QUALIFICATION SPECIFICATION

gateway qualifications

Certificate in Science and Technology (Level 2)

Access to HE
Apprenticeships
Digital
Employability & Enterprise
English & Maths
ESOL
Personal & Social Development
Professional Development
Vocational

This qualification specification covers the following qualification:

Qualification Number	Qualification Title
601/8977/0	Gateway Qualifications Level 2 Certificate in Science and Technology

Version and date	Change detail	Section/Page Reference
1.2 November 2019	Addition of grading change statement	9

About this qualification specification

This qualification specification is intended for tutors, assessors, internal quality assurers, centre quality managers and other staff within Gateway Qualifications recognised centres and/or prospective centres.

It sets out what is required of the learner in order to achieve the qualification. It also contains information specific to managing and delivering the qualification(s) including specific quality assurance requirements.

The guide should be read in conjunction with the Gateway Qualifications Centre Handbook and other publications available on the website which contain more detailed guidance on assessment and verification practice.

In order to offer this qualification you must be a Gateway Qualifications recognised centre.

If your centre is not yet recognised, please contact our Development Team to discuss becoming a Gateway Qualifications Recognised Centre:

Telephone: 01206 911211
Email: enquiries@gatewayqualifications.org.uk
Website: www.gatewayqualifications.org.uk/recognition

Contents

1. Qualification Information

1.1. About the qualification

The qualification has been approved by Ofqual, the Office of Qualifications and Examinations Regulation (Ofqual) regulates qualifications, examinations and assessments in England.

The qualification has been developed in conjunction with further education colleges. It is intended primarily for learners post 16 who are interested in Science and Technology but have not studied Science or Technology at Key Stage 4 or who have not achieved higher grade GCSEs in these subjects.

The qualification is intended to give learners the knowledge, understanding and skills that will enable them to progress to qualifications in a science or technology or other related area at a higher level and that could be used within the 16-19 Programmes of Study.

1.2. Objective

The Level 2 Certificate in Science and Technology is intended to give learners the knowledge, understanding and skills that will enable them to progress to qualifications in a science or technology related area at a higher level or to employment in a science or technology related area.

1.3. Key Facts

Qualification Title	Total Qualification Time	Guided Learning	Credit Value
Gateway Qualifications Level 2 Certificate in Science and Technology	330	270	33

Total Qualification Time is the number of notional hours which represents an estimate of the total amount of time that could be reasonably expected to be required for a Learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of the qualification.

Total Qualification Time is comprised of the following two elements:

- The number of hours which an awarding organisation has assigned to a qualification for Guided Learning, and
- An estimate of the number of hours a Learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place by – but, unlike Guided Learning, not under the Immediate Guidance or Supervision of – a lecturer, supervisor, tutor or other appropriate provider of education or training.

1.4. Achievement methodology

A qualification will be awarded to learners who successfully achieve an approved unit or combination of units through a portfolio of evidence that has been successfully verified and monitored through Gateway Qualifications' quality assurance process. Achievement is therefore determined by successful completion of unit assessment with no further requirement for additional/summative assessment.

This qualification is graded at unit and qualification level.

To achieve a Pass	• **learners must evidence all Pass criteria from the assessment and grading grid**
To achieve a Merit	• learners must evidence all Pass and Merit criteria from the assessment and grading grid • should a learner achieve some of the Merit criteria but not all, this would provide the opportunity for additional guidance to enable the learner to progress all work to the required standard to achieve all the Merit criteria • partial achievement of the Merit criteria **cannot** attract the Merit grade.
To achieve a Distinction	• learners must evidence all Pass, Merit and Distinction criteria from the assessment and grading grid • Distinction criteria are qualitative extensions of the Merit criteria • should a learner achieve some of the Distinction criteria but not all, this would provide the opportunity for additional guidance to enable the learner to progress all work to the required standard to achieve all the Distinction criteria • partial achievement of the Distinction criteria cannot attract the Distinction grade.

