





Programme of Study – Year 10 Biology 2023-24 (Edexcel)

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| | Theme | Overview of key learning to take place | How learning will be assessed |
|--------|---|---|---|
| Term 1 | Unit 1- The nature and variety of living organisms | <p>(a) Characteristics of living organisms (1 lesson) 1.1: I can understand how living organisms share the following characteristics:</p> <ul style="list-style-type: none"> • they require nutrition • they respire • they excrete their waste • they respond to their surroundings • they move • they control their internal conditions • they reproduce • they grow and develop  <p>(b) Characteristics of living organisms (3 lessons) 1.2-1.4: I can understand the variety of living organisms including:</p> <ul style="list-style-type: none"> • The common features shown by eukaryotic organisms: plants, animals, fungi and protist • The features shown by prokaryotic organisms such as bacteria • The term pathogen and know that these include fungi, bacteria, protist or viruses | <p>Examples of Formative Assessment to be used this term: In class peer and self-assessment of extended answer questions Homework questions</p> <p>Summative assessment: Baseline assessment</p>  |
| Term 1 | Unit 2- Structure and function of different organisms | <p>(a) Characteristics of living organisms (1 lesson) 2.1: I can describe the levels of organisation in organisms in terms of cells, tissues, organs and systems</p> <p>(b) Cell structure (3 lessons) 2.2-2.3: I can identify, name and describe the cellular structures 2.4: I can explain the differences between plant and animal cells 2.5B: I can explain the importance of cell differentiation in the development of specialised cells 2.6B: I can understand the advantages and disadvantages of using stem cells in medicine</p> | |

(c) Biological molecules (6 lessons)

2.7 I can identify the chemical elements present in carbohydrates, proteins and lipids (fats and oils)

2.8: I can describe the structure of carbohydrates, proteins and lipids

2.9: I can carry out practical to investigate food samples for the presence of glucose, starch, protein and fat and analyse results

2.10: I can understand the role of enzymes as biological catalysts in metabolic reactions

2.11: I can understand how temperature changes can affect enzyme function

2.12: I can carry out practical to investigate how enzyme activity can be affected by changes in temperature and analyse results

2.13: I can understand how enzyme function can be affected by changes in pH altering the active site

2.14B practical: investigate how enzyme activity can be affected by changes in pH and analyse results



(d) Movement in and out of cells (4 lessons)

2.15: I can understand the processes of diffusion, osmosis and active transport

2.16 I can understand how factors affect the rate of movement of substances into and out of cells

2.17: I can carry out practical to investigate diffusion and osmosis using living and non-living systems

(e) Nutrition in Flowering Plants (6 lessons)

2.18: I can understand the process of photosynthesis

2.19: I can recall the word equation and the balanced chemical symbol equation for photosynthesis

2.20: I can understand how varying carbon dioxide concentration, light intensity and temperature affect the rate of photosynthesis

2.21: I can describe the structure of the leaf and explain how it is adapted for photosynthesis

Examples of Formative Assessment to be used this term:



In class peer and self-assessment of extended answer questions
Homework questions



Summative assessment:

Mid term assessment to include Unit 1 and Unit 2 parts (a) and (b)

End of term assessment to include unit 1 and 2 (a-e)

