Higher National Unit specification

General information

Unit title: Human Body Structure and Function (SCQF level 8)

Unit code: H92C 35

Superclass: RH

Publication date: May 2015

Source: Scottish Qualifications Authority

Version: 02, September 2019

Unit purpose

This Unit is designed to enable learners to understand key aspects of the human body and its physiological processes. Learners will also develop practical skills in techniques relevant to physiology. The Unit is suitable for learners studying at HNC level, and will provide the necessary underpinning knowledge and skills to enable progression to further study of human physiological processes at HND level or to seek employment in science based industries.

Outcomes

On successful completion of the Unit the learner will be able to:

1 Describe and explain the physiological control of the human body by the nervous and endocrine systems.
2 Describe and explain the physiology of the musculoskeletal system.
3 Describe and explain the physiology of the cardiovascular system.
4 Describe and explain the dual role of the respiratory and excretory systems in maintaining homeostasis.
5 Describe and explain the physiology of the digestive system.
6 Perform practical experiments related to physiology.

Credit points and level

2 Higher National Unit credits at SCQF level 8: (16 SCQF credit points at SCQF level 8)

Higher National Unit specification: General information (cont)

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Recommended entry to the Unit

Entry is at the discretion of the centre, however it is recommended that learners should have completed the HN Unit H927 34 *Cell Biology: Theory and Laboratory Skills* or equivalent, or have experience of Biology or Human Biology at Higher level.

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Unit.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

The Assessment Support Pack (ASP) for this Unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website **(http://www.sqa.org.uk/sqa/46233.2769.html)**.

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**.

Higher National Unit specification: Statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Describe and explain the physiological control of the human body by the nervous and endocrine systems.

Knowledge and/or Skills

- Reflex actions
- Transmission pathways
- Homeostasis and negative feedback control
- Hormone regulation

Outcome 2

Describe and explain the physiology of the musculoskeletal system.

Knowledge and/or Skills

- Neuromuscular junction
- Sliding filament theory
- Isotonic and isometric contraction
- Movement of skeleton

Outcome 3

Describe and explain the physiology of the cardiovascular system.

Knowledge and/or Skills

- Blood
- Cardiac output, peripheral resistance and blood pressure
- Blood vessels and distribution of materials
- Control of cardiovascular system

Higher National Unit specification: Statement of standards (cont)

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Outcome 4

Describe and explain the dual role of the respiratory and excretory systems in maintaining homeostasis.

Knowledge and/or Skills

- Structure and function of respiratory system
- Structure and function of excretory system
- Interaction of respiratory and excretory systems to maintain acid-base balance

Outcome 5

Describe and explain the physiology of the digestive system.

Knowledge and/or Skills

- Structure and function of gastrointestinal tract
- Structure and function of accessory glands
- Nervous and endocrine control of digestion

Outcome 6

Perform practical experiments related to physiology.

Knowledge and/or Skills

- Physiology of human body experiments
- Working safely, within current health and safety regulations
- Consistent and accurate results
- Recording observations and results
- Evaluation skills
- Result analysis and conclusions

Higher National Unit specification: Statement of standards (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Evidence Requirements for this Unit

Written and/or oral recorded evidence for Outcomes 1-5 could be assessed using a holistic closed-book assessment under supervised conditions. Outcomes 1-5 may also be split into two separate assessments, assessing at least two Outcomes on each occasion. The assessment will use a sampling approach to the Knowledge and/or Skills as detailed below. It is recommended that the assessment — whether holistically or on two separate occasions — be completed within 90 minutes.

Written and/or oral recorded evidence for Outcome 6 should be assessed by production of a full laboratory report, completion of an appropriate pro forma or a laboratory diary entry. An assessor's observation checklist could be used to record performance evidence of practical experiments.

Outcome 1

The assessment will sample 3 of the 4 Knowledge and/or Skills items. Learners will not have prior knowledge of which items are being assessed. Those items which are not sampled must be covered in the alternative (re-sit) assessment.

Where an item is sampled, a learner's response will be judged satisfactory where the evidence shows that the learner can:

- Describe and explain somatic and autonomic reflexes.
- Describe and explain the transmission pathways of the somatic and autonomic nervous systems.
- Describe and explain homeostasis and negative feedback control by the autonomic nervous and endocrine systems.
- Describe and explain negative feedback mechanisms involved in hormonal regulation.

Outcome 2

The assessment will sample 3 of the 4 Knowledge and/or Skills items. Learners will not have prior knowledge of which items are being assessed. Those items which are not sampled must be covered in the alternative (re-sit) assessment.

