

Specification checklist

How to use: tick one box for each of the 176 spec points as you revise. Go back to the “Not yet” rows first, and keep going until every row is “Confident”.

The numbers are Edexcel's own spec references for 4BI1, and each note title links to its note on clockitwithsci.com. **Biology only** only in International GCSE Biology. Double Award students can skip it.

1 The nature and variety of living organisms

Characteristics and variety of living organisms **Spec 1.1-1.4**

Spec	What to know (the note)	Not yet	Nearly	Confident
1.1	Characteristics of living organisms	☐	☐	☐
1.2	Plants and animals; Fungi and protocists	☐	☐	☐
1.3	Bacteria	☐	☐	☐
1.4	Viruses and pathogens	☐	☐	☐

2 Structure and functions in living organisms

Cells and levels of organisation **Spec 2.1-2.6B**

Spec	What to know (the note)	Not yet	Nearly	Confident
2.1	Levels of organisation	☐	☐	☐
2.2	Animal and plant cell structure	☐	☐	☐
2.3	Animal and plant cell structure	☐	☐	☐
2.4	Animal and plant cell structure	☐	☐	☐
2.5B	Cell differentiation and specialised cells Biology only	☐	☐	☐
2.6B	Stem cells in medicine Biology only	☐	☐	☐

Biological molecules and enzymes **Spec 2.7-2.14B**

Spec	What to know (the note)	Not yet	Nearly	Confident
2.7	Carbohydrates, proteins and lipids	☐	☐	☐
2.8	Carbohydrates, proteins and lipids	☐	☐	☐
2.9	Practical: food tests	☐	☐	☐
2.10	Enzymes as biological catalysts	☐	☐	☐
2.11	Temperature, pH and enzyme activity	☐	☐	☐
2.12	Practical: temperature, pH and enzyme activity	☐	☐	☐
2.13	Temperature, pH and enzyme activity	☐	☐	☐
2.14B	Practical: temperature, pH and enzyme activity	☐	☐	☐

Movement of substances into and out of cells **Spec 2.15-2.17**

Spec	What to know (the note)	Not yet	Nearly	Confident
2.15	Diffusion; Osmosis; Active transport	☐	☐	☐
2.16	Factors affecting the rate of movement	☐	☐	☐
2.17	Practical: diffusion and osmosis	☐	☐	☐

Nutrition in flowering plants Spec 2.18-2.23

Spec	What to know (the note)	Not yet	Nearly	Confident
2.18	Photosynthesis and its equations	☐	☐	☐
2.19	Photosynthesis and its equations	☐	☐	☐
2.20	Factors affecting the rate of photosynthesis	☐	☐	☐
2.21	Leaf structure and adaptations	☐	☐	☐
2.22	Mineral ions: magnesium and nitrate	☐	☐	☐
2.23	Practical: oxygen from a water plant; Practical: starch, light, carbon dioxide and chlorophyll	☐	☐	☐
2.42B	Leaf structure and adaptations	☐	☐	☐

Human nutrition Spec 2.24-2.33B

Spec	What to know (the note)	Not yet	Nearly	Confident
2.24	A balanced diet and energy needs	☐	☐	☐
2.25	Nutrients: sources and functions	☐	☐	☐
2.26	A balanced diet and energy needs	☐	☐	☐
2.27	The alimentary canal and peristalsis	☐	☐	☐
2.28	The alimentary canal and peristalsis	☐	☐	☐
2.29	Digestive enzymes	☐	☐	☐
2.30	Bile	☐	☐	☐
2.31	Bile	☐	☐	☐
2.32	Absorption in the small intestine	☐	☐	☐
2.33B	Practical: energy content of food Biology only	☐	☐	☐

Respiration Spec 2.34-2.39

Spec	What to know (the note)	Not yet	Nearly	Confident
2.34	Respiration and ATP	☐	☐	☐
2.35	Respiration and ATP	☐	☐	☐
2.36	Comparing aerobic and anaerobic respiration	☐	☐	☐
2.37	Aerobic and anaerobic respiration equations	☐	☐	☐
2.38	Aerobic and anaerobic respiration equations	☐	☐	☐
2.39	Practical: carbon dioxide and heat from respiring seeds	☐	☐	☐

