

Specification checklist

How to use: tick one box for each of the 141 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 4SD0, and each note title links to its note on clockitwithsci.com.

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	☐	☐	☐

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	☐	☐	☐

Spec	What to know (the note)	Not yet	Nearly	Confident
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	☐	☐	☐

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	☐	☐	☐
2.70	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	☐	☐	☐

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	☐	☐	☐

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	☐	☐	☐

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	☐	☐	☐

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	☐	☐	☐
3.11	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	☐	☐	☐

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	☐	☐	☐
3.22	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	☐	☐	☐
3.38	Darwin's theory of evolution by natural selection	☐	☐	☐

Spec	What to know (the note)	Not yet	Nearly	Confident
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	☐	☐	☐
4.5	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	☐	☐	☐

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	☐	☐	☐

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	☐	☐	☐

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	☐	☐	☐

Spec	What to know (the note)	Not yet	Nearly	Confident
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	☐	☐	☐