Where an item is sampled, a learner's response will be judged satisfactory where the evidence shows that the learner can:

- Describe the structure of the neuromuscular junction; explain the sequence of events leading to the production of a muscle action potential.
- Describe and explain the sliding filament theory of muscle contraction.
- Describe isotonic and isometric muscle contraction.
- Describe and explain the movement of the skeleton.

Higher National Unit specification: Statement of standards (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Outcome 3

The assessment will sample 3 of the 4 Knowledge and/or Skills items. Learners will not have prior knowledge of which items are being assessed. Those items which are not sampled must be covered in the alternative (re-sit) assessment.

Where an item is sampled, a learner's response will be judged satisfactory where the evidence shows that the learner can:

- Describe the different components of blood and explain their role.
- Apply knowledge of cardiac output and peripheral resistance to describe alterations in blood pressure.
- Describe and explain the role of various blood vessels within the circulatory systems of the body and the transport of materials.
- Describe and explain the control of the cardiovascular system.

Outcome 4

The assessment will sample 2 of the 3 Knowledge and/or Skills items. Learners will not have prior knowledge of which items are being assessed. Those items which are not sampled must be covered in the alternative (re-sit) assessment.

Where an item is sampled, a learner's response will be judged satisfactory where the evidence shows that the learner can:

- Describe the structure and function of the respiratory system and explain their role in respiration.
- Describe the structure and function of the excretory system in the production of urine and explain their role in maintaining osmolarity and blood pressure.
- Describe and explain the dual role of the respiratory and excretory systems in the maintenance of acid-base balance.

Outcome 5

The assessment will sample 2 of the 3 Knowledge and/or Skills items. Learners will not have prior knowledge of which items are being assessed. Those items which are not sampled must be covered in the alternative (re-sit) assessment.

Where an item is sampled, a learner's response will be judged satisfactory where the evidence shows that the learner can:

- Describe the structure and function of the gastrointestinal tract and explain its role in digestion.
- Describe the structure and function of the accessory glands and explain their role in digestion.
- Describe and explain the control of digestion by the nervous and endocrine systems.

Higher National Unit specification: Statement of standards (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Outcome 6

Learners will perform a minimum of two practical experiments, the content of which will be related to Outcomes 1–5. A learner's response will be judged satisfactory where the evidence shows that the learner can achieve all of the following:

- Follow instructions to perform experiments related to physiology of the human body.
- Work in a safe manner regarding current health and safety regulations.
- Achieve consistent and accurate results.
- Record experimental observations and results clearly and accurately.
- Evaluate validity of results in terms of sources of and values of experimental errors.
- Analyse results correctly and state valid conclusions.

An assessor observation checklist will be used to record the learner's performance of the practical work in line with given instructions and health and safety requirements.

Learners must report one of the two practical experiments by production of a full laboratory report. Learners may report the remaining practical experiment by production of a full laboratory report, completion of an appropriate pro forma or a laboratory diary entry. Where a pro forma approach is deployed, the pro forma will not present information or assistance to the learners on how to correctly perform calculations, analyse experimental results or experimental errors. Learners will be expected to perform such activities independently on the basis of the experimental data. Where a laboratory diary approach is deployed, the laboratory diary must meet all of the requirements of a pro forma (in particular an evaluation of experimental errors), as set out in the Understanding Standards materials.

Where a learner does not perform an assessed practical experiment to the required standard, they will be given the chance to either reattempt the same practical experiment, or to undertake a different practical experiment of similar complexity. Where a laboratory report, pro forma or laboratory diary entry does not meet required standard, then the learner will be given a single opportunity to re-draft. If the required standard is still not attained, then an alternative practical experiment will be set.

Higher National Unit Support Notes

Unit title: Human Body Structure and Function (SCQF level 8)

Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 80 hours.

Guidance on the content and context for this Unit

This Unit is intended as part of the framework for HNC/HND Applied Sciences and HND Applied Biological Sciences but may be suitable for inclusion in other HN Science awards. It is designed to develop the theoretical and practical aspects of the structure and function of the human body.

