Year 12 - De Lisle Advent Term Assessments 2025

Subject	Biology A level	
Title/Topic	**Format**	**Length**
Paper 1 – Biology	Written	45 mins
Paper 2 – Biology	Written	45 mins

In this Advent assessment I will be asked to show I can…

You will have 2 papers, the topics will be split across the two papers.

Topic 1: Lifestyle, Health and Risk

1.1 Understand why many animals have a heart and circulation (mass transport to overcome limitations of diffusion in meeting the requirements of organisms).
1.2 Understand the importance of water as a solvent in transport, including its dipole nature.
1.3 Understand how the structures of blood vessels (capillaries, arteries and veins) relate to their functions.
1.4 i) Know the cardiac cycle (atrial systole, ventricular systole and cardiac diastole) and relate the structure and operation of the mammalian heart, including the major blood vessels, to its function.
ii) Know how the relationship between heart structure and function can be investigated practically.
1.5 Understand the course of events that leads to atherosclerosis (endothelial dysfunction, inflammatory response, plaque formation, raised blood pressure).
1.6 Understand the blood-clotting process (thromboplastin release, conversion of prothrombin to thrombin and fibrinogen to fibrin) and its role in cardiovascular disease (CVD).
1.7 Know how factors such as genetics, diet, age, gender, high blood pressure, smoking and inactivity increase the risk of cardiovascular disease (CVD).
1.8 Be able to analyse and interpret quantitative data on illness and mortality rates to determine health risks, including distinguishing between correlation and causation and recognising conflicting evidence.
1.9 Be able to evaluate the design of studies used to determine health risk factors, including sample selection and sample size used to collect data that is both valid and reliable.
1.10 Understand why people's perceptions of risks are often different from the actual risks, including underestimating and overestimating the risks due to diet and other lifestyle factors in the development of heart disease.
1.11 i) Be able to analyse data on energy budgets and diet.
ii) Understand the consequences of energy imbalance, including weight loss, weight gain, and development of obesity.
1.12 i) Know the difference between monosaccharides, disaccharides and polysaccharides, including glycogen and starch (amylose and amylopectin).
ii) Be able to relate the structures of monosaccharides, disaccharides and polysaccharides to their roles in providing and storing energy (β-glucose and cellulose are not required in this topic).
1.13 Know how monosaccharides join to form disaccharides (sucrose, lactose and maltose) and polysaccharides (glycogen and amylose) through condensation reactions forming glycosidic bonds, and how these can be split through hydrolysis reactions.
1.14 i) Know how a triglyceride is synthesised by the formation of ester bonds during condensation reactions between glycerol and three fatty acids.

ii) Know the differences between saturated and unsaturated lipids.
1.15 i) Be able to analyse and interpret data on the possible significance for health of blood cholesterol levels and levels of high-density lipoproteins (HDLs) and low-density lipoproteins (LDLs).
ii) Know the evidence for a causal relationship between blood cholesterol levels (total cholesterol and LDL cholesterol) and cardiovascular disease (CVD).
1.16 Understand how people use scientific knowledge about the effects of diet, including obesity indicators, body mass index and waist-to-hip ratio, exercise and smoking to reduce their risk of coronary heart disease.
CORE PRACTICAL 1: Investigate the effect of caffeine on heart rate in *Daphnia*.
1.17 Be able discuss the potential ethical issues regarding the use of invertebrates in research.
CORE PRACTICAL 2: Investigate the vitamin C content of food and drink.
1.18 Know the benefits and risks of treatments for cardiovascular disease (CVD) (antihypertensives, statins, anticoagulants and platelet inhibitors).

Topic 2: Genes and Health
2.1 i) Know the properties of gas exchange surfaces in living organisms (large surface area to volume ratio, thickness of surface, difference in concentration).
ii) Understand how the rate of diffusion is dependent on these properties and can be calculated using Fick's Law of Diffusion.
iii) Understand how the structure of the mammalian lung is adapted for rapid gaseous exchange.
2.2 i) Know the structure and properties of cell membranes.
ii) Understand how models such as the fluid mosaic model of cell membranes are interpretations of data used to develop scientific explanations of the structure and properties of cell membranes.
2.3 Understand what is meant by osmosis in terms of the movement of free water molecules through a partially permeable membrane (consideration of water potential is not required).
2.4 i) Understand what is meant by passive transport (diffusion, facilitated diffusion), active transport (including the role of ATP as an immediate source of energy), endocytosis and exocytosis.
ii) Understand the involvement of carrier and channel proteins in membrane transport.
2.5 i) Know the basic structure of mononucleotides (deoxyribose or ribose linked to a phosphate and a base, including thymine, uracil, cytosine, adenine or guanine) and the structures of DNA and RNA (polynucleotides composed of mononucleotides linked through condensation reactions).
ii) Know how complementary base pairing and the hydrogen bonding between two complementary strands are involved in the formation of the DNA double helix.
2.6 i) Understand the process of protein synthesis (transcription) including the role of RNA polymerase, translation, messenger RNA, transfer RNA, ribosomes and the role of start and stop codons.
ii) Understand the roles of the DNA template (antisense) strand in transcription, codons on messenger RNA and anticodons on transfer RNA.
2.7 Understand the nature of the genetic code (triplet code, non-overlapping and degenerate).
2.8 Know that a gene is a sequence of bases on a DNA molecule that codes for a sequence of amino acids in a polypeptide chain.

What should I do to revise and prepare for this assessment?
To prepare for this assessment: 1. Use your processes book and do look/cover/write/check to learn key processes. 2. Use your revision guide. 3. Make flash cards for key knowledge and definitions. 4. Use Seneca learning. 5. Crash course videos on topics

What useful websites/resources could I use to help me prepare?
Seneca learning Free Homework & Revision for A Level, GCSE, KS3 & KS2 (senecalearning.com) Your revision guide – use the revision guide suggested to you by your teacher. Past paper questions from the exam board website or physics and maths tutor