**Fifth Year Biology Christmas Revision List** 

***Unit 1 The Study of Life***

1 The Scientific Method

Define the term ‘biology’

Give examples of areas of biological study

Define ‘the scientific method’

Describe the steps in the scientific method

Define hypothesis, experiment, data, theory, principle, law

Describe the ‘principles of experimentation’

Describe the ‘limitations of the value of the scientific method’

Define variable, control, replicate, placebo, double blind testing

Define ethics

Give two examples of ethics in relation to the use of the scientific method.

2 The Characteristics of Life

Define the terms life, metabolism, continuity of life

Define and identify the characteristics of life: organization, nutrition, excretion, response, reproduction

3 Food

Explain why living things need food

List the elements present in food

Describe the roles of carbohydrates, proteins and lipids in *structure* and *metabolism*

Define anabolic reaction and catabolic reaction and give an example of both

Describe the role of a water-soluble vitamin (vitamin C) and a fat-soluble vitamin (Vitamin D) in metabolism and disorders associated with the deficiency of these vitamins (scurvy/rickets)

Name two minerals needed by plants and two minerals needed by animals and give their use

Describe why water is important for living things

Describe tests for starch, fat, reducing sugar and protein (always give the results)

***Unit 2 The Cell***

7 Cell Structure

Be able to label the parts of the microscope and explain their functions

Explain how a transmission electron microscope works

Be able to label the parts of an animal cell and explain their functions

Be able to label a plant cell and explain their functions

Know the differences between a plant and animal cell

Explain the terms ‘prokaryotic’ and ‘eukaryotic’

Explain how to prepare a plant cell (onion) and an animal cell (cheek) and how to examine them under the microscope

Be able to draw the following diagrams:

Structure of a membrane (p.86)

Ultrastructure of a mitochondria (p.87)

Ultrastructure of a chloroplast (p.88)

Ultrastructure of an animal cell (p.88)

Ultrastructure of a plant cell (p.88)

8 Cell Diversity

Define the term ‘tissue’ and give examples of 2 plant tissues and 2 animal tissues

Explain what tissue culture is and state 2 ways in which it can be used (p.97)

Define the term ‘organ’ and give an example of one plant organ and one animal organ

Define the term ‘organ system’ and give examples of two organ systems in animals

9 Enzymes

Define the term ‘metabolism’

Describe the difference between solar and cellular energy (p.102)

Define the term ‘enzyme’ (p.103)

Describe the structure and function of enzymes in plant and animal metabolism (p.103-104)

Describe the use of immobilized enzymes in bioprocessing (p.106)

Explain how to prepare an enzyme immobilization and examine how it is applied (p.109-110)

Be able to draw ‘immobilising an enzyme’ (p.109)

Be able to draw ‘application of an immobilized enzyme’ (p.110)

Describe how to investigate the effect of (a) pH and (b) temperature on the rate of enzyme activity

10 Enzymes and Energy Carriers (HIGHER LEVEL ONLY)

Describe the active site theory to explain the function and specificity of enzymes (p.114-115)

Define the term ‘optimum activity’ in relation to pH and temperature

Know what ADP and ATP stand for

Explain the role of the following as energy carriers

1. ATP (and ADP)
2. NADP+ (and NADPH)
3. NAD+ (and NADH)

Explain what a denatured enzyme is and how it becomes denatured

Describe an experiment to investigate heat denaturation of an enzyme (always include a control)

13 Diffusion and Osmosis

Define the terms ‘diffusion’ and ‘osmosis’ and give examples of both

Explain how cell membranes are ‘selectively permeable’

Define the term ‘turgor’ and explain turgidity in plant cells

Explain how high levels of salt and sugar are used in food preservation

Describe an experiment to investigate osmosis and be able to draw a labelled diagram of the experiment

***Unit 3 The Organism***

25 Blood

Name the four main parts in blood and give the function of each part

Name the four common blood groups and name the two rhesus blood types

*Describe the structure of red blood cells in detail*

*Describe the structure of white blood cells*

*Classification of white blood cells as Lymphocytes or monocytes*

26 The Circulatory System

Understand what is meant by the term Closed Circulation System in humans

Describe the structure and organisation of the human Closed Circulation System i.e. strong muscular heart, arteries, arterioles, capillaries, venules, veins

Identify the two circuits in the human system circulation system
 (1) pulmonary Circuit (2) Systemic Circuit

Draw and label the structure of the heart

Mark the pathway of blood in a diagram of the heart and through the systemic and pulmonary circuits

Explain the term Portal System and identify the Hepatic Portal Vein in a diagram

Explain the role of muscles and valves in the heart and blood vessels

Explain how the heart supplies blood to the heart wall through the Coronary arteries and Cardiac veins

Explain the term ‘pulse’

Explain the term ‘blood pressure’

Explain the effect of exercise on the circulation system

Explain the effect of salt, fat and being overweight on the circulation system

Give a simple explanation of the heart beat and how it is controlled

*Know the location of the Pacemaker node (SA Node) and the AV node on the heart diagram*

*Explain why Cardiac Muscle is specialised*

*Explain the stages in the Cardiac Cycle*

*Explain the terms ‘systole’ and ‘diastole’*

*Explain how the AV and SA nodes function in relation to the heart cycle*

27 The Lymphatic System

Describe the structure of the lymphatic system (include lymph nodes and lymph vessels)

Describe 3 functions of the lymphatic system

36 The Endocrine System

Define the term ‘hormone’

Be able to compare the nervous system and the endocrine system (nerve action, speed of transmission etc)

Distinguish between an exocrine and an endocrine gland.

Give an example of an exocrine and an endocrine gland.

Give the location of the main endocrine glands in the human.

For each of the main endocrine glands name one hormone it produces and its functions.

Name one hormone and give a description of its deficiency symptoms, excess symptoms and corrective measures.