Outcome 1 — Describe and explain the physiological control of the human body by the nervous and endocrine systems

♦ Reflex actions:	Definition of a reflex, basic structure of a reflex arc and examples of both somatic and autonomic reflexes.
♦ Transmission pathways:	Comparison of somatic and autonomic nervous systems, and sympathetic and parasympathetic pathways including neurotransmitters.
♦ Homeostasis and negative feedback control:	Definition of homeostasis and negative feedback loop. Examples of negative feedback loops involving autonomic nervous system and endocrine system. Comparison of nervous and endocrine systems: mode of signal delivery, target organ, speed of delivery and duration of signal.
♦ Hormone regulation and negative feedback control:	Hypothalamus and Post. Pituitary (ADH, TRH, CRH). Ant. Pituitary (Growth hormone, TSH, FSH, LH, ACTH). Thyroid (Thyroxine, calcitonin), negative feedback control of blood thyroxine levels. Parathyroid (parathyroid hormone), control of blood calcium along with calcitonin. Pancreas (Insulin and Glucagon), dual control of blood glucose levels. Adrenals (Aldosterone), negative feedback control via ACTH. Ovaries and Testes (oestrogen, progesterone, testosterone), negative feedback control via LH and FSH.

Higher National Unit Support Notes (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Outcome 2 — Describe and explain the physiology of the musculoskeletal system

♦ Neuromuscular junction:	Structure of neuromuscular junction including somatic motor neurone, axon terminals, motor unit, motor end plate and synaptic cleft. Release of acetyl choline from presynaptic vesicles, binding to motor end plate receptors and triggering of muscle action potential.
♦ Sliding filament theory:	Structure of muscle fibre including myofibrils, myofilaments (actin, myosin, troponin, tropomyosin) and sarcomeres. Sliding filament theory; role of calcium ions and ATP, binding of actin and myosin, power stroke (ratchet) moves actin and shortening of sarcomere.
♦ Isotonic and isometric contraction:	Isotonic contraction including concentric and eccentric, isometric contraction, antagonistic muscles including common examples, all or none principal of contraction and muscle tone.
♦ Movement of skeleton:	Muscle attachment (origin and insertion points), body movement at joints using levers (first class, second class, third class) and named examples of each type.

Outcome 3 — Describe and explain the physiology of the cardiovascular system

♦ Blood:	Composition of blood; plasma and blood cells, (red blood cells, white blood cells and platelets), role of each in transport of materials, protection against infection, clotting and blood group determination.
♦ Cardiac output, peripheral resistance and blood pressure:	Cardiac output = stroke volume x heart rate, peripheral resistance: blood viscosity, blood vessel length and radius, blood pressure: (normal systolic and diastolic), alterations in both CO and PR will affect BP. Effect of physiological changes on CO and BP: exercise, altitude, stress, etc.
♦ Blood vessels and distribution of materials:	Blood vessels (arteries, arterioles, capillaries, venules, veins), coronary, systemic and pulmonary circulations, distribution of nutrients (hepatic portal vein), gases, hormones and heat.
♦ Control of cardiovascular system:	Conduction system of heart (sino-atrial node, atrio-ventricular node, Bundle of His, right and left bundle branches, Purkinje fibres), nervous (role of cardiovascular centre, baroreceptors, chemoreceptors) and hormonal (adrenaline).

Higher National Unit Support Notes (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Outcome 4 — Describe and explain the dual role of the respiratory and excretory systems in maintaining homeostasis

♦ Structure and function of respiratory system:	Relating the structure of various parts of respiratory system to their function: nose, pharynx, larynx, trachea, bronchi, bronchioles — cleaning, warming and moistening air, alveoli — gas exchange, respiratory muscles and ribs — mechanism of breathing, gas transport, oxygen dissociation, lung volumes and capacities, control of respiration.
♦ Structure and function of excretory system:	Relating structure of various parts of the nephron to their function: renal corpuscle (glomerulus and Bowman's capsule) — ultrafiltration, proximal convoluted tubule and loop of Henle — tubular reabsorption, distal convoluted tubule — tubular secretion. Role of Aldosterone and ADH in maintaining osmolarity and blood pressure.
♦ Interaction of respiratory and excretory systems to maintain acid-base balance:	Maintenance of blood pH — CO2 exhalation, H+ secretion, HCO-3 reabsorption, buffer systems, acid-base imbalances.

Outcome 5 — Describe and explain the physiology of the digestive system

♦ Structure and function of gastrointestinal tract:	Relating the structure of the various parts of the gastrointestinal tract to their role in digestion: mouth and salivary glands — digestion, oesophagus — peristalsis, stomach and gastric glands — digestion, small intestine — digestion and absorption, large intestine — water reabsorption.
♦ Structure and function of accessory glands:	Relating the structure of the various accessory glands to their role in digestion: pancreas and pancreatic juice — digestion, liver and gall bladder in bile production and storage — fat absorption.
♦ Nervous and endocrine control of digestion:	Nervous (parasympathetic — stimulatory, sympathetic — inhibitory), endocrine — gastrin, secretin and cholecystokinin (CCK).

