Biology Paper 1 (higher) – Check list

Practice applying your knowledge after using the knowledge organiser to revise a unit or topic:

- Take each learning statement and prove you can do it by answering that statement on paper.
- For any statement you cannot answer, use BBC bitesize to make notes and try to re-learn it.
- If you are still stuck, use Cognito science video lessons or ask a friend to re-explain

Topic	Tier	Learning statement	Answer from memory
Types of cell	F	Describe the structure of plant, animal and bacteria cells, classifying as prokaryotic and eukaryotic cells.	
Types of cell	F	Identify and explain the functions of sub-cellular structures	
Specialised cells	F	Describe the difference between '*cell differentiation'* and '*cell division'*	
Specialised cells	F	Describe how cells are specialised and explain their roles (*animal cells: sperm cells, nerve cells, muscle cells. Plant cells: root hair, xylem and phloem*).	
Specialised cells	F	Define '*tissue', 'organ' and 'organ system'* and explain how they work together to create a functioning '*organism'*	
Microscopy	F	Compare and contrast electron and light microscopes	
Microscopy	F	Define *'magnification'* and '*resolution'*	
Microscopy	F	Calculate magnification using a formula (magnification = size of image ÷ size of real object)	
Microscopy	F	Explain how electron microscopy has improved our understanding of subcellular structures	
Microscopy	F	Define and apply the prefixes '*centi*', '*milli*', '*micro'* and *'nano'*	
Microscopy	F	**RP Microscopy:** Use a light microscope to observe, draw and label a selection of plant and animal cells. A scale magnification must be included.	
Cell division (mitosis)	F	Define, locate and rank in terms of size, *'Genes', 'Chromosomes', 'DNA' and 'nucleus'*	
Cell division (mitosis)	F	Explain the process of *'mitosis'* and the '*cell cycle'* (when, where, how and why)	
Cell division (mitosis)	F	Describe what stem cells are, where they can be found and how the can be used	
Cell division (mitosis)	F	Explain the process of *'therapeutic cloning'*	
Cell division (mitosis)	F	Evaluate the risks and benefits, including the social and ethical implications, of using stem cells in treatments	
Cell division (mitosis)	F	Explain how plants can be cloned from stem cells and the benefits of doing this	
Introducing pathogens and types of disease	F	Define '*health*'	
Introducing pathogens and types of disease	F	List factors that affect mental and physical health	
Introducing pathogens and types of disease	F	Define '*pathogens*' and explain the difference between '*communicable'* and '*non-communicable'* diseases	
Introducing pathogens and types of disease	F	Explain how '*viruses'*, '*bacteria'*, '*protists'* and '*fungi'* are spread in animals and plants	
Introducing pathogens and types of disease	F	Describe the how bacteria and virus cause problems within the body	
Introducing pathogens and types of disease	F	State 4 ways to reduce or prevent the spread of communicable diseases	
Detailed disease case studies	F	Describe three viral diseases in details – the effects, how they are spread, how people are trying to reduce its impact (Measles, HIV and Tobacco Mosaic Virus)	

