



**Institute for Apprenticeships
& Technical Education**

Construction: On- Site Construction

**T Level outline content: final version for
inclusion in ITT**

March 2019

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Introduction

T Levels are new, two-year, technical study programmes, designed with employers to give young people the skills that industry needs. T Levels will provide a mixture of:

- technical knowledge and skills specific to their chosen industry or occupation
- an industry placement of at least 45 days in their chosen industry or occupation
- relevant maths, English and digital skills.

T Levels will become one of three major options for students to study at level 3, alongside apprenticeships for those who wish to study and train for a specific occupation 'on the job', and A levels for students who wish to continue academic education.

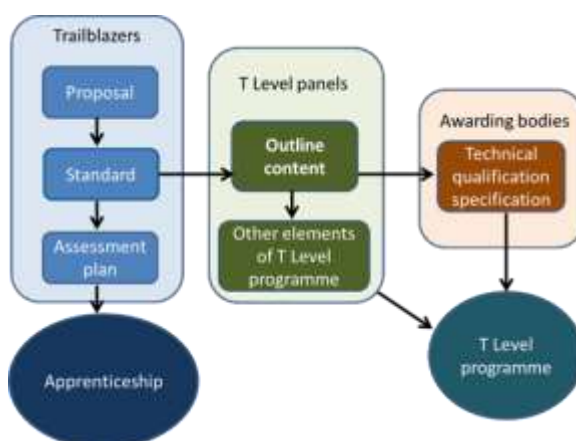
When they complete a T Level study programme, students will be able to choose between moving into a skilled occupation or further study, for example, a higher or degree level apprenticeship, or higher level technical study, including higher education.

Technical education has been categorised into fifteen different technical routes, according to occupational specialism. T Levels will be available across eleven of those routes, with occupations in the remaining four routes accessible through an apprenticeship only. Most routes have been split into a number of pathways; the T Level will broadly sit at pathway level. The occupations within scope for each T Level are set out in the Institute for Apprenticeships and Technical Education's occupational maps.

Outline content

This outline content has been produced by [T Level panels](#) of employers, professional bodies and providers, and is based on the same standards as those used for apprenticeships. The outline content will form the basis of the specifications for T Level Technical Qualifications, which will be developed by awarding organisations for approval by the Institute for Apprenticeships and Technical Education. One awarding organisation will be appointed to develop and deliver each Technical Qualification after a procurement process.

The diagram below demonstrates how the same standard created by employer-led Trailblazer groups is used for both apprenticeships, and as the basis for this outline content. It also shows that this outline content will be used by awarding organisations to develop the full Technical Qualification (TQ) specification.

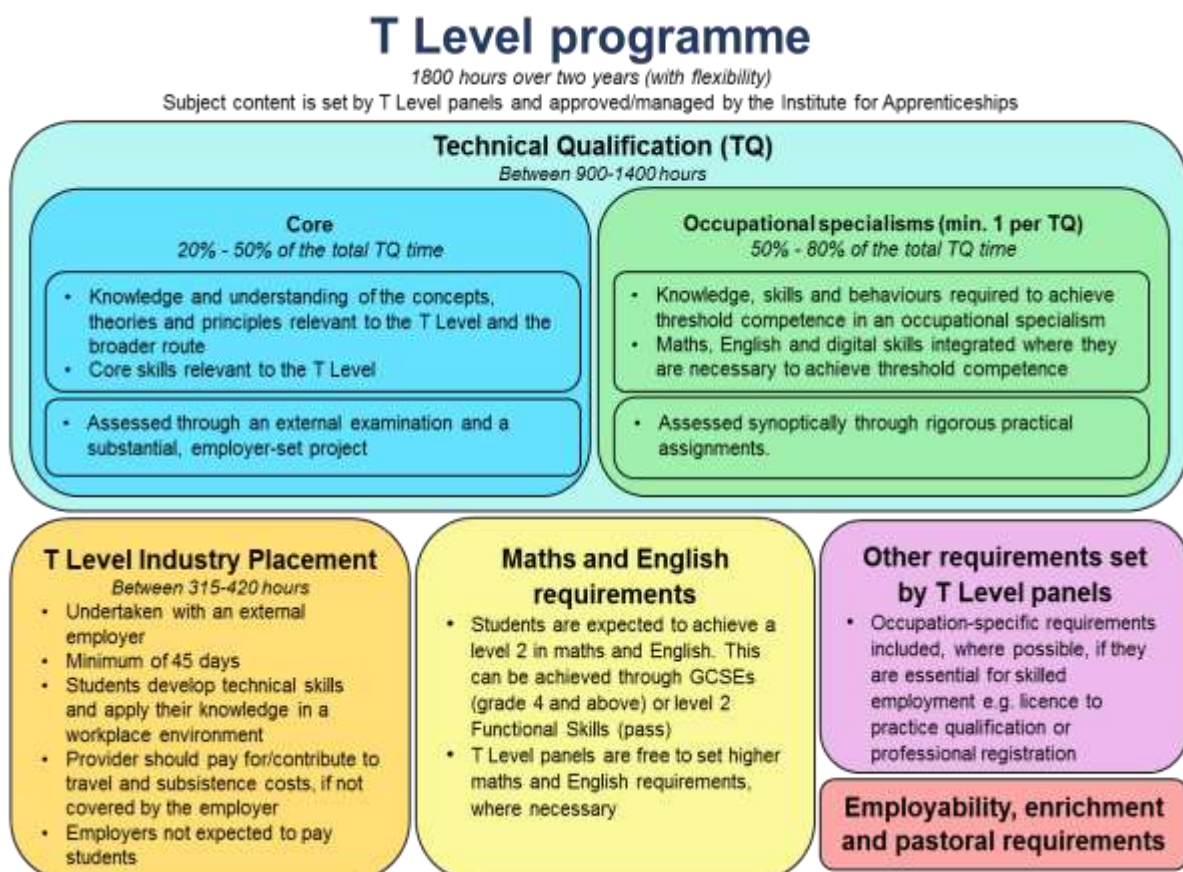


Colleges and other education and training providers will decide how to structure the T Level courses they offer, based on the qualification specifications. This will enable them to deliver the study programme's mandatory components in the most effective way for students.

T Level study programmes will include the following mandatory elements:

- a 'core' set of underpinning knowledge, concepts and skills, tailored for their chosen industry and occupation: 'core content'
- specialist content covering occupational or industry-specific skills: 'occupational specialist content'
- an industry placement with an employer, which will last for a minimum of 45 working days.

The diagram below demonstrates the different elements of a T Level programme. This outline content relates solely to the Technical Qualification part of a T Level programme.



Purpose Statement

Qualification Purpose

The purpose of the level 3 Technical Qualification is to ensure students have the knowledge and skills needed to progress into skilled employment or higher level technical training relevant to the T Level.¹

To achieve this, each level 3 Technical Qualification must:

- provide reliable evidence of students' attainment in relation to:
 - the core knowledge and skills relevant to the route and occupational specialisms covered by the qualification
 - the knowledge and skills required for at least one occupational specialism relevant to the qualification.
- be up-to-date, providing the knowledge and skills needed for the occupations to have continued currency among employers and others.
- ensure that maths, English and digital skills are developed and applied where they are essential to achieve occupationally relevant outcomes.
- ensure that the minimum pass grade standard for occupational specialisms attests to competence, meets employer expectations, and is as close to full occupational competence as possible.
- allow the accurate identification of students' level of attainment and the effective differentiation of their performance.
- provide a clear and coherent basis for development of suitably demanding high-quality level 3 courses, which enable students to realise their potential.
- provide students with the opportunity to manage and improve their own performance.
- support fair access to attainment for all students who take the qualification, including those with special educational needs and disabilities (SEND).

¹ The Institute for Apprenticeships and Technical Education may only approve the qualification "if satisfied that by obtaining the qualification a person demonstrates that he or she has attained as many of the outcomes set out in the standards as may reasonably be expected to be attained by undertaking a course of education" (Technical and Further Education Act 2017).

Technical Qualification Design

T Level programmes will differ in length to reflect the requirements of different occupations, but are expected to last 1800 hours over two years (on average).

To accommodate legitimate differences in content across T Levels, we propose that the total time for the Technical Qualification:

- will fall within a defined range of between 900 and 1400 hours
- is no less than 50% of the time for the T level programme as a whole and
- is no more than 75% of the total time for the programme as a whole.