The qualification grade will be automatically calculated for learners when the learner unit grades are submitted by a centre. The overall grade is calculated based on the rules of combination for the qualification, in the following way:

1. The grade is converted to a number of points per credit (see table below).
2. The units required to meet the rules of combination are selected and the points allocated per credit are applied.
3. If the amount of credit needed for the qualification is less than the amount of credit achieved by the learner the total number of points will be adjusted. This will be calculated as a proportion of the total number of credits achieved by the required number of credits to complete the overall grade:

   No. of credits required x Total No. of Points = Adjusted Points Total
   No. of credits achieved
4. Any surplus credits will be listed on the credit transcript.
5. Number of points are totalled and the overall grade applied according to the 'qualification grade' table.

The table below shows the **number of points scored per credit** at the unit level and grade:

Level	Points per credit		
	Pass	Merit	Distinction
Level 2	5	6	7

Learners who achieve the correct number of points within the ranges show in the 'qualification grade' table below will achieve the qualification merit or distinction grade:

Qualification	Points range above pass grade		
	Pass	Merit	Distinction
Level 2 Certificate	165-182	183-212	213 - 231

Gateway Qualifications monitors the maintenance of qualification standards through its quality assurance activity. In order to maintain standards there may be occasions where it is necessary to change the overall grade threshold. In the event of a change notification will be communicated to centres.

Example 1

Achievement of pass qualification grade

Units	**Grade**	**Grade Points**	**Credit**	**Total Unit Points** (credit x grade)
Carrying out a Science or Technology Project	Pass	5	6	30
Effective Communication in the Workplace	Pass	5	3	15
Chemistry and Our Earth	Pass	5	6	30

Energy and Our Universe	Pass	5	6	30
The Living Body	Merit	6	6	36
Electronics in Action	Merit	6	6	36
Qualification Points totals			**33**	**177**

Example 2

Achievement of a merit qualification grade

Units	**Grade**	**Grade Points**	**Credit**	**Total Unit Points** (credit x grade)
Carrying out a Science or Technology Project	Distinction	7	6	42
Effective Communication in the Workplace	Pass	5	3	15
Chemistry and Our Earth	Distinction	7	6	42
Energy and Our Universe	Distinction	7	6	42
The Living Body	Pass	5	6	30
Electronics in Action	Pass	5	6	30
Qualification Points totals			**33**	**201**

1.5. Geographical Coverage

This qualification has been approved by Ofqual to be offered in England.

If a centre based in Wales, Northern Ireland or overseas (including Scotland) would like to offer this qualification, they should make an enquiry to Gateway Qualifications.

1.6. Progression Opportunities

These qualifications allow learners to progress to qualifications in applied science or technology or related areas at a higher level or to study of particular aspects of science and technology in greater depth. They also provide learners with the opportunity to acquire knowledge and skills that would support progression to employment in Science or Technology or a related field.

1.7. Relationship with other frameworks

The Gateway Qualifications Applied Science and Technology qualifications cover some of the material in the Science National Curriculum.

1.8. Funding

For information regarding potential sources of funding please visit the following websites;

The Education Funding Agency http://www.gov.uk/efa
The Skills Funding Agency https://www.gov.uk/sfa.

1.9. Equality, Diversity and Inclusion

It is Gateway Qualifications' aim that there shall be equal opportunities within this organisation and in all the services it provides and within its recognised centres and via the services they provide and so meet the organisation's legal responsibilities to prevent discrimination.

In particular it is the organisation's intention that there should be no discrimination on the grounds of a protected characteristic including age, disability, gender assignment, marriage and civil partnership, pregnancy and maternity, race, religion and belief, sex, sexual orientation. It is acknowledged that this is not an exhaustive list.

2. Learner Entry Requirements

2.1. Age

The qualifications have been approved for learners aged 16-18 and 19+.

2.2. Prior Qualifications or Units

There is no requirement for learners to have achieved prior qualifications.

2.3. Prior Skills/Knowledge/Understanding

There is no requirement for learners to have prior skills, knowledge or understanding. However to access the qualifications learners should ideally have achieved mathematics at level 1 and be working towards level 2.