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| | <p>2.22: I can understand that plants require mineral ions for growth, and that magnesium ions are needed for chlorophyll and nitrate ions are needed for amino acids</p> <p>2.23: I can carry out practical to investigate photosynthesis and analyse results</p> <p>(e.) Nutrition in Animals (8 lessons)</p> <p>2.24: I can understand and explain the parts necessary for a balanced diet</p> <p>2.25: I can identify the sources and describe the functions of components of diet</p> <p>2.26: I can understand how energy requirements vary with activity levels, age and pregnancy</p> <p>2.27 I can describe the structure and function of human alimentary canal</p> <p>2.28: I can understand and explain how food is moved through the gut by peristalsis</p> <p>2.29: I can understand and explain the role of digestive enzymes</p> <p>2.30: I can understand that bile is produced by the liver and stored in the gall bladder</p> <p>2.31: I can explain the role of bile in neutralising stomach acid and emulsifying lipids</p> <p>2.32: I can describe and explain how the small intestine is adapted for absorption</p> <p>2.33B: I can carry out practical to investigate the energy content in a food sample and analyse the data</p> |  <p>the</p>  |
| <p>Term 2</p> | <p>(f) Respiration (4 lessons)</p> <p>2.34: I can understand the process of respiration in living organisms</p> <p>2.35: I can recall that ATP provides energy for cells</p> <p>2.36: I can describe the differences between aerobic and anaerobic respiration</p> <p>2.37: I can recall the word equation and the balanced chemical symbol equation for aerobic respiration in living organisms</p> <p>2.38: I can recall the word equation for anaerobic respiration in plants and in animals</p> | |

Unit 2- Structure and function of different organisms (Continued)

2.39: I can carry out practical to investigate the evolution of carbon dioxide and heat from respiring seeds or other suitable living organisms and analyse the data

(g) Gas exchange in Flowering Plants (4 lessons)

- 2.40B: I can understand the role of diffusion in gas exchange
- 2.41B: I can understand gas exchange (of carbon dioxide and oxygen) in relation to respiration and photosynthesis
- 2.42B: I can understand and explain how the structure of the leaf is adapted for gas exchange
- 2.43B: I can describe the role of stomata in gas exchange
- 2.44B: I can explain how respiration continues during the day and night, but that the net exchange of carbon dioxide and oxygen depends on the intensity of light
- 2.45B: I can carry out practical to investigate the effect of light on net gas exchange from a leaf, using hydrogen-carbonate indicator and analyse results

(g) Gas exchange in Humans (3 lessons)

- 2.46: I can describe the structure of the thorax
- 2.47: I can explain the role of the intercostal muscles and the diaphragm in ventilation
- 2.48: I can explain how alveoli are adapted for gas exchange
- 2.49: I can understand the biological consequences of smoking
- 2.50: I can carry out practical to investigate breathing in humans, including the release of carbon dioxide and the effect of exercise and analyse results

(h) Transport (1 lesson)

- 2.51: I can explain why simple, unicellular organisms can rely on diffusion for movement of substances in and out of the cell
- 2.52: I can explain the need for a transport system in multicellular organisms

(h) Transport in Flowering Plants (4 lessons)

- 2.53: I can describe the role of phloem
- 2.54: I can describe the role of xylem

Examples of Formative Assessment to be used this term:

In class peer and self-assessment of extended answer questions
Homework questions

Summative assessment:

Mid term assessment to include Unit 2 part (f-g)

End of term assessment to include Unit 2 part (f-i)



2.55B: I can describe how water is absorbed by root hair cells

2.56B: I can explain transpiration

2.57B: I can explain the factors that affect the rate of

2.58B: I can carry out a practical to investigate the role of environmental factors in determining the rate of transpiration from a leafy shoot and analyse the data



(h) Transport in Humans (6 lessons)

2.59: I can describe the composition of the blood

2.60: I can describe the role of plasma

2.61: I can explain the adaptations of red blood cells

2.62: I can explain how the immune system responds to disease using white blood cells

2.63B: I can explain the role of vaccination

2.64B: I can describe the role of platelets

2.65: I can describe the structure of the heart

2.67: I can explain understand how factors may increase the risk of developing coronary heart disease

2.68: I can describe the structure of arteries, veins and capillaries relate to their function

2.69: I can describe the general structure of the circulation system



(i) Excretion in Flowering plants (1 lesson)

2.70: I can describe the origin of carbon dioxide and oxygen as waste products of metabolism and their loss from the stomata of a leaf

(i) Excretion in Humans (4 lessons)

2.71: I can recall the excretory products of the lungs, kidneys and skin (organs of excretion)

2.72B: I can explain how the kidney carries out its roles of excretion and osmoregulation

