



National Unit specification: general information

Unit title: Stringed Instruments: Material Science for Stringed Instruments (SCQF level 6)

Unit code: H1Y9 12

Superclass: LJ

Publication date: August 2012

Source: Scottish Qualifications Authority

Version: 01

Summary

The purpose of this Unit is to provide knowledge and understanding about the principal materials used to construct stringed musical instruments. Candidates will study material preparation by investigating timber growth, conversion and usage. The properties of a range of timbers and glues will be outlined and the relevance of different materials in instrument construction will also be examined.

This is a mandatory Unit within the National Certificate in Stringed Musical Instrument Making and Repair (SCQF level 6) but can be taken as a free-standing Unit.

This Unit is suitable for candidates who are studying instrument construction and repair or for those interested in studying the materials used in the manufacture of musical instruments.

Outcomes

- 1 Describe the principal materials used for stringed instrument construction.
- 2 Describe the main methods of material preparation.
- 3 Describe the relevance of the materials to stringed musical instruments.

Recommended entry

Entry is at the discretion of the centre.

General information (cont)

Unit title: Stringed Instruments: Material Science for Stringed Instruments (SCQF level 6)

Credit points and level

1 National Unit credit at SCQF level 6: (6 SCQF credit points at SCQF level 6*)

**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

Opportunities to develop aspects of Core Skills are highlighted in the support notes of this Unit specification.

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

National Unit specification: statement of standards

Unit title: Stringed Instruments: Material Science for Stringed Instruments (SCQF level 6)

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

Identify the principal materials used for stringed instrument construction.

Performance Criteria

- (a) The materials are correctly named.
- (b) The physical appearance of the materials is correctly stated.
- (c) The chemical composition of the materials is correctly stated.
- (d) The physical properties of the materials are correctly stated.

Outcome 2

Describe the main methods of material preparation.

Performance Criteria

- (a) Sources of the materials are correctly described using the correct botanical names.
- (b) Timber cutting procedures are correctly described.
- (c) Methods of material preparation are correctly described.
- (d) Methods used to evaluate the relevant physical properties of the materials are correctly described.

Outcome 3

Describe the relevance of the materials to stringed musical instruments.

Performance Criteria

- (a) The position of the material on the musical instrument is correctly described.
- (b) The relevant physical characteristics of the material are correctly described.
- (c) The justification for the use of the material on musical instruments is correctly described.
- (d) Appropriate alternative materials are correctly stated.

National Unit specification: statement of standards (cont)

Unit title: Stringed Instruments: Material Science for Stringed Instruments (SCQF level 6)

Evidence Requirements for this Unit

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

For Outcome 1, PC (a) and (b), performance evidence is required to show that a minimum of 12 wood samples can be visually identified and named. This should be gathered under closed-book conditions.

For Outcome 1 PC (a) and Outcome 2 PC (a), written and/or oral evidence is required which shows that candidates can describe the places of origin for a minimum of ten species of timber, including the use of correct botanical names.

For Outcome 1, PC (b), (c) and (d), written and/or oral evidence to demonstrate that candidates can identify the correct name, the physical appearance, the general chemical makeup and the physical properties of eight from the following list:

- ◆ bark
- ◆ cambium
- ◆ phloem
- ◆ xylem
- ◆ sapwood
- ◆ heartwood
- ◆ pith
- ◆ tracheids
- ◆ parenchyma
- ◆ pits
- ◆ vessels
- ◆ fibre

For Outcome 2, PC (b), (c) and (d), written and/or oral evidence is required which demonstrates that candidates can describe the preparation of materials including the following:

- ◆ timber cutting
- ◆ drying
- ◆ converting
- ◆ defects

For Outcome 3, PC (b) and (c), a minimum 200 words written and/or oral evidence is required which demonstrates that candidates can describe the properties and use of four glues, including Titebond (Aliphatic resin) and Animal glue. Evidence should be gathered under open-book conditions.

For Outcome 3, PC (a) and (d), written and/or oral evidence is required which demonstrates that candidates can describe the relevance of materials to musical instruments. The description must include the position of the material on the instrument, the justification for its use and appropriate alternative materials.

National Unit specification: support notes

Unit title: Stringed Instruments: Material Science for Stringed Instruments (SCQF level 6)

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

Candidates completing this Unit will be working towards aspects of the following National Occupational Standards (NOS) from Creative and Cultural Skills.

- ◆ Craft: CR13 Select and use techniques, materials, tools and equipment for craft
- ◆ Craft: CR14 Prepare and maintain materials, tools and equipment for craft
- ◆ Craft: CR15 Use safe working practices and spaces for craft
- ◆ Craft: CR16 Complete the craft making process
- ◆ Craft: CR17 Document and record craft work and work practice
- ◆ Craft: CR51 Maintain and repair craft work
- ◆ Craft: CR52 Restore, conserve and reconstruct work in craft
- ◆ Craft: CR56 Make sure your own actions reduce risks to health and safety

This is a mandatory Unit within the National Certificate in Stringed Musical Instrument Making and Repair (SCQF level 6) but can be taken as a freestanding Unit.

