering drugs
Who discovered Penicillin?	Alexander Fleming	B6.3 Discovering drugs
How are new drugs discovered?	Synthesised by chemists	B6.3 Discovering drugs
New drugs are tested extensively for three factors. Name the three factors.	Toxicity, efficacy, dose	B6.4 Developing drugs
What living materials are used in preclinical testing?	Cells, tissues, live animals	B6.4 Developing drugs
What is the difference between preclinical testing and clinical trials?	PT: Use cells, tissues, animals; CT: Use healthy volunteers and patients	B6.4 Developing drugs
Define 'placebo'.	A medicine that does not contain the active drug being tested	B6.4 Developing drugs
What process have published journals gone through	peer review	B6.4 Developing drugs

What is a double-blind trial?	Neither the doctors nor the patients know who gets the real drug/placebo	B6.4 Developing drugs
What are non-communicable diseases?	Non-infectious diseases	B7.1 non-communicable diseases
What is a risk factor?	Aspects of a person's lifestyle or a substance that is linked to an increase rate of disease	B7.1 non-communicable diseases
Define 'carcinogens'.	Cancer-causing substances	B7.1 non-communicable diseases
What is the difference between correlation and causal mechanism?	Correlation: A link between two; Causal: One thing leads to the other	B7.1 non-communicable diseases
State a risk factor for non-communicable diseases.	Lifestyle, substance present in body/environment	B7.1 non-communicable diseases
Define 'tumour'.	A mass of cells grown abnormally (uncontrollable growth and division)	B7.2 Cancer
Define 'benign tumours'.	Growth of abnormal cells contained in one area within a membrane, don't invade other tissues	B7.2 Cancer
Define 'malignant tumours'.	Tumours that invade other tissues and can spread to other parts of the body through blood to form secondary tumours	B7.2 Cancer
Which tumour leads to cancer - benign or malignant?	Malignant	B7.2 Cancer
Name a risk factor of developing cancer.	Smoking, obesity, common viruses, UV exposure, genetic factors	B7.2 Cancer
Name the two ways to treat cancer.	Chemotherapy, radiotherapy	B7.2 Cancer
What is used in chemotherapy?	Chemicals to kill cancer cells, but also healthy cells in the process	B7.2 Cancer
What is used in radiotherapy?	Targeted doses of radiation	B7.2 Cancer
What is the effect of nicotine in tobacco smoke?	Addictiveness	B7.3 Smoking and the risk of disease
Name the carcinogen in tobacco smoke.	Tar	B7.3 Smoking and the risk of disease
Briefly describe how tobacco smoke causes lung infection.	Stops cilia from working, excess mucus (trapping bacteria in lungs)	B7.3 Smoking and the risk of disease
Briefly describe how tobacco smoke causes cardiovascular diseases.	Increase heart rate, damage artery lining, increase risk of clot formation, increase blood pressure	B7.3 Smoking and the risk of disease
State an effect of smoking on foetuses.	Premature birth/Low birthweight/Stillbirth	B7.3 Smoking and the risk of disease
Name a risk factor for obesity.	Poor/unbalanced diet; lack of exercise; High cholesterol diet	B7.4 Diet, exercise and disease
Name a risk factor for type 2 diabetes.	Obesity; Unbalance diet (high sugar diet); Lack of exercise	B7.4 Diet, exercise and disease
How can a high fat diet lead to coronary heart disease?	Fat deposit in coronary arteries	B7.4 Diet, exercise and disease

Which organ breaks down alcohol before it causes permanent damage?	Liver	B7.5 Alcohol and other carcinogens
State one disease caused by long-term heavy drinking.	Liver cirrhosis/Liver cancer/Brain damage	B7.5 Alcohol and other carcinogens
State a risk of drinking alcohol during pregnancy.	Miscarriage/Stillbirths/Premature births/Low birthweight	B7.5 Alcohol and other carcinogens
Name the condition that babies may have if their mothers drink lots of alcohol during pregnancy.	Foetal alcohol syndrome	B7.5 Alcohol and other carcinogens
How do ionising radiation causes mutation?	Penetrates cells and damage chromosomes	B7.5 Alcohol and other carcinogens
Name a source of ionising radiation.	UV light from sun/Radioactive materials in soil, water, air/Medical and dental X-rays/Accidents in nuclear power stations	B7.5 Alcohol and other carcinogens
Is photosynthesis endothermic or exothermic?	Endothermic	B8.1 Photosynthesis
State the equation of photosynthesis.	6CO2 + 6H2O --> C6H12O6 + 6O2	B8.1 Photosynthesis
Where does photosynthesis occur in the cell?	Chloroplast	B8.1 Photosynthesis
What is photosynthesis?	Building glucose from carbon dioxide and water using light	B8.1 Photosynthesis
Name the pigment in chloroplasts that absorbs light.	Chlorophyll	B8.1 Photosynthesis
State an adaptation of the leaf for efficient photosynthesis.	Broad leaves/Thin/Have chlorophyll/Air spaces/Guard cells to regulate stomata opening	B8.1 Photosynthesis
How does higher light intensity affect the rate of photosynthesis?	Increase	B8.2 The rate of photosynthesis
Apart from light and carbon dioxide concentration, name one other limiting factor of photosynthetic rate.	Temperature/Chlorophyll levels	B8.2 The rate of photosynthesis
Why would photosynthetic rate decrease at higher temperatures?	Enzymes become denatured	B8.2 The rate of photosynthesis
Name one use of glucose in plants.	Respiration/Make and strengthen cellulose cell wall/Make starch for storage/Make lipids as energy store	B8.3 How plants use glucose
Why do plants need nitrates for good growth?	Make proteins	B8.3 How plants use glucose
Define 'aerobic respiration'.	Exothermic reaction that breaks down glucose to release energy using oxygen	B9.1 Aerobic respiration
State the equation of aerobic respiration.	Glucose + Oxygen --> Carbon dioxide + Water	B9.1 Aerobic respiration
Is respiration endothermic or exothermic?	Exothermic	B9.1 Aerobic respiration
Where does aerobic respiration occur in the cell?	Mitochondria	B9.1 Aerobic respiration
Give one importance of respiration.	Metabolic reactions (e.g. Build)/Muscle contraction/Minting body temp/Active transport	B9.1 Aerobic respiration

State one response of the body to exercise.	Increase heart rate/breathing rate/Glycogen converted to glucose/Increase blood flow to muscles	B9.2 The response to exercise
What happens to the glycogen stored in muscles when you exercise?	Converted into glucose for respiration	B9.2 The response to exercise
What is anaerobic respiration?	Breakdown of glucose to release small amount of energy without the use of oxygen	B9.3 Anaerobic respiration
Name the toxic substance produced by anaerobic respiration.	Lactic acid	B9.3 Anaerobic respiration
State an effect on your body after anaerobic respiration.	Muscle fatigue	B9.3 Anaerobic respiration
What do plants make in anaerobic respiration?	Ethanol and carbon dioxide	B9.3 Anaerobic respiration
Give one use of yeast doing anaerobic respiration.	Making bread/alcohol	B9.3 Anaerobic respiration
Define metabolism?	the sum of all the reactions in a cell or the body	B9.4 Metabolism and the liver
Give one example of a metabolic reaction in cells.	Convert glucose to glycogen, starch, cellulose/Make lipids/proteins/Respiration/Photosynthesis/Breakdown of proteins	B9.4 Metabolism and the liver