Gas exchange in flowering plants Spec 2.40B, 2.41B, 2.43B-2.45B, 2.70

Spec	What to know (the note)	Not yet	Nearly	Confident
2.40B	Gas exchange, diffusion and stomata	☐	☐	☐
2.41B	Gas exchange, diffusion and stomata	☐	☐	☐
2.43B	Gas exchange, diffusion and stomata	☐	☐	☐
2.44B	Net gas exchange by day and night Biology only	☐	☐	☐
2.45B	Practical: light and net gas exchange Biology only	☐	☐	☐
2.70	Gas exchange, diffusion and stomata	☐	☐	☐

Gas exchange in humans Spec 2.46-2.50

Spec	What to know (the note)	Not yet	Nearly	Confident
2.46	The structure of the thorax	☐	☐	☐
2.47	Ventilation: breathing in and out	☐	☐	☐
2.48	Alveoli and gas exchange	☐	☐	☐
2.49	Smoking, the lungs and the circulatory system	☐	☐	☐
2.50	Practical: breathing, carbon dioxide and exercise	☐	☐	☐

The need for transport and transport in plants Spec 2.51-2.58B

Spec	What to know (the note)	Not yet	Nearly	Confident
2.51	Why multicellular organisms need transport systems	☐	☐	☐
2.52	Why multicellular organisms need transport systems	☐	☐	☐
2.53	Xylem and phloem	☐	☐	☐
2.54	Xylem and phloem	☐	☐	☐
2.55B	Water uptake by root hair cells Biology only	☐	☐	☐
2.56B	Transpiration Biology only	☐	☐	☐
2.57B	Factors affecting transpiration and the potometer Biology only	☐	☐	☐
2.58B	Factors affecting transpiration and the potometer Biology only	☐	☐	☐

Blood and the immune system Spec 2.59-2.64B

Spec	What to know (the note)	Not yet	Nearly	Confident
2.59	Blood: composition, plasma and red blood cells	☐	☐	☐
2.60	Blood: composition, plasma and red blood cells	☐	☐	☐
2.61	Blood: composition, plasma and red blood cells	☐	☐	☐
2.62	White blood cells and the immune response	☐	☐	☐
2.63B	Vaccination and memory cells Biology only	☐	☐	☐
2.64B	Platelets and blood clotting Biology only	☐	☐	☐

The heart and circulation Spec 2.65-2.69

Spec	What to know (the note)	Not yet	Nearly	Confident
2.65	Structure and function of the heart	☐	☐	☐
2.66	Heart rate, exercise and adrenaline	☐	☐	☐
2.67	Coronary heart disease and its risk factors	☐	☐	☐
2.68	Arteries, veins and capillaries	☐	☐	☐
2.69	The circulation system	☐	☐	☐

Excretion Spec 2.71-2.79B

Spec	What to know (the note)	Not yet	Nearly	Confident
2.71	Excretion: lungs, kidneys and skin	☐	☐	☐
2.72B	The kidney and the urinary system Biology only	☐	☐	☐
2.73B	The kidney and the urinary system Biology only	☐	☐	☐
2.74B	The nephron and ultrafiltration Biology only	☐	☐	☐
2.75B	The nephron and ultrafiltration Biology only	☐	☐	☐
2.76B	Selective reabsorption and urine Biology only	☐	☐	☐
2.77B	Selective reabsorption and urine Biology only	☐	☐	☐
2.78B	ADH and the water content of the blood Biology only	☐	☐	☐
2.79B	Selective reabsorption and urine Biology only	☐	☐	☐

Coordination, homeostasis and plant responses Spec 2.80-2.85

Spec	What to know (the note)	Not yet	Nearly	Confident
2.80	Responding to change: stimulus, receptor, effector	☐	☐	☐
2.81	Homeostasis	☐	☐	☐
2.82	Responding to change: stimulus, receptor, effector	☐	☐	☐
2.83	Plant tropisms and auxin	☐	☐	☐
2.84	Plant tropisms and auxin	☐	☐	☐
2.85	Plant tropisms and auxin	☐	☐	☐

