Leaving Cert Biology - Revision

Unit 1

Unit	What I need to know/be able to do
1.1/1.2	Define what is meant by the scientific method Outline steps of the scientific method Define what is meant by a hypothesis and double-blind testing Outline principles of good experimentation List limitations of the scientific method
1.3	Outline the main chemical composition of carbohydrates, proteins & fats Name trace elements and salts found in foods Distinguish between monosaccharides, disaccharides and polysaccharides, giving examples of each Outline a structural and metabolic role of carbohydrates Distinguish between triglycerides and phospholipids Outline a structural and metabolic role of lipids/fats Distinguish between fibrous and globular proteins and give examples of each Outline a structural and metabolic role of proteins Distinguish between fat-soluble and water-soluble vitamins, giving an example of each and naming a deficiency associated with each Outline the steps involved in the tests for sugar, fats, protein and starch

1.4/1.5	efine the terms habitat, ecosystem, biosphere, niche and trophic level and predation Draw the diagram to represent the predator-prey cycle Name an adaptive feature of any predator you know that helps it catch prey Outline what you did in your field study. How did you collect fauna and identify them? What is the difference between a quantitative and qualitative study How did you make sure you used the quadrat randomly Were there any safety hazards you had to take into account? How did you present the results of your survey? Were there any possible sources of error?

Unit 2

2.1	Label the main parts of the microscope Calculate total magnification Outline the steps involved in examining plant and animals cells using the light microscope Identify and outline the functions of the main structures of plant and animals cells Distinguish between prokaryotic and eukaryotic cells
2.2	Distinguish between diffusion and osmosis

	Outline osmosis in animal and plant cells (explain turgor, flaccid and plasmolyszed) and know what diagrams look like. Outline uses of osmosis Recall steps of demonstrating osmosis experiment **D**efine what is meant by an enzyme and which food biomolecule group they belong to (proteins) Distinguish between a substrate and product Outline how enzymes work (induced-fit theory): active site, shape changing, enzymes specific to substrates, return to normal shape after products formed (diagram included) Differentiate between anabolic and catabolic enzymes and give an example of an anabolic and catabolic reaction in humans State factors that can affect enzyme activity Outline what is meant by enzymes being specific Outline what is meant by optimum activity and name enzymes that act best outside body temperature and pH of 7 (name an enzyme that works best at really high/low temperatures and pHs) State what immobilized enzymes are List advantages of using immobilized enzymes Label a diagram of the structure of the leaf Name the tissue type found on the lower and upper surface of the leaf What structures are found within the mesophyll layer to allow for photosynthesis to occur?

	Name the gases that diffuse in and out of the leaf What type of cells surround the stomata to allow it to open and close Where in the cell does photosynthesis take place? Outline the makeup of ATP and state what it stands for Why did we use an aquatic plant for the experiment? How did you measure the rate of photosynthesis? What did you change? What did you keep the same? What is water split into during photosynthesis? Outline the steps involved during the light and dark stage of photosynthesis Differentiate between pathway 1 and pathway 2 of electron transport? Why is one pathway referred to as being cyclical and the other isn't? How is ATP and NADPH formed in pathway 1 and 2 respectively? How is glucose formed in the dark stage? What is meant by respiration? Distinguish between anaerobic and aerobic respiration What happens during stage 1 (glycolysis) of respiration Outline what happens in stage 2 (kreb's cycle) of respiration

2.3	Define what is meant by the terms mitosis, meiosis, haploid and diploid Outline the events that take place in interphase, prophase, metaphase, anaphase and telophases associated with mitosis Outline functions of mitosis and meiosis State what cancer is. Outline causes of cancer
2.5	What does DNA stand for? Name the components of a nucleotide Name the 4 base pairs and what group (purine or pyrimidine) they belong to What type of bond holds DNA together? How do DNA and RNA differ? What is the difference between coding and non-coding (junk) DNA? What is meant by variation and species? What is heredity? Distinguish between DNA profiling and genetic screening Outline the stages involved in DNA profiling Outline the stages of DNA replication Outline uses of DNA profiling Define what is meant by evolution

	Name the two scientists involved in the study of evolution initially Outline evidence that exists to show support for the theory of evolution Outline the stages of protein synthesis, making reference to initiation, transcription and translation and where in a cell each stage occurs What does t, m and r stand for in tRNA, mRNA and rRNA. What does tRNA do? Explain the term genetics What base pairs are complementary to each other in DNA What is meant by the following terms: Gene, allele, dominant, recessive, genotype, phenotype, homozygous, heterozygous and gene expression What is meant by a sex-linked condition Which scientist is known best for his work on genetics State Medel's law of segregation and his law of independent assortment Perform a monohybrid cross Perform a monohybrid cross involving incomplete dominance Perform a dihybrid cross

Unit 3

Unit	What I need to know/be able to do
3.1	**Kingdoms of life:** Name the 5 kingdoms, giving an example of an organism in each kingdom **Monera:** List the shapes in which bacteria are normally classified by Outline and draw the general structure of a bacterium giving a function for each named part Name the process by which bacteria replicate and outline the stages involved using a labelled diagram Describe how bacteria can survive in unfavourable conditions (endospore formation) List factors that can impact bacterial growth Distinguish between aerobic and anaerobic bacteria (obligate anaerobes and facultative anaerobes) Explain positives and negatives associated with bacteria Draw and label the stages of the bacterial growth curve, explaining what happens at each stage Name the part of the bacteria responsible for antibiotic resistance Outline how bacteria can become resistant to antibiotics