2.73B: I can describe the structure of the urinary system

2.74B: I can describe the structure of a nephron,

2.75B: I can describe ultrafiltration in the Bowman's capsule and the composition of the glomerular filtrate

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| | | <p>2.76B: I can describe how water is reabsorbed into the blood from the collecting duct</p> <p>2.77B: I can explain why selective reabsorption of glucose occurs at the proximal convoluted tubule</p> <p>2.78B: I can describe the role of ADH in regulating the water content of the blood</p> <p>2.79B: I can recall that urine contains water, urea and ions</p> | |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Term 3</p> | <p>Unit 2- Structure and function of different organisms (Continued)</p> | <p>(j) Coordination and response (1 lesson)</p> <p>2.80: I can describe how organisms are able to respond to changes in their environment</p> <p>2.81: I can describe homeostasis</p> <p>2.82: I can describe a co-ordinated response</p> <p>(j) Coordination and response in Flowering Plants (1 lesson)</p> <p>2.83: I can understand that plants respond to stimuli</p> <p>2.84: I can describe the geotropic and phototropic responses of roots and stems</p> <p>2.85: I can explain the role of auxin in the phototropic response of stem</p> <p>(j) Coordination and response in Humans (6 lessons)</p> <p>2.86: I can describe how nervous and hormonal communication control responses and understand the differences between the two systems</p> <p>2.87: I can describe the central nervous system</p> <p>2.88: I can describe the role of receptors</p> <p>2.89: I can explain the role of neurotransmitters at synapses</p> <p>2.90: I can describe the structure and functioning of a simple reflex arc</p> <p>2.91: I can describe the structure and function of the eye as a receptor</p> <p>2.92: I can explain the function of the eye in focusing on near and distant objects, and in responding to changes in light intensity</p> | <p>Examples of Formative Assessment to be used this term:</p> <p>In class peer and self-assessment of extended answer questions</p> <p>Homework questions</p> <p>Summative assessment:</p> <p>Mid term assessment to include Unit 2 part (j)</p> |



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| | | <p>2.93: I can describe the role of the skin in temperature regulation</p> <p>2.94: I can explain the sources, roles and effects of the following hormones</p> <p>2.95B: I can recall the sources, and describe the roles and effects of the following hormones: ADH, FSH and LH</p> | |
| <p>Term 3</p> | <p>Unit 3- Reproduction and inheritance</p> | <p>(a) Reproduction (1 lesson)</p> <p>3.1: I can compare the differences between sexual and asexual reproduction</p> <p>3.2: I can explain the process of fertilisation</p> <p>(a) Reproduction in Flowering Plants (3 lessons)</p> <p>3.3: I can describe the structures of an insect-pollinated and a wind-pollinated flower and explain how each is adapted for pollination</p> <p>3.4: I can describe the growth of the pollen tube followed by fertilisation leads to seed and fruit formation</p> <p>3.5: I can carry out practical to investigate the conditions needed for seed germination</p> <p>3.6: I can describe how germinating seeds utilise food reserves until the seedling can carry out photosynthesis</p> <p>3.7: I can describe natural and artificial methods of asexual reproduction</p> <p>(a) Reproduction in Humans (5 lessons)</p> <p>3.8: I can describe and explain how the structure of the male and female reproductive systems are adapted for their functions</p> <p>3.9: I can describe the roles of oestrogen and progesterone in the menstrual cycle</p> <p>3.10B: I can describe the roles of FSH and LH in the menstrual cycle</p> | <p>Examples of Formative Assessment to be used this term:</p> <p>In class peer and self-assessment of extended answer questions</p> <p>Homework questions</p> <p>Summative assessment:</p> <p>End of year assessment Unit 1-3 (part a)</p> |



3.11: I can describe the role of the placenta in the nutrition of the developing embryo

3.12: I can describe how the developing embryo is protected by amniotic fluid

3.13: I can explain the roles of oestrogen and testosterone in the development of secondary sexual characteristics