Outcome 6 — Perform practical experiments related to physiology

Guidance on suitable practical experiments for assessment purposes is given elsewhere in this document. However, it is envisaged that learners will also participate in a range of other practical experiments which will both develop their laboratory skills and support the theory covered in Outcomes 1–5.

In carrying out such experiments, learners should follow Good Laboratory Practice (GLP) and carry out or be familiar with the risk and Control of Substances Hazardous to Health (COSHH) assessments on all procedures undertaken. Opportunities should be taken to develop awareness of the sources of experimental error and of the accuracy of measurements, with quantification of errors where possible

Guidance on approaches to delivery of this Unit

There is no particular order in which Outcomes 2–5 would be best delivered. However, it is envisaged that Outcome 1 is delivered first as the concepts of homeostasis and the control by nervous and endocrine systems occur in all the other systems. Before commencing Outcome 1, it is recommended that learners are provided with introductory information on the body tissues and the specialised nature of these tissues. This information can then be reinforced when addressing the structure of the organs and systems contained within the other Outcomes.

It is envisaged that laboratory work and demonstrations will feature across the delivery of each of the Outcomes, and that the assessed practical experiments for Outcome 5 will be undertaken in a similar timeframe to the underpinning theory.

It is envisaged the delivery of Outcome 1 could commence with an overview of the nervous system including its organisation into central and peripheral nervous systems, the sensory, integrative and motor functions of the nervous system and associated nerves. This would then lead onto the composition of a basic reflex arc and somatic and autonomic reflexes. It is envisaged that the various types of reflex will be discussed using named examples, but all four somatic reflexes need not be taught provided learners have a clear understanding of how the reflex provides protection. Practical demonstration of reflexes could help in understanding the concept. The differences between the somatic and autonomic nervous systems should be explained whilst comparing somatic and autonomic reflexes. A clear understanding of the structural and functional differences between the sympathetic and parasympathetic nervous systems is expected, and this will be essential to understanding dual innervation of the cardiovascular and digestive systems in later Outcomes.

Homeostasis should commence with a definition of homeostasis and how it is controlled by negative feedback. Homeostasis involving the autonomic nervous system would ideally be introduced using a practical experiment to demonstrate homeostatic control of core body temperature. A clear understanding of negative feedback regulation is expected before moving on to homeostatic control by the endocrine system and the differences between the nervous and endocrine systems in terms of signal delivery, target organ, speed of delivery and duration of signal.

Approaches to delivery of the endocrine system should target its role in maintaining homeostasis via negative feedback control with examples such as blood glucose, blood calcium and thyroxine being discussed. This topic lends itself to data handling exercises (for example glucose tolerance data) and learner centred research into diseases such as diabetes, hypothyroidism and hyperthyroidism where the normal homeostatic controls are lost.

Higher National Unit Support Notes (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

It is envisaged that the delivery of Outcome 2 could commence with the neuromuscular junction, the somatic nervous system control of muscle contraction following on logically from Outcome 1. Revision and reinforcement of somatic reflexes could also be incorporated at this point. The structure of the motor neurone should be covered in detail to allow learners to gain an understanding of the process of signal transfer from axon terminal to muscle fibre and the generation of a muscular action potential. Delivery of the sliding filament theory naturally follows on and completes the story. It is expected that at this SCQF level the role of calcium and troponin/tropomyosin will be discussed as well as actin, myosin and ATP. The importance of ATP in muscle contraction can be investigated as a practical experiment or via a demonstration. The differences between isotonic and isometric contraction provide an opportunity to integrate theory and practice (step tests, hand grip strength, etc). A physiological practical experiment such as aerobic capacity could be undertaken either during Outcome 2 or Outcome 3 and would provide an opportunity to integrate knowledge from a number of Outcomes (homeostasis, isotonic contraction, increased heart rate, O_2 debt). Elucidation of different types of joints is not required but an understanding of the muscle attachment at its origin and insertion points and the fixed nature of the origin and moveable nature of insertion is vital to fully understanding the movement of the skeleton via levers. It is intended that learners learn the different types of levers by referring to named examples within the body and learners should be encouraged to undertake the movement provided by each lever.