2.4. Restrictions

There are no restrictions to entry. However learners should have undertaken relevant initial assessments to ensure that they are following an appropriate learning programme leading to the summative assessment.

2.5. Access to qualifications for learners with disabilities or specific needs

Gateway Qualifications and recognised centres have a responsibility to ensure that the process of assessment is robust and fair and allows the learner to show what they know and can do without compromising the assessment criteria.

Gateway Qualification has a duty to permit a reasonable adjustment where an assessment arrangement would put a disabled person at a substantial disadvantage in comparison to someone who is not disabled.

The following adaptations are examples of what may be considered for the purposes of facilitating access, as long as they do not impact on any competence standards being tested:

- adapting assessment materials;
- adaptation of the physical environment for access purposes;
- adaptation to equipment;
- assessment material in an enlarged format or Braille;
- assessment material on coloured paper or in audio format;
- British Sign Language (BSL);
- changing or adapting the assessment method;

- changing usual assessment arrangements;
- extra time, e.g. assignment extensions;
- language modified assessment material;
- practical assistant;
- prompter;
- providing assistance during assessment;
- reader;
- scribe;
- transcript;
- use of assistive software;
- using assistive technology;
- use of CCTV, coloured overlays, low vision aids;
- use of a different assessment location;
- use of ICT/responses using electronic devices.

It is important to note that not all of the adjustments (as above) will be reasonable, permissible or practical in particular situations. The learner may not need, nor be allowed the same adjustment for all assessments.

Learners should be fully involved in any decisions about adjustments/adaptations. This will ensure that individual needs can be met, whilst still bearing in mind the specified assessment criteria for a particular qualification.

A reasonable adjustment for a particular learner may be unique to that individual and may not be included in the list of available access arrangements specified above.

Special Considerations

Requests for special consideration should be submitted as soon as possible. Please refer to the Reasonable Adjustments and Special Consideration Policy.

2.6. Additional Requirements/Guidance

There are no additional rules or guidance regarding learner entry requirements.

2.7. Recruiting Learners with Integrity

It is vital that centres recruit with integrity with regard to qualifications. Centres must ensure that learners have the correct information and advice on their selected qualification(s) and that the qualification(s) will meet their needs.

The recruitment process must include the centre assessing each potential learner and making justifiable and professional judgements about the learner's potential to successfully complete the assessment and achieve the qualification. Such an assessment must identify, where appropriate, the support that will be made available to the learner to facilitate access to the qualification(s).

3. Achieving the Qualification

3.1. Qualification Structure (Rules of Combination and Unit List)

The knowledge, skills and understanding that will be assessed as part of the qualification are set out within the unit specifications. These include the learning outcomes and associated assessment criteria.
For information on Recognition of Prior Learning/Exempt and Equivalent units please see section **3.2 Recognition of Prior Learning (RPL)/Exemptions/Equivalencies**

Gateway Qualification Level 2 Certificate In Science and Technology

Learners must complete a total of 33 credits. Learners must achieve 9 credits from the Mandatory Group (M) and 24 credits from the Optional Group (O).

Mandatory

Learners must complete 9 credits from this group.

Unit Reference Number	Unit Title	Level	Guided Learning	Credit Value
L/505/5361	Carrying Out a Science or Technology Project	2	48	6
H/504/6312	Effective Communication in the Workplace	2	30	3

Optional

Learners must complete 24 credits from this group.

Unit Reference Number	Unit Title	Level	Guided Learning	Credit Value
D/505/5350	Chemistry and Our Earth	2	48	6
H/505/5351	Energy and Our Universe	2	48	6
K/505/5352	Biology and Our Environment	2	48	6
M/505/5353	Electronics in Action	2	48	6
J/505/5357	The Living Body	2	48	6

3.2. Recognition of Prior Learning

Recognition of Prior Learning (RPL) provides learners and Centres with an alternative assessment method by which a learner's previous achievements can meet the assessment requirements for a unit/qualification through the knowledge, understanding or skills that they already possess and so, do not need to develop these through a course of learning.

It enables the recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable to contribute to a unit, units or a whole qualification according to the RPL criteria for a given qualification.

