Level 2 Technical Certificate in Forestry and Arboriculture (0174-21)

August 2019 Version 1.9

Qualification Handbook

Qualification at a glance

Industry area	Forestry and Arboriculture
City & Guilds qualification number	0174-21
Age group	16-19 (Key Stage 5), 19+
Entry requirements	Centres must ensure that any pre-requisites stated in the *What is this qualification about?* section are met.
Assessment	To gain this qualification, candidates must successfully achieve the following assessments: • One externally set, externally moderated assignment • One externally set, externally marked exam, sat under examination conditions • One externally set, internally marked health and safety assignment.
Additional requirements to gain this qualification	Employer involvement in the delivery and/or assessment of this qualification is essential for all candidates and will be externally quality assured.
Grading	This qualification is graded Pass/Merit/Distinction/Distinction* For more information on grading, please see Section 7: Grading.
Approvals	These qualifications require full centre and qualification approval
Support materials	Sample assessments Guidance for delivery Guidance on use of marking grids
Registration and certification	Registration and certification of this qualification is through the Walled Garden, and is subject to end dates.
External quality assurance	This qualification is externally quality assured by City & Guilds, and its internally marked assignments are subject to external moderation. There is no direct claim status available for this qualification.

Title and level	Size (GLH)	City & Guilds qualification number	Ofqual accreditation number
Level 2 Technical Certificate in Forestry and Arboriculture	360	0174-21	603/1175/7

Version and date	Change detail	Section
1.1 June 2017	Assessment overview updated to include an externally set, internally marked and externally moderated assignment	Qualification at a glance
	Amended the component number for Employer involvement	Assessment requirements and employer involvement
	Assessment conditions for assessment 201 Changed to externally set, internally marked assignment	Summary of assessment methods and conditions
	Assessment objectives table Removed the Assessment Objectives 6 – 8 and changed the weighting/amended descriptors for the assessment objectives 1 -5	Assessment objectives
	Amended the duration for the external exam to 1.5 hours	Exam specification
	Amended the number of units and marks per unit/overall for the external exam	Exam specification
1.2 August 2017	Unit 201 aim updated	Units
	Branding updated	Throughout
1.3 September 2017	Purpose statement amended to include how the qualification relates to a wider learning programme	Purpose statement
	Unit 201 title amended	Throughout
1.4 October 2017	Assessment type for unit 230 changed to assignment	1. Introduction 5. Assessment
1.5 December 2017	Amendment to summary of assessment methods and conditions table	5. Assessment
1.6 February 2018	Titles of components 022 and 023/523 amended	Assessment requirements and employer involvement
1.7 September 2018	Amendment to summary of assessment methods and conditions table – Assessment 230	Assessment
1.8 October 2018	Added assessment method for unit 201	1. Introduction – Assessment requirements and employer involvement
	Amended assessment method for unit 201	5. Assessment - Summary of assessment methods and conditions

| 1.9 August 2019 | Unit 202 aim and delivery guidance updated for work experience requirements | Unit 202 |

Contents

1   Introduction

What is this qualification about?

The following purpose is for the City & Guilds Level 2 Technical Certificate in Forestry and Arboriculture (603/1175/7).

Area	Description
OVERVIEW	
Who is this qualification for?	This Level 2 Technical Certificate in Forestry and Arboriculture is for you if you are looking to start a career within the forestry or arboricultural sector. Modern forestry and arboriculture practices involve far more than just growing trees for timber. There are numerous career options depending on your interests and goals, which range from managing large forests to managing trees for amenity and urban landscapes. This qualification is suitable if you are 16 years old, or over. You may or may not have any previous knowledge or experience in forestry or arboriculture. You will gain an understanding of the skills and knowledge that are important when you are working in a treework setting, or progressing to further learning and training in this area.
What does this qualification cover?	This qualification covers the skills you will need to progress to further learning and training, or to enter the world of work within the forestry and arboriculture industries. You will study the following mandatory content: - Working in a forestry or arboriculture related business - Introduction to the forestry and arboriculture sectors - Health and safety for the land-based industries - Tools and equipment - Environment and conservation - Introduction to plant science - Tree classification and Identification - Tree establishment - Tree and woodland management

	There is also a requirement to complete 150 hours of work experience.
	You will get lots of practice and support to enable you to develop the required skills and knowledge to prepare you for the learning and end assessment.
	Colleges and training/education centres will work with local employers who will contribute to the knowledge and delivery of training. The different ways in which centres could support your learning, by working with both local and national forestry or arboricultural businesses, include: • structured work-experience or work-placements within their business • your attendance at classes or lectures given by industry experts • employers input into projects and exercises • employers who act as 'expert witnesses' to contribute to the assessment of your work. This practical based training is ideal preparation for gaining employment in the forestry and arboriculture sector or further specialist study.
How does this qualification relate to a wider learning programme	This qualification provides an opportunity for you to gain real work specific skills and knowledge, and enables you to link your technical learning to the work experience part of your course. There may also be the opportunity to undertake short courses or qualifications, such as our Certificates of Technical Competence or a GCSE in Biology, alongside this qualification. When taken as part of a full study programme you will typically receive regular personal tutorials which will help with target setting, enabling you to reflect on and improve your performance and progress. You will also benefit from enrichment activities to develop your employability, team work and problem solving skills. These are essential when working in industry. Typically, you will also take this qualification alongside English and/or maths, so these, as well as and digital technology are included within the course to enhance your skills which will assist you with future job opportunities or progression to higher level learning.

WHAT COULD THIS QUALIFICATION LEAD TO?

Will the qualification lead to employment, and if so, in which job role and at what level?	Achievement of this qualification demonstrates to an employer that you have the necessary technical skills

	and knowledge they are looking for when recruiting for a trainee:
	- arboriculture/forestry worker - forestry team member - tree nursery worker
Why choose this qualification over similar qualifications?	There are no other College-based qualifications within this suite at this Level.
Will the qualification lead to further learning?	Yes. Once you have successfully completed this qualification, you could go on to study a Level 3 College-based qualification over one year, or two years. Over one year: - Level 3 Advanced Technical Certificate in Forestry and Arboriculture Over two years: - Level 3 Advanced Technical Extended Diploma in Forestry and Arboriculture (1080) (Forestry) or (Arboriculture) The larger qualification taken over two years will allow you to specialise in forestry or arboriculture, which could lead to a greater range of more diverse career opportunities. This qualification could also lead you to an apprenticeship in Forestry & Arboriculture. - Intermediate Apprenticeship, including the Level 2 Diploma in Work-based Trees and Timber - Advanced Apprenticeship, including the Level 3 Diploma in Work-based Trees and Timber

WHO SUPPORTS THIS QUALIFICAITON?

Professional/Trade Associations	The Arboriculture Association The Royal Forestry Society
FURTHER INFORMATION	Please refer to the Qualification Handbook, available on the City & Guilds website, for more information on the structure of this qualification, the content of the units, and assessment.

Qualification structure

For the **Level 2 Technical Certificate in Forestry and Arboriculture** the teaching programme must cover the content detailed in the structure below:

Unit number	Unit title	GLH
Mandatory		
201	Health and safety for the land-based industries	30
202	Introduction to the forestry and arboriculture sector	30
203	Environment and conservation	30
204	Tree classification and identification	30
205	Introduction to plant science	60
206	Tree establishment	60
207	Tree and woodland management	90
208	Tools and equipment	30

Total qualification time (TQT)

Total Qualification Time (TQT) is the total amount of time, in hours, expected to be spent by a learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

Title and level	GLH	TQT
Level 2 Technical Certificate in Forestry and Arboriculture	360	600

Assessment requirements and employer involvement

To achieve the **Level 2 Technical Certificate in Forestry and Arboriculture** candidates must successfully complete **all** mandatory assessment components**.**

Component number	Title
Mandatory	
022	Level 2 Forestry and Arboriculture - Synoptic Assignment
023 or 523	Level 2 Forestry and Arboriculture – Theory exam
201	Health and safety for the land-based industries – Theory exam

In addition, candidates **must** achieve the mandatory employer involvement (work experience) requirement for this qualification **before** they can be awarded a qualification grade. For more information, please see guidance in *Section 4: Employer involvement*.

Employer involvement	
Component number	Title
Mandatory	
821	Employer involvement

*Number of mandatory assessments per assessment type

2   Centre requirements

Approval
New centres will need to gain centre approval. Existing centres who wish to offer this qualification must go through City & Guilds' **full** Qualification Approval Process. There is no fast track approval for this qualification. Please refer to the City & Guilds website for further information on the approval process: **www.cityandguilds.com**.

Resource requirements
Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

Centre staffing
Staff delivering these qualifications must be able to demonstrate that they meet the following requirements:
- be technically competent in the areas in which they are delivering
- be able to deliver across the breadth and depth of the content of the qualification being taught
- have recent relevant teaching and assessment experience in the specific area they will be teaching, or be working towards this
- demonstrate continuing CPD.

Physical resources
Centres must be able to demonstrate that they have access to the equipment and technical resources required to deliver this qualification and its assessment.

Internal quality assurance
Internal quality assurance is key to ensuring accuracy and consistency of tutors and markers. Internal Quality Assurers (IQAs) monitor the work of all tutors involved with a qualification to ensure they are applying standards consistently throughout assessment activities. IQAs must have, and maintain, an appropriate level of technical competence and be qualified to make both marking and quality assurance decisions through a teaching qualification or recent, relevant experience.

Learner entry requirements
Centres must ensure that all learners have the opportunity to gain the qualification through appropriate study and training, and that any prerequisites stated in the *What is this qualification about?* section are met when registering on this qualification.

Age restrictions
This qualification is approved for learners aged 16 – 19, 19+.

3 Delivering technical qualifications

Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- if the learner has any specific learning or training needs
- support and guidance they may need when working towards their qualification
- the appropriate type and level of qualification.

We recommend that centres provide an introduction so that learners fully understand the requirements of the qualification, their responsibilities as a learner, and the responsibilities of the centre. This information can be recorded on a learning contract.

Employer involvement

Employer involvement is essential to maximise the value of each learner's experience. Centres are required to involve employers in the delivery of technical qualifications at Key Stage 5 and/or their assessment, for every learner. This must be in place or planned before delivery programmes begin in order to gain qualification approval. See *Section 4: Employer involvement* for more detail.

Work experience

Work experience will provide learners with the opportunity to participate in the world of work and gain practical experience that is relevant to both the qualification and future employment possibilities.