Component	Content	Assessment	Grading	Planned Hours
Core Students complete one component which covers all the core content	Knowledge and understanding of contexts, concepts, theories and principles relevant to the T Level Ability to apply core knowledge and skills, through a project, to meet employer-set requirements	Assessed through an externally set test and an employer-set project	Six point scale plus ungraded (U) A* – E and U	Between 20% and 50% of the qualification time
Occupational specialisms Students must complete at least one, or more depending on the minimum requirements specific to the qualification	The knowledge and skills required to achieve a level of competence needed to enter employment.	Synoptic assessment of performance outcomes, to determine whether a student meets the minimum competence requirements	Three point scale plus ungraded (U) Distinction, Merit, Pass and Ungraded	Between 50% and 80% of qualification time

Construction: On-Site Construction

Awarding organisations will need to ensure that students have an up-to-date knowledge of the legal and regulatory obligations relating to employment in the occupations relevant to the T Level, and understand the practical implication of these on their work.

Maths, English and Digital skills are set out in the final section of this document. Awarding organisations should integrate these within the qualification so that they are applied in occupationally relevant contexts. Other core skills and behaviours important for employability are already integrated within the content and must be clearly specified in the qualification specification.

Core content

The core content relates to the whole route, and the pathway that the Technical Qualification covers. This breadth of content will help to ensure students are able to apply their skills in a variety of contexts and for a variety of different purposes. The content will vary depending on the requirements of the route and the pathway or occupations covered by the scope of the Technical Qualification.

The core knowledge and understanding is assessed through an examination and core skills through a practical employer-set project.

The core knowledge and understanding focuses on the students' knowledge and understanding of contexts, concepts, theories and principles relevant to the T Level. This could include, where appropriate, assessment of knowledge and understanding relevant to the route and the pathway.

The employer-set project provides the opportunity to develop and apply a minimum range of core skills important for employability. Awarding organisations can integrate knowledge in the employer-set project, to contextualise core skills.

The allocation of content to each type of assessment will need to be approved by the Institute for Apprenticeships and Technical Education.

Construction core knowledge and understanding

Element	Content
Health and safety	<ul style="list-style-type: none"> • Legislation e.g. HASAWA, COSHH, Working at Height, Construction Design and Management regulations (CDM) including an overview of roles, responsibilities and enforcement. • Liability including public liability and employers liability. • Approved codes of practice, including Managing Health and Safety in Construction. • Implications of poor health and safety performance, including ethical, legal, environmental and financial. • Development of safe systems of work, including company management systems, risk assessments, method statements and permits to work. • Safety conscious behaviours e.g. following safe systems of work, reporting potential hazards and implications of poor housekeeping.
Science	<p>Scientific principles, their applications, interaction between them to meet the purpose of the built environment and how their performance in the building is measured including,</p> <ul style="list-style-type: none"> • Materials science, including material properties, chemical composition, degradation, failure and effects of environmental conditions. • Mechanical science, including the relationship between force, work, energy and power. • Electricity, including sources of power, generation, transformation, distribution and the relationship between voltage, current, resistance, electrical power, energy, efficiency and work done. • Structural science, including forces, loads, materials, and structural members. • Heat, including heat transfer, air temperature, air density humidity, condensation air movement, heat loss, thermal conductivity and resistance.

	<ul style="list-style-type: none"> • Light, including refraction, difference in artificial and natural light, glare, directed and reflected light, flow of light energy and daylight factor. • Acoustics, including frequencies, reverberation, decibels, comfort levels and privacy. • Earth science, including physical geography, hydrology, geology, earth forces, natural phenomenon (e.g. earthquakes) and weather.
Design	<ul style="list-style-type: none"> • Benefits of good design including within budget, of good design to product performance e.g. on budget, over specified, difficult to assemble/build. • Design principles e.g. buildability and integration of services. • Role of different disciplines (e.g. contractor, architect) involved in design. • Design process from conception to completion. Human factors e.g. inclusivity, heat, acoustics, lighting and air quality. • Understanding of the whole building, including life cycle assessment.
Construction & the built environment industry	<ul style="list-style-type: none"> • Structure of the construction industry. • How the construction industry serves the economy as a whole. • Integration of the supply chain through partnering and collaborative practices. • How projects are procured within the construction sector e.g. tenders and supply chain. • Roles and responsibilities of the construction professions e.g. surveyor, carpenter, heating engineer. • The role of CPD in developing the knowledge and skills of those working in the sector and those that may provide it e.g. through professional bodies, accreditation, certification bodies. • Building information modelling, including Digital Plan of Works (DPoW), Employer's Information

	<p>Requirements (EIR), Common Data Environment (CDE), information exchange and the effect on project delivery.</p> <ul style="list-style-type: none"> • How current examples of PESTLE factors may impact the industry. e.g. post Grenfell, tax changes for self-employed, augmented reality.
Sustainability	<ul style="list-style-type: none"> • Importance of sustainability when planning and delivering a construction project e.g. environmental protection. • Types of sustainable solutions e.g. social, environmental, economic and human. • Obligations under environmental legislation e.g. Clean Air Act and Water Act. • Environmental policies and initiatives and how they impact on design and construction. • Environmental performance measures e.g. water use, radioactive waste. • Principles of heritage and conservation e.g. listed buildings, traditional buildings and maintenance of existing stock. • Lean construction including reduce, repurpose and recycle. • Waste management including types of materials that require specific actions (e.g. asbestos) and the measures in place by construction organisations. • Energy production and energy use (including embodied energy).
Measurement	<ul style="list-style-type: none"> • The benefits of accurate and appropriate measurement on built environment performance e.g. accurate reporting. • Types of measurement, including standard units of measurement and mensuration techniques. • Measurement standards, guidance and practice including measurement rules.
Building Technology	<ul style="list-style-type: none"> • Construction methods, including traditional and modern methods e.g. on and off-site construction and robotics.

	<ul style="list-style-type: none"> • Forms of construction, built environment and civil engineering structures, sub-structures, superstructures, foundations and external works. • Building regulations and their purpose in construction including renovation. • Building standards and their purpose in renovation and construction including ISO, British and industry. • Manufacturers' instructions and their purpose in renovation and construction. • Internet of things e.g. data capture in a completed building, utilising data for manufacture and delivery and machine to machine learning.
Information and data	<ul style="list-style-type: none"> • Key elements of data, including accuracy, generalisation, interoperability, level of detail and metadata. • Purpose of information standards, regulation, and guidance and practice. • Sources of information e.g. product data and manufacturer's specifications. • Data management and confidentiality, including data protection legislation and typical organisational procedures.
Relationship Management	<ul style="list-style-type: none"> • Types of stakeholders e.g. client, team and end user. • Roles, expectations and interrelationships of different stakeholders throughout the construction project delivery e.g. at design stage, through construction, to handover and in use. • The importance of a collaborative approach to project delivery and reporting, and how this is applied in practice. • Customer service principles e.g. product knowledge, time and communication. • The importance of team work to team and project performance.

	<ul style="list-style-type: none"> • Team dynamics, including what is expected of a team member, what qualities are needed and how these qualities are demonstrated. • Equality, diversity and representation including related legislation. • Negotiation techniques e.g. win-win. • Conflict management techniques e.g. mediation. • Methods (e.g. verbal, non-verbal) and styles (e.g. formal, informal) of communication and suitability for different situations that may arise throughout a construction project. • Employment rights and responsibilities of the employer and employee e.g. health and safety. • Ethics and ethical behaviour e.g. honesty, fairness. • How sources of information, including social networking contribute to knowledge sharing.
Digital Technology	<ul style="list-style-type: none"> • Internet of things e.g. crowd sourcing digital data to assist just in time asset management, information interdependencies. • Digital engineering techniques e.g. simulation, animation. • Opportunities for the use of technology used in other industries and contexts and adapting for use in construction and the built environment.
Commercial/Business	<ul style="list-style-type: none"> • Business structures e.g. community interest companies and SMEs. • Business objectives e.g. financial and social. • Business values e.g. care for life, ethical and transparent, commit to customer and better together. • Principles and examples of corporate social responsibility e.g. community design, local recruitment. • Principles of entrepreneurship and innovation e.g. vision, research, finance.

	<ul style="list-style-type: none">• How businesses measure success e.g. benchmarking, KPIs and target setting.• Principles of project management e.g. clear goals and objectives, defined roles, milestones.• Quality management and techniques used in business.
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Employer-set project

The employer-set project ensures students have the opportunity to combine core knowledge and skills to develop a substantial piece of work in response to an employer-set brief.

To ensure consistency in project scope and demand, awarding organisations will develop assessment objectives which require students to:

- plan their approach to meeting the brief
- apply core knowledge and skills as appropriate
- select relevant techniques and resources to meet the brief
- use maths, English and digital skills as appropriate
- realise a project outcome and review how well the outcome meets the brief.

The awarding organisation will work with a relevant employer or employers to devise a set brief that:

- ensures a motivating starting point for students' projects, for example, a real-world problem to solve
- ensures students can generate evidence that covers the assessment objectives
- is manageable for providers to deliver
- is officially approved by the awarding organisation and employer.

