

Topic	Sub-heading	Key words	Specification Statements (2017 spec)	Specification Statements (modular)
The nature and variety of living organisms	Classification and the variety of life	Characteristics of living organisms, classification, kingdom	1.1-1.2	1.1-1.2
Structure and functions in living organisms	Cells, tissues, organs and organ systems	Cells, tissues and organs, organ systems	2.1	
Structure and functions in living organisms	Cells	Plant cell, animal cell, bacterial cell, chloroplast, vacuole, cell wall, membrane, mitochondria, cytoplasm, nucleus, specialised cells	1.3 2.2-2.4	1.3 2.2-2.4
Structure and functions in living organisms	Stem cells	Stem cells, specialised cells, stem cells in medicine	2.5B-2.6B	2.5B-2.6B
Structure and functions in living organisms	Diet	nutrients, carbohydrates, fats, proteins, food tests, balanced diet	2.7-2.9 2.33B	2.7-2.9 2.33B
Structure and functions in living organisms	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	2.10-2.13	2.10-2.13
Structure and functions in living organisms	Diffusion, osmosis and active transport	diffusion, osmosis, partially permeable membrane, active transport in roots	2.15-2.17	2.15-2.17
Structure and functions in living organisms	The leaf and photosynthesis	structure of the leaf, chlorophyll, chloroplast, stomata, photosynthesis, word equation, limiting factors (light, CO ₂ , temp), stomata, gas exchange, use of glasshouses	2.18-2.21, 2.23 2.40B-2.45B 2.70 5.1-5.2	2.18-2.21, 2.23 2.40B-2.45B 3.20 6.1-6.2
Structure and functions in living organisms	Digestive system and digestive enzymes	ingestion, egestion, parts (mouth oesophagus, stomach, small and large intestines, pancreas, liver, gall bladder), peristalsis, carbohydrases, bile, villi	2.27-2.32	2.27-2.32
Structure and functions in living organisms	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	2.34-2.39 5.5	2.34-2.39 6.5
Structure and functions in living organisms	Gas exchange and the lungs	gas exchange system, lungs, alevoli, trachea, diaphragm, inspired and expired air, breathing mechanism, smoking	2.46-2.49	2.46-2.49
Structure and functions in living organisms	Effects of exercise on the body	heart rate, breathing rate	2.50 2.66 (effect of exercise on the heart)	2.50 3.16 (effect of exercise on the heart)
Structure and functions in living organisms	Transpiration and plant transport	xylem, phloem, root hair cells, transpiration, rate of transpiration	2.22 2.53-2.58B 5.3	2.22 3.3-3.8B 6.3

Structure and functions in living organisms	Blood and circulatory system	blood (red, white cells, plasma, platelets), heart, valves, circulatory system, arteries, veins, capillaries	2.51-2.52 2.59-2.61 2.64B-2.65 2.68-2.69	3.1-3.2 3.9-3.11 3.14B-3.16 3.18-3.19
Structure and functions in living organisms	Coronary heart disease	coronary heart disease, coronay arteries, risk factors	2.67	3.17
Structure and functions in living organisms	Harmful microbes, vaccination and immunity	immune system, phagocytes, lymphocytes, vaccination	1.4 2.62-2.63B	1.4 3.11-3.14B
Structure and functions in living organisms	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, osmoregulation, ADH, pituitary gland, negative feedback	2.71-2.79B 2.95B (ADH)	3.21-3.29B 3.45B (ADH)
Structure and functions in living organisms	Homeostasis	Homeostasis, thermoregulation, osmoregulation, blood glucose	2.80-2.81	3.30-3.31
Structure and functions in living organisms	Tropisms - hormone control of plant growth	plant hormones, phototropism, geotropism, auxin, cell elongation, gibberellins	2.83-2.85	3.33-3.35
Structure and functions in living organisms	The nervous system	nervous system, brain, spinal cord, sense organs, nerves, neurones, receptors	2.82 2.87-2.88	3.32 3.37-3.38
Structure and functions in living organisms	The synapse	synapse, neurotransmitters	2.89	3.39
Structure and functions in living organisms	The reflex arc	sensory, relay, motor neurone, synapse, myelin, neurotransmitter, reflex arc	2.90	3.40
Structure and functions in living organisms	The eye and vision	lens, accommodation, pupil reflex	2.91-2.92	3.41-3.42
Structure and functions in living organisms	Thermoregulation	thermoregulation, skin, sweat, blood vessels, hair, vasoconstriction, vasodilation, negative feedback	2.93	3.43
Structure and functions in living organisms	Hormones in our bodies	hormones, endocrine gland, adrenaline, insulin	2.66 (effect of adrenaline on the heart) 2.86 2.94 (adrenaline, insulin)	3.16 (effect of adrenaline on the heart) 3.36 3.44 (adrenaline, insulin)
Structure and functions in living organisms	Hormone control of the menstrual cycle	FSH, LH, oestrogen, progesterone, menstrual cycle	2.94 (progesterone and oestrogen) 2.95B 3.10B	3.44 (progesterone and oestrogen) 3.45B 4.10B
Reproduction and inheritance	Plant reproduction	asexual reproduction, pollination, pollen, seed, fruit, germination	3.1 3.3-3.7	4.1 4.3-4.7