It is envisaged that Outcome 3 could commence with the composition of blood and its function in transport, homeostatic regulation and protection before considering how the blood is pumped around the body. The role of the heart and blood vessels in transport and regulation could then be discussed before considering the nervous and hormonal control of the cardiovascular system. This Outcome provides plenty of opportunity for revision of the autonomic nervous system and the endocrine system and their dual role in maintaining homeostasis.

Outcome 3 provides lots of opportunity for practical experiments to reinforce the theory: microscopy of blood smears and blood group determination, demonstration of the structure of the heart and blood vessels using lamb or ox heart, aerobic capacity experiments, measurement of pulse, heart rate and blood pressure are all simple experiments which can be combined readily with the theory. This Outcome lends itself to the utilisation of learner IT skills for research and presentation of findings as display posters, information leaflets or as part of an oral presentation.

The respiratory system should be delivered first within Outcome 4 considering its close relationship with the cardiovascular system. There are multiple opportunities to revise the cardiovascular system whilst learning the respiratory system and the dissection of an intact heart and lung will help the learners to understand the close relationship between the two systems. This topic also provides opportunities for practical experiments: alteration of breathing rate during exercise, lung function tests, etc. Delivery of the excretory system also provides opportunities for practical experiments, such as kidney dissection and urine analysis, as well as consolidating knowledge of the endocrine system when addressing hormonal control of urine production. The interrelationship of respiratory and excretory systems in the control of blood pH gives an opportunity to relate other science based Units to biological systems whilst studying acid-base balance, buffers and equilibrium reactions.

Higher National Unit Support Notes (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

This topic also gives the learner an opportunity to understand compensatory mechanisms and the effects on the body should these mechanisms fail. Data handling exercises (ADH levels and urine concentration) and learner centred research could be incorporated into the Outcome.

The delivery of Outcome 5 would lend itself to an integrated approach where the structure and function of the accessory structures and control of digestion are blended into the relevant section of the gastrointestinal tract, for instance the role of pancreas and liver would be discussed at the same time as the duodenum along with control of duodenal, pancreatic and liver secretions by secretin and CCK. This Outcome lends itself to the utilisation of learner IT skills for research and presentation of findings as display posters, information leaflets or by PowerPoint as part of an oral presentation.

It is envisaged that Outcome 6 will be delivered alongside the theoretical based Outcomes 1–5. A range of practical experiments could be utilised to both support understanding of the underlying theory and to prepare learners for undertaking the assessed practical experiments. Aspects suitable for experimental investigation might include stroop test, reflexes, temperature regulation, ATP and muscle contraction, isometric hand grip strength, blood group typing, effects of exercise on blood pressure, heart rate, lung function, urine analysis and digestion.

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Outcomes 1–5 could be assessed by a single holistic closed-book assessment with an appropriate cut-off score that covers the sampling requirements as detailed in the Evidence Requirements. Outcomes 1-5 may also be split into two separate assessments, assessing at least two Outcomes on each occasion. Assessment should be carried out in supervised conditions, and it is recommended that the assessment — whether holistically or on two separate occasions — be completed within 90 minutes.

Where evidence of Outcomes 1–5 is assessed by sampling, the whole of the content listed in the Knowledge and/or Skills must be taught and available for assessment. Learners should not know in advance the items on which they will be assessed, and different items should be sampled on each assessment occasion. Any items not sampled in the first assessment must be included in the alternative (re-sit) assessment.

In Outcome 6 learners are required to undertake two assessed practical experiments, the content of which will be related to Outcomes 1–5. Examples of suitable experiments are given below. However, this list is not prescriptive, and other practical experiments of similar complexity may be used by the centre.

Higher National Unit Support Notes (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Suitable practical experiments for Outcome 6 are:

Laboratory experiments

- stroop test
- reflexes
- temperature regulation
- ATP and muscle contraction
- isometric hand grip strength
- blood group typing
- effects of exercise on blood pressure
- heart rate
- lung function
- urine analysis
- digestion

Assessed practical experiments will usually be performed individually. However, there may be some experiments that are suitable to be undertaken in pairs or small groups. If this is the case then the assessor should ensure that all participants are actively involved and are able to adequately demonstrate the required skills.

An exemplar instrument of assessment with marking guidelines has been produced to indicate the national standard of achievement at SCQF level 8.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at **www.sqa.org.uk/e-assessment**.

Higher National Unit Support Notes (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Opportunities for developing Core and other essential skills

The delivery and assessment of this Unit will provide learners with the opportunity to develop the Core Skills of *Numeracy* and *Problem Solving* at SCQF level 6, and *Information and Communication Technology (ICT)* at SCQF level 4.