For On-site Construction in achieving the assessment objectives and meeting the brief students must demonstrate the following core skills:

- communication e.g. providing information and advice to customers and / or wider stakeholders on the potential risks of a construction project, or making a relevant presentation to a stakeholder on a proposed methodology and timescale
- work collaboratively with other team members and stakeholders e.g. to develop content for a refurbishment tender
- applying a logical approach to solving problems, identifying issues and proposing solutions e.g. through setting criteria for a refurbishment, using cost / benefit analysis of the introduction of new procedures or equipment
- primary research e.g. obtaining measurements related to a design and / or customer requirements.

Occupational Specialist Content

Specialist content is structured into different occupational specialisms, which correspond to the apprenticeship standards listed on the occupational map covered by the T Level. Occupational specialisms ensure students develop the knowledge and skills necessary to achieve a level of competence needed to enter employment in the occupational specialism.

Achievement of this minimum level of competence signals that a student is well-placed to develop full occupational competence, with further support and development, once in work (including an apprenticeship). The knowledge and skills listed are required to achieve one or more 'performance outcomes'. These indicate what the student will be able to do as a result of learning and applying the specified knowledge and skills.

In essence, each performance outcome describes, at a high level, what the student 'can do' to have met minimum competence requirements in an occupational specialism.

Core skills and behaviours are specified in occupational specialism(s) only where they are essential to achieving the given performance outcome. Although the behaviours maybe assessed implicitly through application of skills, they must be clearly specified in the qualification specification to support effective application of those skills.

Occupational Specialism 1: Carpentry & Joinery

Performance Outcome 1: Prepare for the production of complex timber-based building products and structures

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Approved Code of Practice (ACoP) (Safe Use of Woodworking Machines) and additional guidance (including HSE Woodwork Information Sheets) to employers, those working on the production and installation of timber-based products and how the tasks are undertaken. • The identification of hazards (e.g. sharp edges, moving parts, working with adhesives, working at height) and risks associated with carpentry and joinery tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. <p>Information</p> <ul style="list-style-type: none"> • Types of information required for the production, assembly and installation of timber-based products (e.g. drawings, specifications, schedules, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development (might get instructions for assembly and installation). • How to obtain relevant information from building regulations, standards e.g. for stairs. 	<ul style="list-style-type: none"> • Identify information requirements from a brief e.g. size, shape, function, budget. • Interpret drawings, specifications and schedules. • Use questioning techniques to obtain and clarify information required. • Calculate lengths and angles required to meet specification. • Measure length, area and volume. • Produce scaled drawings by hand in plan, elevation and section. • Produce cutting lists. • Inspect materials e.g. for defects. • Mark out measurements on to timber-based products and sheet materials. • Inspect equipment e.g. calibrated, serviceable. • Estimate resource requirements e.g. time, materials, equipment availability. • Follow a method statement including production and installation details.

Tools and equipment

- Types of tools and equipment used for access, measuring, marking out, cutting, shaping, assembling, installing (including hand and power tools) and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage, greasing, sharpening.

Wood science

- Ways in which wood is classified (e.g. hardwood, softwood, grade, durability).
- Types of wood used in construction, their properties, characteristics (e.g. colour, grain) and suitability for different purposes.
- Types of timber-based products (e.g. plywood, chipboard, medium density fibreboard (MDF)), their characteristics and their suitability for different purposes in construction.
- Formats and stock sizes of timber-based products (e.g. sheet, board) and their suitability for different functions in construction.
- How wood is processed into timber e.g. conversion methods, timescale, seasoning, treatments.
- Natural and seasoning defects and those arising from time, use, neglect and element and their causes and the implications to the production and installation of timber-based products.

- Sustainable timber, the supply chain and licensing, the implications of use and how to minimise waste.

Fixings and ironmongery

- Types of fixings (e.g. screws, nails, hinges), their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with different wood types.
- Types of adhesives and their suitability for different types of timber-based products, components and assembly requirements.
- Types of ironmongery (e.g. locks, hinges, handles) their characteristics, material properties, design features and suitability for different purposes.

Maths

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) to the preparation, production, assembly and installation of timber-based components and products.

Business/commercial

- Costs associated with the production, assembly and installation of timber-based products and components including labour, materials, consumables and overheads and how they impact on profitability including wastage.

Performance Outcome 2: Produce complex timber-based components

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Approved Code of Practice (ACoP) (Safe Use of Woodworking Machines) and additional guidance (including HSE Woodwork Information Sheets) to employers, those working on the production and installation of timber-based products and how the tasks are undertaken. • The identification of hazards (e.g. sharp edges, moving parts, working with adhesives, working at height) and risks associated with carpentry and joinery tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. <p>Information</p> <ul style="list-style-type: none"> • Types of information required for the production, assembly and installation of timber-based products (e.g. drawings, specifications, schedules, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development (might get instructions for assembly and installation). • How to obtain relevant information from building regulations, standards e.g. for stairs. <p>Tools and equipment</p>	<ul style="list-style-type: none"> • Research information required for producing complex components. • Carry out geometrical calculations relating to complex 3D shapes e.g. area, volume and length. • Protect integrity, quality and conditioning of materials during handling and storing e.g. preventing warping, maintaining cleanliness. • Use woodworking machinery and equipment e.g. planer, band saw, router. • Use tools including hand and power tools. • Create templates and work holding jigs. • Produce test pieces e.g. sample. • Feed materials into equipment using workpiece support (e.g. roller table, stand) and safety aids e.g. push sticks, glue block saddles, work holding jigs. • Produce complex shapes including single curvature, arches, gothic, ellipses. • Set up and adjust machinery e.g. change tooling for depth of cut. • Label and prepare components for e.g. face and edge marks.

- Types of tools and equipment used for access, measuring, marking out, cutting, shaping, assembling, installing (including hand and power tools) and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage, greasing, sharpening.

Wood science

- Ways in which wood is classified (e.g. hardwood, softwood, grade, durability).
- Types of wood used in construction, their properties, characteristics (e.g. colour, grain) and suitability for different purposes.
- Types of timber-based products (e.g. plywood, chipboard, medium density fibreboard (MDF)), their characteristics and their suitability for different purposes in construction.
- Formats and stock sizes of timber-based products (e.g. sheet, board) and their suitability for different functions in construction.
- How wood is processed into timber e.g. conversion methods, timescale, seasoning, treatments.
- Natural and seasoning defects and those arising from time, use, neglect and element and their causes and the implications to the production and installation of timber-based products.
- Sustainable timber, the supply chain and licensing, the implications of use and how to minimise waste.

Fixings and ironmongery

- Types of fixings (e.g. screws, nails, hinges), their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with different wood types.
- Types of adhesives and their suitability for different types of timber-based products, components and assembly requirements.
- Types of ironmongery (e.g. locks, hinges, handles) their characteristics, material properties, design features and suitability for different purposes.

Maths

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) to the preparation, production, assembly and installation of timber-based components and products.

Complex shapes

- Types of complex shapes including double curvature, gothic, semi-circular, elliptical, segmental and the types of components in which they are used e.g. rails, stiles, sills.
- Techniques used to form curved shapes (e.g. built up, laminated).
How to produce templates and work holding jigs from drawings.

Performance Outcome 3: Assemble complex timber-based products

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Approved Code of Practice (ACoP) (Safe Use of Woodworking Machines) and additional guidance (including HSE Woodwork Information Sheets) to employers, those working on the production and installation of timber-based products and how the tasks are undertaken. • The identification of hazards (e.g. sharp edges, moving parts, working with adhesives, working at height) and risks associated with carpentry and joinery tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. <p>Information</p> <ul style="list-style-type: none"> • Types of information required for the production, assembly and installation of timber-based products (e.g. drawings, specifications, schedules, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development (might get instructions for assembly and installation). • How to obtain relevant information from building regulations, standards e.g. for stairs. <p>Tools and equipment</p>	<ul style="list-style-type: none"> • Assess suitability of information provided e.g. currency, accuracy, sufficiency. • Use tools and equipment to assemble components to form products e.g. cramps. • Join timber-based components to other timber-based components and to non-timber-based components including fixtures and fittings. • Use non-permanent joining techniques e.g. cramping, drawpins. • Use permanent joining techniques e.g. drilling, pegging, scribing, using adhesives. • Use jigs for assembly. • Prepare assembled timber-based products for transportation e.g. wrapping.

- Types of tools and equipment used for access, measuring, marking out, cutting, shaping, assembling, installing (including hand and power tools) and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage, greasing, sharpening.