The recognition of prior learning is permitted for this qualification and includes the prior attainment of units on a qualification offered by Gateway Qualifications, e.g. where a learner progresses from a smaller qualification to a larger qualification and where the qualifications have shared content such as an Award, Certificate and/or Diploma.

Centres should refer to the Gateway Qualifications' Recognition of Prior Learning policy and follow the process available on the website.

3.3. Links to other qualifications

The qualification is for learners interested in Science and Technology but who have not studied or achieved GCSEs in these subjects. It is part of a coherent suite of qualifications that Gateway Qualifications has developed in Science, Technology and Engineering. It is intended to give learners the knowledge, understanding and skills that will enable them to progress to further learning or training qualifications in a Science and Technology related area including Engineering or Health Sciences at a higher level and supports the Government's Industrial Strategy in the following sector subject areas: aerospace; automotive; life sciences; agricultural technologies; nuclear. It is unique to other qualifications available as the qualification includes both subject specific learning and the opportunity to develop and gain recognition for applying English skills.

4. Assessment and Quality Assurance

The following are in addition to the standard assessment and quality assurance requirements set out in the Gateway Qualifications Centre Handbook.

4.1. Method of Assessment

The method of assessment for the qualifications is through a portfolio of evidence.

4.2. Assessment Materials

There are no specific assessment materials provided for this qualification.

4.3. Qualification-Specific Centre Requirements

Centres must ensure that they have the appropriate resources in place when delivering performance units from vocational areas.

4.4. Qualification-Specific Tutor/Assessor Requirements

Tutor/Assessors must be fully qualified and experienced in the subject area in which they are delivering, details of which must be provided to Gateway Qualifications as part of the Qualification Approval application.

4.5. Qualification-Specific Quality Assurance Requirements

There are no additional internal/external quality assurance requirements for this/these qualification.

4.6. Additional Requirements/Guidance

There are no additional requirements that Learners must satisfy in order for assessment to be undertaken and the unit/qualification to be awarded.

5. What to do next

For existing centres please contact your named Development Manager or Development Officer.

For organisations, not yet registered as Gateway Qualifications centre please contact:

Gateway Qualifications
Gateway House
3 Tollgate Business Park
Colchester
CO3 8AB

Tel: 01206 911211

Email: enquiries@gatewayqualifications.org.uk

6. Gateway Qualifications

Gateway Qualifications, a not for profit registered charity, is an Awarding Organisation based in Colchester.

We work with learning providers and industry experts to design and develop qualifications that benefit the learner and the employer.

We support flexible, responsive and quality assured learning opportunities whether it's in the classroom, at work, in the community or through distance learning.

We are recognised by Ofqual, to design, develop and submit qualifications to the Regulated Qualifications Framework (RQF).