Numeracy — Using Number at SCQF level 6

Learners will be required to decide on the steps and operations to solve complex problems, carrying out sustained and complex calculations.

Problem Solving — Reviewing and Evaluating at SCQF level 6

Following assessed practical experiments learners will be required to review and evaluate the effectiveness of the exercise with a thorough interpretation of random and systematic sources of error. Learners will be required to reach sound conclusions on the basis of the data collected and the inherent errors.

Information and Communication Technology (ICT) — Providing/Creating Information at SCQF level 4

Learners will make effective and appropriate use of ICT packages to produce laboratory reports or pro formas in an appropriate format. Packages used will likely include word processing and spreadsheets.

Sustainability

Sustainability can be embedded in delivery of the Unit in a variety of ways. For example, by encouraging minimum usage, correct disposal procedures and possibly recycling (eg of solvents) during practical experiments.

History of changes to Unit

Version	Description of change	Date
2	Outcomes 1-5 could be assessed using a holistic closed-book assessment or split into two separate assessments, assessing at least two Outcomes on each occasion. One of the two practical experiments can be reported by production of a full laboratory report, completion of an appropriate pro forma or a laboratory diary entry.	03/09/19

General information for learners

Unit title: Human Body Structure and Function (SCQF level 8)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

This is a 2 credit Unit at SCQF level 8, which you are likely to be studying as part of the first year of an HNC/HND science programme. Before progressing to this Unit it would be beneficial to have completed the HN Unit H927 34 *Cell Biology: Theory and Laboratory Skills*, where you will have learned underpinning aspects of Human Body Structure and Function and developed your practical skills.

On completion of the Unit you should be able to:

1 Describe and explain the physiological control of the human body by the nervous and endocrine systems.
2 Describe and explain the physiology of the musculoskeletal system.
3 Describe and explain the physiology of the cardiovascular system.
4 Describe and explain the dual role of the respiratory and excretory systems in maintaining homeostasis.
5 Describe and explain the physiology of the digestive system.
6 Perform practical experiments related to physiology.

Outcome 1

In this Outcome you will cover aspects of the physiological control of the human body by the nervous and endocrine systems. You will consider reflexes both somatic and autonomic and the similarities and differences in the transmission pathways of the somatic and autonomic nervous systems. In addition, you will study negative feedback control of homeostasis in the human body and the role of both the nervous and endocrine systems. You will also consider the negative feedback control involved in hormonal regulation.

Outcome 2

In this Outcome you will study the physiology of the musculoskeletal system. You will gain an understanding of how muscle contraction is generated and controlled. In addition, you will consider the different types of muscle contraction and the dual role of skeletal muscles and bones in the movement of the skeleton.

Outcome 3

In this Outcome you will consider the physiology of the cardiovascular system. You will consider the three parts of the cardiovascular system; blood, blood vessels and the heart and their role in the transport of materials around the body. In addition, you will study the control of heart rate and the factors that affect blood pressure.

Outcome 4

In this Outcome you will study the role of the respiratory and excretory systems in maintaining homeostasis. You will cover respiration and gas exchange and the production of urine. In addition, you will consider the role of these systems in maintaining osmolarity, blood pressure and acid-base balance.

General information for learners (cont)

Unit title: Human Body Structure and Function (SCQF level 8)

Outcome 5

In this Outcome you will consider the physiology of the digestive system. You will study the role of the gastrointestinal tract and the accessory glands in the digestion and absorption of nutrients. In addition, you will cover the control of digestion by the nervous and endocrine systems.

Outcome 6

In this Outcome you will undertake practical experiments, based on the content of Outcomes 1–5.

During this practical work, you will also be expected to develop good laboratory practices as well as improve your skills of manipulation, observation and measurement. You will also be encouraged to develop safe working practices and to strive constantly to improve the accuracy and reliability of your results. The reporting and analysis of experimental data is an important aspect of the practical sessions.

Assessment

For Outcomes 1 to 5, depending on which centre you attend, assessment may be conducted by one single assessment or two separate assessments. Assessment will be conducted under closed-book conditions.

Outcome 6 will be assessed after you have learned the necessary practical skills, and will take the form of two practical experiments, for which you will report your results either in full laboratory reports, completion of pro forma reports or laboratory diary entires.

Core Skills

Although there is no automatic certification of Core Skills in the Unit, you will have opportunities to develop the Core Skills of *Numeracy* and *Problem Solving* at SCQF level 6, and *Information and Communication Technology (ICT)* at SCQF level 4.