Wood science

- Ways in which wood is classified (e.g. hardwood, softwood, grade, durability).
- Types of wood used in construction, their properties, characteristics (e.g. colour, grain) and suitability for different purposes.
- Types of timber-based products (e.g. plywood, chipboard, medium density fibreboard (MDF)), their characteristics and their suitability for different purposes in construction.
- Formats and stock sizes of timber-based products (e.g. sheet, board) and their suitability for different functions in construction.
- How wood is processed into timber e.g. conversion methods, timescale, seasoning, treatments.
- Natural and seasoning defects and those arising from time, use, neglect and element and their causes and the implications to the production and installation of timber-based products.
- Sustainable timber, the supply chain and licensing, the implications of use and how to minimise waste.

Fixings and ironmongery

- Types of fixings (e.g. screws, nails, hinges), their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with different wood types.
- Types of adhesives and their suitability for different types of timber-based products, components and assembly requirements.
- Types of ironmongery (e.g. locks, hinges, handles) their characteristics, material properties, design features and suitability for different purposes.

Maths

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) to the preparation, production, assembly and installation of timber-based components and products.

Complex timber-based products

- Types of timber-based products (including floors, walls, cut-hipped roof, trussed gable-end roof, complex and non-standard doors, panelling/cladding, veneers, windows with opening lights, shaped door and hatch linings, staircases with turns, structural carcassing, carcasses, accessible encasements, partitions with openings, products with single curvature features, engineered solutions), their constituent timber-based components and function.

<p>Assembly techniques</p> <ul style="list-style-type: none"> • Jointing methods e.g. splicing, curved to curved, straight to curved and how they are achieved. • Types of jointing e.g. bridle, mortice and tenon, dovetail, machine cut and their suitability for different products, environments and purposes. • Types of transportation protection and transportation techniques, storage and handling. 	
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Performance Outcome 4: Install complex timber-based products into complex structures

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Approved Code of Practice (ACoP) (Safe Use of Woodworking Machines) and additional guidance (including HSE Woodwork Information Sheets) to employers, those working on the production and installation of timber-based products and how the tasks are undertaken. • The identification of hazards (e.g. sharp edges, moving parts, working with adhesives, working at height) and risks associated with carpentry and joinery tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. 	<ul style="list-style-type: none"> • Assess risks associated with the installation task. • Prioritise and schedule tasks. • Check compliance with building regulations and standards provided. • Prepare timber-based products for installation e.g. planing, sanding. • Prepare environments for installation e.g. cleaning, levelling. • Position, fix and secure complex timber-based and non-timber based products to building fabric. • Adapt timber-based products to meet installation requirements e.g. trim, adjust, repair.

Information

- Types of information required for the production, assembly and installation of timber-based products (e.g. drawings, specifications, schedules, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development (might get instructions for assembly and installation).
- How to obtain relevant information from building regulations, standards e.g. for stairs.

Tools and equipment

- Types of tools and equipment used for access, measuring, marking out, cutting, shaping, assembling, installing (including hand and power tools) and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage, greasing, sharpening.

Wood science

- Ways in which wood is classified (e.g. hardwood, softwood, grade, durability).
- Types of wood used in construction, their properties, characteristics (e.g. colour, grain) and suitability for different purposes.
- Types of timber-based products (e.g. plywood, chipboard, medium density fibreboard (MDF)), their characteristics and their suitability for different purposes in construction.

- Maintain tools including clean down, sharpen.
- Install door and window ironmongery into timber-based products e.g. locks, handles.
- Carry out quality checks e.g. plumb, level, square.

- Formats and stock sizes of timber-based products (e.g. sheet, board) and their suitability for different functions in construction.
- How wood is processed into timber e.g. conversion methods, timescale, seasoning, treatments.
- Natural and seasoning defects and those arising from time, use, neglect and element and their causes and the implications to the production and installation of timber-based products.
- Sustainable timber, the supply chain and licensing, the implications of use and how to minimise waste.

Fixings and ironmongery

- Types of fixings (e.g. screws, nails, hinges), their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with different wood types.
- Types of adhesives and their suitability for different types of timber-based products, components and assembly requirements.
- Types of ironmongery (e.g. locks, hinges, handles) their characteristics, material properties, design features and suitability for different purposes.

Maths

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) to the

preparation, production, assembly and installation of timber-based components and products.

Building technology

- How the type of structure of a building affects the installation task.
- How the structure of building components affects the installation task, including:

Roofs

- Different types of roofs e.g. single, double.
- Shapes of roofs e.g. flat, lean to, hipped end.
- Different types of roof coverings e.g. tiles, slates.
- Different types of roofing components e.g. rafter, purlin.
- Roof finishings e.g. fascia, guttering.
- Roof flashings e.g. roof lights.

Openings

- Different types of openings e.g. chimneys, stairwells , window.
- Different types of windows e.g. bay, sliding sash, dormer.

Carcasses

- Different types of carcasses e.g. kitchen, wardrobes.

Structural carcassing

- Different types of structural carcasses e.g. floor, roof, hips and valleys.

Doors

- Different types of doors e.g. fire, composite.

Stairs

- Different types of stairs e.g. cut string, open riser.
- Stair components e.g. newel, string, tread.

Partitions

- Different types of partition coverings different types plasterboard, plywood and cladding.

Installation

- Methods of fixing (e.g. counterbored, concealed brackets) and their suitability for different products, structures and purposes.
- How to deal with unexpected situations e.g. out of square buildings, uneven surfaces.

Occupational Specialism 2: Plastering

Performance Outcome 1: Prepare backgrounds for plastering

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Plastering Information Sheets) to employers, those working on the production and installation of plaster-based products and how the tasks are undertaken. • The identification of hazards and risks associated with plastering tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. <p>Communication</p> <ul style="list-style-type: none"> • The impact of positive and negative body postures and tone of voice on effective communication. <p>Information</p> <ul style="list-style-type: none"> • Types of information required (e.g. drawings, specifications) and the related symbols, conventions and terminology needed to aid interpretation and development. • Requirements of the building regulations and industry standards e.g. Tolerances. 	<ul style="list-style-type: none"> • Interpret drawings, specifications and schedules. • Use questioning techniques to obtain and clarify information required. • Measure length, area and volume. • Produce scaled drawings by hand in plan, elevation and section. • Inspect backgrounds for suction and/or defects. • Remove loose materials from backgrounds. • Apply preparations e.g. dubbing out coat. • Inspect materials e.g. for defects, correct type of plaster. • Inspect tools and equipment e.g. safety guards, electrical cable. • Estimate resource requirements including time, materials, equipment and lead times. • Follow a method statement. • Apply keys to differing backgrounds e.g. splatterdash to concrete, EML to wooden/concrete backgrounds.

Tools and equipment

- Types of tools and equipment used for plastering tasks including hand and power tools and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage.
- Types of fixings (e.g. screws, nails), their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with internal/external situations.

Scientific concepts and principles applied to plastering

- Materials science including plaster classifications, characteristics (including properties) and implications for use in plastering situations (including compatibility); different render materials and products, their classifications, characteristics (including properties) and implications for use in rendering situations (including compatibility).
- The principles (including u-values) of thermal and sound efficiency and the relationship with substrates and plastering materials and techniques.
- Principles of fire protection to include materials used and methods of application.
- Chemical reactions from various plasters and additives and the effect these can have on the finished product.

- Protect surrounding areas e.g. dust sheets.

- Water, moisture and damp, condensation and the importance and implications of damp proofing/tanking including chemical damp proofing.
- Causes, symptoms and rectification of faults in plastering systems.

Maths

- Application of maths including working out quantities both in areas, linear and volume in metric and imperial units of measurement.
- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagorus theorem).
- Application of ratios to plastering tasks.

Business/Commercial

- Costs associated with the preparation of backgrounds for plastering including labour, materials, consumables, overheads and how they impact on profitability including wastage.

Protection

- Techniques used to protect the areas of work e.g. masking, sheeting.

Background Preparation

- The differing internal/external backgrounds and the preparation needed to allow for effective plastering to take

<p>place including types of backgrounds, suction for different backgrounds and different types of key required.</p> <ul style="list-style-type: none"> • Suitability of materials, equipment and techniques to control suction. • Suitability of materials, equipment and techniques to produce a key. 	
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Performance Outcome 2: Apply plastering systems

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Plastering Information Sheets) to employers, those working on the production and installation of plaster-based products and how the tasks are undertaken. • The identification of hazards and risks associated with plastering tasks and controls that needs to be in place e.g. training, good housekeeping use of PPE. <p>Communication</p> <ul style="list-style-type: none"> • The impact of positive and negative body postures and tone of voice on effective communication. 	<ul style="list-style-type: none"> • Protect integrity, quality and condition of materials during handling and storage. • Use tools including hand and power tools. • Set out plasterboard to stud work and direct bond. • Fix plasterboard to timber/metal stud work and solid backgrounds. • Mix mortar, including plaster and render. • Apply light weight plasters to internal surfaces including two coat, three coat and finishing plasters. • Apply tape to a drywall system joint. • Apply render plasters to internal surfaces. • Fix laths (expanded metal, rib, timber) to surfaces including walls and ceilings.

Information

- Types of information required (e.g. drawings, specifications) and the related symbols, conventions and terminology needed to aid interpretation and development.
- Requirements of the building regulations and industry standards e.g. Tolerances.

Tools and equipment

- Types of tools and equipment used for plastering tasks including hand and power tools and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage.
- Types of fixings (e.g. screws, nails), their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with internal/external situations.

Scientific concepts and principles applied to plastering.

- Materials science including plaster classifications, characteristics (including properties) and implications for use in plastering situations (including compatibility); different render materials and products, their classifications, characteristics (including properties) and implications for use in rendering situations(including compatibility).

- Apply sand and lime plasters including pricking up coats, scratch coats, floating coats and finishing coats.
- Fix trims (e.g. metal, plastic) using different techniques including mechanical fixes and adhesives.
- Cut various metal/plastic trim including angle bead, render stop beads, skim stop beads.
- Produce traditional external render finishes including plain face, ashlar, Tyrolean and dry dash.
- Apply light weight one coat renders.

- The principles (including u-values) of thermal and sound efficiency and the relationship with substrates and plastering materials and techniques.
- Principles of fire protection to include materials used and methods of application.
- Chemical reactions from various plasters and additives and the effect these can have on the finished product.
- Water, moisture and damp, condensation and the importance and implications of damp proofing/tanking including chemical damp proofing.
- Causes, symptoms and rectification of faults in plastering systems.

Maths

- Application of maths including working out quantities both in areas, linear and volume in metric and imperial units of measurement.
- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagorus theorem).
- Application of ratios to plastering tasks.

Application of modern and traditional plastering systems

- The suitability of trim beads for internal and external use.
- How to cut and fix various metal/plastic trim beads.
- Modern techniques used to apply plaster to internal surfaces including, two coat work, three coat work, direct bond, plaster boarding, dry wall systems and render finishes.

<ul style="list-style-type: none"> • Traditional techniques for plastering including fixing laths, applying sand/lime plasters. <p>Application of render products</p> <ul style="list-style-type: none"> • Techniques used for application of external render finishes including traditional and light weight renders. 	
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Performance Outcome 3: Fix plaster casted from moulds

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Plastering Information Sheets) to employers, those working on the production and installation of plaster-based products and how the tasks are undertaken. • The identification of hazards and risks associated with plastering tasks and controls that needs to be in place e.g. training, good housekeeping use of PPE. <p>Communication</p> <ul style="list-style-type: none"> • The impact of positive and negative body postures and tone of voice on effective communication. 	<ul style="list-style-type: none"> • Transfer moulding shapes (e.g. cyma recta, cyma reversa, ovolo and cavetto) to metal. • Cut shapes from metal. • Join templates to running moulds. • Apply running rule to casting bench. • Grease bench in preparation for reverse mould. • Prepare materials including hessian ropes, wooden laths and casting plaster. • Run a reverse mould on the bench including coring out the mould and applying the finishing coat. • Prepare moulds ready for casting e.g. plaster reverse mould, rubber mould, fibreglass mould, clay.

Information

- Types of information required (e.g. drawings, specifications) and the related symbols, conventions and terminology needed to aid interpretation and development.
- Requirements of the building regulations and industry standards e.g. Tolerances.

Tools and equipment

- Types of tools and equipment used for plastering tasks including hand and power tools and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage.
- Types of fixings (e.g. screws, nails), their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with internal/external situations.

Scientific concepts and principles applied to plastering

- Materials science including plaster classifications, characteristics (including properties) and implications for use in plastering situations (including compatibility); different render materials and products, their classifications, characteristics (including properties) and implications for use in rendering situations(including compatibility).

- Cast from moulds including reverse running moulds, rubber moulds and fibreglass moulds.
- Take templates from an existing in-situ mould e.g. clay squeeze, profile template, paper.
- Run moulds in-situ including coring out and topping off.
- Mark out materials including mitres.
- Cut castings to produce internal and external angles.
- Fix plaster casts e.g. plaster wads, screws, adhesive.
- Apply plaster to internal and external joints to produce a finish.

- The principles (including u-values) of thermal and sound efficiency and the relationship with substrates and plastering materials and techniques.
- Principles of fire protection to include materials used and methods of application.
- Chemical reactions from various plasters and additives and the effect these can have on the finished product.
- Water, moisture and damp, condensation and the importance and implications of damp proofing/tanking including chemical damp proofing.
- Causes, symptoms and rectification of faults in plastering systems.

Maths

- Application of maths including working out quantities both in areas, linear and volume in metric and imperial units of measurement.
- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagorus theorem).
- Application of ratios to plastering tasks.

Casting from moulds on bench

- Methods for constructing a running mould including materials used.
- Types of materials used to produce moulds used in casting e.g. rubber and fibreglass.
- How to prepare the casting bench ready for running a reverse mould.

<ul style="list-style-type: none"> • Process for applying casting plaster to the bench to produce a reverse mould including coring out and mixing of plaster. • Methods of preparing the reverse mould for casting e.g. sealing, greasing. • Methods of mixing the casting plaster to produce the cast e.g. firstings, secondings. • Methods used to reinforce casts made from reverse moulds e.g. hessian ropes, wooden laths. <p>In-Situ moulds</p> <ul style="list-style-type: none"> • Techniques for taking templates of existing in-situ moulds. • Methods of running moulds in-situ e.g. coring out, topping off. <p>Fixing moulds</p> <ul style="list-style-type: none"> • How to cut mitres including internal and external angles. • Methods of fixing plaster casts e.g. screws, adhesives. • Principles of jointing casts when fixing e.g. leaving gaps, application of plaster to gaps. 	
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Performance Outcome 4: Repair plastering systems

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Plastering Information 	<ul style="list-style-type: none"> • Inspect plastering system for damage. • Remove damaged materials including internal plasting, external render and ornate plaster finishes. • Maintain integrity of plastering system materials and surrounding building fabric. • Match new materials to existing plastering system materials.

Sheets) to employers, those working on the production and installation of plaster-based products and how the tasks are undertaken.

- The identification of hazards and risks associated with plastering tasks and controls that needs to be in place e.g. training, good housekeeping use of PPE.

Communication

- The impact of positive and negative body postures and tone of voice on effective communication.

Information

- Types of information required (e.g. drawings, specifications) and the related symbols, conventions and terminology needed to aid interpretation and development.
- Requirements of building regulations and industry standards e.g. tolerances.

Tools and equipment

- Types of tools and equipment used for plastering tasks including hand and power tools and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. storage.
- Types of fixings (e.g. screws, nails), their characteristics, material properties, stock sizes and suitability for different

- Blend new materials to existing plastering system including internal plaster, external render and ornate plaster finishes.

purposes including compatibility with internal/external situations.

Scientific concepts and principles applied to plastering

- Materials science including plaster classifications, characteristics (including properties) and implications for use in plastering situations (including compatibility); different render materials and products, their classifications, characteristics (including properties) and implications for use in rendering situations(including compatibility).
- The principles (including u-values) of thermal and sound efficiency and the relationship with substrates and plastering materials and techniques.
- Principles of fire protection to include materials used and methods of application.
- Chemical reactions from various plasters and additives and the effect these can have on the finished product.
- Water, moisture and damp, condensation and the importance and implications of damp proofing/tanking including chemical damp proofing.
- Causes, symptoms and rectification of faults in plastering systems.

Maths

- Application of maths including working out quantities both in areas, linear and volume in metric and imperial units of measurement.

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagorus theorem).
- Application of ratios to plastering tasks.

Repairing plastering systems

- Techniques for the inspection of plastering systems
- How to protect surrounding areas when repairing plastering systems.
- Methods for the removal of damaged plaster in various internal plastering systems e.g. repairs to plasterboard, solid walls.
- Techniques for the removal of damaged ornate plaster systems.
- Methods for the removal of damaged renders in various external rendering systems e.g. repairs to plain faced render finishes, light weight render finishes.
- How to reinstate internal plasterwork to various plaster systems e.g. plasterboard, solid walls.
- Reinstating external render systems including joint lines.
- Methods of reinstating ornate plaster systems e.g. matching up to existing work.

Occupational Specialism 3: Bricklaying

Performance Outcome 1: Prepare for the construction of complex masonry structures

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Information Sheets) to employers, those working on the production and installation of mortar-based products and how the tasks are undertaken. • The identification of hazards and risks associated with bricklaying tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. • Content of inductions, method statements and risk assessments. <p>Information</p> <ul style="list-style-type: none"> • Types of information required for the production, assembly and installation of masonry and components (e.g. drawings, specifications, schedules, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development. • Requirements of building regulations and standards e.g. fireplaces, chimneys, flues. • Quality standards applicable to masonry structures. <p>Tools and equipment</p>	<ul style="list-style-type: none"> • Identify information requirements from a brief e.g. size, shape, function, budget. • Use questioning techniques to obtain and clarify information required. • Calculate lengths, heights and openings required to meet specification. • Measure length, height and area. • Interpret scaled drawings in elevation and section. • Inspect tools, equipment and materials for defects. • Mark out measurements for gauge & bonding arrangements. • Inspect equipment and tools for accuracy and fit for purpose. • Select materials and resources required to enable setting out and laying of substructures e.g. concrete, drainage. • Estimate resource requirements e.g. time, materials and equipment (forklift and working platform). • Follow a method statement and risk assessment.

- Types of tools and equipment used for bricklaying (including hand and power tools) and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of tool and equipment maintenance and how to maintain tools.

Scientific concepts and principles applied to bricklaying

- Masonry classifications and the implications of use in bricklaying situations including different load requirements.
- Types and classifications of mortars, techniques for strengthening mortars and the implications of use in different bricklaying situations including different load requirements.
- Types of pointing techniques and materials, their application and suitability for different situations.
- Effects of the external environment including trees and drainage on masonry products.
- Manufacture of brick, blocks and mortars used in construction, their properties, characteristics (e.g. colour, grain) and suitability for different purpose.
- Causes, effects, prevention and treatment of efflorescence.
- The principles of thermal and sound efficiency (including insulation) their purpose, application and installation and the relationship with masonry materials and techniques.
- Movement joints and differential movement.
- Resistance to contaminants and moisture e.g. damp proofing, cavity trays and their purpose, application and installation.
- The relationship between masonry and different forms of construction frames including timber, steel, concrete.

- Chemical reactions from combining masonry materials including sand, cement, lime products, the effect of adding waterproofing chemicals, the effect plasters/mortars have on hardwoods.

Building Technology

- Integral building components (including ties, expansion joints, lintels and bearers), their purpose, application and installation.
- Types of radial and battered brickwork i.e. complex arches, concave and convex brickwork, battered brickwork.
- Types of reinforced brickwork, their purpose, application and installation.
- Different types of openings including arches, fireplaces, chimneys, flues their purpose, application and installation.
- Types of finishes to wall plate and rafter level e.g. corbels.
- Different types of bonds used in masonry structures e.g. herringbone, Flemish.
- Types of cladding systems, including steel and timber, their purpose, application and installation.
- Basic principles of cavity ties and ancillary brick support systems.

Maths

- Application of maths including working out quantities both in areas, linear and volume including 'U' values.
- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) for setting out and verification.
- Application of ratios to bricklaying tasks.

<p>Business/commercial</p> <p>Costs associated with the production, assembly and installation of Masonry products and components including labour, materials, consumables and overheads and how they impact on profitability including wastage.</p>	
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Performance Outcome 2: Construct complex masonry structures

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Information Sheets) to employers, those working on the production and installation of mortar-based products and how the tasks are undertaken. • The identification of hazards and risks associated with bricklaying tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. • Content of inductions, method statements and risk assessments. <p>Information</p> <ul style="list-style-type: none"> • Types of information required for the production, assembly and installation of masonry and components (e.g. drawings, specifications, schedules, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development. 	<ul style="list-style-type: none"> • Present information on constructed masonry to stakeholders (e.g. clients, other trades) orally and in writing. • Operate tools and equipment required for bricklaying tasks. • Mix mortar to application requirements. • Protect integrity and quality of materials during handling and storing e.g. maintaining cleanliness and dryness. • Maintain plumb, line, level and axial deviation. • Construct complex masonry structures including chimney stacks (single-flue, double-flue, decorative) cavity walling (brick and block), inspection chambers, reinforced brickwork. • Produce template for obtuse and acute quoins. • Shape components for obtuse and acute quoins. • Insert obtuse and acute quoins into masonry structures.

- Requirements of building regulations and standards e.g. fireplaces, chimneys, flues.
- Quality standards applicable to masonry structures.

Tools and equipment

- Types of tools and equipment used for bricklaying (including hand and power tools) and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain tools.

Scientific concepts and principles applied to bricklaying

- Masonry classifications and the implications of use in bricklaying situations including different load requirements.
- Types and classifications of mortars, techniques for strengthening mortars and the implications of use in different bricklaying situations including different load requirements.
- Types of pointing techniques and materials, their application and suitability for different situations.
- Effects of the external environment including trees and drainage on masonry products.
- Manufacture of brick, blocks and mortars used in construction, their properties, characteristics (e.g. colour, grain) and suitability for different purpose.
- Causes, effects, prevention and treatment of efflorescence.
- The principles of thermal and sound efficiency (including insulation) their purpose, application and installation and the relationship with masonry materials and techniques.
- Resistance to contaminants and moisture e.g. damp proofing, cavity trays and their purpose, application and installation.

- Set out decorative brickwork features e.g. Victorian weave, quoins.
- Shape masonry products to application requirements.
- Create different types of advanced bonding patterns e.g. Monk bond, Header bond, Sussex Bond, English cross bond.
- Maintain cavity widths and squareness of structure.
- Apply joints to finished masonry structures e.g. flush jointing, half-round.
- Classify and organise waste for disposal.

- The relationship between masonry and different forms of construction frames including timber, steel, concrete.
- Chemical reactions from combining masonry materials including sand, cement, lime products, the effect of adding waterproofing chemicals, the effect plasters/mortars have on hardwoods.
- Movement joints and differential movement.

Building Technology

- Integral building components (including ties, expansion joints, lintels and bearers), their purpose, application and installation.
- Types of radial and battered brickwork i.e. complex arches, concave and convex brickwork, battered brickwork.
- Types of reinforced brickwork, their purpose, application and installation.
- Different types of openings including arches, fireplaces, chimneys, flues their purpose, application and installation.
- Types of finishes to wall plate and rafter level e.g. corbels.
- Different types of bonds used in masonry structures e.g. herringbone, Flemish.
- Types of cladding systems, including steel and timber, their purpose, application and installation.
- Basic principles of cavity ties and ancillary brick support systems.

Maths

- Application of maths including working out quantities both in areas, linear and volume including 'U' values.

<ul style="list-style-type: none"> • Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) for setting out and verification. • Application of ratios to bricklaying tasks. 	
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Performance Outcome 3: Renovate masonry structures

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Information Sheets) to employers, those working on the production and installation of mortar-based products and how the tasks are undertaken. • The identification of hazards and risks associated with bricklaying tasks and controls that needs to be in place e.g. training, good housekeeping, use of PPE. • Content of inductions, method statements and risk assessments. <p>Information</p> <ul style="list-style-type: none"> • Types of information required for the production, assembly and installation of masonry and components (e.g. drawings, specifications, schedules, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development. • Requirements of building regulations and standards e.g. fireplaces, chimneys, flues. 	<ul style="list-style-type: none"> • Assess suitability of information provided e.g. currency, accuracy, sufficiency. • Use questioning techniques to obtain and clarify information required. • Inspect masonry structures for damage. • Remove damaged materials including brickwork, mortar and pointing. • Maintain integrity of masonry structure including materials and surrounding building fabric. • Match masonry to the period of construction including materials, bonding, mortar, finishes, sizes (Imperial to metric). • Blend new masonry products and materials to existing building fabric. • Insert supports to maintain the structural integrity following refurbishment.

- Quality standards applicable to masonry structures.

Tools and equipment

- Types of tools and equipment used for bricklaying (including hand and power tools) and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements of tools and equipment.
- Importance of maintenance and how to maintain tools.

Scientific concepts and principles applied to bricklaying

- Masonry classifications and the implications of use in bricklaying situations including different load requirements.
- Types and classifications of mortars, techniques for strengthening mortars and the implications of use in different bricklaying situations including different load requirements.
- Types of pointing techniques and materials, their application and suitability for different situations.
- Effects of the external environment including trees and drainage on masonry products.
- Manufacture of brick, blocks and mortars used in construction, their properties, characteristics (e.g. colour, grain) and suitability for different purpose.
- Causes, effects, prevention and treatment of efflorescence.
- The principles of thermal and sound efficiency (including insulation) their purpose, application and installation and the relationship with masonry materials and techniques.
- Resistance to contaminants and moisture e.g. damp proofing, cavity trays and their purpose, application and installation.
- The relationship between masonry and different forms of construction frames including timber, steel, concrete.

- Chemical reactions from combining masonry materials including sand, cement, lime products, the effect of adding waterproofing chemicals, the effect plasters/mortars have on hardwoods.
- Movement joints and differential movement.

Building Technology

- Integral building components (including ties, expansion joints, lintels and bearers), their purpose, application and installation.
- Types of radial and battered brickwork i.e. complex arches, concave and convex brickwork, battered brickwork.
- Types of reinforced brickwork, their purpose, application and installation.
- Different types of openings including arches, fireplaces, chimneys, flues their purpose, application and installation.
- Types of finishes to wall plate and rafter level e.g. corbels.
- Different types of bonds used in masonry structures e.g. herringbone, Flemish.
- Types of cladding systems, including steel and timber, their purpose, application and installation.
- Basic principles of cavity ties and ancillary brick support systems.

Maths

- Application of maths including working out quantities both in areas, linear and volume including 'U' values.
- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) for setting out and verification.

Application of ratios to bricklaying tasks.	
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Occupational Specialism 4: Painting and Decorating

Performance Outcome 1: Prepare for the application of surface coatings and wallcoverings

Knowledge Specific to Performance Outcome	Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Substances Hazardous to Health (CoSHH) , Control of Lead at Work Regulations (CLAW), Provision and Use of Work Equipment Regulations (PUWER), and additional guidance (including HSE Working at Height Information Sheets) to employers, those working on the preparation and application of surface coatings and wallcoverings and how the tasks are undertaken. • The identification of hazards (e.g. sharp edges, moving parts, working with chemicals, existing toxic / hazardous materials - lead, asbestos, mould, working at height) and risks associated with applying surface coating and decorating tasks and controls that needs to be in place e.g. training, good housekeeping, personal protective equipment (PPE). <p>Information</p> <ul style="list-style-type: none"> • Types of information required for the preparation and application of surface coatings and wallcoverings (e.g. drawings, specifications, schedules, safety data sheets (MSDS), risk assessments, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development). • How to obtain relevant information from building regulations, standards e.g. for energy efficiency. 	<ul style="list-style-type: none"> • Identify information requirements from a brief e.g. size, shape, function, budget. • Interpret drawings, specifications and schedules. • Use questioning techniques to obtain and clarify information required. • Advise customers on design choices, including colour and products. • Use appropriate terminology with key stakeholders. • Design decorative scheme to meet customer requirements. • Calculate area and volume of different geometric shapes. • Produce scaled drawings by hand in plan, elevation and section. • Inspect materials e.g. for defects. • Prepare working environment for task, including preparation of substrates, removal of existing materials (including wallcoverings, coatings) from surfaces using different methods and materials e.g. heat, liquid, abrasives and making good surfaces with fillers e.g. powder, resin. • Mark out measurements on to materials and backgrounds.

Tools and equipment

- Types of tools and equipment (including hand and power tools) used for access, measuring, marking out, cutting, surface preparation, applications; and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements for tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. cleaning, sharpening, lubricating, storing.
- The environmental impact of tools and equipment.
- Principles of waste management e.g. reduce, reuse, recycle.

Science

- Internal and external environmental effects which may affect the preparation and application of surface coatings and wallcoverings e.g. type of substrate, weather, air conditioning.
- Principles of moisture transmission and ventilation which may affect the preparation and application of surface coatings and wallcoverings, including drying process.

Maths

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) to the preparation and application of surface coatings and wallcoverings.
- Application of ratio, proportion and rates of change to the preparation and application of surface coatings and wallcoverings.

Business/commercial

- Costs associated with the preparation and application of surface coatings and wallcoverings including labour,

- Inspect equipment e.g. calibrated, serviceable.
- Estimate resource requirements e.g. time, materials, equipment availability.
- Follow a method statement.

materials, consumables and overheads and how they impact on profitability including wastage.

Building technology

- Key factors and systems of working in different sectors such as occupied properties, health and education facilities where residents, patients and students may be present.
- Different types of construction materials to be coated and their reaction to coating materials.
- The relationship between the type of building structure and the painting and decorating task to be completed.

Coating science

- Ways in which coatings are classified (including water-borne and solvent-borne coatings systems), their characteristics, their properties and suitability for different purposes.
- Properties of commonly used materials (including modern and traditional coatings) and potential chemical reactions when using common surface coatings and decorating materials e.g. mix ratios, reversible and non-reversible coatings, and adverse reactions with substrates etc.
- Causes and symptoms of defects found in coatings and the implications to their application and the finished effect.

The environmental impact of paint manufacture, use and disposal.

Surface Coating Application

- How to apply different surface coatings' application techniques in complex areas (including ceilings, panels, windows, alcoves) and factors affecting their suitability including for a range of geometric shapes.

- The implications of not following manufacturers' guidance for application, drying and recoating times.
- Principles of good design including colour, contrast, light, shade, patterns, shapes and the required and potential impact.
- How to apply specialist decorative techniques including marbling, stencilling, gilding, graining.
- Techniques for identifying and rectifying coating defects.

Wallcovering and adhesive science

- Ways in which wallcoverings and adhesives are classified, their characteristics, their properties and suitability for different purposes.
- Properties of commonly used materials (including modern and traditional) and potential chemical reactions when using decorating materials e.g. mix ratios, reversible and non-reversible coatings, and adverse reactions with substrates etc.
- Causes and symptoms of defects found in wallcoverings and adhesives and the implications to their application and the finished effect.
- The environmental impact of wallcovering and adhesive manufacture, use and disposal.

Wall Covering

- Principles of good design including pattern types, use of repeats, colour, contrast and the required and potential impact.
- Hanging techniques for differing wallcoverings, their suitability and how they are applied.
- Techniques for dealing with structural complexities (e.g. chimney breasts, openings,) and their applications.

<ul style="list-style-type: none"> • The implications of not following manufacturers' guidance for application, drying and finishing. • The importance of techniques used to reduce wastage. • Techniques for identifying and rectifying wallcovering defects. <p>Preparation Methods</p> <ul style="list-style-type: none"> • Suitability of preparation methods for the task environment. • The importance of protection of work in progress and completed work. • How to apply traditional and modern techniques for different types of surfaces including bare and sound, previously coated substrates; coatings and substrates with defects. 	
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Performance Outcome 2: Apply specialist surface coatings in complex environments

Knowledge	Specialist Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Substances Hazardous to Health (CoSHH) , Control of Lead at Work Regulations (CLAW), Provision and Use of Work Equipment Regulations (PUWER), and additional guidance (including HSE Working at Height Information Sheets) to employers, those working on the preparation and application of surface coatings and wallcoverings and how the tasks are undertaken. • The identification of hazards (e.g. sharp edges, moving parts, working with chemicals, existing toxic / hazardous materials - lead, asbestos, mould, working at height) and risks associated with applying surface coating and decorating tasks and controls that needs to be in place e.g. training, good housekeeping, personal protective equipment (PPE). 	<ul style="list-style-type: none"> • Apply coating techniques (including cutting in) for complex areas including broad, linear and specialist. • Apply water-borne and solvent-borne coatings. • Use different types of equipment including brush, roller, spray, power-assisted rollers, special effect tools. • Inspect finish. • Rectify irregular surface coating problems.

Information

- Types of information required for the preparation and application of surface coatings and wallcoverings (e.g. drawings, specifications, schedules, safety data sheets (MSDS), risk assessments, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development).
- How to obtain relevant information from building regulations, standards e.g. for energy efficiency.

Tools and equipment

- Types of tools and equipment (including hand and power tools) used for access, measuring, marking out, cutting, surface preparation, applications; and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements for tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. cleaning, sharpening, lubricating, storing.
- The environmental impact of tools and equipment.
- Principles of waste management e.g. reduce, reuse, recycle.

Science

- Internal and external environmental effects which may affect the preparation and application of surface coatings and wallcoverings e.g. type of substrate, weather, air conditioning.
- Principles of moisture transmission and ventilation which may affect the preparation and application of surface coatings and wallcoverings, including drying process.

Maths

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) to the preparation and application of surface coatings and wallcoverings.
- Application of ratio, proportion and rates of change to the preparation and application of surface coatings and wallcoverings.

Business/commercial

- Costs associated with the preparation and application of surface coatings and wallcoverings including labour, materials, consumables and overheads and how they impact on profitability including wastage.

Building technology

- Key factors and systems of working in different sectors such as occupied properties, health and education facilities where residents, patients and students may be present.
- Different types of construction materials to be coated and their reaction to coating materials.
- The relationship between the type of building structure and the painting and decorating task to be completed.

Coating science

- Ways in which coatings are classified (including water-borne and solvent-borne coatings systems), their characteristics, their properties and suitability for different purposes.
- Properties of commonly used materials (including modern and traditional coatings) and potential chemical reactions when using common surface coatings and decorating materials e.g.

mix ratios, reversible and non-reversible coatings, and adverse reactions with substrates etc.

- Causes and symptoms of defects found in coatings and the implications to their application and the finished effect.
- The environmental impact of paint manufacture, use and disposal.

Surface Coating Application

- How to apply different surface coatings' application techniques in complex areas (including ceilings, panels, windows, alcoves) and factors affecting their suitability including for a range of geometric shapes.
- The implications of not following manufacturers' guidance for application, drying and recoating times.
- Principles of good design including colour, contrast, light, shade, patterns, shapes and the required and potential impact.
- How to apply specialist decorative techniques including marbling, stencilling, gilding, graining.
- Techniques for identifying and rectifying coating defects.

Wallcovering and adhesive science

- Ways in which wallcoverings and adhesives are classified, their characteristics, their properties and suitability for different purposes.
- Properties of commonly used materials (including modern and traditional) and potential chemical reactions when using decorating materials e.g. mix ratios, reversible and non-reversible coatings, and adverse reactions with substrates etc.
- Causes and symptoms of defects found in wallcoverings and adhesives and the implications to their application and the finished effect.

<ul style="list-style-type: none"> • The environmental impact of wallcovering and adhesive manufacture, use and disposal. <p>Wall Covering</p> <ul style="list-style-type: none"> • Principles of good design including pattern types, use of repeats, colour, contrast and the required and potential impact. • Hanging techniques for differing wallcoverings, their suitability and how they are applied. • Techniques for dealing with structural complexities (e.g. chimney breasts, openings,) and their applications. • The implications of not following manufacturers' guidance for application, drying and finishing. • The importance of techniques used to reduce wastage. • Techniques for identifying and rectifying wallcovering defects. 	
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Performance Outcome 3: Apply specialist wallcoverings in complex environments

Knowledge	Specialist Skills
<p>Health and safety</p> <ul style="list-style-type: none"> • Implications of legislation (including Control of Noise at Work Regulations, Control of Substances Hazardous to Health (CoSHH) , Control of Lead at Work Regulations (CLAW), Provision and Use of Work Equipment Regulations (PUWER), and additional guidance (including HSE Working at Height Information Sheets) to employers, those working on the preparation and application of surface coatings and wallcoverings and how the tasks are undertaken. • The identification of hazards (e.g. sharp edges, moving parts, working with chemicals, existing toxic / hazardous materials - lead, asbestos, mould, working at height) and risks associated 	<ul style="list-style-type: none"> • Measure lengths. • Cut wallcoverings for complex environments, minimising waste. • Apply adhesives to wallcoverings. • Apply techniques for the hanging of a range of wallcoverings including patterned paper, embossed, wide width. • Apply techniques for hanging wallcoverings in complex environment including internal and external angles.

with applying surface coating and decorating tasks and controls that needs to be in place e.g. training, good housekeeping, personal protective equipment (PPE).

Information

- Types of information required for the preparation and application of surface coatings and wallcoverings (e.g. drawings, specifications, schedules, safety data sheets (MSDS), risk assessments, method statements) and the related symbols, conventions and terminology needed to aid interpretation and development).
- How to obtain relevant information from building regulations, standards e.g. for energy efficiency.

Tools and equipment

- Types of tools and equipment (including hand and power tools) used for access, measuring, marking out, cutting, surface preparation, applications; and their characteristics, purpose and suitability for tasks.
- Operation and handling requirements for tools and equipment.
- Importance of maintenance and how to maintain equipment e.g. cleaning, sharpening, lubricating, storing.
- The environmental impact of tools and equipment.
- Principles of waste management e.g. reduce, reuse, recycle.

Science

- Internal and external environmental effects which may affect the preparation and application of surface coatings and wallcoverings e.g. type of substrate, weather, air conditioning.

- Inspect finish.
- Rectify complex wallcovering problems e.g. tears, non alignment of pattern, short cuts, curved lines.

- Principles of moisture transmission and ventilation which may affect the preparation and application of surface coatings and wallcoverings, including drying process.

Maths

- Application of geometry (including angles, shapes, points on a plane, lines and curves, Pythagoras theorem) to the preparation and application of surface coatings and wallcoverings.
- Application of ratio, proportion and rates of change to the preparation and application of surface coatings and wallcoverings.

Business/commercial

- Costs associated with the preparation and application of surface coatings and wallcoverings including labour, materials, consumables and overheads and how they impact on profitability including wastage.

Building technology

- Key factors and systems of working in different sectors such as occupied properties, health and education facilities where residents, patients and students may be present.
- Different types of construction materials to be coated and their reaction to coating materials.
- The relationship between the type of building structure and the painting and decorating task to be completed.

Coating science

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- Properties of commonly used materials (including modern and traditional coatings) and potential chemical reactions when using common surface coatings and decorating materials e.g. mix ratios, reversible and non-reversible coatings, and adverse reactions with substrates etc.
- Causes and symptoms of defects found in coatings and the implications to their application and the finished effect.
- The environmental impact of paint manufacture, use and disposal.

Surface Coating Application

- How to apply different surface coatings' application techniques and factors affecting their suitability including for a range of geometric shapes.
- The implications of not following manufacturers' guidance for application, drying and recoating times.
- Principles of good design including colour, contrast, light, shade, patterns, shapes and the required and potential impact.
- How to apply specialist decorative techniques including marbling, stencilling, gilding, graining.
- Techniques for identifying and rectifying coating defects.

Wallcovering and adhesive science

- Ways in which wallcoverings and adhesives are classified, their characteristics, their properties and suitability for different purposes.
- Properties of commonly used materials (including modern and traditional) and potential chemical reactions when using

decorating materials e.g. mix ratios, reversible and non-reversible coatings, and adverse reactions with substrates etc.

- Causes and symptoms of defects found in wallcoverings and adhesives and the implications to their application and the finished effect.
- The environmental impact of wallcovering and adhesive manufacture, use and disposal.

Wall Covering

- Principles of good design including pattern types, use of repeats, colour, contrast and the required and potential impact.
- Hanging techniques for differing wallcoverings, their suitability and how they are applied.
- Techniques for dealing with structural complexities (e.g. chimney breasts, opening,) and their applications.
- The implications of not following manufacturers' guidance for application, drying and finishing.
- The importance of techniques used to reduce wastage. Techniques for identifying and rectifying complex wallcovering defects e.g. bubbles, non-adhesions, tears, non alignment of pattern, short cuts, curved lines.

Integrating maths, English and digital skills

Maths

The completion of a level 2 mathematics qualification (GCSE mathematics or Functional Skills) is a minimum exit requirement for all T Levels. This will ensure that all students have demonstrated fluency and competence in mathematics, and are able to recognise the importance of mathematics in their own lives, in work and to society. Achievement of a level 2 mathematics qualification will also provide the foundation to access mathematics at a higher level, if required.

Technical Qualifications should contain sufficient and appropriate maths to help students reach the minimum required competence in their chosen specialism(s). The following General Maths Competencies (GMCs) have been developed with input from the Royal Society Advisory Committee on Maths Education (ACME), and awarding organisations will need to embed these, and the underpinning maths, into the specifications and assessments being developed as part of the Technical Qualification.

The GMCs below are relevant to this particular Technical Qualification:

- Communicate using mathematics
- Cost a project
- Estimate, calculate and error-spot
- Measure with precision
- Optimise work processes
- Process data
- Represent with mathematical diagrams
- Understand data
- Use rules and formulae
- Work with proportion.

Awarding organisations that are awarded an exclusive licence will need to integrate these into the Technical Qualification specification and assessments, drawing upon a more detailed framework of maths that underpins the GMCs, currently being developed in association with the Royal Society ACME.

English

The completion of a level 2 English qualification (English language GCSE or Functional Skills) is a minimum exit requirement for all T Levels. This will ensure that all students have demonstrated that they can read fluently, communicate and write effectively, and demonstrate a confident control of Standard English.

The specification for a Technical Qualification should ensure that students acquire the technical vocabulary, and gain the practical communication skills (written and oral), needed to achieve competence in their chosen occupational specialism(s).

The assessments for Technical Qualifications should ensure that students:

- Know the correct technical vocabulary and use it appropriately

- Apply their communication skills (written and oral) appropriately, using Standard English
- Use accurate spelling, punctuation and grammar.

Digital

Technical Qualifications should contain sufficient and appropriate digital skills to help students reach competence in their chosen specialism(s).

This Technical Qualification should support students to develop the digital knowledge and skills needed in order to:

- Adopt professional approaches to using digital communications and social media
- Collate, manage, access and use digital data in spreadsheets, databases and other formats
- Design and create new digital artefacts and materials such as digital writing, digital imaging, digital audio and video, digital code, apps and interfaces and web pages
- Follow licensing guidelines, using only approved and licensed software applications
- Gather and organise information from different digital sources
- Make use of standard analytical tools in applications to better interpret information.

Awarding organisations that are awarded an exclusive licence will need to integrate these into the Technical Qualification specification and assessments.