7. Appendices

7.1. Appendix 1 – Unit Details

Carrying Out a Science or Technology Project

Level: Level 2

Credit Value: 6

GLH: 48

Unit Reference Number: L/505/5361

This unit has 5 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
1. Be able to identify and select a science or technology project.	1.1 Agree a suitable topic and scope for a science or technology project. 1.2 Explain why they have chosen the particular topic or focus for the project. 1.3 Identify intended project outcomes and actions they need to take to achieve these (e.g. specific experiments or data collection). 1.4 Outline skills for example scientific, project-management, needed to complete project.	M(i) Explain what they hope to achieve through the project. M(ii) Give reasons why each action is required. M(iii) Describe how these skills will be deployed. M(iv) Produce a plan for the project which includes timelines, order of activities, resources and facilities needed.	D(i) Explain how this will contribute to their understanding of a particular area of science or technology. D(ii) Produce a well-organised and clear plan for the project which includes timelines, order of activities, resources and facilities needed and contingencies.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
	1.5 Plan how to meet agreed deadlines.		
2. Be able to carry out research for a science or technology project.	2.1 Identify different sources of information relevant to the project. 2.2 Select data that is relevant and reliable. 2.3 Reference evidence and information appropriately.	M(v) Recognise the relative reliability and bias in different sources M(vi) Select and combine data from different sources.	D(iii) Analyse data systematically to determine its relevance and reliability
3. Be able to undertake activity to complete a science or technology project.	3.1 Carry out the necessary actions to complete the science or technology project. 3.2 Apply appropriate skills and knowledge to complete the project.	M(vi) Make on-going adjustments where needed. M(vii) Apply a range of relevant scientific skills and knowledge to complete the project.	D(iv) Follow contingency plan where necessary. D(v) Apply and extend own scientific skills and knowledge to complete the project.
4. Be able to present a science or technology project.	4.1 Select appropriate information to include in a presentation, including method and findings or conclusions. 4.2 Use appropriate format and language, including scientific terms, to present project outcomes to a specific audience.	M(viii) Sequence information to ensure a logical flow.	D(vi) Include a summary of key points and highlight the most important outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
5. Be able to evaluate science or technology project outcomes and own performance.	5.1 Review own performance in planning, carrying out and presenting outcomes from a science or technology project, identifying what went well and what could be improved.	M(ix) Determine the success criteria of a good presentation and use these to make suggestions for improving performance.	D(vii) Evaluate how well each success criterion was met 5.2 Summarise scientific or technological knowledge and skills gained.

Effective Communication in the Workplace

Level: Level 2

Credit Value: 3

GLH: 30

Unit Reference Number: H/504/6312

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
1. Understand the importance of effective communication in the workplace.	1.1. Explain how effective communication creates a positive impression of the organisation on the customer. 1.2. Explain how effective communication between colleagues enables work to be completed to a high standard. 1.3. Describe the possible impact of poor communication on an organisation.	M(i) Evaluate the key features of effective communication in a specific workplace.	

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
2. Know how different types of communication are appropriate for different situations.	2.1. Describe the main types of communication, oral and written, used in organisations. 2.2. Explain why different types of communication are required for different circumstances and when communicating with different people.	M(ii) Compare and contrast the different approaches taken by an organisation when presenting similar information to two different audiences	D(i) Evaluate the effectiveness of a specific document or other form of communication in presenting information to its intended audience.
3. Use appropriate forms of written communication.	3.1. Select appropriate formats of written communication for different purposes. 3.2. Produce documents that are clearly and accurately presented and appropriate for the audience.	M(iii) Produce documents that combine visual and text-based information	D(ii) Produce a document that presents complex information in a way that is accessible to the intended audience
4. Use appropriate forms of oral communication.	4.1. Communicate clearly in speech in different workplace situations, adjusting register and tone to match the audience and purpose of the communication.	M(iv) Evaluate the advantages and disadvantages of two possible approaches to the oral presentation of a specific piece of information or issue, in order to select the most appropriate.	D(iii) Use oral communication to present complex information or issues, in a manner appropriate to the audience and purpose of the communication

Chemistry and Our Earth

Level: Level 2
Credit Value: 6
GLH: 48
Unit Reference Number: D/505/5350

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
1. Know how uses of chemical substances depend upon their chemical and physical properties.	1.1 Describe physical and chemical properties of chemical substances. 1.2 Describe how chemical substances are used based on their physical properties. 1.3 Describe how chemical substances are used based on their chemical properties.	M(i) Explain how physical and chemical properties of chemical substances make them suitable for their uses.	D(i) Explain why a range of chemical substances have particular physical properties.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
2. Know about chemical reactivity and bonding.	2.1 Describe the physical and chemical properties of group 1 and 7 elements. 2.2 Describe the formation of ionic compounds in terms of electron transfer. 2.3 Describe the formation of covalent compounds in terms of electron sharing. 2.4 Relate properties of typical ionic and covalent compounds to their bonding.		D(ii) Explain how the properties of given elements and compounds relate to their atomic and molecular structure respectively.
3. Be able to investigate the factors that affect the rate of chemical reactions.	3.1 Describe the factors that can affect the rates of chemical reactions. 3.2 Carry out an investigation to establish how factors affect the rates of chemical reactions.	M(iii) Explain how given factors affect the rate of chemical reactions.	
4. Know the factors that are affecting the Earth and its environment.	4.1 Describe human activities that are affecting the Earth and its environment. 4.2 Describe natural factors that have changed the surface and atmosphere of the Earth over time.	M(iv) Explain how a range of human activities are affecting the Earth and its environment. M(v) Explain how natural factors have changed the surface and atmosphere of the Earth over time.	D(iii) Make predictions as to how human activities and/or natural factors might affect the Earth and its environment in the future.

Electronics in Action

Level: Level 2
Credit Value: 6
GLH: 48
Unit Reference Number: M/505/5353

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
1. Know the components used in electronic systems.	1.1 Use circuit symbols to identify components of an electronic circuit. 1.2 Identify the specific requirements of some electronic components e.g. need to be connected the correct way round. 1.3 Identify the components that are used as input transducers, processors and output transducers in simple electronic systems.	M(i) Describe the action of a sensing component as part of an input transducer in an electronic system. M(ii) Describe the action of an output transducer as part of an electronic system. M(iii) Describe the action of a processor in a simple electronic system.	D(i) Explain the action of a sensing component as part of an input transducer in an electronic system. D(ii) Explain the action of an output transducer as part of an electronic system. D(iii) Explain the action of a processor in a simple electronic system.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
2. Be able to carry out electrical measurements on electronic circuits safely.	2.1 Identify the appropriate range required on a multi-meter to make a measurement. 2.2 Measure the resistance of a given resistor using the ohms range.	M(iv) Measure the resistance of a number of resistors using the ohms range. M(v) Measure the voltage across a resistor, input transducer and output transducer in an electronic circuit safely.	
3. Be able to safely construct an electronic system to help solve an identified problem.	3.1 Identify the input, processor and output of an electronic system. 3.2 Produce and use a drawing (systems or circuit) which will support the construction of the electronic solution to an identified problem. 3.3 Assemble an electronic system, which contains an active device that could be used to help solve an identified problem.	M(vi) Identify the input, processor and output of an electronic system to help solve an identified problem. M(vii) Explain how the electronic system will help solve the identified problem.	D(iv) Describe the limitations of the working electronic system.
4. Be able to assess the constructed electronic system safely.	4.1 Perform an electrical test on the constructed electronic system safely.	M(viii) Explain the outcomes of the electrical test.	D(v) Explain how the working electronic system can be further improved.

Electronic Devices and Communications Applications

Level: Level 2

Credit Value: 6

GLH: 48

Unit Reference Number: H/505/5365

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA	Merit	Distinction
The learner will:	**The learner can:**		
1. Know the types of signals and units of measurements used in electronic systems.	1.1. Describe the type of signals produced by electronic devices including the correct units of measurement.		
2. Know the functions of electronic components and devices.	2.1. Describe the functions of electronic components and devices. 2.2. Identify BS symbols and the physical forms of given electronic components and devices.		D(i) Justify the choice of components and devices to ensure the correct functionality of an electronic circuit.

LEARNING OUTCOMES	ASSESSMENT CRITERIA	Merit	Distinction
The learner will:	**The learner can:**		
3. Be able to construct and test analogue and digital electronic circuits.	3.1. Construct a passive circuit using at least two different methods of construction. 3.2. Construct and test the operation of an analogue circuit. 3.3. Construct and test the operation of a digital electronic circuit.	M(i) Explain the operation of an analogue electronic circuit and a digital electronic circuit.	
4. Understand electronic communication systems and data transmission.	4.1. Explain how electronic communication is achieved. 4.2. Explain how electronic communication systems can be used to successfully transfer data.	M(ii) Explain the function of repeaters and regenerators for communication over longer distances and how they are used.	D(ii) Explain the advantages of two given electronic communication systems.