Each learner is expected to complete a 150 hours work experience placement as part of the programme. This work placement should be with an employer that will provide the learner with structured opportunities to develop the skills and knowledge that are relevant to the qualification and should be undertaken in a real business environment relevant to the subject interest of the learner. Work experience may be gained by a number of routes, e.g. as part of an industrial placement whilst within the programme, whilst working on a planned daily or weekly basis on the centre's commercial and/or educational facilities, whilst undertaking voluntary work within the industry, or as a member of a group of learners invited to carry out practical work on a suitable business. The work placement can take place at any time during the learning programme. Centres should be able to provide evidence that the work experience placement has been completed by the learner and this evidence may be reviewed on request by City & Guilds.

The 150 hours work experience is included in the Total Qualification Time

Support materials

The following resources are available for this qualification:

Description	How to access
Sample assessments	Available 2017 on the qualification pages on the **City & Guilds Website: www.cityandguilds.com**
Technical Qualifications: Guide to Teaching, Learning and Assessment	Available on the City and Guild website: **https://www.cityandguilds.com/techbac/technical-qualifications/resources-and-support#teaching**
Technical Qualifications: Marking and Moderation Guide	Available on the City and Guild website: **https://www.cityandguilds.com/techbac/technical-qualifications/resources-and-support#teaching**

4 Employer involvement

Employer involvement is a formal component of Key Stage 5 Technical qualifications. It does not contribute to the overall qualification grading, but is a mandatory requirement that all learners must meet. As such it is subject to external quality assurance by City & Guilds.

Department for Education (DfE) requirements state:

Employer involvement in the delivery and/or assessment of technical qualifications provides a clear 'line of sight' to work, enriches learning, raises the credibility of the qualification in the eyes of employers, parents and students and furthers collaboration between the learning and skills sector and industry.

[Technical qualifications] must:

• require all students to undertake meaningful activity involving employers during their study; and

• be governed by quality assurance procedures run by the awarding organisation to confirm that education providers have secured employer involvement for every student.

Extract from: ***Vocational qualifications for 16 to 19 year olds, 2017 and 2018 performance tables: technical guidance for awarding organisations***, **paragraphs 89-90**

City & Guilds will provide support, guidance and quality assurance of employer involvement.

Qualification approval

To be approved to offer City & Guilds technicals, centres must provide an Employer Involvement planner and tracker showing how every learner will be able to experience meaningful employer involvement, and from where sufficient and suitable employer representatives are expected to be sourced.

Centres must include in their planner a sufficient range of activities throughout the learning programme that provide a range of employer interactions for learners. Centres must also plan contingencies for learners who may be absent for employer involvement activities, so that they are not disadvantaged.

As part of the approval process, City & Guilds will review this planner and tracker. Centres which cannot show sufficient commitment from employers and/or a credible planner and tracker will be given an action for improvement with a realistic timescale for completion. **Approval will not be given** if employer involvement cannot be assured either at the start of the qualification, or through an appropriate plan of action to address this requirement before the learner is certificated.

Monitoring and reporting learner engagement

Employer involvement is a formal component of this qualification and is subject to quality assurance monitoring. Centres must record evidence that demonstrates that each learner has been involved in meaningful employer based activities against the mandatory content before claiming the employer involvement component for learners.

Centres must record the range and type of employer involvement each learner has experienced and submit confirmation that all learners have met the requirements to City & Guilds. If a centre cannot provide evidence that learners have met the requirements to achieve the component, then the learner will not be able to achieve the overall Technical Qualification.

Types of involvement

Centres should note that to be eligible, employer involvement activities **must** relate to one or more elements of the mandatory content of this qualification.

As the aim of employer involvement is to enrich learning and to give learners a taste of the expectations of employers in the industry area they are studying, centres are encouraged to work creatively with local employers.

Employers can identify the areas of skills and knowledge in their particular industry that they would wish to see emphasised for learners who may apply to work with them in the future. Centres and employers can then establish the type of input, and which employer representative might be able to best support these aims.

To be of most benefit this must add to, rather than replace the centre's programme of learning.

Some examples of meaningful employer involvement are listed below. Employer involvement not related to the mandatory element of the qualification, although valuable in other ways, does not count towards this element of the qualification.

The DfE has provided the following examples of what does and does not count as meaningful employer involvement, as follows[1]:

The following activities meet the requirement for meaningful employer involvement:

- *students undertake structured work-experience or work-placements that develop skills and knowledge relevant to the qualification[2];*
- *students undertake project(s), exercises(s) and/or assessments/examination(s) set with input from industry practitioner(s);*
- *students take one or more units delivered or co-delivered by an industry practitioner(s). This could take the form of master classes or guest lectures;*
- *industry practitioners operate as 'expert witnesses' that contribute to the assessment of a student's work or practice, operating within a specified assessment framework. This may be a specific project(s), exercise(s) or examination(s), or all assessments for a qualification.*

In all cases participating industry practitioners and employers must be relevant to the industry sector or occupation/occupational group to which the qualification relates.

The following activities, whilst valuable, do not meet the requirement for meaningful employer involvement:

- *employers' or industry practitioners' input to the initial design and content of a qualification;*
- *employers hosting visits, providing premises, facilities or equipment;*
- *employers or industry practitioners providing talks or contributing to delivery on employability, general careers advice, CV writing, interview training etc;*
- *student attendance at career fairs, events or other networking opportunities;*
- *simulated or provider-based working environments eg hairdressing salons, florists, restaurants, travel agents, small manufacturing units, car servicing facilities;*
- *employers providing students with job references.*

Types of evidence

For each employer involvement activity, centres are required to provide evidence of which learners undertook it, eg a candidate attendance register. The types of additional evidence required to support a claim for this component will vary depending on the nature of the involvement e.g. for a guest lecture it is expected that a synopsis of the lecture and register would be taken which each

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[1] Based on Technical and applied qualifications for 14 to 19 year olds Key stage 4 and 16 to 19 performance tables from 2019: technical guidance for awarding organisations, August 2016.

learner and the guest speaker will have signed; expert witnesses will be identified and will have signed the relevant assessment paperwork for each learner they have been involved in assessing; evidence of contribution from employers to the development of locally set or adapted assignments.

Quality assurance process

As the employer involvement component is a requirement for achieving the KS5 Technical qualifications, it is subject to external quality assurance by City & Guilds at the approval stage and when centres wish to claim certification for learners.

Evidence will be validated by City & Guilds before learners can achieve the employer involvement component. Where employer involvement is not judged to be sufficient, certificates cannot be claimed for learners.

Sufficiency of involvement for each learner

It is expected that the centre will plan a range of activities that provide sufficient opportunities for each learner to interact directly with a range of individuals employed in the related industry. Centres must also provide contingencies for learners who may be absent for part of their teaching, so they are not disadvantaged. Any absence that results in a learner missing arranged activities must be documented. Where learners are unable to undertake all employer involvement activities due to temporary illness, temporary injury or other indisposition, centres should contact City & Guilds for further guidance.

Live involvement

Learners will gain most benefit from direct interaction with employers and/or their staff; however the use of technology (e.g. the use of live webinars) is encouraged to maximise the range of interactions. Where learners are able to interact in real time with employers, including through the use of technology, this will be classed as 'live involvement'.

It is considered good practice to record learning activities, where possible, to allow learners to revisit their experience and to provide a contingency for absent learners. This is not classed as live involvement however, and any involvement of this type for a learner must be identified as contingency.

Timing

A learner who has not met the minimum requirements cannot be awarded the component, and will therefore not achieve the qualification. It is therefore important that centres give consideration to scheduling employer involvement activities, and that enough time is allotted throughout delivery and assessment of the qualification to ensure that requirements are fully met.

5 Assessment

Summary of assessment methods and conditions

Component numbers	Assessment method	Description and conditions
022	Synoptic assignment	The synoptic assignment is **externally set, internally marked and externally moderated.** The assignment requires candidates to identify and use effectively in an integrated way an appropriate selection of skills, techniques, concepts, theories, and knowledge from across the content area. Candidates will be judged against the assessment objectives.
		Assignments will be released to centres as per dates indicated in the Assessment and Examination timetable published on our website.
		Where seasonality is a factor in the timing of the assignment the assignment will be released early to ensure that candidates can take the assignment to fit in with the seasonal requirements.
		Centres will be required to maintain the security of all live assessment materials. Assignments will be password-protected and released to centres through a secure method.
		There will be one opportunity within each academic year to sit the assignment. Candidates who fail the assignment will have one re-sit opportunity. The re-sit opportunity will be in the next academic year, and will be the assignment set for that academic year once released to centres. If the re-sit is failed, the candidate will fail the qualification.
		Please note that for externally set assignments City & Guilds provides guidance and support to centres on the marking and moderation process.
023/ 523	Externally marked exam	The exam is **externally set and externally marked** and can be taken either online through City & Guilds' computer-based testing platform, (023) or as a paper based test (523).
		The exam is designed to assess the candidate's depth and breadth of understanding across content in the qualification at the end of the period of learning, using a range of question types and will be sat under invigilated examination conditions. See JCQ requirements for details: **http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations**
		The exam specification shows the coverage of the exam across the qualification content.
		Candidates who fail the exam at the first sitting will have **one** opportunity to re-sit. If the re-sit is failed the candidate will fail the

		qualification. For exam dates, please refer to the Assessment and Examination timetable.
201	Internally marked theory exam	This theory exam is **externally set, internally marked and externally moderated.** It is designed to assess the candidate's depth and breadth of understanding from across the unit content area and will be sat under supervised conditions. This assessment is available on our website. The assessment can be taken at any point during the academic year, but evidence must be submitted on to the Moderation Portal by the deadline in Assessment and Examination timetable, published on our website. Centres will be required to maintain the security of all live assessment materials. Assessments will be password protected and released to centres through a secure method. There is no re-sit limit for this assessment. If a learner fails, they can re-sit a different version. Assessors should allow seven days before reassessment.

What is synoptic assessment?

Technical qualifications are based around the development of a toolkit of knowledge, understanding and skills that an individual needs in order to have the capability to work in a particular industry or occupational area. Individuals in all technical areas are expected to be able to apply their knowledge, understanding and skills in decision making to solve problems and achieve given outcomes independently and confidently.

City & Guilds technical qualifications require candidates to draw together their learning from across the qualification to solve problems or achieve specific outcomes by explicitly assessing this through the synoptic assignment component.

In this externally set, internally marked and externally moderated assessment the focus is on bringing together, selecting and applying learning from across the qualification rather than demonstrating achievement against units or subsets of the qualification content. The candidate will be given an appropriately levelled, substantial, occupationally relevant problem to solve or outcome to achieve. For example this might be in the form of a briefing from a client, leaving the candidate with the scope to select and carry out the processes required to achieve the client's wishes, as they would in the workplace.