Reproduction and inheritance	Human reproduction	fertilisation, zygote, embryo, reproductive systems, placenta, amniotic fluid, secondary sexual characteristics	2.94 (testosterone) 3.2 3.8-3.9, 3.11-	3.44 (testosterone) 4.2 4.8-4.9, 4.11-
Reproduction and inheritance	Variation and inherited characteristics	DNA, chromosomes, genes, alleles, inherited characteristics, environmental variation, mutation	3.14-3.16B 3.19 3.33-3.37B	4.14-4.16B 4.19 4.33-4.37B
Reproduction and inheritance	How proteins are made	RNA, transcription, translation, mRNA, tRNA, ribosomes, codon, anticodon	3.17B-3.18B	4.17B-4.18B
Reproduction and inheritance	Genes and inheritance	dominant, recessive, homozygous, heterozygous, phenotype, genotype, monohybrid cross, genetic diagram, Punnett square, sex inheritance, codominance	3.20-3.27	4.20-4.27
Reproduction and inheritance	Cell division - mitosis	mitosis, genetically identical body cells, growth, repair, asexual reproduction, cloning	3.28-3.29	4.28-4.29
Reproduction and inheritance	Cell division- meiosis	meiosis, haploid gametes, fertilisation, diploid zygote	3.30-3.32	4.30-4.32
Reproduction and inheritance	Evolution by natural selection	Darwin, evolution, natural selection, antibiotic resistance	3.38-3.39	4.38-4.39
Ecology and the environment	Fieldwork techniques	population, community, quadrats	4.1-4.2 4.4B	5.1-5.2 5.4B
Ecology and the environment	Energy and biomass in food chains	interdependence, food chain, trophic levels, pyramid of biomass, energy losses	4.6-4.9	5.6-5.9
Ecology and the environment	Pollution and environmental change	pollution, greenhouses gases, sulfur dioxide, eutrophication, deforestation	4.3B 4.5 4.12-4.18B	5.3B 5.5 5.12-5.18B
Ecology and the environment	The carbon cycle	carbon cycle, photosynthesis, respiration, decomposer, combustion, fossil fuel	4.10	5.10
Ecology and the environment	The nitrogen cycle	nitrogen fixation, root nodules, lightening, decomposers, protein, urea, ammonia, nitrifying bacteria, nitrates, denitrifying bacteria	4.11B	5.11B
Use of biological resources	Farming	fertilisers, pesticides, biological control, fish farming	5.3-5.4 5.9B	6.3-6.4 6.9B
Use of biological resources	Making use of microbes	mycoprotein, yoghurt, yeast	5.7-5.8	6.7-6.8
Use of biological resources	Food security	genetic modification, chemical fertilisers, pesticides, biological control, selective breeding	5.10-5.11 5.15	6.10-6.11 6.15
Use of biological resources	Genetic engineering	recombinant DNA technology (insulin, restriction enzymes, ligase, sticky ends)	5.12-5.16	6.12-6.16
Use of biological resources	Cloning	micropropagation, cloning	5.17B-5.20B	6.17B-6.20B