Detailed disease case studies	F	Describe two bacterial diseases in detail – the effects, how they are spread, how people are trying to reduce its impact (Gonorrhoea and Salmonella)	
Detailed disease case studies	F	Describe one fungal disease in detail – the effects, how it is spread, how people are trying to reduce its impact (Rose Black Spot)	
Detailed disease case studies	F	Describe one protist disease in detail – the effects, how it is spread, how people are trying to reduce its impact (malaria)	
Preventing pathogen	F	Describe how the body prevents entry of pathogens into the body	
Preventing pathogen	F	Describe how the immune system tackles pathogens once they have made it into the body (phagocytosis, antibody production and antitoxin production)	
Preventing pathogen	F	Explain how vaccines work	
Preventing pathogen	F	Discuss the global use of vaccination in the prevention of disease	
Preventing pathogen	F	Explain the use of antibiotics and other medicines	
Developing new medicines	F	Describe how bacteria have developed resistance to antibiotics – in particular MRSA (and use this as an example of evolution)	
Developing new medicines	F	Explain the issues with the development of new antibiotics in the race against antibiotic resistance and what we can do as a society to reduce the rate of development of antibiotic resistance bacteria (linking to medicine and agriculture)	
Developing new medicines	F	Describe how many new drugs are still developed from plants and microorganisms (including digitalis and aspirin)	
Developing new medicines	F	Explain how preclinical and clinical trials are used to test new drugs (including tests for safety, effectiveness, toxicity and dosage)	
Developing new medicines	F	Compare and contrast painkillers and antibiotics	
Developing new medicines	F	Explain the benefits and drawbacks of antibiotics and limitations of antivirals	
Using and interpreting data	F	Describe situations where types of diseases interact (poor physical health, viruses causing cancer, pathogens -> allergic reactions, immune system defects -> more susceptible to infectious disease)	
Using and interpreting data	F	Translate numerical information between tables and graphs	
Using and interpreting data	F	Construct and interpret bar charts and histograms	
Breathing and respiration	F	Describe the purpose of cellular respiration, recalling the word & symbol equation for aerobic respiration	
Breathing and respiration	F	Explain how the body responds to exercise in terms of heart rate, breathing rate and breath volume	
Breathing and respiration	F	Explain when anaerobic respiration occurs in humans and recall the word equation for this process	
Breathing and respiration	F	Explain what is meant by the term 'oxygen debt'	
Breathing and respiration	HT	Explain how lactic acid is converted back into glucose following a period of vigorous activity	
Breathing and respiration	F	Explain anaerobic respiration in yeast, recalling the word equation for this process	
Breathing and respiration	F	Describe how this process of anaerobic respiration (fermentation) is used by humans in the manufacturing industry	
Breathing and respiration	F	Label the structure and describe the function of the human lungs (including how they are adapted for gaseous exchange)	
Blood and the heart	F	Describe the structure and function of the human heart	
Blood and the heart	F	Describe the roles of the four blood vessels associated with the heart	

Blood and the heart	F	Describe the 3 different types of blood vessel in the body and their structure	
Blood and the heart	F	Carry out rate calculations for blood flow	
Blood and the heart	F	Describe how our body controls our natural resting heart rate	
Blood and the heart	F	Describe the composition of blood and know the functions of each of the components	
Blood and the heart	F	Draw blood cells from under a microscope and recognise different types of blood cells from a photo or diagram, explaining how they are adapted to their functions	
Blood and the heart	F	Describe coronary heart disease	
Blood and the heart	F	Describe what a 'stent', 'statin', 'mechanical/biological valve replacement', 'pacemaker' and 'transplant' are	
Blood and the heart	F	Evaluate the advantages and disadvantages of treating cardiovascular diseases using drugs, mechanical devices or transplants	
Blood and the heart	F	Evaluate risks associated with the use of blood products	
Interpreting disease data	F	Construct and interpret frequency tables and diagrams	
Interpreting disease data	F	Apply the techniques of scientific sampling to disease incident information	
Interpreting disease data	F	Discuss the human and financial cost of non-communicable diseases (individual, local community, national and global level)	
Interpreting disease data	F	Describe the causal mechanisms of some risk factors for non-communicable diseases (causes of: cardiovascular disease, type 2 diabetes, brain and liver function, lung disease and lung cancer, cancers and foetal damage) including the effects of diet, alcohol and smoking	
Interpreting disease data	F	Use a scatter diagram to identify a correlation between two variables (linking to disease incidence)	
Digestion	F	Describe what the digestive system is	
Digestion	F	Explain the role of enzymes in the digestive system making reference to 'lock and key'	
Digestion	F	Explain how carbohydrates, proteins and lipids are synthesised, broken down and used, making reference to sugars, amino acids, fatty acids and glycerol	
Digestion	F	Link carbohydrase (amylase), protease, lipase & bile to the breakdown of particular food groups, identifying where they are produced	
Digestion	F	**RP Food Tests:** Use qualitative reagents to test for a range of carbohydrates, proteins and lipids	
Digestion	F	Describe the effects of temperature and pH on the rate of enzyme reactions and investigate the effect of pH on the rate of reaction of amylase	
Digestion	F	**RP Enzymes:** Investigate the effect of pH on the rate of reaction of amylase enzyme	
Digestion	F	Define 'metabolism'	
Digestion	F	Calculate the rate of given chemical reactions	
Digestion	F	Explain the 5 processes that contribute to our metabolism (starch formation, lipid formation, protein synthesis, respiration and protein breakdown)	
Diffusion	F	Define 'diffusion' and give examples of diffusion in plants and animals (gas exchange and urea in the kidney)	
Diffusion	F	Explain how different factors affect the rate of diffusion (concentration, surface area, temperature)	
Diffusion	F	Calculate surface area: volume ratios	
Diffusion	F	Explain how surface area: volume ratio of a single celled organism (amoeba) allows sufficient molecule transport	
Diffusion	F	Explain adaptations for exchange materials in: small intestines, lungs, gills, roots and leaves	
Photosynthesis	F	Draw and label an unspecialised plant cell and a palisade, root hair, xylem and phloem specialised cell	
Photosynthesis	F	Describe the 5 tissues and name the key organs in the plant	

Photosynthesis	F	Label a transverse section of a leaf	
Photosynthesis	F	Describe the process of osmosis	
Photosynthesis	F	Calculate the rate of water uptake by a plant	
Photosynthesis	F	Calculate the percentage change in mass following osmosis	
Photosynthesis	F	Analyse and draw graphs relating to osmosis	
Photosynthesis	F	**RP Osmosis:** Analyse the range of concentrations of solutions on the change in mass of plant tissue	
Photosynthesis	F	Describe the process of active transport and explain why it is necessary	
Photosynthesis	F	Compare diffusion, osmosis and active transport	
Photosynthesis	F	Describe the process of active transport and how root hair cells are adapted to this	
Photosynthesis	F	Describe the process of transpiration and translocation (including the structure and function of stomata).	
Photosynthesis	F	Explain the effect of changing temperature, humidity, air movement and light intensity on the rate of transpiration	
Photosynthesis	F	Calculate surface area, volume and mean in transpiration investigation	
Photosynthesis	F	Analyse data from graphs and tables relating to transpiration experiments	
Photosynthesis	F	Describe in detail the location, function and adaptations of xylem tissue, phloem tissue, stomata and guard cells	
Photosynthesis	F	Describe the process of photosynthesis	
Photosynthesis	F	Recall the word and symbol equation for photosynthesis	
Photosynthesis	F	Explain the effects of temperature, light intensity, carbon dioxide intensity and the amount of chlorophyll on the rate of photosynthesis	
Photosynthesis	F	Analyse data and calculate rates of photosynthesis and limiting factors from graphs and tables	
Photosynthesis	F	Translate information between tabulated and graphical form (from tables to graphs) selecting the appropriate scale for axes	
Photosynthesis	F	**RP Photosynthesis:** Investigate the effect of light intensity on the rate of photosynthesis on an aquatic plant	
Photosynthesis	F	Describe how glucose is used after photosynthesis	
Photosynthesis	F	Explain the use of nitrate ions within plants	
Photosynthesis	F	Use tests to identify starch, glucose and proteins	
Photosynthesis	HT	Explain limiting factors of photosynthesis (HT only)	
Photosynthesis	HT	Apply inverse square laws and light intensity to the context of photosynthesis. (HT only)	
Photosynthesis	HT	Explain the economic importance of limiting factors in greenhouses (HT only)	