Candidates will be marked against assessment objectives (AOs) such as their breadth and accuracy of knowledge, understanding of concepts, and the quality of their technical skills as well as their ability to use what they have learned in an integrated way to achieve a considered and high quality outcome.

How the assignment is synoptic for this qualification

The typical assignment brief could be to plan, prepare and plant trees on a given site. The tasks would involve an initial tree and site survey of the area, production of a planting plan for the proposed work, selection of trees and subsequent aftercare requirements. The recommended time for this assignment is **twenty hours** and it is the centre's responsibility to arrange how this time is managed to fit with timetables during the assessment period.

External exam for stretch, challenge and integration

The exam draws from across the mandatory content of the qualification, using:

- **Multiple choice questions** to confirm breadth of knowledge and understanding.
- **Multiple choice applied knowledge and understanding questions**, giving candidates the opportunity to demonstrate higher level, integrated understanding through application, analysis and evaluation.

Assessment objectives

The assessments for this qualification are set against a set of assessment objectives (AOs) which are used across all City & Guilds Technicals to promote consistency among qualifications of a similar purpose. They are designed to allow judgement of the candidate to be made across a number of different categories of performance.

Each assessment for the qualification has been allocated a set number of marks against these AOs based on weightings recommended by stakeholders of the qualification. This mark allocation remains the same for all versions of the assessments, ensuring consistency across assessment versions and over time.

The following table explains all AOs in detail, including weightings for the synoptic assignments. In some cases, due to the nature of a qualification's content, it is not appropriate to award marks for some AOs. Where this is the case these have been marked as N/A. Weightings for exams (AOs 1, 2 and 4 only) can be found with the exam specification.

Assessment objective	Level 2 Technical Certificate in Forestry & Arboriculture Typical expected evidence of knowledge, understanding and skills	Approximate weighting (Assignment)
AO1 Recalls knowledge from across the breadth of the qualification.	Legislation, health and safety considerations, use of tools and equipment, industry contacts, associations, different habitats, pollution, tree identification, plant physiology, soil characteristics, ground preparation, site surveys	20%
AO2 Demonstrates understanding of concepts, theories and processes from across the breadth of the qualification.	Planning tree works, tree planting, habitat creation, justification of choices, environmental management, implication of site conditions, functions of plant tissues and their parts, tree planting and extraction, use of tools for specific jobs, safety features and common faults of tools	20%
AO3 Demonstrates technical skills from across the breadth of the qualification.	Site assessments, risk assessments, planning and preparation for tree works, selection of PPE, safe use of equipment including pre use and post use checks, Site preparation, planting techniques, protection methods, aftercare, collection of data	30%
AO4 Applies knowledge, understanding and skills from across the breadth of the qualification in an integrated and holistic way to achieve specified purposes.	Linking site assessment and use/purpose of area to tree selection, showing knowledge of health and safety and legislation through good working practices, standard of work consistent throughout assessment, able to reflect on own work at different stages and adjusting plans and processes if necessary, leaving work site neat and tidy with no residual hazards, completing written work coherently	20%
AO5 Demonstrates perseverance in achieving high standards and attention to detail while showing an understanding of wider impact of their actions.	Accuracy of data collection and recording, level of detail in risk assessment, detail in plan and adherence to plan, consistently checking tools and equipment throughout task, following industry good practice and manufacturer's guidelines, focussing on task, carrying out quality checks	10%

Exam specification

AO weightings per exam

AO	Component 023 weighting (approx. %)
AO1 Recalls knowledge from across the breadth of the qualification.	50
AO2 Demonstrates understanding of concepts, theories and processes from across the breadth of the qualification.	30
AO4 Applies knowledge, understanding and skills from across the breadth of the qualification in an integrated and holistic way to achieve specified purposes.	20

The way the exam covers the content of the qualification is laid out in the table below:

Assessment type: Examiner marked, written exam, usually delivered online*
Assessment conditions: Invigilated examination conditions
Grading: X/P/M/D

023/ 524	Duration: 1.5 hours		
Unit	**Unit Title**	**Number of marks**	**%**
Unit 202	Introduction to the forestry and arboriculture sector	4	10
Unit 203	Environment and conservation	6	16
Unit 205	Introduction to plant science	11	27
Unit 206	Tree establishment	11	27
N/A	Integration across the units	8	20
	Total	**40**	**100**

*These exams are sat under invigilated examination conditions, as defined by the JCQ:
http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations

Entry for exams can be made through the City & Guilds Walled Garden.

6   Moderation and standardisation of assessment

City & Guilds' externally set assignments for technical qualifications are designed to draw from across the qualifications' content, and to contribute a significant proportion towards the learner's final qualification grade. They are subject to a rigorous external quality assurance process known as external moderation. This process is outlined below. For more detailed information, please refer to 'Marking and moderation - Technicals centre guidance' available to download on the City & Guilds website.

It is vital that centres familiarise themselves with this process, and how it impacts on their delivery plan within the academic year.

Supervision and authentication of internally assessed work

The Head of Centre is responsible for ensuring that internally assessed work is conducted in accordance with City & Guilds' requirements.

City & Guilds requires both tutors and candidates to sign declarations of authenticity. If the tutor is unable to sign the authentication statement for a particular candidate, then the candidate's work cannot be accepted for assessment.

Internal standardisation

For internally marked work[2] the centre is required to conduct internal standardisation to ensure that all work at the centre has been marked to the same standard. It is the Internal Quality Assurer's (IQA's) responsibility to ensure that standardisation has taken place, and that the training includes the use of reference and archive materials such as work from previous years as appropriate.

Provision for reworking evidence after submission for marking by the tutor

It is expected that in many cases a candidate who is struggling with a specific piece of work may themselves choose to restart and rectify the situation during their normal allocated time, and before it gets to the stage of it being handed in for final marking by the tutor.

In exceptional circumstances however, where a candidate has completed the assignment in the required timescales, and has handed it in for marking by the tutor but is judged to have significantly underperformed, may be allowed to rework or supplement their original evidence for remarking prior to submission for moderation. For this to be allowed, the centre must be confident that the candidate will be able to improve their performance without additional feedback from their tutor and within the required timescales, ie the candidate has shown they can perform sufficiently better previously in formative assessments.

The reworked and/or supplemented original evidence must be remarked by the tutor in advance of the original moderation deadline and the moderator informed of any candidates who have been allowed to resubmit evidence.

The process must be managed through the IQA. The justification for allowing a resubmission should be recorded and made available on request. The use of this provision will be monitored by City & Guilds.

Internal appeal

Centres must have an internal process in place for candidates to appeal the marking of internally marked components, ie the synoptic assignment and any optional unit assignments. This must take place before the submission of marks for moderation. The internal process must include candidates

being informed of the marks (or grades) the centre has given for internally assessed components, as they will need these to make the decision about whether or not to appeal.

Centres cannot appeal the outcome of moderation for individual candidates, only the moderation process itself. A request for a review of the moderation process should be made to **appeals@cityandguilds.com**.

Moderation

Moderation is the process where external markers are standardised to a national standard in order to review centre marking of internally marked assessments. These markers are referred to as 'moderators'. Moderators will mark a representative sample of candidates' work from every centre. Their marks act as a benchmark to inform City & Guilds whether centre marking is in line with City & Guilds' standard.

Where moderation shows that the centre is applying the marking criteria correctly, centre marks for the whole cohort will be accepted.

Where moderation shows that the centre is either consistently too lenient or consistently too harsh in comparison to the national standard, an appropriate adjustment will be made to the marks of the whole cohort, retaining the centre's rank ordering.

Where centre application of the marking criteria is inconsistent, an appropriate adjustment for the whole cohort may not be possible on the basis of the sample of candidate work. In these instances a complete remark of the candidate work may be necessary. This may be carried out by the centre based on feedback provided by the moderator, or carried out by the moderator directly.

Moderation applies to all internally marked assignments. Following standardisation and marking, the centre submits all marks and candidate work to City & Guilds via the moderation platform. The deadline for submission of evidence will be available on Walled Garden. See the *Marking and moderation - Technicals Centre Guidance* document for full details of the requirements and process.

In most cases candidate work will be submitted directly to the moderator for moderation. This includes written work, photographic and pictorial evidence, or video and audio evidence. For some qualifications there will be a requirement for moderators to visit centres to observe practical assessments being undertaken. This will be for qualifications where the assessment of essential learner skills can only be demonstrated through live observation. The purpose of these visits is to ensure that the centre is assessing the practical skills to the required standards, and to provide the moderators with additional evidence to be used during moderation. These visits will be planned in advance with the centre for all relevant qualifications.

Post-moderation procedures

Once the moderation process has been completed, the confirmed marks for the cohort are provided to the centre along with feedback from the moderator on the standard of marking at the centre, highlighting areas of good practice, and potential areas for improvement. This will inform future marking and internal standardisation activities.

City & Guilds will then carry out awarding, the process by which grade boundaries are set with reference to the candidate evidence available on the platform.

Centres retaining evidence

Centres must retain assessment records for each candidate for a minimum of three years. To help prevent plagiarism or unfair advantage in future versions, candidate work may not be returned to candidates. Samples may, however, be retained by the centre as examples for future standardisation of marking.

7 Grading

Awarding individual assessments

Individual assessments will be graded, by City & Guilds, as pass/merit/distinction where relevant. The grade boundaries for pass and distinction for each assessment will be set through a process of professional judgement by technical experts. Merit will usually be set at the midpoint between pass and distinction. The grade descriptors for pass and distinction, and other relevant information (eg archived samples of candidate work and statistical evidence) will be used to determine the mark at which candidate performance in the assessment best aligns with the grade descriptor in the context of the qualification's purpose. Boundaries will be set for each version of each assessment to take into account relative difficulty.

Please note that as the Merit grade will usually be set at the arithmetical midpoint between pass and distinction, there are no descriptors for the Merit grade for the qualification overall.

Grade descriptors
To achieve a pass, a candidate will be able to:
- Demonstrate the knowledge and understanding required to work in the occupational area, its principles, practices and legislation
- Describe some of the main factors impacting on the occupation to show good understanding of how work tasks are shaped by the broader social, environmental and business environment it operates within
- Use the technical industry-specific terminology accurately
- Apply relevant theory and understanding to solve non-routine problems
- Interpret a brief for complex work related tasks, identifying the key aspects, and showing a secure understanding of the application of concepts to specific work-related tasks
- Carry out planning which shows an ability to identify and analyse the relevant information in the brief and use knowledge and understanding from across the qualification (including complex technical information) to interpret what a fit for purpose outcome would be and develop a plausible plan to achieve it
- Achieve an outcome which successfully meets the key requirements of the brief
- Identify and reflect on the most obvious measures of success for the task and evaluate how successful they have been in meeting the intentions of the plan
- Work safely throughout, independently carrying out tasks and procedures, and having some confidence in attempting the more complex tasks

To achieve a distinction, a candidate will be able to:
- Demonstrate the excellent knowledge and understanding required to work to a high level in the occupational area, its principles, practices and legislation
- Analyse the impact of different factors on the occupation to show deep understanding of how work tasks are shaped by the broader social, environmental, and business environment it operates within
- Apply relevant theory and understanding to provide efficient and effective solutions to complex and non-routine problems
- Analyse the brief in detail, showing confident understanding of concepts and themes from across the qualification content, bringing these together to develop a clear and stretching plan, that would credibly achieve an outcome that is highly fit for purpose
- Achieve an outcome which shows an attention to detail in its planning, development and completion, so that it completely meets or exceeds the expectations of the brief to a high standard

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- Carry out an evaluation in a systematic way, focussing on relevant quality points, identifying areas of development/improvement as well as assessing the fitness for purpose of the outcome

Awarding grades and reporting results

The overall qualification grade will be calculated based on aggregation of the candidate's achievement in each of the assessments for the mandatory units, taking into account the assessments' weighting. The **Level 2 Technical Certificate in Forestry and Arboriculture** will be reported on a four grade scale: Pass, Merit, Distinction, Distinction*.

All assessments **must** be achieved at a minimum of Pass for the qualification to be awarded. Candidates who fail to reach the minimum standard for grade Pass for an assessment(s) will not have a qualification grade awarded and will not receive a qualification certificate.

The approximate pass grade boundary for the synoptic assignment(s) in this qualification are:

Synoptic Assignment	Pass Mark (%)
022	40

Please note that each synoptic assignment is subject to an awarding process before final grade boundaries are confirmed.

The health and safety assessment 201 must be passed to achieve the qualification. This assessment is graded pass/fail.

The contribution of assessments towards the overall qualification grade is as follows:

Assessment method	Grade scale	% contribution
Synoptic Assignment	X/P/M/D	60%
Exams	X/P/M/D	40%

Both synoptic assignments and exams are awarded (see 'Awarding individual assessments', at the start of Section 7, above), and candidates' grades converted to points. The minimum points available for each assessment grade is listed in the table below. A range of points between the Pass, Merit and Distinction boundaries will be accessible to candidates. For example a candidate that achieves a middle to high Pass in an assessment will receive between 8 and 10 points, a candidate that achieves a low to middle Merit in an assessment will receive between 12 and 14 points. The points above the minimum for the grade for each assessment are calculated based on the candidate's score in that assessment.

	Pass	Merit	Distinction
Assignment: 60%	6	12	18
Exams: 40%	6	12	18

The candidate's points for each assessment are multiplied by the % contribution of the assessment and then aggregated. The minimum points required for each qualification grade are as follows:

Qualification Grade	Points
Distinction*	20.5
Distinction	17
Merit	11
Pass	6

Candidates achieving Distinction* will be the highest achieving of the Distinction candidates.

8   Administration

Approved centres must have effective quality assurance systems to ensure valid and reliable delivery and assessment of qualifications. Quality assurance includes initial centre registration by City & Guilds and the centre's own internal procedures for monitoring quality assurance procedures.

Consistent quality assurance requires City & Guilds and its associated centres to work together closely; our Quality Assurance Model encompasses both internal quality assurance (activities and processes undertaken within centres) and external quality assurance (activities and processes undertaken by City & Guilds).

For this qualification, standards and rigorous quality assurance are maintained by the use of:
- internal quality assurance
- City & Guilds external moderation.

In order to carry out the quality assurance role, Internal Quality Assurers (IQAs) must have and maintain an appropriate level of technical competence and have recent relevant assessment experience. For more information on the requirements, refer to *Section 2: Centre requirements* in this handbook.

To meet the quality assurance criteria for this qualification, the centre must ensure that the following procedures are followed:
- suitable training of staff involved in the assessment of the qualification to ensure they understand the process of marking and standardisation
- completion by the person responsible for internal standardisation of the Centre Declaration Sheet to confirm that internal standardisation has taken place
- the completion by candidates and supervisors/tutors of the record form for each candidate's work.

External quality assurance

City & Guilds will undertake external moderation activities to ensure that the quality assurance criteria for this qualification are being met. Centres must ensure that they co-operate with City & Guilds staff and representatives when undertaking these activities.

City & Guilds requires the Head of Centre to
- facilitate any inspection of the centre which is undertaken on behalf of City & Guilds
- make arrangements to receive, check and keep assessment material secure at all times
- maintain the security of City & Guilds confidential material from receipt to the time when it is no longer confidential and
- keep completed assignment work and examination scripts secure from the time they are collected from the candidates to their dispatch to City & Guilds.

Enquiries about results

The services available for enquiries about results include a review of marking for exam results and review of moderation for internally marked assessments.

For further details on enquiries and appeals process and for copies of the application forms, please visit the **appeals page** of the City & Guilds website at **www.cityandguilds.com.**

Re-sits and shelf-life of assessment results
For the synoptic theory exam and synoptic assignment, candidates who have failed an assessment or wish to re-take it in an attempt to improve their grade, can re-sit assessments **once only**. The best result will count towards the final qualification. See guidance on individual assessment types and re-sit conditions in Section 5.

Factors affecting individual learners
If work is lost, City & Guilds should be notified immediately of the date of the loss, how it occurred, and who was responsible for the loss. Centres should use the JCQ form, JCQ/LCW, to inform City & Guilds Customer Services of the circumstances.

Learners who move from one centre to another during the course may require individual attention. Possible courses of action depend on the stage at which the move takes place. Centres should contact City & Guilds at the earliest possible stage for advice about appropriate arrangements in individual cases.

Malpractice
Please refer to the City & Guilds guidance notes *Managing cases of suspected malpractice in examinations and assessments*. This document sets out the procedures to be followed in identifying and reporting malpractice by candidates and/or centre staff and the actions which City & Guilds may subsequently take. The document includes examples of candidate and centre malpractice and explains the responsibilities of centre staff to report actual or suspected malpractice. Centres can access this document on the City & Guilds website.

Examples of candidate malpractice are detailed below (please note that this is not an exhaustive list):
- falsification of assessment evidence or results documentation
- plagiarism of any nature
- collusion with others
- copying from another candidate (including the use of ICT to aid copying), or allowing work to be copied
- deliberate destruction of another's work
- false declaration of authenticity in relation to assessments
- impersonation.

These actions constitute malpractice, for which a penalty (eg disqualification from the assessment) will be applied.

Where suspected malpractice is identified by a centre after the candidate has signed the declaration of authentication, the Head of Centre must submit full details of the case to City & Guilds at the earliest opportunity. Please refer to the form in the document *Managing cases of suspected malpractice in examinations and assessments*.

Access arrangements and special consideration
Access arrangements are adjustments that allow candidates with disabilities, special educational needs and temporary injuries to access the assessment and demonstrate their skills and knowledge without changing the demands of the assessment. These arrangements must be made before assessment takes place.

It is the responsibility of the centre to ensure at the start of a programme of learning that candidates will be able to access the requirements of the qualification.

Please refer to the *JCQ access arrangements and reasonable adjustments and Access arrangements - when and how applications need to be made to City & Guilds* for more information. Both are available on the City & Guilds website: **http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments**.

Special consideration

We can give special consideration to candidates who have had a temporary illness, injury or indisposition at the time of the examination. Where we do this, it is given after the examination.

Applications for either access arrangements or special consideration should be submitted to City & Guilds by the Examinations Officer at the centre. For more information please consult the current version of the JCQ document, *A guide to the special consideration process*. This document is available on the City & Guilds website: **http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments**.

Unit 201   Health and safety for the land-based industries

Level:	2
GLH:	30

What is this unit about?

The purpose of this unit is for learners to understand the principles and importance of health and safety within land-based settings. This unit covers health and safety legislation which provides the requirements upon which policies and procedures within the industry are based.

Working in land-based roles is exciting and varied but operating in these environments can be dangerous and present potential risks and hazards. As part of this unit learners will look at the legislation that is in place to maintain safety, the requirements for risk assessment and how these impact on working practices.

This unit also introduces learners to the basic requirements of fire prevention, safe manual handling and basic first aid.

Learners should consider the following questions as a starting point to this unit:
- What is the difference between a hazard and a risk?
- What legislation covers health and safety when working in land-based environments?
- How should heavy materials or equipment be moved safety?
- What different types of fire prevention equipment are there?

This unit must be taught alongside **all** technical units within the qualification ensuring learners gain an appreciation of its importance and so that they are equipped with knowledge and understanding to protect themselves and others when working in the industry.

Learning outcomes

In this unit, learners will:
1. Understand the impact legislation has on land-based industries
2. Understand risk assessment requirements for land-based industries
3. Understand safe working practices when working in land-based industries.

Learning outcome:

1. Understand the impact legislation has on land-based industries

Topics

1.1 Legislation relevant to land-based industries
1.2 Employer and employee responsibilities

Topic 1.1

The following legislation applies in the land-based sector. For purposes of assessment, there is no requirement for detail, but learners must appreciate that there is legislation and where each applies.

Legislation:

- Health and Safety at Work Act (HASAW) (1974)
- Provision and Use of Work Equipment Regulations (PUWER) (1998)
- Reporting of Injuries Diseases and Dangerous Occurrences Regulations (RIDDOR) (2013)
- Control of Substances Hazardous to Health (COSHH) Regulations (2002)
- Management of Health and Safety at Work Regulations (1999)
- Personal Protective Equipment Regulations (PPE) (1992)
- Regulatory Reform (Fire Safety) Order (2005)
- Environmental Protection Act

NB - Health and safety relating to specific tasks/practices will be covered within the relevant specific unit.

Topic 1.2

Employer responsibilities under health and safety regulations:

- Providing healthy work environment – washing facilities, toilets, ventilation, heating and lighting, no smoking policy, first aid
- Providing safe work environment - signage, personal protective equipment (PPE), fire safety, risk assessments, safe equipment
- Training
- Reporting

Employee responsibilities when health and safety legislation:

- Responsibility for own personal health and safety
- Co-operation with employer
- Not interfering with or misusing equipment/provisions (eg alarms, signage) provided for health, safety and welfare
- Lines of reporting for:
  – Accidents
  – Faults
  – Damage
- Following instructions and safe working practice (using PPE where provided)
- Helping others and sharing good practice

Learning outcome:

2. Understand risk assessment requirements for land-based industries

Topics

2.1 Risk assessment terminology

2.2 Hazards, risks and control measures

Topic 2.1

Definitions of risk assessment terminology:

- Generic risk assessment
- Site specific
- Task specific
- Emergency action plan
- Method statement
- Hazard
- Risk
- Persons at risk (yourself, colleagues, general public)
- Control measures

Topic 2.2

The five step process for risk assessments:

- Identifying hazards
- Deciding who might be harmed and how
- Evaluating risks, deciding on precautions
- Recording finding and implementing
- Reviewing as required

Learning outcome:

3. Understand safe working practices when working in land-based industries

Topics

3.1 Manual handling principles

3.2 Basic first aid procedures

3.3 Fire safety principles

Topic 3.1

Principles of and techniques for manual handling, and consequences of not following:

- Legislative requirement
- Safe lifting techniques
- Use of mechanical aids
- Potential implications of poor manual handling – back injury, dropped and damaged goods/equipment
- That it is covered by manual handling risk assessment

Topic 3.2

First aid situations:

- Wounds/severe bleeding
- Burns

- Shock
- Unconsciousness
- Falls from height

Response to first aid situations:
- Procedures to be taken
- How and when to call for assistance
- Reporting requirements
- Own limitations when responding to first aid emergency

Topic 3.3
Principles of fire safety, procedures to follow, and fire safety equipment and their uses:
- Procedures for raising the alarm
- Evacuations and drills
- Types and uses of fire safety equipment:
  - Smoke detectors
  - Fire alarms
  - Fire extinguishers (water, dry powder, foam, CO2)
  - Fire blankets
  - Fire hoses
- Own limitations when responding to potential fire emergency

Guidance for delivery

This unit links closely with all other units and provides the basis of knowledge required to work safely on all tasks in the range of land-based environments. Tutors should guide learners to develop their understanding of principles of health and safety required for working within the industry as learners will need to understand how these are essential for employment within the sector.

This is a knowledge only unit and although the majority of content could be delivered in a classroom environment, it is important that learners can relate this knowledge and understanding to real life working tasks and environments. Reference to this unit should be made when teaching the other practical units that make up this qualification.

It is expected that a range of delivery methods will be used including presentations, classroom discussions and individual study.

Topic 1.1 relates to legislation - there is no requirement for a detailed understanding at this level, but learners must appreciate where there is legislation, what they are and where each applies. Tutors should ensure that they keep up to date with changes and amendments to legislations covered by this unit and include delivery of locally relevant policy and standards where relevant.

Suggested learning resources

Websites

Health and Safety Executive (HSE)   www.hse.gov.uk

Unit 202 Introduction to the forestry and arboriculture sector

Level:	2
GLH:	30

What is this unit about?

The aim of this unit is to provide the learner with knowledge of the forestry and arboriculture sector and the types of organisations that operate within it. Learners will understand their roles and responsibilities in supporting a business to achieve its commercial objectives.

Learners will understand the different career opportunities available. They will understand the processes involved in completing applications and preparing for job interviews.

Learners should consider the following questions as a starting point to this unit:

- What are the differences between forestry and arboriculture?
- Are additional skills and qualifications required to undertake works for different industry sectors?
- What career opportunities are available?

As part of the unit requirements, learners must achieve 150 hours of work experience within the industry. This requirement is subject to external quality assurance through sampling of learner evidence, which must be provided by centres upon request by City & Guilds.

Learning outcomes

In this unit, learners will:
1. Understand the forestry and arboriculture sector
2. Understand career development opportunities and progression.

Learning outcome:

1. Understand the forestry and arboriculture sector

Topics

1.1 Definitions of forestry and arboriculture
1.2 Sectors of the forestry and arboriculture industry
1.3 Regional variations in job roles
1.4 Requirements for working in the industry
1.5 Types of employment in the industry

Topic 1.1
- Forestry – the science and practice of planting and managing trees as a crop
- Arboriculture – managing trees for purposes other than timber production

Topic 1.2
Different sectors in the forestry & arboriculture industry:
- Domestic
  - Private landowners
  - Householders
- Governmental organisations
  - Forestry Commission
  - MOD
  - Environment Agency
  - Highways Agency
- Non- Governmental Organisations (NGO)
  - National Trust
  - Wildlife Trusts
- Local authority
  - Local
  - Borough and parish councils
- Utility works
  - Road and rail networks
  - Electricity
  - Waterways

Requirements for working in local authority, governmental and non-governmental organisations:
- Accreditation by industry bodies
  - Arboricultural Association
  - Institute of Chartered Foresters
- Relevant sector qualifications
- Insurance
  - Public liability
  - Employers liability
  - Professional indemnity

Requirements for working in utilities organisations

- Differences between highways, telephone, rail and power-line works
- Distribution Network Operator (DNO) approval
- Additional qualifications - Utility Arboriculture units

Topic 1.3

Regional variations in the type of job roles available in the UK :
- Arboriculture more prevalent in urbanised areas
- Forestry more prevalent in rural areas

Topic 1.4

Qualities required to work in the industry:
- Work ethics
    - Health and safety awareness and conduct
    - Tidy job/good job
    - Reliable
    - Punctual
    - Polite
    - Timekeeping
    - Appearance
    - Respecting diversity
    - Honesty
    - Resilience
- Communication
- Customer expectations
- Qualifications including refresher training and CPD

Topic 1.5

Types of employment in the industry:
- Self-employment
    - Insurance & liability
    - Fixed and variable costs
    - Planning for periods of no income - sickness, holidays, accident, training
    - Tax and self-assessment

- Employment
    - PAYE
    - Holiday entitlement
    - Employer legal responsibilities - employers liability insurance, provision of PPE, legislative responsibilities

Learning outcome:

2. Understand career development opportunities and progression

Topics

2.1 Job roles and methods of career development
2.2 Job applications and interview preparation

Topic 2.1

Roles and responsibilities of:
- Forester
- Forest manager
- Ranger
- Researcher

- Ground person
- Climber
- Team leader
- Tree officer
- Surveyor
- Consultant
- Expert witness

Methods of career development:
- Career development plans to identify knowledge and skills advancement
- Continuous professional development (CPD) through seminars, workshops, research, training

Topic 2.2
The importance of documentation relevant to job applications:
- Structure of a CV
  - Personal details
  - Personal statement
  - Education
  - Employment details
  - Skills
  - Referees

- Format of cover letters
  - Personal address and employers address
  - Date
  - Addressee
  - Content - ensure letter is relevant to job role, avoid duplication of information in cv
  - Use of accepted letter writing format, ie faithfully, sincerely
  - Signature

The importance of good preparation for interviews:
- Read job description
- Research the company
- Prepare questions and answers
- Question and answering techniques
- Select and prepare suitable attire
- Plan journey
- Reflection on interview process

Guidance for delivery

This unit provides an overview of the arboriculture and forestry sectors and jobs within the sectors. Tutors could also discuss the opportunities presented by overseas work and types of international jobs that may be available to learners. Learners should be encouraged to undertake research into job roles in these sectors and to reflect on their own potential career development once they have completed the course.

This unit should be undertaken in a real business environment relevant to the subject interest of the learner but work experience may be gained by a number of routes, e.g. as part of an industrial placement whilst within the programme, whilst working on a planned daily or weekly basis on the

centre's commercial and/or educational facilities, whilst undertaking voluntary work within the industry, or as a member of a group of learners invited to carry out practical work on a suitable business.

Any Act or legislation that is sector specific should be adhered to.

Learners must complete 150 hours work experience. Centres should be mindful of their responsibilities for ensuring that work placements have appropriate supervision, insurance and health and safety policies in place and that learners have access to appropriate support whilst on placement. This requirement is subject to external quality assurance through sampling of learner evidence, which must be provided by centres upon request by City & Guilds.

Provided it meets the requirements detailed in the Qualification Handbook and the Employer Involvement Centre Guidance, this work experience can also count as the meaningful employer involvement component that all learners are also required to undertake.

In these instances, centres must record work experience activities on the Employer Involvement Planner and Tracker and retain records confirming each learner's attendance at these placements. These must be made available to City & Guilds if required, as part of our standard quality assurance monitoring.

The unit also covers career progression, opportunities and job applications and learners should be encouraged to consider their own career development plan and wherever possible should practice job applications and interview techniques. This could be carried out through completing mock applications for real jobs that they see advertised and role playing mock interviews.

Topic 1.1
Tutors should expand on the definitions for forestry and arboriculture and could include information on different aspects of the industry such as:
- Forestry - crop rotation, coppicing, planting schemes, thinning methods, canopy cover
- Arboriculture - co-existence with humans in an urban environment, wildlife, amenity, preservation, improving air quality and flood controls

Topic 1.3
When discussing regional variations in the type of job roles available in the UK tutors should provide examples of jobs or visits to employers in their local area

Topic 1.4
When discussing qualities required for this type of work it is important to discuss the requirement to work in most weather conditions and an understanding of the conditions when it would be inappropriate to work.

Unit 203   Environment and conservation

Level:	2
GLH:	30

What is this unit about?

The purpose of this unit is for learners to understand the importance of the environment and its conservation. Learners will understand that through appropriate management of the land it will become more sustainable and potentially more productive. They will understand bio security and resilience in managing tree stock.

They will understand the causes and effects of pollution and surface water and will know the control methods that can be used to manage these issues. Learners will understand how to manage habitats and control wildlife and be expected to create and protect a given wildlife habitat

Learners should consider the following questions as a starting point to this unit:
- How is environmental damage caused?
- How can environmental damage be prevented?
- How can habitats be protected?
- How can we prevent the spread of invasive threats?

Learning outcomes

In this unit, learners will:

1. Understand environmental legislation
2. Understand pollution, drainage and water management
3. Understand habitats, wildlife control and management
4. Understand bio-security and resilience of tree stock.

1. Understand environmental legislation

Topics
1.1 Tree protection legislation
1.2 Other environmental legislation

> **Topic 1.1**
> The key points of tree protection legislation:
> - Tree Preservation Orders (TPOs)
> - Conservation areas
> - Sites of Special Scientific Interest (SSSIs)
> - Felling licences
>
> **Topic 1.2**
> The key points of other environmental legislation:
> - Areas of Outstanding Natural Beauty (AONB)
> - European Protected Species (1994)
> - Wildlife and Countryside Act (1981)
> - Countryside Rights of Way Act (2000)
> - Hedgerow Regulations (1997)

Learning outcome:

2. Understand pollution, drainage and water management

Topics
2.1 Types and effects of pollution
2.2 Control measures to manage pollution
2.3 Effects of surface water and drainage management solutions

> **Topic 2.1**
> Types of pollution and the effect on the environment:
> - Fossil fuels
>   - Acid rain
>   - Greenhouse effect/climate change
>   - Ground level ozone
> - Surface/sub surface contamination
>   - Oil spills
>   - Agricultural surface run off
>   - Brown field and land fill sites
>   - Methane gas
>   - Sub-surface pollution
>
> - Noise and light pollution
>   - Disturbs established wildlife patterns
>   - Deters population establishment

Topic 2.2

Control measures for pollution:
- o Vegetation planting
- o Spill kits
- o Specialist fuels
- o Reduction in vehicle use
- o Emerging technologies
- o Infrastructure changes (coal-fired power stations)

Topic 2.3

The effects of surface water and drainage management solutions:

- Flooding
  - o Reduced crop yields
  - o Loss of livestock/property
  - o Erosion
  - o Ground saturation
  - o Wind-throw risk
- Solutions
  - o Sustainable / urban drainage systems (suds)
  - o Drainage ditch creation and maintenance
  - o Siltation of streams and rivers
  - o Flood mitigation

Learning outcome:

3. Understand habitats, wildlife control and management

Topics

3.1 Creation and protection of habitats

3.2 Management and control of wildlife

Topic 3.1

Planning the creation and protection of habitats:

- Creation
  - o Woodland
  - o Invertebrate stack
  - o Standing dead wood
  - o Riparian
  - o Fencing
- Methods of protection
  - o Fencing
  - o Population management
  - o Seasonal work - only working at specific times of the year to reduce impact on the habitat
  - o Introduction of advantageous species
  - o Management of invasive species

Topic 3.2

Management and control of wildlife populations:
- Management
  - Monitoring population levels
  - Food chain management
- Control
  - Culling
  - Fertility control
  - Predation
  - Repellents
  - Traps
  - Sonic nets

Learning outcome:

4. Understand bio-security and resilience of tree stock

Topics

4.1 Bio-security in forestry and arboriculture
4.2 Resilience of tree stock

Topic 4.1

Bio-security and methods used to minimise risk to plant or animal health:
- Monitoring systems and procedures
- Quarantine
- Sterilisation of equipment, clothing and vehicles
- Population control
- Sanitary felling
- Plant passport

Topic 4.2

Measures undertaken to maintain resilient tree stock:
- Inoculation
- Breeding
- Resistant tree species
- Fire breaks
- Education

Guidance for delivery

In this unit learners will develop an understanding of the causes and effects of environmental damage and invasive threats to woodland and tree species. Tutors should reference the key government agencies as part of the teaching for this unit - The Department of the Environment and Rural Affairs (Defra) for information on the National Plant Risk Register, and the Food and Environment Research Agency (Fera) and the Forestry Commission for information on notifiable pests and diseases.

This unit will largely be classroom based with the use of case studies and practical examples used to apply theory, with current and topical issues highlighted as and when they arise.

Learners should apply environmental and sustainable theories taught in the classroom to their practical work and will be expected to understand the processes involved in planning for the creation and protection of wildlife habitats.

Topic 3.2

When discussing "monitoring population levels" tutors should consider both internal and external methods.

Unit 204   Tree classification and identification

Level:	2
GLH:	30

What is this unit about?

The purpose of this unit is for learners to understand the methods by which trees can be identified. They will understand classifications and the nomenclature of trees and their characteristics.

They will be able to identify a range of trees using botanical and common names when they are in both their growth and dormant states.

Learners should consider the following questions as a starting point to this unit:

- How is Taxonomy used in tree identification?
- How are the visual characteristics of a tree used during identification?
- What is the importance of using botanical names in tree identification?

Learning outcomes

In this unit, learners will:

1. Understand classification, naming and characteristics of trees
2. Identify trees.

Learning outcome:

1. Understand classification, naming and characteristics of trees

Topics

1.1 Classification of trees
1.2 Naming of trees
1.3 Physical characteristics of trees

Topic 1.1
- Evergreen
- Deciduous
- Broadleaf
- Coniferous

Topic 1.2
Importance and use of scientific naming.
Naming of trees:
- Taxonomy
  - Genera
  - Species
  - Varieties
  - Cultivars

Topic 1.3
Physical characteristics of trees:
- Form
- Bud arrangement
- Bark
- Leaf shape
- Leaf type
- Flowers and fruits

Learning outcome:

2. Identify trees

Topics

2.1 Visual characteristics of trees
2.2 Identify different types of tree in the field

Topic 2.1
- Form
- Leaf characteristics
  - Simple
  - Compound
  - Margin
  - Colour
- Leaf scars
- Fruit/flowers/cones
- Bud/leaf arrangement
- Bark
- Lenticels

Topic 2.2

Identify trees in the field comparing visual characteristics and recording information using botanical and common names.

Guidance for delivery

This unit should be delivered in line with the health and safety principles, policies and procedures covered in unit 201. The Health and safety unit provides the underpinning knowledge for Health and safety and legislation which must be embedded across all units in this qualification. The unit provides an understanding of policies and procedures that are in place to maintain safety, the importance of risk assessment and how these impact on working practices. Health and safety relating to specific tasks/practices will be covered within the relevant specific unit.

Learners should be given sufficient opportunity to identify a wide range of woodland and amenity trees in their growth and dormant stages. They should also be encouraged to collate personal identification fact sheets as a means of improving their identification skills. Use of clear colour photographs is acceptable where live examples are unavailable.

Centres are encouraged to introduce employers and specific professionals from the horticulture, forestry or arboriculture industries to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of working sites and nurseries to add depth to the learner's experience.

It is anticipated that this unit will be delivered through supervised practical training and the learner will be able to consolidate their learning through online tree identification web sites and mobile apps. The unit should be delivered throughout the year, with consideration given to appropriate seasonal aspects of tree growth and characteristic development.

Topic 2.2

Learners are expected to identify a **minimum of 20** trees in the field, the 20 (marked with an asterisk) from the list below **must** be included. They must be able to compare visual characteristics and record information using both the botanical and common names

Common name	Scientific name
Grand Fir	*Abies grandis*
Noble Fir	*Abies procera*
Field Maple	*Acer campestre*
Norway Maple	*Acer platanoides*
*Sycamore	*Acer pseudoplatanus*
*Horse Chestnut	*Aesculus hippocastanum*
Common Alder	*Alnus glutinosa*
*Silver Birch	*Betula pendula*
Common Box	*Buxus sempervirens*
*Sweet Chestnut	*Castanea sativa*
*Hornbeam	*Carpinus betulus*
Deodar Cedar	*Cedrus deodara*
Lawson Cypress	*Chamaecyparis lawsoniana*
*Common Hazel	*Corylus avellana*
*Hawthorn	*Crataegus monogyna*
Leyland Cypress	x *Cuprocyparis leylandii*
Cider Gum	*Eucalyptus gunnii*
*European Beech	*Fagus sylvatica*
*Common Ash	*Fraxinus excelsior*
*Common Holly	*Ilex aquifolium*
Black Walnut	*Juglans nigra*
Common Juniper	*Juniperus communis*
Common Laburnum	*Laburnum anagyroides*
*European Larch	*Larix decidua*
Hybrid Larch	*Larix x marschlinsii*
Common Apple	*Malus domestica*
Crab Apple	*Malus sylvestris*
*Scots Pine	*Pinus sylvestris*
Corsican Pine	*Pinus nigra* ssp. *laricio*
Lodgepole Pine	*Pinus contorta* ssp. *latifolia*
*Norway Spruce	*Picea abies*
Sitka Spruce	*Picea sitchensis*
*London Plane	*Platanus* x *hispanica*
Hybrid Black Poplar	*Populus* x *canadensis*
*Lombardy Poplar	*Populus nigra* "Italica"

Bird Cherry	*Prunus padus*
Aspen	*Populus tremula*
*Wild Cherry	*Prunus avium*
*Douglas Fir	*Pseudotsuga menziesii*
Sessile Oak	*Quercus petraea*
*Pedunculate Oak	*Quercus robur*
Red Oak	*Quercus rubra*
Black Locust	*Robinia pseudoacacia*
Goat Willow	*Salix caprea*
Crack Willow	*Salix fragilis*
Whitebeam	*Sorbus aria*
*Rowan/ Mountain Ash	*Sorbus aucuparia*
Wild Service Tree	*Sorbus torminalis*
Common Yew	*Taxus baccata*
*Common Lime	*Tilia x europaea*
Western Hemlock	*Tsuga heterophylla*
Wych Elm	*Ulmus glabra*
Common Elm	*Ulmus procera*

Unit 205   Introduction to plant science

| **Level:** | 2 |
| **GLH:** | 60 |

What is this unit about?

On completion of this unit, learners will have developed an understanding of the composition and characteristics of soil which influence plant growth. They will have knowledge of the soil structure and basic plant physiology.

Learners will understand a range of control measures for common pests, diseases and fungi associated with trees and will be able to identify pests and diseases in a practical working environment.

Learners should consider the following questions as a starting point to this unit:
- What are the characteristics of different types of soil?
- What are the different plant parts and their functions?
- What are the different types of pests and diseases that affect trees?
- How can pests and diseases be controlled?

Learning outcomes

In this unit, learners will:

1. Understand different soil types
2. Understand plant physiology
3. Understand control measures for pests, disease and fungi in trees.

Learning outcome:
1. Understand different soil types

Topics
1.1 Soil types and characteristics
1.2 Influences on plant growth
1.3 Actions to improve soil properties

Topic 1.1
Impact of different soil types and characteristics on plant growth.
Soil types:
- Sand
- Silt
- Clay

Soil characteristics:
- Soil structure
- Soil texture
- Compaction
- Porosity

Topic 1.2
Influence of soil properties on plant growth:
- Water availability
- Availability of air
- Nutrient availability
- PH of soil

Topic 1.3
Actions to improve soil properties
- De-compaction
- Mulching
- Fertilisation
- Drainage
- Soil improvers (amelioration)
  - Compost
  - Organic matter
  - Mycorrhizae

Learning outcome:
2. Understand plant physiology

Topics
2.1 Plant tissues
2.2 Plant parts and their functions

Topic 2.1

Plant tissues and their primary functions:
- Vascular tissues
  - Xylem – water and nutrient uptake
  - Phloem – transports photosynthates
- Meristematic tissues – undifferentiated cells, eg cambium, buds

Topic 2.2

Plant parts and their primary functions:
- Roots
  - Anchorage
  - Water and nutrient uptake
  - Storage
- Stem
  - Support
  - Water movement
  - Storage
- Bark
  - Protection
  - Gas exchange
  - Water loss
- Leaves
  - Water movement
  - Photosynthesis

Learning outcome:
3. Understand control measures for pests, diseases and fungi in trees

Topics
3.1 Control measures for vertebrate pest species
3.2 Control measures for invertebrate pest species
3.3 Control measures for tree diseases and disorders
3.4 Control measures for fungi species

Topic 3.1

Control measures for common vertebrate pest species:

- Pest species
  - Rabbits
  - Squirrels
  - Deer
- Control measures
  - Fencing
  - Culling
  - Trapping

Topic 3.2

Control measures for common invertebrate pest species:

- Pest species
  - Gall wasps and their larvae
  - Beetles and their larvae
  - Butterflies/moths and their larvae
- Control measures
  - Trapping
  - Predation
  - Spraying
  - Micro-injections

Topic 3.3

Control measures for common tree diseases and disorders:

- Tree diseases and disorders
  - Bleeding cankers
  - Viruses
  - Bacteria
- Control measures
  - Spraying
  - Micro-injections
  - Pruning
  - Sanitary felling
  - Bio security

Topic 3.4

Control measures for common fungi species:

- Detrimental fungi
  - Parasitic
  - Saprophytic
- Control measures
  - Felling
  - Pruning

Beneficial fungal species for trees:

- Mycorrhizae

Guidance for delivery

Laboratory and field-based practical work will be essential to help learners to explore soil characteristics, plant physiology and structure. In order to develop an understanding of the structure and basic plant physiology learners are required to study a range of plants for this unit and tutors should encourage external visits to help learners better understand plant growth and development.

This unit will provide learners with an understanding of the composition and characteristics of soil which influence plant growth. They should have access to a range of soils, as well as appropriate equipment and resources to undertake soil sampling and investigate soil profiles.

Field based practical work is essential to identify common pests and diseases and tutors should use the opportunity to explain the different control measures linked to cultural, biological and chemical processes. Tutors should ensure that they remain up to date with current Defra guidelines and forest research on pests and diseases when delivering this unit.

Visiting speakers could enhance relevance of the subject to learners. Development of areas within a college environment where learners are able to modify and manipulate plant environments may enhance understanding of the complexities of plants and their life cycles.

Unit 206 Tree establishment

Level:	2
GLH:	60

What is this unit about?

The purpose of this unit is for learners to understand the requirements for the successful establishment of trees. They will understand the principles that govern the selection of trees, how to prepare the ground and the impact of cultivation methods on specific sites.

Learners will be able to prepare sites for planting and plant trees using a range of different techniques. They will understand the requirements for maintenance and be able to plan and provide suitable aftercare over a period of time.

Learners should consider the following questions as a starting point to this unit:
- Why plant trees?
- What do I plant, when do I plant it and how?
- What steps need to be taken to improve survival rates?
- What needs to be done before and after planting?

Learning outcomes

In this unit, learners will:
1. Understand the tree selection process for specific sites
2. Preparation of sites for planting
3. Plant and protect trees
4. Understand aftercare requirements for trees.

Learning outcome:

1. Understand the tree selection process for specific sites

Topics

1.1 Tree selection
1.2 Nursery stock specification
1.3 Nursery stock handling

Topic 1.1
Reasons for selection:
- Nursery stock
- Timber stock
- Seasonal interest
- Urban planting
- Fruit production

Factors which influence the selection:
- Species
- Predicted size/spread
- Soil type
- Aspect
- Topography
- Local climate

Topic 1.2
Nursery stock specification defined by form and root.
Form:
- Seedlings
- Cuttings
- Transplants
- Whips
- Feathered
- Standards

Root:
- Bare root
- Root balled
- Containerised and cell grown

Topic 1.3
The importance of correct handling, transportation and storage of trees before planting
- Tying down
- Covering
- Avoid damage to apical bud
- Heeling in
- Cold storage
- Bags

Learning outcome:

2. Preparation of sites for planting

Topics
2.1 Principles of ground preparation
2.2 Cultivation methods

Topic 2.1

Principles of ground preparation:
- Weed control
  - Chemical
  - Mechanical
- Cultivation
- Drainage
- Amelioration - organic matter, mycorrhizae, polymers
- Litter picking
- Fencing

Topic 2.2

Type of cultivation methods on different sites:
- Digging
- Rotavating
- Sub-soiling

Learning outcome:

3. Plant and protect trees

Topics
3.1 Planting techniques
3.2 Staking and supporting trees
3.3 Tree protection
3.4 Site preparation and planting

Topic 3.1

Different planting techniques and their uses:
- Notch planting
- Mound planting
- Pit planting

Topic 3.2

Methods of staking and supporting trees:
- Upright
- Angled

- Double stake and rail
- Guying
- Underground anchors

Topic 3.3

Methods of protecting new stock after planting:

- Mulch mats
- Spirals
- Shelters
- Guards
- Fencing to prevent against damage from stock, deer and rabbit

Topic 3.4

Methods of site preparation and selection of nursery stock suitable for the site and environment.

Topic 3.5

Ground preparation and planting techniques including aftercare for nursery stock such as staking and protection.

Learning outcome:

4. Understand aftercare requirements for trees

Topics

4.1 Methods of aftercare
4.2 Monitoring trees
4.3 Scheduled aftercare and re-surveying

Topic 4.1

Providing aftercare for planted trees:

- Weeding
- Watering
- Mulching
- Adjusting/removal of stakes and ties
- Herbicides/pesticides
- Litter control
- Fence repairs
- Beating up

Topic 4.2

Importance of monitoring the health and establishment of trees:

- Timing
  - Frequency

- o Times of year
- Pests and diseases
- Environmental factors
- Mortality rates
- Record keeping

Topic 4.3
Benefits of scheduled aftercare and re-surveying sites:
- Longevity
- Quality
- Yield
- Income
- Cost
- Reputation
- Future health & safety issues

Guidance for delivery

This unit should be delivered in line with the health and safety principles, policies and procedures covered in unit 201. The Health and safety unit provides the underpinning knowledge for health and safety and legislation which must be embedded across all units in this qualification. The unit provides an understanding of policies and procedures that are in place to maintain safety, the importance of risk assessment and how these impact on working practices. Health and safety relating to specific tasks/practices will be covered within the relevant specific unit.

This unit is designed to provide the learner with the knowledge and skills required to successfully select and plant trees. The unit should cover a range of planting and aftercare techniques, appropriate to the area of study as well as those locally or regionally significant to the learners.

Learners will be introduced to nursery stock, its handling and planting techniques. They will appreciate the preparation required to facilitate planting and have an awareness of the aftercare requirements. A range of site conditions and planting requirements should be available to study. These will inform the choice of tree species, as well as the choice of planting methods and stock.

Centres are encouraged to introduce employers and specific professionals from the horticulture, forestry or arboriculture industries to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of working sites and trade shows to add depth to the learner's experience. In addition, current and topical issues regarding tree establishment and protection should be highlighted as and when they arise.

It is anticipated that this unit will be delivered through supervised practical training and the learner will be able to consolidate operational skills within realistic working environments. The unit should be delivered throughout the year, with consideration given to appropriate seasonal aspects of tree planting and the impact of weather extremes on operations.

Topic 1.1
Tutors could refer learners to nursery catalogue or BS3936 part 1and BS8545 for further information on types of nursery stock.

Topics 3.4 and 3.5

In these topics learners are expected to select and plant at least two different types of nursery stock from any of the combinations below:

- Bare root transplants
- Root-balled light standards
- Containerised standards
- Bare root whips

Unit 207   Tree and woodland management

Level:	2
GLH:	90

What is this unit about?

The purpose of this unit is for learners to understand tree and woodland management and the importance of identifying and working towards specific planned objectives.

Learners will identify objectives, carry out a site survey to gather data which will allow them to identify and prioritise works. They will plan and undertake aerial and ground based operations in order to complete work and produce timber products.

Learners should consider the following questions as a starting point to this unit:
- Why are trees and woodlands managed?
- What information do I need to gather during a survey?
- How do I plan to undertake works?

Learning outcomes

In this unit, learners will:
1. Understand the objectives of management plans
2. Conduct tree surveys
3. Carry out tree works
4. Understand the process of timber production for markets.

Learning outcome:

1. Understand the objectives of management plans

Topics

1.1 Tree and woodland management plans
1.2 Site surveys
1.3 Data collection

Topic 1.1

Objectives of management plans:

- Timber production
    o Thinning schedules
    o Species selection
    o Silvicultural systems
- Conservation/wildlife protection
    o Habitat creation
    o Wildlife corridors
- Sporting game/management
- Maintaining health
    o Pruning
    o Pest and diseases
    o Soil conditions
- Hazard abatement
- Visual amenity
- Requirements for community use
    o Accessibility
    o Parking
    o Education
- Provision of recreation facilities
    o Cycling
    o Walking
    o Horse riding
    o Bird watching

Topic 1.2

Purpose of site surveys in achieving management plans:

- Gather relevant information to
    o Determine current use and status of site
    o Identify work required
    o Ascertain feasibility

Topic 1.3

Importance of data collection:

- Accuracy of measurements
    o Volume
    o Height
    o Diameter at breast height (dbh)
- Species identification
- Location of sites features
    o Drainage
    o Streams

Learning outcome:

2.   Conduct tree surveys

Topics
2.1 Types and purpose of tree surveys
2.2 Information for tree surveys
2.3 Tree inventory survey

Topic 2.1
Different types and purpose of tree surveys:
- Inventory survey
- Condition survey
- Hazard abatement

Topic 2.2
Information required for tree surveys:
- Visual assessment
- Primary data records
  o   Species
  o   Height
  o   Crown spread
  o   Number of stems
  o   Diameter at breast height (dbh)
  o   Condition
  o   Any other notes
- Secondary data
  o   Statutory protection
  o   Topographical data

Topic 2.3
Primary data requirements for tree inventory surveys:
- Common name
- Scientific name
- Tree height
- Crown spread
- Number of stems
- Diameter at breast height (dbh)
- Tree health and condition
- Additional notes

Learning outcome:

3. Carry out tree works

Topics

3.1 Planning for tree works
3.2 Undertake tree works
3.3 Dispose of arisings

Topic 3.1

Planning process for tree works:
- Site specific risk assessment
- Relevant permissions/licences
- Roles and responsibilities of site operatives
- Site considerations
  o Domestic
  o Commercial
  o Highway
  o Utility
  o Wildlife
  o Statutory protection
- List required equipment
  o Powered and non-powered equipment
  o PPE
  o Signage
  o Identify labour and skills requirements

Topic 3.2

Undertake tree works in line with industry code of practice

Topic 3.3

Dispose of arisings appropriately based on site constraints

Learning outcome:

4. Understand the process of timber production for markets

Topics

4.1 Criteria for selecting trees to be extracted
4.2 Harvesting and extraction
4.3 Factors that determine timber markets
4.4 Equipment for timber production
4.5 Create timber products

Topic 4.1

Criteria for selecting trees for extraction:

- Conservation
- Habitat
- Timber
    o Asymmetrical
    o Twin leaders
    o Cavities
    o Diseased

Topic 4.2

Harvesting techniques and considerations for extracting:

- Harvesting techniques
    o Manual
    o Mechanised
- Considerations for extracting
    o Access for extraction
    o Preparation of timber – consider tree length, cord wood, pulp wood
    o Woodland stacking – how and where
- Impact of choice of equipment such as forwarder, skidder, horse
    o Short term
    o Long term
    o Public perception

Topic 4.3

Factors that determine the market for timber and timber products:

- Demand
- Species
- Quality of timber
- Size
- Availability

Topic 4.4

Equipment used for conversion of timber and timber products:

- Chainsaw
- Harvester
- Chipper
- Mulcher
- Mobile saw mill

- Skidder
- Peeler-pointer

Topic 4.5

Convert timber into products for the intended market using appropriate equipment:
- Logs
- Planks
- Mulch
- Pulp
- Bio-fuel
- Tree stakes
- Fence posts
- Chainsaw carving

Guidance for delivery

This unit should be delivered in line with the health and safety principles, policies and procedures covered in unit 201. The Health and safety unit provides the underpinning knowledge for health and safety and legislation which must be embedded across all units in this qualification. The unit provides an understanding of policies and procedures that are in place to maintain safety, the importance of risk assessment and how these impact on working practices. Health and safety relating to specific tasks/practices will be covered within the relevant specific unit.

Centres are encouraged to introduce employers and specific professionals from the horticulture, forestry or arboriculture industries to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of working sites and trade shows to add depth to the learner's experience. In addition, current and topical issues regarding tree establishment and protection should be highlighted as and when they arise.

It is anticipated that this unit will be delivered through supervised practical training and the learner will be able to consolidate operational skills within realistic working environments.

Topics 1.1 and 1.2

Tutors should make learners aware that there is an additional level of protection relating to countryside conservation and should discuss Sites of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).

Topic 2.3

In this outcome learners are expected to conduct a tree inventory survey. **A minimum of 10 different trees** of varying species are to be surveyed.

Topic 3.2

In this outcome, learners will undertake tree works to include tree climbing skills and ground-related operations.

There is **no requirement** for learners to use chainsaws in an aerial situation but learners must carry out target pruning in a safe and controlled manner. At all times learners must work under appropriate supervision.

Learners will develop skills with chainsaws as part of ground related operations. This must include maintenance and cross-cutting in accordance with industry best practice. At all times learners

should be under appropriate supervision and equipped with correct PPE for the operations being undertaken.

Learning outcome 4

In this outcome, learners will explore the processes and logistics of timber harvesting and extraction, including the identification of uses and markets. Regional variation and sustainability should be considered.

Learners will produce timber products using the equipment available to them. Products should be chosen to suit the centres resource capabilities but should have an identified market or use that the learners can relate to.

Unit 208   Tools and equipment

Level:	2
GLH:	30

What is this unit about?

The purpose of this unit is for learners to gain a working knowledge of the purpose and operation of hand tools and equipment commonly used in forestry and arboriculture.

Learners will understand the application and maintenance of hand and power tools and equipment. They will be familiar with power equipment layout, safety features and controls. They will be able to carry out pre and post-start checks and running adjustments as well as selecting and wearing the appropriate personal protective equipment (PPE) when using tools and equipment.

Learners should consider the following questions as a starting point to this unit:
- What tools or equipment should I use to complete a given task?
- What are the specific requirements when using tools and equipment?
- What do I need to do to become proficient in the use of tools and equipment?

Learning outcomes

In this unit, learners will:
1. Understand tools and equipment used in forestry and arboriculture
2. Prepare tools and equipment for work
3. Operate tools and equipment.

Learning outcome:

1. Understand tools and equipment used in forestry and arboriculture

Topics

1.1 Purpose of hand tools and equipment
1.2 Characteristics of powered equipment
1.3 Working practices
1.4 Legislation and industry guidance

Topic 1.1

Purpose of hand tools and equipment:

Hand tools

- Secateurs
- Loppers
- Pruning saw
- Winches
- Felling levers
- Cant hook
- Wedges

Equipment for specific tasks

- Felling
  - Chainsaws
  - Harvester
- Dismantling
  - MEWPS
  - Cranes
- Extraction
  - Skidder
  - Forwarder
- Processing
  - Chipper
  - Saw mill
  - Log splitter
- Stump removal
  - Stump grinder
  - Powered winch
  - Excavator
- Tree planting
  - Spades
  - Dibbles
  - Spears

Topic 1.2

Characteristics of powered equipment:

- Safety features
- Power source
  - Petrol/diesel
  - Electric
  - Battery
  - PTO
  - Hydraulic
- Drive and transmission systems

Topic 1.3

Importance of following good working practices:

- Tools and equipment must be fit for purpose
- Operator competence - review and retraining
- Follow manufacturer's and industry guidance
  o Safe working load
  o Working parameters
  o Safe working distances
- Duration of use
  o Fuel capacity
  o Vibration
  o Noise
  o Exposure time

Topic 1.4

Legislation and industry good practice:

- Legislation
  o Health and Safety at Work Act (HASAW) (1974)
  o Provision and Use of Work Equipment Regulations (PUWER) (1998)
  o Control of Substances Hazardous to Health Regulations (COSHH) (2002)
  o Manual Handling Operations Regulations (1992) (as amended)
  o Personal Protective Equipment (PPE) at Work Regulations (1992)
  o Control of Noise at Work Regulations (2005)
  o Control of Vibration at Work Regulations (2005)
  o Lifting Operations and Lifting Equipment Regulations (LOLER) (1998)

- Industry guidance
  o Forest Industry Safety Accord (FISA)
  o Arboriculture and Forestry Advisory Group (AFAG)

Learning outcome:

2. Prepare tools and equipment for work

Topics

2.1 Pre and post-use tools and equipment checks
2.2 Scheduled maintenance for tools and equipment
2.3 Common faults and remedial actions.

Topic 2.1

Pre and post-use tool and equipment checks:

- Indications of obvious damage or lack of maintenance
- Safety features present and functioning
- Pre-use checks
  o Visual checks
  o Fuel/oil checks
  o Belt/chain tension
  o Operation of safety features

   o On/off switch

Topic 2.2

Scheduled maintenance for tools and equipment:

- Use of manufacturer's handbook
- Selection and use of personal protective equipment (PPE) for maintenance tasks
- Selection and use of appropriate tools for maintenance
- Maintenance records

Topic 2.3

Common faults, remedial actions and procedures for faulty tools and equipment:

- Common faults
  - Wear and tear
  - Power source
  - Safety features
  - Lack of power or poor performance
  - Fuel mix
- Remedial actions
  - Replacement parts
  - Fuel flush
  - Adjustments
- Procedures
  - Isolate
  - Identify as out of service
  - Arrange for repair or disposal
  - Update PUWER records

Learning outcome:

3. Operate tools and equipment

Topics

3.1 Use tools and equipment

3.2 Storage and transport

Topic 3.1

Safe and efficient use of tools and equipment:

- Complete a site specific risk assessment
- Select appropriate PPE
- Set up safe working area
- Use selected tools or machinery for a given task

Topic 3.2

Safe storage and transportation of tools and equipment

- Follow manufacturer's guidelines
- Transport
  - Secure load
  - Use protective sheaths/covers
- Planning for long term storage
  - Remove tension from belts
  - Drain fuel
  - Clean and lubricate
  - Secure storage

Guidance for delivery

This unit should be delivered in line with the health and safety principles, policies and procedures covered in unit 201. The Health and safety unit provides the underpinning knowledge for health and safety and legislation which must be embedded across all units in this qualification. The unit provides an understanding of policies and procedures that are in place to maintain safety, the importance of risk assessment and how these impact on working practices. Health and safety relating to use of tools and equipment will be covered specifically within this unit.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner will be aware of safe working practices and familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate equipment therefore health and safety issues relevant to the equipment and tasks involved will be stressed and regularly reinforced.

Adequate personal protective equipment (PPE), appropriate to the learner, the equipment and the task will be provided and worn in accordance with the associated risk assessment, industry and operator's manual. Emphasis should also be put on the need for cleanliness when working with tools and equipment. Learners should be taught the importance of regular maintenance and sharpening of tools. They should also be encouraged to use and refer to manufacturer's manuals and industry good practice when using tools and equipment.

It is anticipated that this unit will be delivered through supervised practical training with the learner able to consolidate operational skills within working woodland environments. The unit is linked to unit 206 Tree establishment and unit 207 Tree and woodland management, and learners will be

expected to use a range of tools and equipment whilst completing the practical elements of these units.

This unit also links with the current NPTC awards in land-based machinery maintenance and use, allowing learners to prepare for certificate of competence training and assessment.

Appendix 1   Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the Centres and Training Providers homepage on www.cityandguilds.com.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues.

Specifically, the document includes sections on:
- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information on such things as:

- **Walled Garden**: how to register and certificate candidates on line
- **Events:** dates and information on the latest Centre events
- **Online assessment**: how to register for e-assessments.

Centre Guide – Delivering International Qualifications contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification.

Specifically, the document includes sections on:
- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates

- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Appendix 2   Useful contacts

UK learners
General qualification information

E: learnersupport@cityandguilds.com

International learners
General qualification information

E: intcg@cityandguilds.com

Centres
Exam entries, Certificates,
Registrations/enrolment, Invoices, Missing
or late exam materials, Nominal roll reports,
Results

E: centresupport@cityandguilds.com

Single subject qualifications
Exam entries, Results, Certification, Missing
or late exam materials, Incorrect exam
papers, Forms request (BB, results entry),
Exam date and time change

E: singlesubjects@cityandguilds.com

International awards
Results, Entries, Enrolments, Invoices,
Missing or late exam materials, Nominal roll
reports

E: intops@cityandguilds.com

Walled Garden
Re-issue of password or username,
Technical problems, Entries, Results, e-
assessment, Navigation, User/menu option,
Problems

E: walledgarden@cityandguilds.com

Employer
Employer solutions, Mapping, Accreditation,
Development Skills, Consultancy

E: business@cityandguilds.com

Publications
Logbooks, Centre documents, Forms, Free
literature

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