This Unit provides knowledge and understanding of the principal materials used to construct stringed musical instruments, with several topics that may be considered. The main focus of the examination of instrument making materials is likely to consist of the timbers that are commonly used in construction together with the glues utilised to bond the timber components.

This examination of materials might include the ability to name and describe the appearance, physical properties and chemical makeup of materials. The following materials could be discussed:

- ◆ ebony
- ◆ mahogany
- ◆ maple or sycamore
- ◆ rosewood
- ◆ European spruce
- ◆ pernumbuco
- ◆ cedar
- ◆ western red cedar
- ◆ walnut
- ◆ boxwood
- ◆ sitka spruce
- ◆ cherry
- ◆ beech
- ◆ oak
- ◆ ash
- ◆ cypress

National Unit specification: support notes (cont)

Unit title: Stringed Instruments: Material Science for Stringed Instruments (SCQF level 6)

To facilitate an understanding of the physical properties, appearance and chemical makeup of these materials the following items will be studied:

- ◆ bark
- ◆ cambium
- ◆ phloem
- ◆ sylem
- ◆ sapwood
- ◆ heartwood
- ◆ pith
- ◆ tracheids
- ◆ parenchyma
- ◆ pits
- ◆ vessels
- ◆ fibre

By relating some or all of the above to timber samples and through visual recognition, candidates could learn to identify a range of timbers. Other materials such as bone, plastic, shell, horse hair, rosin, steel, gut, nylon, silver and brass might also be included for investigation where appropriate.

Candidates should receive information about tree growth, timber conversion, timber usage and timber defects. The following related topics could be included:

- ◆ the direction a log will most easily split
- ◆ systems of timber conversion
- ◆ methods of drying timber
- ◆ identification of natural timber defects
- ◆ identification of timber seasoning defects
- ◆ methods of treatment for insect infestation
- ◆ timber moisture content
- ◆ timber shrinkage

The physical properties such as strength and durability of glues could be explored through the use of a tensometer, testing the suitability of glue types under specific conditions, eg hot environment, damp environment, speed of assembly, etc.

The glues tested could include:

- ◆ Titebond (Aliphatic resin)
- ◆ Animal glue
- ◆ Superglue
- ◆ Epoxy

A range of wood samples can also be used in the tensometer tests.

National Unit specification: support notes (cont)

Unit title: Stringed Instruments: Material Science for Stringed Instruments (SCQF level 6)

Guidance on learning and teaching approaches for this Unit

Tutor input in the form of a series of lectures will provide the information for most Outcomes.

In Outcome 1 candidates could work in pairs to practice visually identifying timbers. Wood samples can be provided for identification. Photographs showing the constituent parts of a tree can be provided with actual examples provided where it is practical to do so.

Recommended examples include:

- ◆ bark
- ◆ cambium
- ◆ phloem
- ◆ xylem
- ◆ sapwood
- ◆ heartwood
- ◆ pith
- ◆ tracheids
- ◆ parenchyma

It will be necessary to provide magnification in order to view some of the above items.

In Outcome 2 it would be useful to show the use of a timber moisture meter and hygrometer and discuss their practical use within the workshop environment.

Outcomes 2 and 3 will require a tensometer to perform a practical experiment in material strength and suitability.

Computers can be used for research and investigation, especially in relation to sourcing botanical names and identifying possible materials for use with instruments.

Guidance on approaches to assessment for this Unit

Outcome 1, PC (a) and (b) could be assessed via a multiple choice assessment and/or observation checklist. Candidates should be given ample time to practice visual recognition of wood samples prior to being assessed.

Outcome 1, PC (b), (c) and (d) could be assessed via a short written assignment which describes tree growth.

Outcome 2, PC (a), (b) and (c) could be assessed via a written and/or oral test on the subjects of timber conversion, drying and defects.

Outcome 2, PC (d) and Outcome 3 PC (b), (c) and (d) could be assessed via a written and/or oral assignment which analyses the results of a practical test to determine material strength.

Outcome 3 PC (a) and (d) could be assessed via a short written and/or oral test to determine the position of materials and their source.

National Unit specification: support notes (cont)

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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 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 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)*.

Opportunities for developing Core Skills

In this Unit candidates will recognise timbers and understand timber growth, conversion and usage. They will also test the strength and durability of materials and learn which materials are appropriate to use for individual parts of an instrument. In addition candidates may use ICT to research and investigate materials. Candidate's activities may include

- ◆ reading text relating to materials
- ◆ implementing an experiment to test materials
- ◆ answering questions relating materials

This means that as candidates are doing this Unit, they may develop aspects of the Core Skills of *Communication, Numeracy, Problem Solving* and *Information Communication Technology (ICT)*.

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

History of changes to Unit

| Version | Description of change | Date |
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