Sample Teaching Plan
Unit G622: Monitoring the Activity of the Human Body

Suggested teaching time	Plan is based on 12 weeks at 5 hours per week (4 hours contact time + 1 hour directed study)

This unit is assessed by a 90 minute written paper.
The learning activities are suggestions only. Teachers may wish to develop alternative strategies.

Note: The following two statements from Section 3.3.6 of the unit specification are likely to be addressed best in the context of work in sections 3.3.1 to 3.3.5 inclusive and section 3.3.7.

- Candidates need to be able to choose and evaluate relevant sources of data.
- Candidates need to be able to obtain and use primary and secondary data.

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
1	**3.3.2:** Structure and function of the circulatory and respiratory systems (introduction) • Describe the structure of the heart, the roles of the four chambers, the position and function of valves in double circulation, and the characteristic features of arteries, veins and capillaries. • Explain how heart rate is affected by nervous and hormonal inputs. • Explain how blood pressure changes with the activity of the body, and the effect of carbon dioxide levels in the blood.	• Teacher-led instruction. • Simple 'jogging on the spot followed by rest period' demonstration to indicate nervous effect on heart rate (pulse rate). • Candidate research.	Teacher-generated 'Need to know' sheet, which should include the principles, facts etc. likely to be assessed based on the specification references. Worksheets for candidate tasks. *Worksheet A:* Monitoring cardiovascular performance.

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2	**3.3.2** Structure and function of the circulatory and respiratory systems • Describe the structure of the lungs, trachea and bronchial tubes, and how ventilation is brought about by muscles. • Explain how gases are exchanged between the atmosphere and the blood through the respiratory surfaces of the lungs. • Explain how oxygen and nutrients reach the cells within tissues, and how carbon dioxide is removed from the cells and from the bloodstream.	• Teacher-led instruction, including use of PowerPoint images to show healthy and damaged alveoli and a simple model of gaseous exchange at the lungs. • Candidate research.	Teacher-generated 'Need to know' sheet, worksheets for candidate tasks.

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3	**3.3.1:** Respiration in energy terms • Compare cellular respiration to the burning of fuels. • Describe how the circulatory and respiratory systems both play a part in the process of respiration. • Outline why humans need to respire, with reference to muscle cell contraction, nerve impulse transmission, active transport and metabolic reactions. • State that ATP provides the immediate source of energy for biological processes. • State the differences between aerobic and anaerobic respiration in terms of their location within cells, substrates, products and quantity of energy made available to a respiring cell. • Relate cellular respiration to what happens in a muscle cell during various levels of physical activity. • Explain how monitoring a person's circulatory and respiratory systems and analysing their blood provides information about a person's state of health or fitness.	• Teacher-led instruction, including a simple model of combustion using fossil fuels. • Candidate research, including the link between health/fitness levels and monitoring circulatory and respiratory performance.	Teacher-generated 'Need to know' sheet, worksheets for candidate tasks.

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4	**3.3.3:** Uses of physiological measurement • Explain why you need to know the average values and ranges for physiological indicators that are regarded as 'normal' for male and female adults at rest. • State the typical blood plasma concentration and the conditions related to the appearance of glucose in urine. • State the values or ranges relating to breathing, blood pressure and body temperature. • Explain how to measure body temperature accurately. • Use graphs to monitor changes in temperature. • Recognise the normal body temperature for an average adult at rest, the range that a healthy body can withstand in the context of hypothermia and hyperthermia, and body temperatures that are dangerously high or low due to medical conditions. • Describe the mechanisms available to the body to maintain a stable body. temperature including shivering, sweating, vasoconstriction and vasodilation.	• Teacher-led instruction, providing a summary table of values/ranges for normal blood plasma glucose concentration, breathing, blood pressure and body temperature (including hyperthermia/heat exhaustion/heatstroke). • Candidate research – visit a fitness clinic and/or hospital unit and observe the recording of physiological measurements. • Candidate research, including the use of clinical thermometers (mercury and electronic/digital).	Teacher-generated: 'Need to know' sheets for each section and worksheets for candidate tasks.

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5	**3.3.3:** Uses of physiological measurements **3.3.4:** Methods of taking physiological measurements • Explain how to take pulse-rate measurements. • State that the typical range for pulse rate is 60 – 80 beats per minute. • Describe how to assess a person's current level of fitness and whether their performance is improving, using pulse-rate measurements taken before, during and after exercising. • Use graphs to monitor changes in pulse rate. • State that electrocardiograph can be used to monitor the activity of the heart. • Recognise a normal trace for an electrocardiograph and describe what it shows. • Recognise traces for normal heart, sinus tachycardia, bradycardia, sinus arrhythmia and ventricular fibrillation. • Describe what ECG traces show about the probable physiological status of people.	• Candidate research based. • Practical work. • Worksheets A (if not already covered in task 2, week 1) and B, with access to suggested websites.	Teacher-generated 'Need to know' sheets for each section and worksheets for candidate tasks *Worksheet A:* Monitoring cardiovascular performance. *Worksheet B:* The effect of exercise on cardiovascular performance in fit and unfit individuals.

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6	Assessment period	• Specification review. • Complete Worksheet C. • Identify areas covered so far (weeks 1 to 5), revise essential content. Identify weaknesses, omissions. • Exam technique. • Past paper questions. • Peer assessment and feedback.	Teacher-generated worksheets for candidate tasks Photocopies of examination questions. *Worksheet C:* Electrocardiography.
7	**3.3.3:** Uses of physiological measurements **3.3.4:** Methods of taking physiological measurements **3.3.6:** Regulations governing specific procedures and data management • Explain how to measure blood-pressure using a manual sphygmomanometer and an electronic digital sphygmomanometer. • Use graphs to monitor changes in blood pressure. • Recognise normal values for blood pressure. • Describe what sphygmomanometer readings show about the probable physiological status of people. • Design a risk assessment for any other non-invasive physiological measurement, e.g. heart rate measurement, stating what the hazards	• Produce flyer to encourage people to have their blood pressure checked regularly. • Assessment unit. • Case study material.	Teacher-generated 'Need to know' sheets for each section and worksheets for candidate tasks

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	are and explaining how to minimise the risk from these hazards to anyone involved.		
8	**3.3.3:** Uses of physiological measurements **3.3.4:** Methods of taking physiological measurements • Explain how to measure breathing rate. • Explain how to measure tidal volume and vital capacity of the lungs (using a simple spirometer). • State that a spirometer can be used to monitor the activity of the lungs. • Recognise a normal trace for a spirometer and describe what it shows. • Describe what spirometer traces show about the probable physiological status of people.	• Practical work – could be combined with pulse rate measurement. • Practical using spirometer. • Assessment unit.	Teacher-generated 'Need to know' sheets for each section, and worksheets for candidate tasks

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
9	**3.3.3:** Uses of physiological measurements **3.3.4:** Methods of taking physiological measurements • Explain how to measure peak expiratory flow rate using a peak flow meter. • State that a peak-flow meter can be used to monitor the activity of the lungs. • Recognise a maximum value for a peak-flow meter and describe what it shows. • Describe what peak-flow meter readings show about the probable physiological status of people. • State the principles of how breathing tests of, for example, tidal volume and peak flow rate are used in the treatment of asthma.	• Practical work. • Research to produce a report on asthma. • Case study material.	Teacher-generated 'Need to know' sheets for each section and worksheets for candidate tasks

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10	**3.3.3:** Uses of physiological measurements **3.3.6:** Regulations governing specific procedures and data management • Describe how blood cell counts can be useful in diagnosis, e.g. red blood cell counts for anaemia and white blood cell counts for leukaemia. • Distinguish between type 1 (insulin dependent) and type 2 (non-insulin dependent) diabetes (details of insulin action are not required). • Describe the link between type 2 diabetes and diet. • State the link between 'early onset' diabetes and obesity in children and young adults. • State the principles of how blood-sugar monitoring is used in the treatment of diabetes. • Describe procedures for the diagnosis of type 2 diabetes, with reference to the fasting blood-glucose test and glucose tolerance test. • Outline the way biosensors are used to monitor blood-glucose levels.	• Practical work – counting yeast/Chlorella cells as 'substitutes' for blood cells, using a haemocytometer.	Teacher-generated 'Need to know' sheets for each section and worksheets for candidate tasks

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	• State the principles of how blood tests are used to find the following chemicals in the blood: – alcohol – a named recreational drug – a named performance-enhancing drug. • State the principles of how blood tests, including ELISA tests, are used to find antibody indicators for diseases, for example, hepatitis, AIDS. • Describe regulations for the disposal of hazardous biological waste, e.g. sharps and hypodermic needles used in obtaining blood for testing. • Describe and explain procedures for the treatment of material that may be contaminated with microbiological hazards, e.g. used petri dishes, materials from antibody testing. • Design a risk assessment for a blood test, stating what the hazards are, and explaining how to minimise the risk from these hazards to the person carrying out the blood test.		

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11	**3.3.5:** Imaging methods **3.2.7:** Ethical issues related to monitoring, diagnosis and treatment • Explain the basic principles of medical X-ray radiography. • Describe how CAT scans and MRI scans are used for diagnosis. • Explain the basic principles of ultrasound scanning and how ultrasound scans may be useful in diagnosis. • Distinguish between different types of medical scanner used in diagnosis, to include X-ray, ultrasound, CAT and MRI. • Discuss the risks, benefits and ethical issues involved in using imaging methods. • Identify the risks and benefits arising from the diagnosis and/or treatment of patients with circulatory or respiratory disorders. • Identify situations where it may be considered inappropriate to diagnose and/or treat patients.	• Research followed by a presentation, each group responsible for one of the listed methods. • Produce a poster and an accompanying pamphlet, for Key Stage 3 pupils, describing the different imaging methods currently in use.	Teacher-generated 'Need to know' sheets for each section and worksheets for candidate tasks *Information Pack:* 'Imaging Methods'.

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
12	Assessment period	• Specification review. • Complete the question in Worksheet D. • Identify areas covered, revise essential content. • Identify weaknesses, omissions. • Exam technique. • Past paper questions. • Peer assessment.	Teacher-generated worksheets for candidate tasks Photocopies of examination questions *Worksheet D:* Assessment material – Electrocardiography & Diagnosis.