



National Unit Specification: general information

UNIT Electricity in the Home (SCQF level 5)

CODE F5HR 11

SUMMARY

This Unit is designed for candidates who wish to know and understand how electricity is supplied to the home and within the home and how electricity should be used safely and efficiently.

The aims of this Unit are to provide candidates with opportunities to develop a knowledge and understanding of the ways in which electricity is generated, transmitted and distributed to the home, how it is distributed in the home, how to use electricity safely and what to do in the event of someone receiving an electric shock. Candidates will also gain knowledge of ways to save on electricity costs.

This Unit may form part of a National Qualification Group Award or may be offered on a free-standing basis.

OUTCOMES

- 1 Describe the sequence of public electrical supply and the ways in which renewable energy sources are contributing to this supply.
- 2 State the purpose of electrical distribution in the home.
- 3 Describe the safe use of electricity in the home.
- 4 State methods for disconnecting a victim from a source of electric shock and perform resuscitation techniques on a victim.
- 5 State methods of reducing electrical energy costs in the home.

RECOMMENDED ENTRY

Entry is at the discretion of the centre.

Administrative Information

Superclass: XJ

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National Unit Specification: general information (cont.)

UNIT Electricity in the Home (SCQF level 5)

CREDIT VALUE

1 credit at SCQF level 5 (6 SCQF credit points at SCQF level 5)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

CORE SKILLS

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

The Unit provides opportunities for candidates to develop aspects of the following Core Skill:

- ◆ Working with Others (SCQF level 4)

These opportunities are highlighted in the Support Notes of this Unit Specification.

National Unit Specification: statement of standards (cont.)

UNIT Electricity in the Home (SCQF level 5)

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.

OUTCOME 1

Describe the sequence of public electrical supply and the ways in which renewable energy sources are contributing to this supply.

Performance Criteria

- (a) State correctly current fuel sources of electrical generation.
- (b) Describe correctly the purpose of the National Grid System.
- (c) State correctly ways in which electrical energy is distributed to the home.
- (d) Describe correctly the contributions that renewable energy sources are making to supplying electricity to the home.

OUTCOME 2

State the purpose of electrical distribution in the home.

Performance Criteria

- (a) State the typical voltage, currents and frequency used in an electrical installation in the home.
- (b) State correctly the purpose of the consumer Unit in an electrical installation in the home.
- (c) State correctly the use of ring and radial circuits in an electrical installation in the home.
- (d) State correctly the purpose of earthing in an electrical installation in the home.
- (e) Sketch clearly the intake equipment of an electrical supply to the home.

OUTCOME 3

Describe the safe use of electricity in the home.

Performance Criteria

- (a) Explain the meaning of the term power rating of electrical appliances.
- (b) Calculate correctly the current taken by electrical appliances of known power rating and thus determine correctly the fuse ratings of the appliances.
- (c) Describe clearly the types and ratings of electrical safety devices used in the home.
- (d) State correctly examples of good electrical safety practice in the home.

Unit Specification: statement of standards (cont)

UNIT Electricity in the Home (SCQF level 5)

OUTCOME 4

State methods for disconnecting a victim from a source of electric shock and perform resuscitation techniques on a victim.

Performance Criteria

- (a) Describe clearly the effects of electric shock on the human body.
- (b) State correctly methods of disconnecting a victim from a source of electrical power.
- (c) Perform correctly mouth to mouth resuscitation techniques.
- (d) Perform correctly cardiac massage techniques.

OUTCOME 5

State methods of reducing electrical energy costs in the home.

Performance Criteria

- (a) Interpret correctly a domestic electricity bill.
- (b) State correctly what steps may be taken to improve the energy efficiency of electrical equipment used in the home.
- (c) State correctly measures that may be taken to reduce the cost of electrical space heating in the home.
- (d) State correctly other methods of reducing electrical energy costs in the home.

EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

Written and/or recorded oral evidence and performance evidence supplemented with an assessor observation checklist(s) should be produced to demonstrate that the candidate has achieved all the Outcomes and Performance Criteria.

Outcomes may be assessed on an individual basis, or as combinations of Outcomes (eg Outcomes 1, 2, 3 and 5 together and Outcomes 4 on its own). Total assessment time for Outcomes 1, 2, 3 and 5 must not exceed 1 hour 30 minutes. Assessment(s) for Outcomes 1, 2, 3 and 5 must be conducted under supervised, closed-book conditions in which candidates may use reference materials provided by the centre but are not allowed to bring their own notes, handouts, textbooks or other materials into the assessment. Candidates may use a scientific calculator during assessment.

Assessment for Outcome 4 should be conducted under supervised conditions. Centres should use a checklist(s) to record evidence that candidates have successfully achieved, or not, the Performance Criteria in Outcome 4.