The nervous system and the eye Spec 2.87-2.92

Spec	What to know (the note)	Not yet	Nearly	Confident
2.87	The central nervous system and nerve impulses	☐	☐	☐
2.88	The central nervous system and nerve impulses	☐	☐	☐
2.89	Synapses and neurotransmitters	☐	☐	☐
2.90	The reflex arc	☐	☐	☐
2.91	Structure and function of the eye	☐	☐	☐
2.92	Focusing and the pupil reflex	☐	☐	☐

Hormones and temperature control Spec 2.86, 2.93-2.95B

Spec	What to know (the note)	Not yet	Nearly	Confident
2.86	Nervous and hormonal communication compared	☐	☐	☐
2.93	The skin and temperature control	☐	☐	☐
2.94	Adrenaline, insulin and the sex hormones	☐	☐	☐
2.95B	ADH, FSH and LH Biology only	☐	☐	☐

3 Reproduction and inheritance**Sexual and asexual reproduction, and reproduction in plants** Spec 3.1-3.7

Spec	What to know (the note)	Not yet	Nearly	Confident
3.1	Sexual and asexual reproduction	☐	☐	☐
3.2	Sexual and asexual reproduction	☐	☐	☐
3.3	Insect- and wind-pollinated flowers	☐	☐	☐
3.4	Fertilisation, seeds and fruits	☐	☐	☐
3.5	Practical: conditions for germination	☐	☐	☐
3.6	Germination and food reserves	☐	☐	☐
3.7	Asexual reproduction in plants	☐	☐	☐

Human reproduction Spec 3.8-3.13

Spec	What to know (the note)	Not yet	Nearly	Confident
3.8	Male and female reproductive systems	☐	☐	☐
3.9	Oestrogen, progesterone and the menstrual cycle	☐	☐	☐
3.10B	FSH and LH in the menstrual cycle Biology only	☐	☐	☐
3.11	The placenta and amniotic fluid	☐	☐	☐
3.12	The placenta and amniotic fluid	☐	☐	☐
3.13	Puberty and secondary sexual characteristics	☐	☐	☐

DNA, genes and protein synthesis Spec 3.14–3.18B

Spec	What to know (the note)	Not yet	Nearly	Confident
3.14	The genome, genes and chromosomes	☐	☐	☐
3.15	The genome, genes and chromosomes	☐	☐	☐
3.16B	The structure of DNA Biology only	☐	☐	☐
3.17B	RNA and protein synthesis Biology only	☐	☐	☐
3.18B	RNA and protein synthesis Biology only	☐	☐	☐

Inheritance Spec 3.19–3.27

Spec	What to know (the note)	Not yet	Nearly	Confident
3.19	Alleles and genetic terms	☐	☐	☐
3.20	Alleles and genetic terms	☐	☐	☐
3.21B	Codominance Biology only	☐	☐	☐
3.22	Polygenic inheritance	☐	☐	☐
3.23	Monohybrid inheritance and genetic diagrams	☐	☐	☐
3.24	Family pedigrees and probabilities	☐	☐	☐
3.25	Family pedigrees and probabilities	☐	☐	☐
3.26	Sex determination	☐	☐	☐
3.27	Sex determination	☐	☐	☐

Cell division, variation and evolution Spec 3.28–3.39

Spec	What to know (the note)	Not yet	Nearly	Confident
3.28	Mitosis	☐	☐	☐
3.29	Growth, repair, cloning and asexual reproduction	☐	☐	☐
3.30	Meiosis, fertilisation and chromosome number	☐	☐	☐
3.31	Meiosis, fertilisation and chromosome number	☐	☐	☐
3.32	Meiosis, fertilisation and chromosome number	☐	☐	☐
3.33	Genetic and environmental variation	☐	☐	☐
3.34	Mutations and the phenotype	☐	☐	☐
3.35B	Mutations and the phenotype	☐	☐	☐
3.36B	Mutations and the phenotype	☐	☐	☐
3.37B	Causes of mutation Biology only	☐	☐	☐
3.38	Darwin's theory of evolution by natural selection	☐	☐	☐
3.39	Antibiotic resistance	☐	☐	☐

4 Ecology and the environment**The organism in the environment** Spec 4.1–4.5

Spec	What to know (the note)	Not yet	Nearly	Confident
4.1	Population, community, habitat and ecosystem	☐	☐	☐
4.2	Practical: population size with quadrats; Estimating population size	☐	☐	☐
4.3B	Biodiversity Biology only	☐	☐	☐
4.4B	Practical: distribution and biodiversity Biology only	☐	☐	☐
4.5	Abiotic and biotic factors	☐	☐	☐

Feeding relationships Spec 4.6-4.9

Spec	What to know (the note)	Not yet	Nearly	Confident
4.6	Trophic levels	☐	☐	☐
4.7	Food chains and food webs; Pyramids of number, biomass and energy	☐	☐	☐
4.8	Energy transfer and the 10% rule	☐	☐	☐
4.9	Energy transfer and the 10% rule	☐	☐	☐

Cycles within ecosystems Spec 4.10-4.11B

Spec	What to know (the note)	Not yet	Nearly	Confident
4.10	The carbon cycle	☐	☐	☐
4.11B	The nitrogen cycle Biology only	☐	☐	☐

Human influences on the environment Spec 4.12-4.18B

Spec	What to know (the note)	Not yet	Nearly	Confident
4.12	Air pollution: sulfur dioxide and carbon monoxide	☐	☐	☐
4.13	Greenhouse gases and human activities	☐	☐	☐
4.14	Greenhouse gases and human activities	☐	☐	☐
4.15	The enhanced greenhouse effect and global warming	☐	☐	☐
4.16	Water pollution by sewage	☐	☐	☐
4.17	Eutrophication	☐	☐	☐
4.18B	Deforestation Biology only	☐	☐	☐

5 Use of biological resources

Food production: crop plants Spec 5.1-5.4

Spec	What to know (the note)	Not yet	Nearly	Confident
5.1	Glasshouses and polythene tunnels	☐	☐	☐
5.2	Glasshouses and polythene tunnels	☐	☐	☐
5.3	Fertilisers, pesticides and biological control	☐	☐	☐
5.4	Fertilisers, pesticides and biological control	☐	☐	☐

Food production: micro-organisms and fish farming Spec 5.5-5.9B

Spec	What to know (the note)	Not yet	Nearly	Confident
5.5	Yeast and bread making	☐	☐	☐
5.6	Practical: anaerobic respiration in yeast	☐	☐	☐
5.7	Bacteria and yoghurt	☐	☐	☐
5.8	Industrial fermenters	☐	☐	☐
5.9B	Fish farming Biology only	☐	☐	☐

Selective breeding and genetic modification Spec 5.10-5.16

Spec	What to know (the note)	Not yet	Nearly	Confident
5.10	Selective breeding of plants and animals	☐	☐	☐
5.11	Selective breeding of plants and animals	☐	☐	☐
5.12	Restriction enzymes, ligase and vectors	☐	☐	☐
5.13	Restriction enzymes, ligase and vectors	☐	☐	☐
5.14	Human insulin from genetically modified bacteria	☐	☐	☐
5.15	Genetically modified plants	☐	☐	☐
5.16	Restriction enzymes, ligase and vectors	☐	☐	☐

Cloning Spec 5.17B-5.20B

Spec	What to know (the note)	Not yet	Nearly	Confident
5.17B	Micropropagation (tissue culture) Biology only	☐	☐	☐
5.18B	Micropropagation (tissue culture) Biology only	☐	☐	☐
5.19B	Cloning mammals: Dolly the sheep Biology only	☐	☐	☐
5.20B	Cloned transgenic animals and human proteins Biology only	☐	☐	☐