The Living Body

Level: Level 2
Credit Value: 6
GLH: 48
Unit Reference Number: J/505/5357
Unit Review Date: 31-Aug-2018

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
1. Know the role of enzymes as catalysts.	1.1. Describe the key features of enzymes. 1.2. Outline the role of enzymes as catalysts.	M(i) Describe the involvement of different types of enzymes in metabolic processes. M(ii) Explain the factors affecting the function of enzymes.	D(i) Explain how enzymes fulfil their function. D(ii) Explain how enzymes lower the activation energy required for a reaction.
2. Understand body systems.	2.1 Describe the structure of the digestive, respiratory, circulatory and renal systems. 2.2 Outline the function of each system in maintaining health.	M(iii) Explain how the respiratory and circulatory systems interact to maintain body functions.	D(iii) Explain consequences for the body when one of these systems fail.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
3 Know how the nervous and endocrine systems work.	3.1 Describe the components of a simple reflex arc. 3.2 Identify the functions of the main endocrine glands. 3.3 Describe how the nervous and endocrine systems work to coordinate the body systems.	M(iv) Explain how the structure of each of the components in a reflex arc assists in its function. M(v) Describe the functions of given hormones released by each of the endocrine glands.	D(iv) Describe the importance of negative feedback in endocrine control. D(v) Explain how the endocrine and nervous systems work together to maintain homeostasis.
4 Know the structure and functions of the human reproductive system.	4.1 Outline the structure and functions of the male and female human reproductive system.	M(vi) Describe the structure and functions of the male and female human reproductive system. M(vii) Describe how gametes are produced. M(viii) Describe fertilization.	D(vi) Explain how the structure of given organs in the male and female human reproductive system are related to their functions. D(vii) Explain why gametes need half the number of chromosomes of somatic cells. D(viii) Describe fertilisation in terms of cellular and intracellular changes.

Energy and Our Universe

Level: Level 2
Credit Value: 6
GLH: 48
Unit Reference Number: H/505/5351

This unit has 6 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
1. Be able to investigate energy transformations.	1.1 Carry out practical investigations that demonstrate how various types of energy can be transformed.	M(i) Describe the energy transformations and identify useful and non-useful energy changes in these investigations. M(ii) Draw Sankey diagrams to represent various energy transformations.	D(i) Explain how non-useful energy transformations in the home or workplace can be minimised. D(ii) Explain how minimising non-useful energy transformations can reduce the impact on the environment.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
2. Know properties and applications of waves and radiation.	2.1 Describe the trends and patterns in the electromagnetic spectrum. 2.2 Give examples of radio and light radio waves being used in communication.	M(iii) Explain the trends and patterns in the electromagnetic spectrum. M(iv) Explain the advantages of wireless communication.	D(iii) Compare and contrast two different communication systems, e.g. those that use light waves with radio waves or wired with wireless.
3. Know properties and applications of ionising radiations.	3.1 Describe different types of ionising radiations. 3.2 Identify one application of each of the ionising radiations in the modern world. 3.3 Describe the benefits that using ionising radiations brings to the modern world.	M(v) Compare the benefits and drawbacks of using ionising radiations.	D(iv) Explain how the safety mechanisms needed when using ionising radiations work.
4. Know how electrical energy that is generated from different sources can be transferred to electric circuits in the home and industry.	4.1 Describe methods of generating electricity from different energy sources. 4.2 Describe the stages involved in transferring electrical energy from a power station to homes or industry.	M(vi) Compare the efficiency and environmental impact of electricity generated by different sources. M(vii) Assess, in qualitative terms, ways to minimise 'energy losses' when generating electricity.	D(v) Assess in quantitative terms, ways to minimise 'energy losses' when generating electrical energy.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS	MERIT	DISTINCTION
The learner will:	**The learner can:**	**In addition to the pass criteria, the learner can:**	**In addition to the pass and merit criteria, the learner can:**
5. Know the components of the solar system and the way the universe is changing.	5.1 Explain the structure of the universe and our solar system. 5.2 Identify trends and patterns in given quantitative data about the components in the solar system. 5.3 Identify evidence that shows the dynamic nature of the universe.	M(viii) Describe and compare scientific evidence that exists to show how the universe is changing.	D(vi) Analyse trends and patterns in given quantitative data about the components in the solar system to make predictions.
6. Know the methods used to explore space.	6.1 Describe different methods used to observe the universe.	M(ix) Describe the suitability of different methods for observing the universe.	

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