National Unit Specification: statement of standards (cont)

UNIT Electricity in the Home (SCQF level 5)

With regard to Outcome 1:

- ◆ candidates should state three current fuel sources for electrical generation
- ◆ candidates should describe two examples of how renewable energy sources contribute to the supply of electricity to the home

With regard to Outcome 2:

- ◆ candidates should state typical current values for lighting and power circuits

With regard to Outcome 3:

- ◆ calculations/fuse ratings should be performed on two different electrical appliances
- ◆ candidates should state two examples of electrical safety devices
- ◆ candidates should state three examples of good electrical safety practice in the home

With regard to Outcome 5:

- ◆ candidates should state two steps to improve the energy efficiency of electrical equipment used in the home
- ◆ candidates should state three measures that can be taken to reduce the cost of electrical space heating in the home
- ◆ candidates should state two other methods of reducing their electrical energy costs in the home

National Unit Specification: support notes

UNIT Electricity in the Home (SCQF level 5)

This part of the Unit Specification is offered as guidance. The support notes are not mandatory. While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This is an optional Unit within the National Certificate in Electrical Engineering at SCQF level 5. This Unit has been designed to allow candidates to develop a knowledge and understanding of how electricity is supplied to the home and within the home and how electricity should be used safely and efficiently. As such it is suitable to be included in any National Qualification Group Award where this subject matter is applicable to the aims of the Award. The Unit may also be offered on a free-standing basis.

The Unit has been designed to provide candidates with opportunities to develop a knowledge and understanding of the ways in which electricity is generated, transmitted and distributed to the home, how it is distributed in the home, how to use electricity safely and what to do in the event of someone receiving an electric shock. Candidates will also gain knowledge of ways to save on their electricity costs.

The list below shows a suggested range of topics which may be delivered to candidates to support and underpin the requirements set out in the Outcomes, Performance Criteria and Evidence Requirements.

Public provision of electricity:

- ◆ identify different sources of electrical generation (eg oil, gas, nuclear, hydroelectric, wind etc)
- ◆ describe the purpose of the National Grid system
- ◆ identify the ways electrical energy is distributed to the home
- ◆ identify the contribution renewable energy is making to electrical energy supplies to the home (eg hydroelectric schemes, wind farms, solar panels, microgeneration systems etc)

Electrical Installation in the home:

- ◆ develop basic knowledge and understanding of electrical installations in the home to include the following:
 - Consumer Unit
 - Ring Circuits (eg power)
 - Radial Circuits (eg lighting, electric cooker, electric shower)
 - Earthing
 - Intake equipment

Safe use of electricity in the home:

- ◆ power and power ratings of appliances
- ◆ simple current calculations and fuse ratings of electrical appliances

National Unit Specification: support notes (cont)

UNIT Electricity in the Home (SCQF level 5)

- ◆ safety devices and ratings of fuses, MCBs and RCDs
- ◆ good practices (eg not overloading of adapters, not using appliances with worn cables, no cracked or loose accessories, safe use of portable electrical equipment etc)

Resuscitation and Cardiac Techniques:

- ◆ explore physiological effects of electric shock
- ◆ state methods of disconnecting a victim from an electrical source
- ◆ perform mouth to mouth resuscitation techniques
- ◆ perform cardiac massage techniques

Efficient use of electricity:

- ◆ interpret a typical domestic electricity bill in terms of actual and estimated readings and Unit costs
- ◆ explore methods of reducing electricity costs such as the following:
 - steps to improve energy efficiency of electrical equipment (eg use of energy efficient light bulbs, reduced temperature cycles in washing machines, not leaving electrical appliances on stand-by etc)
 - electrical space heating home improvement measures such as loft insulation, draught exclusion, double glazing, cavity wall insulation etc
 - changing energy supplier
 - use of renewable supplies

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

This Unit may be delivered by a combination of lectures, group work, investigations using paper based and electronic sources and practical demonstrations. The Unit should be delivered in a candidate centred, informative and interesting manner with the emphasis being on getting key facts across about the safe and efficient use of electricity. Pictures, block and line diagrams, charts, video/DVD clips, practical examples of electrical materials and accessories (including defective materials and accessories) should be used to support the delivery of the Unit.

Emergency resuscitation techniques must be delivered and assessed by a suitably qualified person.

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

Candidates may have opportunities to develop the *Working with Others* Core Skill while discussing issues relating to the content of the Unit such as the safe use of electricity and reducing their electrical energy costs.

National Unit Specification: support notes (cont)

UNIT Electricity in the Home (SCQF level 5)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Opportunities for the use of 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 communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

Assessment of Outcomes 1, 2, 3 and 5 may be in the form of an assessment paper comprising of short answer questions (possibly multi-choice questions). This assessment paper may be suitable for on-line delivery.

Outcome 4 may be assessed by candidates undertaking a practical based exercise involving mouth to mouth resuscitation and cardiac techniques on a dummy.

DISABLED CANDIDATES AND/OR THOSE WITH ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements