



Higher National Unit specification

General information

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

Unit code: HE32 34

Superclass: PE

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Unit purpose

This Unit is designed to equip the learners with practical skills and knowledge to enable them to competently carry out measuring of feet and last manufacture and understand the manufacture of footwear within a clinical and technical Orthotic delivery setting.

Learners will gain an understanding of the considerations needed by clinicians to prescribe footwear. They will develop a rationale to understand the importance of appropriate manufacturing within elements of clinical practice in the area of footwear in line with the Control of Substances Hazardous to Health (COSHH), Medicines and Healthcare products Regulatory Agency (MHRA) regulations, risk assessment, appropriate use of Personal Protective Equipment (PPE) and all necessary Health and Safety management issues.

This Unit is suitable for trainee technicians or technicians working in an orthotic and footwear technical environment.

Outcomes

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

- 1 Identify and describe foot and ankle anatomy and pathology.
- 2 Prepare last for manufacture.
- 3 Produce a sample of a completed last.

Credit points and level

1 Higher National Unit credit at SCQF level 7: (8 SCQF credit points at SCQF level 7)

Higher National Unit specification: General information (cont)

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

Recommended entry to the Unit

Access to this Unit is at the discretion of the centre. However it would be beneficial if the learner had a basic understanding of manufacturing and workshop technologies.

Core Skills

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

Achievement of this unit gives automatic certification of the following Core Skills component:

Complete Core Skill	None
Core Skill component	Critical Thinking at SCQF level 6 Planning and Organising at SCQF level 6

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.

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

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

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

Identify and describe foot and ankle anatomy and pathology.

Knowledge and/or Skills

- ◆ Bones and joint structures of foot and ankle
- ◆ Common pathologies of foot and ankle
- ◆ Functional anatomy of foot and ankle

Outcome 2

Prepare last for manufacture.

Knowledge and/or Skills

- ◆ Prescriptions
- ◆ Materials and tools
- ◆ Terminology
- ◆ Last preparation
- ◆ Medicine and Healthcare Regulatory Authority (MHRA)
- ◆ Health and safety legislation
- ◆ Quality assurance

Outcome 3

Produce a sample of a completed last.

Knowledge and/or Skills

- ◆ Material types and properties
- ◆ Manufacturing techniques
- ◆ Alignment techniques
- ◆ Machine use
- ◆ Quality assurance
- ◆ Medical and Healthcare Regulatory Authority (MHRA)
- ◆ Health and safety legislation

Higher National Unit specification: Statement of standards (cont)

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Evidence Requirements for this Unit

Learners will need to provide evidence to demonstrate their Knowledge and/or Skills across all Outcomes by showing that they can:

Outcome 1

- ◆ identify five main elements of bone and joint structure for the foot and ankle.
- ◆ identify functionality of the foot and ankle.
- ◆ identify four pathological conditions common to the foot and ankle.

Outcome 2

- ◆ interpret two prescriptions for the manufacture of lasts identifying materials required. These should be agreed by senior technician/prescribing clinician.
- ◆ select and source tools and materials following quality assurance procedures.
- ◆ prepare two lasts conforming to the prescriptions details and quality of finish within acceptable timeframes.
- ◆ adhere to relevant health and safety procedures, MHRA regulations, quality assurance and line management processes.
- ◆ complete documentation to comply with quality assurance procedures.

The lasts should achieve the function as detailed in the prescriptions. Evidence should be generated in a prosthetic/orthotic technical environment.

Outcome 3

- ◆ manufacture, in accordance with the prescription, two lasts using the following manufacturing and alignment techniques using forming, shaping, trimming, grinding, measuring, bonding, joining, and finishing.
- ◆ adhere to relevant health and safety procedures, MHRA regulations, quality assurance and line management processes.
- ◆ complete documentation to comply with quality assurance procedures.

The two lasts should comply with the prescriptions, be finished to a high standard, be fit for purpose without obvious flaw and presented with detailed technical notes.

Evidence should be generated in a prosthetics/orthotic technical environment.



Higher National Unit Support Notes

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

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 40 hours.

Guidance on the content and context for this Unit

This Unit is suitable for either trainee technicians studying lower limb orthotics or technicians working in an Orthotic footwear technical environment within the public (NHS) or private (commercial) sectors.

This Unit is designed to enable learners to produce a body of work that will demonstrate their ability to examine different techniques in the production of Orthotic footwear, their construction methods, components and materials, using them to influence the design and production of both fitting and delivery samples.

It will enable learners to produce a finished fit for purpose device, which clearly shows the production process and development of the device.

Learners will investigate various process and production techniques to produce a minimum of two finished devices.

Outcome 1: Identity and describe foot and ankle anatomy and pathology.

Learners will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can identify five main elements of the bone and joint structures within the foot and ankle, identify the functionality of the foot and ankle and describe four pathological conditions common to the foot and ankle.

A minimum of four random questions on each of the above areas will be required as part of their evaluation.

Notes, sketches, photographs and prescription printouts could be presented in a log/work book for assessment at the end of the Unit.

Higher National Unit Support Notes (cont)

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

Outcome 2: Prepare last for manufacture.

Learners will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

Interpret two prescriptions for the manufacture of lasts identifying the materials required. These should be agreed by senior technician/prescribing clinician.

Select and source tools and materials following quality assurance procedures.

Prepare two lasts conforming to the prescriptions details and quality of finish within acceptable timeframes.

Complete documentation to comply with quality assurance procedures.

The lasts should achieve the function as detailed in the prescriptions. Evidence should be generated in a prosthetic/orthotic technical environment.

Outcome 3: Produce a sample of a completed last.

The learners are required to produce a minimum of two samples, which should include elements from those conditions explored in Outcome 1. This will allow learners to demonstrate greater flexibility when developing their own skills.

The samples produced must show an understanding of process, demonstrate skills and technique. Samples could be fairly complex in their construction, which would reflect conditions considered in Outcome 1, and could take several hours to complete.

Learners should be encouraged to reflect on work in progress and make judgments on possible technical solutions to last design and material selection. Last devices should be finished to a high standard and fit for purpose without obvious flaws and presented for assessment with detailed technical notes.

The last devices produced could be model/demonstration piece or prescribed device finished to a good industry standard, cosmetically pleasing with no obvious flaws. The finished last device should use appropriate construction methods.

Learners should show a clear understanding of the chosen materials and techniques and use these appropriately within their finished last devices. Technical notes, prescriptions, profiles and sketches to accompany the final last device could be presented in a logbook.

The logbook could be in the form of text and photographs, prescriptions and/or worksheets.

Higher National Unit Support Notes (cont)

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

Guidance on approaches to delivery of this Unit

This Unit is likely to form part of a Group Award designed to provide learners with the technical knowledge and skills for employment within a rehabilitation technologies environment.

If this Unit is delivered as part of the Rehabilitation Technologies PDA it is recommended that it should be delivered and assessed within the Orthotic Footwear section. Opportunities may be taken to link or integrate with other aspects of the Group Award and a thematic approach adopted for both delivery and assessment.

As an introduction to the Unit the tutor may provide examples of different styles and designs of Orthotic Footwear with alternative material selection and techniques in preparation.

Evaluation could be carried out by learners following either set prescription(s) or investigating and researching different materials, processes and production techniques to design and produce the footwear that are fit for purpose.

It is recommended that learners should have access to a wide variety of appropriate tooling and materials, and be encouraged to (in conjunction with clinical and senior technical colleagues) source and explore alternative processes and manufacturing techniques.

Throughout this Unit learners should follow appropriate quality assurance procedures, safe and considerate working practices in line with COSHH, MHRA regulations, risk assessment, appropriate use of Personal Protective Equipment (PPE) and all necessary health and safety issues.

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.

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.

Outcome 1

The assessment for this Outcome could be either by multiple-choice or by short answer response. For centres delivering this award a pass mark of 80% is required for multiple choice and short answer response questions.

Higher National Unit Support Notes (cont)

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

Outcome 2

Evidence could be generated through observation of practical performance and manufacture of final last. Detailed technical notes could be used to support the practical assessment evidence.

Learners will need evidence to demonstrate their Knowledge and/or Skills by showing that they can manufacture lasts to given prescription using a range of hand and machine tools. Evidence for skills must be provided by producing lasts that are fit for purpose.

The health and safety procedures may include reference to Control of Substances Hazardous to Health (COSHH), risk assessment and use of Personal Protective Equipment (PPE).