	Protista: Outline the general structure of protista (amoeba) giving a function for each named part Describe how amoeba regulate water so that they don't burst Draw and label structure of rhizopus Give functions of structures of rhizopus Distinguish between saprophytic and parasitic fungi Outline how rhizopus reproduces asexually and sexually Outline how yeast reproduces Give positive and negative impacts of fungi
3.2	**Blood:** Name the main blood cells. Describe the shape and function of each blood cell. For RBCs know the molecule that carries oxygen and why they only have short life-spans Name a deficiency associated with each blood cell Outline where blood cells are produced Name substances transported by the plasma Outline the blood groups and what is meant by the Rhesus factor **Blood vessels:** Name the main blood vessels Outline differences between arteries and veins

	Heart: Draw and label a diagram of the heart Outline how blood flows through the heart, mentioning the main chambers and using terms such as oxygenated and deoxygenated Outline the positions of the SA and AV nodes and how they are responsible for regulating heartbeat Distinguish between the system an pulmonary circuit Outline what is meant by pulse and blood pressure Explain how diet and exercise can have an impact on pulse and blood pressure Outline a disease of the circulatory system **Lymphatic System:** Describe the structure of the lymphatic system Be able to list **AT LEAST 4** functions of the lymphatic system Outline functions of the root and stem of a plant Describe the different root types (fibrous and tap) Draw a transverse and longitudinal section of a root outlining the positions of the dermal, vascular and ground tissue Outline the roles of the zones of differentiation, elongation, cell production and protection What is the meristem?

	Distinguish between herbaceous and woody stems Draw a transverse and longitudinal section of a stem outlining the positions of the dermal, vascular and ground tissue Outline functions of the main tissue types - ground, vascular and dermal Know what xylem (water and minerals) and phloem (food)transports Describe the structure of xylem and phloem Outline whether xylem and phloem are classified as living or dead cells Distinguish between monocots and dicots Outline the difference between monocots and dicots with particular emphasis placed on the arrangement of vascular bundles in stems
3.3	Describe how water is taken up by the plant With reference to the cohesion-tension model, transpiration and root pressure outline how water is moved through the plant Give an example of modified roots, stems and leaves
3.4	Outline the main structures of the human breathing system and give their functions Why do we need cartilage? Where exactly are the intercostal muscles located? Describe what happens to the main structures (lungs, diaphragm etc.) during inhalation and exhalation

	What part of the brain controls our breathing (medulla oblongata) Define the term homeostasis Draw and label a diagram of the nephron Where in the nephron does filtration take place? Where does reabsorption take place? What features of the nephron aid homeosttsis? How does the nephron contribute to homeostasis? Refer to reabsorption of water and removal of waste
3.5	Distinguish between central nervous system and peripheral nervous system Draw structure of a typical neuron, giving functions of the main components Name three types of neurons, giving roles of each. What is different about them in terms of their role and how their structure is slightly different Outline features of a nerve impulse (all or nothing law) Describe what happens at a synapse. Mention pre-synaptic and post-synaptic cleft, diffusion of neurotransmitters, enzymes etc. Distinguish between white and grey matter by mentioning what part of the neurons are in each type of matter Describe what happens as part of a reflex arc Name a disorder associated with the nervous system, how it can be caused and outline treatments available for it utline main structures of the eye, giving the function associated with each part (be able to identify them off a blank diagram)

	Describe the exact location of the aqueous humor. What is located in front of/ or between
	Distinguish between rods and cones and the type of colour vision they are responsible for
	Outline the difference between myopia and hypermetropia and how lenses can be used to rectify them
	Outline components of the ear giving functions of each
	State functions of the ear other than hearing
	Distinguish between the outer, middle and inner ear
	How can we protect ear health?
	Distinguish between the axial and appendicular skeletons
	Outline functions of the skeleton
	Distinguish between compact and spongy bone
	Outline the difference between red and yellow bone marrow
	What name is given to the small bones within the backbone?
	What is the function of cartilage? What biomolecule is it made of?
	Describe the difference between the different types of joints and give an example of each (synovial, fixed and slightly movable)
	Distinguish between ligaments and tendons
	Outline a disorder of the musculoskeletal system giving a cause, prevention and treatment for it

	Draw a diagram of a virus Describe why viruses cannot be classified as living organisms How are viruses transmitted? What is a vaccine? Name viruses diseases How are viruses classified? Give an example of a beneficial use of viruses What is meant by the term 'obligate parasite' Distinguish between a stimulus and response Outline what a tropism and give 3 examples (phototropism, geotropism etc.) What is a growth regulator, growth promoter and growth inhibitor Outline the mechanism of action of auxin using a diagram
3.6	Draw and label features of both male and female reproductive systems List functions of each structure associated with both reproductive systems Define what is meant by secondary sexual characteristics. Give examples in both males and females

	Name and give functions of the hormones associated with both the male and female reproductive systems Outline events that occur during the menstrual cycle giving approximate days for each event Account for the rise and fall of oestrogen, progesterone, FSH and LH during the menstrual cycle What is meant by IVF? What is meant by contraception. Name methods of contraception. Name the structures formed during the development of the embryo (morula, blastocyst) Name the germ layers found in the embryo (endoderm, mesoderm and ectoderm) and list features that are formed in each layer What happens during implantation? Where does it occur? What is the function of the placenta, amnion and amniotic fluid? Draw and label the structure of the flowering plant Outline what parts of the plant comprise the male part (stamen) and the female part (carpel) Name the sex cells involved in plant sexual reproduction (pollen grain and embryo sac) Describe how these sex cells are formed Outline methods of pollination What is meant by fertilisation and double fertilisation Outline seed formation

	What is the difference between monocot and dicot seeds Outline what happens during germination What conditions are required for germination? Outline methods of vegetative propagation