

TOPIC	SUB-HEADING	KEYWORDS
Classification and evolution	Classification	Characteristics of living organisms, classification, the Five Kingdoms, viruses Flowering plants, monocotyledons, dicotyledons, arthropods, chordates, vertebrates Keys Species, binomial system, cladistics
Classification and evolution	Evolution by natural selection	Darwin, evolution, natural selection
Ecosystems, cycles and energy flow	Energy and biomass in food chains	Interdependence, food chain, trophic levels, pyramid of biomass, energy losses
Ecosystems, cycles and energy flow	The carbon and water cycles	Carbon cycle, photosynthesis, respiration, decomposer, combustion, fossil fuel, water cycle
Ecosystems, cycles and energy flow	The nitrogen cycle	Nitrogen fixation, root nodules, lightening, decomposers, protein, urea, ammonia, nitrifying bacteria, nitrates, denitrifying bacteria
Ecosystems, cycles and energy flow	Pollution and environmental change	Population change, population growth curve, pollution, phosphates, nitrates, sulfur dioxide, eutrophication Deforestation, conservation
Ecosystems, cycles and energy flow	Food security	Food security, famine Genetic modification Chemical fertilisers, pesticides, artificial selection
Inheritance	Variation and inherited characteristics	DNA, chromosomes, genes, alleles, inherited characteristics. Continuous and discontinuous variation
Inheritance	Genetic disorders and genetic diagrams	Cystic fibrosis, sickle cell, monohybrid cross, genetic diagram, Punnett square, pedigree, analyse outcomes
Inheritance	Genes and inheritance	Dominant, recessive, homozygous, heterozygous, phenotype, genotype, monohybrid cross, genetic diagram, Punnett square, sex inheritance, codominance
Keeping healthy	Drugs	Drug, heroin, effects of alcohol, effects of tobacco smoke
Keeping healthy	Heart disease	Coronary heart disease and causes
Keeping healthy	Antimicrobial agents and microbial resistance	Antibacterials, antifungals, resistant strains, MRSA, antibiotic misuse
Keeping healthy	Diet	Nutrients, carbohydrates, fats, proteins Food tests Deficiency diseases Food additives, colourings Balanced diet, malnutrition
Homeostasis	Homeostasis - balancing the internal environment	Homeostasis, thermoregulation, osmoregulation, blood glucose
Homeostasis	Thermoregulation - balancing heat gain and loss	Thermoregulation, skin, sweat, blood vessels, hair. Vasoconstriction, vasodilation, negative feedback
Homeostasis	Controlling blood sugar levels	Insulin, glycogen, Type 1 diabetes, Type 2 diabetes, diet, obesity, BMI calculations. Role of glucagon
Nerves and hormones	Hormones in our bodies	Hormones, endocrine gland, adrenaline, comparison with nervous control systems
Nerves and hormones	Tropisms - hormone control of plant growth	Plant hormones, phototropism, geotropism, auxin, cell elongation, interpret experiments, gibberellins
Nerves and hormones	The nervous system	Nervous system, brain, spinal cord, sense organs, nerves, neurons, receptors Antagonistic muscles
Nerves and hormones	The reflex arc	Sensory, relay, motor neurone, synapse, myelin, neurotransmitter, reflex arc
Nerves and hormones	The eye and vision	Structure and function of the eye, accommodation, pupil reflex, rods and cones
Cells and cell division	Cells	Plant cell, animal cell, bacterial cell, chloroplast, vacuole, cell wall, membrane, mitochondria, cytoplasm, nucleus, specialised cells, magnification
Cells and cell division	Cell division - mitosis	Mitosis, genetically identical body cells, growth, repair, asexual reproduction, cloning
Cells and cell division	Cell division - meiosis	Meiosis and fertilisation - genetically different haploid gametes, fertilisation, diploid zygote
Cells and cell division	Growth and development	Increase in size, length, mass, cell division, elongation, differentiation, growth in plants and animals
Cell processes	Diffusion, osmosis and active transport	Diffusion, osmosis, partially permeable membrane, active transport in roots

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Cell processes	Aerobic and anaerobic respiration	Aerobic respiration, role of circulatory system, capillaries, diffusion of oxygen, carbon dioxide and glucose, word equation, anaerobic respiration and word equation, lactic acid, oxygen debt
Cell processes	Enzymes	Biological catalyst, enzymes in DNA replication, protein synthesis and digestion, factors influencing enzymes (temp, substrate conc., pH), specificity, lock and key hypothesis, denaturation, enzyme experiments
Photosynthesis	The leaf and photosynthesis	Structure of the leaf, chlorophyll, chloroplast, stomata. Photosynthesis, word equation, limiting factors (light, CO <sub>2</sub> , temp) - experiments
Photosynthesis	Transpiration and plant transport	Transpiration, transport of water, glucose and minerals, active transport, xylem and phloem, root hair cells, translocation
Tissues, organs and organ systems	Cells, tissues, organs and organ systems	Cells, tissues and organs, organ systems
Tissues, organs and organ systems	Blood and circulatory system	Blood (red, white cells, plasma, platelets) Structure of the heart and function (named blood vessels and pumping chambers), valves and blood flow. Circulatory system (arteries, veins, capillaries) Lymphatic system
Tissues, organs and organ systems	Gas exchange and the lungs	Gas exchange surfaces Parts of human respiratory system, inspired and expired air composition Breathing mechanism
Tissues, organs and organ systems	Digestive system and digestive enzymes	Ingestion, egestion, parts (mouth oesophagus, stomach, small and large intestines, pancreas, liver, gall bladder), peristalsis, carbohydrases, proteases, lipases, role of bile, villi Teeth and dental decay Assimilation, role of liver, deamination
Tissues, organs and organ systems	The kidney and water balance	Waste products, urea, urinary system (renal artery, vein, kidney, ureters, bladder, urethra), dialysis, organ donation, nephron (glomerulus, Bowman's capsule, convoluted tubules, loop of Henle, collecting duct, urine formation and osmoregulation, ADH, pituitary gland, negative feedback
Tissues, organs and organ systems	Effect of exercise on the body	Heart rate and breathing rate during exercise
Biotechnology	Making use of microbes	Advantages of microbes, mycoprotein production with <i>Fusarium</i> , yoghurt production
Biotechnology	Using enzymes in industry	Enzyme technology (chymosin, invertase, enzymes in washing powder), experiments - immobilised lactase, enzymes in food production
Biotechnology	Genetic engineering	Recombinant DNA technology (insulin, restriction enzymes, ligase, sticky ends)
Reproduction	Plant reproduction	Parts of the flower and their functions Pollination Structure of seeds, seed and fruit dispersal
Reproduction	Human reproduction	Asexual/sexual reproduction Puberty, male reproductive system, sexual intercourse Development of the fetus, labour
Reproduction	Hormone control of the menstrual cycle	Hormonal control of the menstrual cycle by oestrogen, progesterone, FSH, LH, negative feedback
Reproduction	Controlling fertility	Birth control Infertility treatments (hormone treatments, artificial insemination, donor eggs and sperm) Sexually-transmitted diseases