Outcome 3

Evidence could be generated through observation of practical performance and manufacture of final last. Detailed technical notes could be used to support the practical assessment evidence.

Learners will need evidence to demonstrate their Knowledge and/or Skills by showing that they can manufacture a last(s) to given prescription using a range of hand and machine tools. Evidence for skills must be provided by producing a last(s) fit for purpose.

The health and safety procedures may include reference to Control of Substances Hazardous to Health (COSHH), risk assessment and use of Personal Protective Equipment (PPE).

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)

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Opportunities for developing Core and other essential skills

There are opportunities to develop the Core Skills of *Communication*, *Problem Solving* and *Working with Others* at SCQF level 5 in this Unit although there is no automatic certification of Core Skills or Core Skills components.

The Core Skill of *Communication* may be developed through the production of technical notes, which may bring together both visual and written notes.

The Core Skill of *Problem Solving* may be developed through the practical stages in Outcome 2 where learners are encouraged to explore techniques, identify problems and devise solutions. In Outcome 3 the skill may also be developed as learners work to produce finished devices, and reflect on what they have achieved.

The practical nature of the workshops and equipment access, together with design and component use may mean that learners will have to negotiate access with other learners and work with clinicians in the design/selection phase of the final device. This may provide the opportunity to develop the Core Skill of *Working with Others* at SCQF level 5.

This unit has the Critical Thinking component of *Problem Solving* embedded in it. This means that when learners achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.

History of changes to Unit

Version	Description of change	Date

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General information for learners

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

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 Unit is designed to enable you to develop knowledge and skills in Orthotic Footwear. It will allow you to evaluate and explore a variety of manufacturing techniques, production processes, produce sample lasts to fitting using various techniques and complete sample lasts to final delivery. Techniques explored could include forming, shaping, component use, tooling and machining.

The assessment for this Unit could be presented in the form of a brief, or set prescription from which you will be expected to:

- ◆ provide evidence to demonstrate their Knowledge and/or Skills by showing that they can identify the main elements of the bone and joint structure within the foot and ankle, identify the common functionality of the foot and ankle and describe the common pathologies relating to the foot and ankle.
- ◆ a minimum of four random questions on each of the above areas will be required as part of their evaluation.
- ◆ notes, sketches, photographs and prescription printouts could be presented in a log/work book for assessment at the end of the Unit.
- ◆ provide evidence to demonstrate their Knowledge and/or Skills by showing they can prepare a last for manufacture. The learners are required to prepare a minimum of two samples, which should include elements from those explored in Outcome 1. This will allow learners to demonstrate greater flexibility when developing their own skills.
- ◆ the samples produced must show an understanding of process, demonstrate skills and technique. Samples could be fairly complex in their construction and material selection, which would reflect areas, considered in Outcome 1, and could take several hours to complete.
- ◆ manufacture a final last device, which should incorporate at least two of the techniques explored and for which samples have been prepared in Outcome 2.
- ◆ the last device produced could be model/demonstration piece or prescribed last device finished to a good industry standard, cosmetically pleasing with no obvious flaws. The finished last device should use appropriate construction methods and materials and be produced to a fit for purpose standard of finish with no obvious faults or flaws.
- ◆ learners should show a clear understanding of the chosen materials and techniques and use these appropriately within their finished last device. Technical notes, prescriptions, profiles and sketches to accompany the final last device could be presented in a logbook.
- ◆ the logbook could be in the form of text and photographs, prescriptions and/or worksheets.

Throughout the delivery of the Unit you will be required to follow appropriate quality assurance procedures, safe and considerate working practices in line with COSHH, MHRA regulations, risk assessment, appropriate use of Personal Protective Equipment (PPE) and all necessary health and safety issues.

General information for learners (cont)

Unit title: Orthotics: Footwear Manufacture 1: Measuring the Foot and Last Manufacture (SCQF level 7)

You may have the opportunity to develop the Core Skills of *Communication*, *Problem Solving* and *Working with Others* at SCQF level 5 in this Unit although there is no automatic certification of Core Skills or Core Skills components.

This unit has the Critical Thinking component of *Problem Solving* embedded in it. This means that when you achieve the Unit, your Core Skills profile will also be updated to show you have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.