

GCSE Biology Paper 1 Revision checklist

Key Point	1	2
Cells & microscopy		
Label the major features of animal, plant and bacterial cells		
Describe differences between animal and plant cells		
Describe the functions of all the parts – e.g nucleus, ribosomes etc		
Use Magnification=Image/Actual to calculate size of cells or magnification		
Use prefixes centi, milli, micro and nano and change numbers between units		
Describe what is meant by 'differentiation' or specialisation		
Relate a cells specialised features to its function		
Describe how microscopy has developed over time and give advantages of the electron microscope over the light microscope		
Describe the stages in the cell cycle		
Describe and explain the stages in the culture of microbes for investigation		
Recognise & define mitosis and give examples of it may occur		
Define the term 'stem cells'		
Name sources of stem cells and describe their use – adult, embryo and meristem		
Evaluate the use of stem cells in medical research and treatments		
Transport		
Describe diffusion and the factors that can affect the rate		
Describe how organs and surfaces are specialised for effective diffusion – lungs, gills in fish, roots and leaves in plants		
Define the term osmosis and give examples of where it happens		
Define the term 'Active Transport' and explain why it is necessary		
Organisation		
Name the organs in the digestive system		
Use the 'lock and key' model to explain how enzymes work		
Name the three digestive enzymes, what they act on and what the products are		
Explain why digestion of food is necessary		
Explain the functions of bile and hydrochloric acid in digestion		
Describe the chemical tests for sugar, starch, fat and protein and their results		
Label a diagram of the major structures of the heart		
Label a diagram of the major structures of the lungs		

Describe how the heart rate is normally regulated and the use of artificial pacemakers		
Describe the features of arteries, veins and capillaries		
Name and describe the functions of the four components of blood		
Describe what 'coronary heart disease' is, describe and evaluate treatment options		
Describe some of the diseases linked with lifestyle factors		
Describe the causes of cancer and what is meant by 'benign' and 'malignant' tumours		
Name the different plant tissues and describe how they are adapted for their function		
Explain how transpiration happens and describe factors that can affect the rate		
Explain what is meant by 'translocation'		
Infection & response		
Define the term 'pathogen'		
Describe the spread and symptoms of viral diseases such as measles, HIV and Tobacco Mosaic Virus (TMV)		
Describe the spread and symptoms of the bacterial infections Salmonella and Gonorrhoea		
Describe the symptoms, spread and treatment of the fungal disease rose black spot		
Describe the spread of and the prevention of malaria by protists		
Describe the main physical barriers humans have to infection		
Describe how white cells fight pathogens that do get into the body		
Explain how vaccinations prevent disease		
Explain the use of antibiotics and other medicines in treating diseases		
Describe the origins of many drugs and how new drugs are developed, including the use of placebos		
Explain the development of and uses for monoclonal antibodies, including in pregnancy testing		
Describe and explain the main defence mechanisms plants have to prevent disease		
Describe the effects on plants of a lack of nitrate and magnesium in the soil		
Bioenergetics		
Represent photosynthesis using an equation and state uses for the products		
Describe and explain how factors may affect the rate of photosynthesis and explain the idea of 'limiting factors'		
Represent aerobic and anaerobic respiration using equations and compare them in terms of energy release and waste products		
Describe and explain changes in the body during exercise		
Define metabolism and give examples of the reactions this includes		

GCSE Biology Paper 2 Revision checklist

Key Point	1	2
Homeostasis & Response		
Define homeostasis and explain why it is important		
Give examples of conditions that are maintained in the body		
Name the different types of receptor humans have and describe how they react to a stimulus		
Know what the words receptor, sensory neurone, relay neurone, motor neurone, effector and synapse refer to and use them to describe a response		
Describe how nerve impulses travel and how they cross the synapse		
Explain what a reflex is and be able to label a diagram of a reflex arc		
Describe how the parts of the nervous system are adapted for their function		
Explain the importance of reflexes		
Describe a method to test reaction time, identifying variables and processing data obtained		
Describe the functions of the cortex, cerebellum and medulla and label these on a diagram of the brain		
Explain some of the difficulties involved in studying brain function and treating brain disease		
Label the parts of the eye and describe their functions		
Describe how the eye adapts to focus on near and far objects		
Describe common defects of the sight and how they are corrected (short sightedness and long sightedness)		
Explain how body temperature is monitored and controlled, including vasoconstriction and vasodilation		
Describe the structure and function of the endocrine system, identifying major endocrine glands in the human body		
Describe what a hormone is and explain the main differences between hormonal and nervous responses		
Describe how blood sugar varies and is normally controlled by insulin		
Describe the role of glucagon in maintaining blood sugar levels, including negative feedback		
Describe and compare Type 1 and Type 2 diabetes in terms of problems in the control of sugar and treatments		
Describe how the kidneys work to produce urine and reabsorb all sugar and the right quantities of ions & water		
Explain the role of the brain and pituitary gland in maintaining water levels of the body		
Describe and evaluate treatment for kidney failure – dialysis and kidney transplants		
Name and describe the effects of the hormones involved in controlling the female menstrual cycle		
Describe the interaction of FSH, LH, oestrogen and progesterone in the menstrual cycle and interpret graphs of hormone levels		
Describe and evaluate forms of contraception (pill, injection, condom, IUD, spermicidal agents, sterilisation, diaphragm etc)		

Describe the use of fertility treatments & IVF and evaluate them in terms of cost, ethics, medical/health, success rates, stress on the parents,		
Define negative feedback		
Describe the roles of adrenaline and thyroxine in the body and explain how thyroxine levels are controlled by negative feedback		
Explain how auxins control plant growth and explain ways of investigating factors affecting plant growth		
Describe commercial uses of auxins, gibberelins and ethene		
Inheritance, Variation & Evolution		
Explain what is meant by the terms 'sexual' and 'asexual' reproduction and the differences between them. Give advantages and disadvantages of each.		
Describe the main stages of the production of gametes by meiosis		
Explain the differences between mitosis and meiosis in terms of daughter cells		
Describe in detail the structure of DNA and define the term genome		
Explain how DNA codes for proteins		
Describe a simple model of protein synthesis and folding to produce unique shapes		
Define mutations and describe how they may affect the protein made		
Describe the importance of understanding the genome		
Define key genetic terms – allele, heterozygous, homozygous, dominant, recessive, genotype and phenotype		
Complete punnett squares to show the possibilities for offspring of a genetic cross and interpret them using direct proportion and ratios		
Describe the chromosome make up of men and women and use genetic crosses to show how gender is inherited		
Use and interpret family tree diagrams		
Construct genetic diagrams and use theory of probability to interpret results		
Describe the inheritance of the diseases polydactyly and cystic fibrosis		
Evaluate the use of embryo screening to prevent these and other inherited diseases		
Describe the work of Mendel and interpret data about his results		
Explain why Darwin's theory of natural selection was not well accepted at first and contrast his theory with that of Lamarck		
Define the reasons for variation within a species and across species		
Explain the role of mutations in variation		
Describe the theory of evolution		
Apply the theory of natural selection to explain how organisms have changed over time		
Explain how different species arise over time		
Describe the work of Wallace in developing our understanding of evolution by natural selection		
Describe 'selective breeding' and give examples of where it is used		
Give the disadvantages of selective breeding in terms of the gene pool		

Describe how plants, animals and bacteria can be genetically engineered and evaluate this – e.g +/- of genetically modified foods, production of insulin by GM bacteria		
Describe the main steps in genetic engineering of crops and bacteria		
Describe the processes involved in cloning techniques – tissue culture, cuttings, embryo transplantation and adult cell cloning.		
Describe the evidence for evolution – fossils, antibiotic resistant bacteria etc		
Explain what fossils show, how they were formed and why the fossil record is incomplete		
Interpret evolutionary trees and explain why organisms may go extinct		
Explain how antibiotic resistant bacteria form and how we can try to prevent this		
Describe Linnaeus' classification system		
Describe the more recent 'three-domain' system		
Ecology		
Describe and explain adaptations for animals and plants – especially ones that live in extreme conditions – deserts, poles etc		
Explain what 'extremophiles' are and give examples		
Define biotic and abiotic factors and explain how they can affect the organisms in a community		
Describe the flow of energy through food chains		
Describe trophic levels and represent them using pyramids of biomass		
Calculate the efficiency of energy transfer within a food chain		
Explain and evaluate ways of improving the efficiency of energy transfers in food production		
Describe some uses of biotechnology – GM crops, production of insulin by GM bacteria, quorn		
Describe methods of determining abundance of organisms within a habitat – using quadrats.		
Name the processes involved in the cycling of carbon and water and describe the importance of this		
Describe the importance of decay and factors that affect the rate of decay		
Describe practical ways of investigating the effect of temperature on the rate of decay		
Explain how waste, pollution, deforestation and global warming have impacted biodiversity		
Describe some of the biological consequences of global warming		
Describe measures to restore biodiversity and evaluate them		